NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA,
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

Lr No. NUPPL/PSOCP/ GM/FC Compliance/2025/05/28 Date: 22.05.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	**Compliance to the Observations made by Ministry of Environment & Forest (Forest Conservation Division) with respect to Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South OCP in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) dated 4th April, 2025.**
Ref:	1. In Principal/Stage – I approval: Dated-18.09.2024. 2. EDS dated : 04.04.2025

Dear Sir,

Submission of compliance against the EDS dated 04.04.2025 cited in reference – 2.

S. L. No.	Observations raised	Compliance Status
i.	In compliance of condition no. (v), the copy of Wildlife Conservation Plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area along with the fund deposition details has not been submitted.	The Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden of Jharkhand has issued and Sanctioned Order No. 16, dt. 3rd April, 2025 towards **Site Specific Wildlife Management Plan** with reference to Diversion of forest land (located in Dumka Forest Division) for Pachwara South Coal Block Project in favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), District Dumka, State Jharkhand. The total budgetary outlay of **Rs. 5216.98 Lakhs** has been sanctioned to be spend over a period of 10 years commencing from 2026-27 to 2035-36. The Sanction Order along with the approved Site Specific Wildlife Conservation Plan is attached in **Annexure-I.** User Agency NUPPL, has already deposited 2% of the Project Cost amounting to **Rs. 4485.8 Lakhs** towards implementation of the Site

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Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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		Specific Wildlife Plan as per the prevailing circular of MOEF & CC, dt. 7.06.2022 vide **[UTR number: SBINR52025010971616787 dt. 9.1.2025]**. The payment detail is furnished in **Annexure-II.** Now upon issuance of the Sanction Order for implementation of the Site Specific Wildlife Conservation Plan, Divisional Forest Officer Dumka has raised demand for differential amount of **Rs. 731.18 Lakhs** vide his letter no. 841, dt. 12.4.2025. The demand letter is furnished in **Annexure-III.** NUPPL has deposited the differential amount of **Rs. 731.18 Lakhs** in the CAMPA fund **[UTR number – SBIN125108738494]**. The payment detail is furnished in **Annexure-IV.**
ii.	In compliance of condition no. (vi), the copy of approved Catchment Area Treatment Plan for river Bansloi along with the fund deposition details has not been submitted.	The Principal Chief Conservator of Forests, Jharkhand has issued and Sanctioned Order No. 51, dt. 7th April, 2025 towards Catchment Area Treatment Plan with reference to Diversion of forest land (located in Dumka Forest Division) for Pachwara South Coal Block Project in favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), District Dumka, State Jharkhand. The total budgetary outlay of **Rs. 3807.98 Lakhs** has been sanctioned to be spend over a period of 10 years commencing from 2026-27 to 2035-36. The Sanction Order along with the approved Catchment Area Treatment Plan is attached in **Annexure-V.** Now upon issuance of the Sanction Order for implementation of the Catchment Area Treatment Plan, Divisional Forest Officer Dumka has raised demand for an amount of **Rs. 3807.98 Lakhs** vide his letter no. 841, dt. 12.4.2025. The demand letter is furnished in **Annexure-VI.** NUPPL has deposited an amount **Rs. 3807.98 Lakhs** in the CAMPA fund **[UTR number –**

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		SBIN325130810563]. Payment detail is furnished in **Annexure-VII.**
iii.	In compliance of condition no. (vii), the details of fund deposited with regard to the plantation inside safety zone has not been submitted.	Divisional Forest Officer Dumka has raised demand for an amount of **Rs. 898.578 Lakhs** vide his letter no. 1088, dt. 17.5.2025. The demand letter is furnished in **Annexure-VIII.** NUPPL has deposited an amount of **Rs. 898.578 Lakhs** in the CAMPA fund [UTR number - SBIN225141946298]. Payment detail is furnished in **Annexure-IX.**
iv.	**In compliance of condition no. (ix), the shortcomings observed are as under:**	
a.	The copy of CAT Plan of 10 km radius including Chatua nala and other nearby nalas duly approved by the PCCF (HoFF) along with the fund deposition details has not been submitted.	The Principal Chief Conservator of Forests, Jharkhand has issued and Sanctioned Order No. 51, dt. 7th April, 2025 towards Catchment Area Treatment Plan with reference to Diversion of forest land (located in Dumka Forest Division) for Pachwara South Coal Block Project in favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), District Dumka, State Jharkhand. The total budgetary outlay of **Rs. 3807.98 Lakhs** has been sanctioned to be spend over a period of 10 years commencing from 2026-27 to 2035-36. The Sanction Order along with the approved Catchment Area Treatment Plan is attached in **Annexure-X.** NUPPL has deposited an amount **Rs. 3807.98 Lakhs** in the CAMPA fund **[UTR number – SBIN325130810563]**. Payment detail is furnished in **Annexure-XI.**
b.	A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.	A request letter has been submitted to DFO Dumka nominating the names from M/s NUPPL. **Annexure – XII.** DFO Dumka forwarded the letter to PCCF Nodal for constitution of team for monitoring the soil erosion, water conservation, ecological restoration activities during the implementation of the project. **Annexure – XIII.**
c.	The State Government has reported that the User Agency has deposited **Rs.** 11,24,95,000.00	User Agency NUPPL, has deposited 0.5% of the Project Cost amounting to **Rs.**

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	with regard to SMC Plan through online in account of NA, CAMPA. However, as per details shown on the web portal, user agency has deposited Rs. 112145000/- towards SMC plan. This is contradictory and need clarification from the State Government.	**1121.4500 lakhs** towards implementation of the Soil and Moisture Conservation Plan as per the prevailing circular of MOEF & CC, dt. 07.06.2022. The amount was deposited as per the Demand Raised by the Divisional Forest officer the above said amount. There is no such difference between the amount demanded and amount deposited. **Annexure XIV**
v.	In compliance of condition no.(x), the Water Security Plan prepared by the group of experts has not been submitted.	Water Security Plan generally refers to a framework with the primary objective of water conservation in a particular area. In the context of Pachwara South Coal Block Project, it is being submitted that a **Soil & Moisture Conservation (SMC) Plan** with reference to the area within 10 km radius of the lease area has been prepared with the financial outlay of **Rs. 4009.59 lakh**, in compliance of one of the conditions laid under the Stage-I approval of the project. Apart from this, **Catchment Area Treatment (CAT) Plan** with respect to Bansloi river, which flows in the vicinity of the lease area, has been prepared with financial outlay of **Rs. 3809.98 lakh**, taking the treatment area to be within 15 km radius of the lease area. Further, a **Pond De-siltation Plan** with reference to ponds situated within 5 km radius of the lease area has also been prepared with financial outlay of **Rs. 738.57 lakh**. Under the SMC Plan and the CAT Plan, the activities viz. Natural Resource Management, Capacity Building, Awareness Development, Alternative Livelihoods Development, Monitoring & Evaluation etc. have been incorporated. Under Natural Resource Management, various structures viz. earthen check dams, Gully Plugging, Stop Dams, loose boulder structures, water absorption trenches have been proposed to be created. Thus, all the three plans stated above, taken together, shall readily meet the objective of ensuring water sustainability in the area.
vi.	In compliance of condition no.(xi), the KML files of the area under diversion and the accepted	All the requisite KML files has been uploaded in the e-Green watch portal of

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NUPPL, Dumka (Jharkhand)

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	area for raising compensatory afforestation has not been uploaded in the e-Green watch portal of FSI.	FSI as per prevailing norm.
vii.	In compliance of condition no.(xiv), the schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule has not been submitted.	Schedule of Mine Reclamation in accordance to the Approved Mining Plan has been prepared by User Agency and Duly Authenticated by the Divisional Forest Officer is furnished in **Annexure-XV.** An undertaking to surrender the reclaimed Forest Land as per schedule is furnished in **Annexure-XVI.**
viii.	In compliance of condition no. xvi (c), the details of the fund deposited for regeneration in the safety zone area has not been submitted.	Divisional Forest Officer Dumka has raised demand for an amount of **Rs. 898.578 Lakhs** vide his letter no. 1088, dt. 17.5.2025. The demand letter is furnished in **Annexure-XVII.** NUPPL has deposit an amount of **Rs. 898.578 Lakhs** in the CAMPA fund [UTR number - SBIN225141946298]. Payment detail is furnished in **Annexure-XVIII.**
ix.	In compliance of condition no. xvii (a), the copy of the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream has not been submitted.	The Copy of Plan/Scheme with respect to Mitigative Measures to minimize soil erosion and choking stream duly authenticated by Divisional Forest Officer, Dumka is furnished in **Annexure-XIX.**
x.	In compliance of condition no. xvii (b), the copy of the approved Plan/Scheme w.r.t Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion has not been submitted.	The Copy of Plan/Scheme with respect to Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion duly authenticated by Divisional Forest Officer, Dumka is furnished in **Annexure-XX.**
xi.	In compliance of condition no. xvii (c), the copy of the approved Plan/Scheme w.r.t Construction of check dams, retention /toe walls to arrest sliding down of the excavated maternal along the contour has not been submitted.	The Copy of Plan/Scheme with respect to Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour duly authenticated by Divisional Forest Officer, Dumka is furnished in **Annexure-XXI.**
xii.	In compliance of condition no. (xix), the copy of the approved Plan w.r.t plantation and SMC activities to undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer	The Principal Chief Conservator of Forests, Jharkhand has issued and Sanctioned Order No. 50, dt. 7th April, 2025 towards Soil and Moisture Conservation Plan with reference to Diversion of forest land (located in Dumka Forest Division) for Pachwara

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Pachwara South OCP

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	perimeter of the mining lease along with the fund deposition details has not been submitted.	South Coal Block Project in favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), District Dumka, State Jharkhand. The total budgetary outlay of **Rs. 4009.5900 Lakhs** has been sanctioned to be spend over a period of 10 years commencing from 2026-27 to 2035-36. The Sanction Order along with the approved Soil and Moisture Conservation Plan is attached in **Annexure-XXII.** User Agency NUPPL, has already deposited 0.5% of the Project Cost amounting to **Rs. 1121.45 Lakhs** towards implementation of the **Soil and Moisture Conservation Plan** as per the prevailing circular of MOEF & CC, dt. 7.06.2022 vide **[UTR number: SBIN525010857359 dt. 10.1.2025].** The payment detail is furnished in **Annexure-XXIII.** NUPPL has deposited the differential amount of **Rs. 2888.14 Lakhs** in the CAMPA fund **[UTR number – SBIN125108738494, dt – 10.05.2025].** The payment detail is furnished in **Annexure-XXIV.** Provisioning for Gap Plantation to rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease has been covered in the Approved Soil & Moisture Conservation Plan.
xiii.	In compliance of condition no. (xx), the copy of the approved Plan w.r.t desilting of village tanks and other water bodies, located within five km from the mine lease boundary, to mitigate the impact of project on such tanks/water bodies has not been submitted.	The Principal Chief Conservator of Forests, Jharkhand, has Sanctioned the De-siltation Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachwara South Coal Block project in Favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), district Dumka (Jharkhand) vide his Order No. 49, Dated 07.04.2025. A budgetary outlay of **Rs. 738.57 Lakhs** has been estimated towards implementation of the plan. The Sanction order is furnished in **Annexure-XXV.**

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NUPPL, Dumka (Jharkhand)

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		NUPPL has deposited an amount **Rs. 738.57 Lakhs** in the DFO Dumka office treasury through e-grass portal. Payment detail is furnished in **Annexure-XXVI.**
xiv.	In compliance of condition no. (xxiii), the copy of undertaking has not been submitted.	The user agency undertakes the de-siltation of the village tanks and other water bodies located within 5 KM from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies whenever required. An undertaking in this regard is furnished as **Annexure-XXVII.**
xv.	In compliance of condition no. (xxiv), the copy of the approved Scheme w.r.t soil conservation measures along the fund deposition details has not been submitted.	The Principal Chief Conservator of Forests, Jharkhand has issued and Sanctioned Order No. 50, dt. 7th April, 2025 towards **Soil and Moisture Conservation Plan** with reference to Diversion of forest land (located in Dumka Forest Division) for Pachwara South Coal Block Project in favour of M/S Neyveli Uttar Pradesh Power Limited (NUPPL), District Dumka, State Jharkhand. The total budgetary outlay of **Rs. 4009.5900 Lakhs** has been sanctioned to be spend over a period of 10 years commencing from 2026-27 to 2035-36. The Sanction Order along with the approved Soil and Moisture Conservation Plan is attached in **Annexure-XXVIII.** User Agency NUPPL, has already deposited 0.5% of the Project Cost amounting to **Rs. 1121.45 Lakhs** towards implementation of the **Soil and Moisture Conservation Plan** as per the prevailing circular of MOEF & CC, dt. 7.06.2022 vide **[UTR number: SBIN525010857359 dt. 10.1.2025].** The payment detail is furnished in **Annexure-XXIX.** NUPPL has deposited the differential amount of **Rs. 2888.14 Lakhs** in the CAMPA fund **[UTR number – SBIN125108738494, dt – 10.05.2025].** The payment detail is furnished in **Annexure-XXX.** Soil Conservation Measures along with

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		their budgetary outlay has been covered under the Approved Soil and Moisture Conservation Plan with respect to Pachwara South Coal Block of M/S Neyveli Uttar Pradesh Power Limited (NUPPL).

Please find above compliance report for your kind perusal and further necessary actions.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSOCP, NUPPL.

SUNIL KUMAR
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

(9)

Ref-1

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-3464 V.P. dated 29.11.2022 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government & on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand subject to fulfilment of the following conditions:

i. Legal status of the diverted forest land shall remain unchanged;

ii. **Compensatory Afforestation**:

a. *Details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion including the area for safety zone/green belt shall be submitted by the State Government along with the compliance report of the Stage-I approval.*
b. *The non-forest land to be identified shall be transferred and mutated in favour*

of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval.

c. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years.

iii. **Net Present Value:**

a. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

b. At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

iv. *Trees should be felled in a phased manner and when become absolutely necessary and under strict supervision of State Forest Department and wherever feasible suitable species should be transplanted.*

v. *The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.*

vi. *As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*

vii. *Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost.*

viii. *A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*

ix. *User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be*

repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

x. *As recommended by the State, the Water security plan prepared by the group of experts shall be adhered to.*

xi. The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;

xii. All the funds received from the user agency under the project shall be transferred/depsoted in CAMPA account only through **e-portal** (https://parivesh.nic.in/); Amount depsoted through other mode will not be accepted as compliance of the Stage-I clearance;

xiii. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent Reclamation Plan as per the approved Mining Plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

xiv. The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

xv. The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

xvi. Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:

a. User agency shall ensure demarcation of safety zone (7.5 meter strip all

along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department;

b. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
c. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department; and
d. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

xvii. Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department:

a. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;
b. Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved Plan/scheme;
c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;
d. Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and
e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

xviii. The validity of approval granted under the Adhiniyam shall be for a period co-terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;

xx. The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

xxi. The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;

xxii. Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

xxiv. The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and

xxv. Under no circumstances, approval granted for the use of forest land for underground mining, shall subsequently be converted to opencast mining operations.

xxvi. The R&R Plan shall be implemented as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones;

xxvii. The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled;

xxviii. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

xxix. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

xxx. No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

xxxi. The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;\The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;

(14)

xxxii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

xxxiii. No damage to the flora and fauna of the adjoining area shall be caused;

xxxiv. The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;

xxxv. The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

xxxvi. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency; and

xxxvii. Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 as issued by this Ministry's letter dated 29.12.2023;

xxxviii. The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Signed by
Dheeraj Mittal
Date: 18-09-2024 14:10:45

Yours sincerely,

(Dr. Dheeraj Mittal)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi for uploading on PARIVESH portal.

Ref-2

(15)

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-1157 V.P. dated 26.03.2025 on the above mentioned subject, forwarding the information on the compliance of conditions stipulated in the *in-principle approval* dated 18.09.2024 and to say that examination of same revealed following shortcomings:

i. In compliance of condition no. (v), the copy of Wildlife Conservation Plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area along with the fund deposition details has not been submitted.
ii. In compliance of condition no. (vi), the copy of approved Catchment Area Treatment Plan for river Bansloi along with the fund deposition details has not been submitted.
iii. In compliance of condition no. (vii), the details of fund deposited with regard to the plantation inside safety zone has not been submitted.
iv. In compliance of condition no. (ix), the shortcomings observed are as under:

a. The copy of CAT Plan of 10 km radius including Chàtua nala and other nearby nalas duly approved by the PCCF (HoFF) along with the fund deposition details has not been submitted.
b. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.
c. The State Government has reported that the User Agency has deposited Rs. 11,24,95,000.00 with regard to SMC Plan through online in account of NA,

(16)

CAMPA. However, as per details shown on the web portal, user agency has deposited Rs. 112145000/- towards SMC plan. This is contradictory and need clarification from the State Government.

v. In compliance of condition no.(x), the Water Security Plan prepared by the group of experts has not been submitted.
vi. In compliance of condition no.(xi), the KML files of the area under diversion and the accepted area for raising compensatory afforestation has not been uploaded in the e-Green watch portal of FSI.
vii. In compliance of condition no.(xiv), the schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule has not been submitted.
viii. In compliance of condition no. xvi (c), the details of the fund deposited for regeneration in the safety zone area has not been submitted.
ix. In compliance of condition no. xvii (a), the copy of the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream has not been submitted.
x. In compliance of condition no. xvii (b), the copy of the approved Plan/Scheme w.r.t Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion has not been submitted.
xi. In compliance of condition no. xvii (c), the copy of the approved Plan/Scheme w.r.t Construction of check dams, retention /toe walls to arrest sliding down of the excavated maternal along the contour has not been submitted.
xii. In compliance of condition no. (xix), the copy of the approved Plan w.r.t plantation and SMC activities to undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease along with the fund deposition details has not been submitted.
xiii. In compliance of condition no. (xx), the copy of the approved Plan w.r.t desilting of village tanks and other water bodies, located within five km from the mine lease boundary, to mitigate the impact of project on such tanks/water bodies has not been submitted.
xiv. In compliance of condition no. (xxiii), the copy of undertaking has not been submitted.
xv. In compliance of condition no. (xxiv), the copy of the approved Scheme w.r.t soil conservation measures along the fund deposition details has not been submitted.

Accordingly, it is requested to furnish the above mentioned information to this Ministry for further consideration of the proposal.

Yours sincerely,

Digitally signed by
SUNEET BHARDWAJ
Date: 04-04-2025
18:09:19

Sd/-
(Suneet Bhardwaj)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF & CC, New Delhi for uploading on PARIVESH portal.

Annexure-I (18)

Office of the Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Jharkhand.

Van Bhawan, Doranda, Ranchi-834002

Email:pccf-wildlife@gov.in; Phone No. 0651-2481744

Office Order No. ...16..... **Dated.03/04/2025**

Sanction Order of the Site-Specific Wildlife Management Plan with reference to diversion of forest land (located in Dumka Forest Division) for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, Jharkhand State.

The instant Site-Specific Wildlife Management Plan (referred to as *'the SSWMP'* hereinafter) has been prepared in pursuance of compliance of the condition mentioned at S. No. v. & viii. of the in-principle approval order issued by the Forest Conservation Division, Ministry of Environment, Forest and Climate Change, Govt. of India vide F. No. 8-37/2022-FC dated 18th September, 2024 for diversion of 455.1108 ha of forest land in Dumka district for Pachwara South Coal Block Project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (referred to as *'NUPPL'* hereinafter).

The aforesaid condition laid by the Forest Conservation Division, Ministry of Environment, Forest and Climate Change, Govt. of India reads as follows:

> *"v. The State Govt. shall prepare and implement Wildlife Conservation Plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost."*
>
> *"**viii.** A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost."*

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachwara South Coal Block is bounded by Pachwara Central Coal Block in the North and Pachwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while Pachwara South Block falls in Dumka Forest Division, both Pachwara Central and Pachwara North Blocks lie in Pakur Forest Division. Both Pachwara Central and Pachwara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects, subject to certain conditions including preparation and approval of Site-specific Wildlife Conservation plan independently against the two projects. In order to comply with the said condition laid by MoEF&CC, GoI, the respective user agencies have prepared Wildlife Conservation Plans which have duly been approved by the undersigned. Notably, the said wildlife conservation plans have been formulated restricting the respective project impact areas

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

within Pakur forest division; within 10 km periphery of the lease in case of Pachwara North and within 10-20 km distance from the lease in case of Pachwara Central. Therefore, in the best interest of the conservation needs of the area, the instant Wildlife Management Plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions within 10 km radius of the boundary of the coal block. Further, enrichment of elephant movement paths, both within the territorial jurisdiction of Dumka and Godda divisions, has also been prescribed under this Plan.

In the above stated background, the User Agency (NUPPL), in pursuance of complying with the aforesaid conditions laid by the Central Government, has prepared the instant SSWMP in consultation with the forest officials of Dumka and Godda forest divisions. Regional Chief Conservator of Forests, Santhal Pargana, Dumka vide his letter no. 365 dated 10.03.2025.has submitted the plan to the office of the undersigned for its due sanction.

While considering the plan for its approval, a meeting was arranged by the undersigned on 24.03.2025, in which the User Agency made a power point presentation. Conservator of Forests, Territorial Circle, Dumka; Divisional Forest Officers, Dumka Forest Division; Divisional Forest Officers, Godda Forest Division; Shree Rajeev Ranjan, Retd. IFS; Shree Gotte Ramesh, General Manager/ Project Head, Pachwara South Coal Block, NUPPL, Dumka; Shree Deepak Vincent Surin, Dy. Chief Engineer; Shree Vinod Kumar Prasad, Addl. Chief Manager attended the meeting.

The Impact Area consists of altogether 169 numbers of villages, 133 in Dumka Forest Division and 36 in Godda Forest Division. The areas of villages which fall partly outside the 10 km boundary have also been considered for prescribing management interventions under the plan. The geographical extent of the Impact Area thus delineated is about 257.73 sq. km.

Chapter 3 of the Plan deals with the impact of the Project on environment. Environmental impacts of mining operations are numerous and diverse. It includes land degradation, noise, dust, poisonous gases and pollution of water and so on. The most immediate environmental impact of open cast mining is the loss of habitat. A vast stretch of land cleared for mining operations displaces flora and fauna, causing a ripple effect throughout the ecosystem. Species lose not only their homes but also their food sources, and the delicate balance of the local biodiversity is upset. Chapter 4 of the Plan discusses objectives of management and strategies to address the wildlife conservation issues. Chapter 5 of the Plan deals with management interventions to be carried out by the Project Proponent within the project area. Chapter 6 exclusively deals with delineation of elephant movement paths in Dumka and Godda forest divisions and its enrichment. It has been proposed under this Plan to enrich the areas falling within 01 (one) km of distance, on both sides of the elephant movement path, with plantation of species which are preferred by elephants as well as silvicultural operations in forest areas and decongestion of bamboo clumps. Towards this end, villages involved in the pathways of elephants have been pinpointed. It may also be noted that the delineated elephant movement path passes through the Impact Area too. Thus, the enrichment activities with respect to the

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

elephant movement path are planned to extend within and beyond the Impact Area. Chapter 7 deals with proposed interventions to be carried out by the Forest Department under the Plan whereas Chapter 8 mentions the financial forecast against the proposed interventions.

It would be pertinent to mention here that in compliance of one of the conditions laid by MoEF&CC towards Forest Clearance to the Project, a dedicated Soil and Moisture Conservation Plan has been prepared for the area within 10 km periphery of the lease boundary. A Catchment Area Treatment Plan with respect to Bansloi River taking the Impact Area between 10 and 15 km of radius from the periphery of mining lease area has also been prepared. Therefore, measures towards soil and moisture conservation within 15 km radius of the lease periphery have not been included under the instant Plan. However, certain check dams have been proposed to be constructed under this plan beyond the 15 km boundary of the lease area so as to meet the water requirement of elephants in and around the elephant movement path.

The total cost to the User Agency towards implementation of the Site-Specific Wildlife Management Plan is Rs. **5216.98 Lakhs** spread over a period of 10 years **(2026-27 to 2035-36)**. The financial projection under the Plan under various broad heads may be tabulated as follows:

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakhs)		
		Dumka Forest Division	Godda Forest Division	Total
A.	Habitat Management	802.24	547.42	1349.66
B.	Enrichment of the Elephant Movement Path	1634.15	449.17	2083.32
C.	Human-Elephant Conflict Management	70.00	35.00	105.00
D.	Awareness Development Programmes	50.00	25.00	75.00
E.	Capacity Development Programmes for Frontline Forest Staff	50.00	25.00	75.00
F.	Development of Alternative Livelihoods	200.00	100.00	300.00
G.	Promotion of Alternative Energy Consumption	50.00	25.00	75.00
H.	Development and Implementation of appropriate Monitoring & Evaluation System	18.00	9.00	27.00
I.	Infrastructural Strengthening	125.00	62.50	187.50
J.	Miscellaneous & Administrative Expenses	50.00	20.00	70.00
K.	Total	3049.39	1298.09	4347.48
L.	Cost Escalation Provision @20%	609.88	259.62	869.50
M.	Grand Total	3659.27	1557.71	5216.98

Considering the proposals under the plan, sanction is hereby accorded to the instant SSWMP subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report the occurrence of any forest/wildlife crime in the area to the nearest forest office/official.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Further, they will extend their full co-operation to the forest officials in control/ mitigation of any incident, natural or man made, detrimental to forest and wildlife in their area of operation.

(ii) That the total amount of Rs. 5216.98 lakhs involved under the instant SSWMP shall be deposited by the User Agency in CAMPA Account under the relevant head/ sub-head and shall be utilized by the State Forest Department. Out of the said 5216.98 lakh, a total of Rs. 3659.27 lakhs shall be spent through DFO, Dumka Forest Division whereas Rs. 1557.71 lakhs shall be spent through DFO, Godda Forest Division over a period of ten years from FY 2026-27 to FY 2035-36.

(iii) That the DFO, Dumka Forest Division and the DFO, Godda Forest Division shall prepare detailed Annual Plan of Operations (APO) for execution of activities provided under the Plan with reference to their respective areas of jurisdiction, following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/ Forest Department. Regional Chief Conservator of Forests, Santhal Pargana Dumka shall accord sanction to the said APOs following due process and he/ she will closely monitor the progress of the activities undertaken by the two divisions. DFOs shall carry out the activities as per the duly sanctioned APOs. Conservator of Forests, Territorial Circle, Dumka shall supervise all the activities as per directions issued by the Forest Department from time to time.

(iv) That the DFOs shall ensure that no violation of duly sanctioned Working Plan of Dumka and Godda forest divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(v) That the instant SSWMP may be revisited after three years and a revised plan may be formulated as per need and convenience of the implementing agencies. The revised plan, if any, shall be put up before the Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Jharkhand for its approval.

(vi) That though adequate provision has been made towards cost escalation in the plan on account of increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, Dumka Forest Division as well as to the Divisional Forest Officer, Godda Forest Division, to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, after 3 years from inception year of the plan.

Sd/-
Principal Chief Conservator of Forests
Wildlife & Chief Wildlife Warden,
Jharkhand, Ranchi.

GOTTE RAMESH
General Manager Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Memo No.- 941(WL)P/2024-25-…….. Dated:……..

Copy forwarded to Deputy Director General (C), Ministry of Environment, Forests and Climate Change, Integrated Regional Office, 2nd Floor, Jharkhand State Housing Board (HQ), Harmu Chowk, Ranchi -834002 [E-mail: *ro.ranchi-mef@gov.in*] / Secretary, Department of Forests, Environment and Climate Change, Govt. of Jharkhand, Ranchi/ Principal Chief Conservator of Forests, Jharkhand, Ranchi for information.

Sd/-
Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden,
Jharkhand, Ranchi.

Memo No.- 941(WL)P/2024-25-…….. Dated:……..

Copy forwarded to PCCF –cum- Executive Director, Wasteland Development Board, Jharkhand, Ranchi/ Addl. PCCF, CAMPA, Jharkhand, Ranchi with a copy of the Plan.

Sd/-
Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden,
Jharkhand, Ranchi.

Memo No.- 941(WL)P/2024-25-…….. Dated:……..

Copy forwarded to Regional Chief Conservator of Forests, Santhal Pargana, Dumka/ Conservator of Forests, Territorial Circle, Giridih/ Divisional Forest Officer, Giridih East Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden,
Jharkhand, Ranchi.

Memo No.- 941(WL)P/2024-25-336 Dated:..03/04/2025..

Copy forwarded to General Manager/ Project Head, Pachwara South Coal Block, NUPPL, Dumka [E-mail: *gotte.ramesh@nlcindia.in*] for information and necessary action.

Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden,
Jharkhand, Ranchi.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex-II

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	5-8598234503	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958885 2_FPJHMIN598232020_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020629	5-8598236291	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 288814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 361932000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	5-8598234091	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_4f380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020708	5-8598237081	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 112 0/-	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUVPL, Dumka (Jharkhand)

	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	5859823337	18 Sep 2024	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 0/- , Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 448580000/- Addl CA : 0/- CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 448580000/-	Paid	Fund Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	Demand Letter (../writereaddata/Fundpdf/0501202519210812_FPJHMIN598232020_User_Fund_Demanded_84333.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	5859823337	18 Sep 2024	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 617635418/- , NA : 0/- NA : 0/- NA : 0/- Total : 617635418/- Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On :20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :20 Dec 2024 Transaction Date :21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/141220241636512671_FPJHMIN598232020_User_Fund_Demanded_84333.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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For any Technical support, Please Contact EFCCID, NIC, New Delhi monitoring-fc(at)nic(dot)in

Annexure - III

(25)

कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101

E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

पत्रांक– 841 दिनांक– 12-4-25

सेवा में,

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय : Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

प्रसंग : प्रधान मुख्य वन संरक्षक, झारखण्ड, रांची के कार्यालय आदेश सं0–49, 50, 51 तद्नुसार ज्ञापांक–911, 912, 913 दिनांक–07.04.2025 तथा प्रधान मुख्य वन संरक्षक, वन्यप्राणी एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची के कार्यालय आदेश सं0–16 तद्नुसार ज्ञापांक–336 दिनांक–03.04.2025

महाशय,

उपर्युक्त विषयक प्रसंग में सूचित करना है कि Pachwara South Coal Block project हेतु भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली का पत्र दिनांक–18.09.2024 द्वारा In-principle/Stage-I की स्वीकृति प्रदान की गई है। In-principle/Stage-I के शर्त्त सं0–v, viii (IWMP), vi, ix (CAT for Bansloi river & SMC Plan), ix, xix, xxiv (CAT Plan) & xxiii (De-Silting Plan) की स्वीकृति प्राप्त है। भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली के पत्र संख्या–FC-11/43/2021-FC दिनांक–07.6.2022 के आलोक में उक्त कार्यों के लिए आपके द्वारा जमा की गई राशि तथा अवशेष जमा की जानेवाली राशि निम्नवत् है :–

शर्त्त सं0	शर्त्त	स्वीकृत राशि (लाख में)	पूर्व में Adhoc CAMPA में जमा की गई राशि (लाख में)	जमा की जानेवाली अवशेष राशि (लाख में)
1	2	3	4	5
v.	The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.	5216.98000	4485.80000	731.18000
viii.	A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.			

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka, Jharkhand

P.T.O.

शर्त संo	शर्त	स्वीकृत राशि (लाख में)	पूर्व में Adhoc CAMPA में जमा की गई राशि (लाख में)	जमा की जानेवाली अवशेष राशि (लाख में)
1	2	3	4	5
vi.	As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost			
ix.	User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.	3807.98000	0.00000	3807.98000
ix.	User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.	4009.59000	1121.45000	2888.14000
xix.	The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;			
xxiv.	The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and			

GOTTE RAMESH
Padmavathi South OCP
NLPPL Durgapur (Chhattisgarh)

अनुरोध है कि अवशेष राशि नियमानुसार जमा किया जाय तथा राशि जमा करने संबंधी E-Payment/ Challan की प्रति इस कार्यालय में समर्पित करना सुनिश्चित करें। आर०टी०जी०एस० / नेफ्ट / डी०डी० / कैश या अन्य किसी माध्यम से जमा की गई राशि को स्वीकार नहीं किया जायेगा।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ई-मेल

ज्ञापांक–...841..... दिनांक–...12-4-25... 12/4/25 12-4-25

प्रतिलिपि:– वन संरक्षक, प्रादेशिक अंचल, दुमका / क्षेत्रीय मुख्य वन संरक्षक, संथाल परगना, दुमका / प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची / प्रधान मुख्य वन संरक्षक, वन्यप्राणी एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची तथा प्रधान मुख्य वन संरक्षक, झारखण्ड, रांची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।
12/4/25 12-4-25

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - IV

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	598234502	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN598232020_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project	MIN598232020629	598236291	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 288814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 361932000/-	Paid	Fund Demand Verified by Nodal Officer On :15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :16 Apr 2025 Transaction Date :18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project	MIN598232020409	598234091	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On :31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_49380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project	MIN598232020708	598237081	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 112	Paid	Fund Demand Verified by Nodal Officer On :10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :10 Jan 2025 Transaction Date :10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

	FP/[illegible]/MIN/[illegible]/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59[illegible]20/[illegible]	58[illegible]334	Sep[illegible]4	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 448580000/-	Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Wild Life Management Plan : 448580000/-	Paid	Fund Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	Demand Letter (../writereaddata/Fundpdf/85012[illegible]1921[illegible]0812_FPJHMIN598232020_User_Fund_Demand[illegible]6b[illegible]x) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	5859823337	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 617635418/-, NA : 0/-, NA : 0/-, NA : 0/-, Total : 617635418/-	Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On :20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :20 Dec 2024 Transaction Date :21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/14122024163651267l_FPJHMIN598232020_User_Fund_Demanded_84333.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337) GOTTE RAMESH General Manager/Project Head Pachwara South OCP NUPPL Dumka (Jharkhand)

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For any Technical support, Please Contact EFCCID, NIC, New Delhi, monitoring-fc(at)nic(dot)in

Annexure - V

(30)

Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no - 22 वि०-2(2)-06/2022.....

Office order No. 51 **dated** 01/04/2025

Sanction Order of the Catchment Area Treatment Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka,

The Instant Catchment Area Treatment Plan has been submitted by M/s Neyveli Uttar Pradesh Power Ltd. (referred to as "the Use Agency") in pursuance of the following condition laid by MoEF&CC under Section 2(1)(ii) of condition no. (VI), and (IX) of Stage-1 approval vide letter no. 8-37/2022-FC dated 18.09.2024 for non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

The aforesaid Term of Reference laid by the Central Government reads as follows:

Condition no. 2(1) (ii) : ***<u>Compensatory Afforestation;</u>***

Condition No. (ii)(vi): *"As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment Area Treatment Plan for river Bansloi shall be prepared and implemented at project cost."*

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Condition No. (ii)(ix): *" The User Agency shall prepare a Digital Elevation Model of 10 km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chotua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department Subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.."*

2. In compliance of the aforesaid condition laid by MoEF&CC, the User Agency M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL) has Submitted a Catchment Area Treatment Plan for diversion of forest land proposal of Pachhawara South Coal Block project prepared in consultation with the forest officials including DFO, Dumka and DFO, Godda Forest Division, the Conservator of Forest Territorial Circle (CF), Dumka and Regional Chief Conservator of Forest (RCCF), Dumka.

3. In the above stated background, the Regional Chief Conservator of Forests, (RCCF), Dumka vide his letter no. 366 dated 10.03.2025 submitted the Plan to office of the undersigned for its consideration for sanction.

4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forest, Dumka, CF Territorial Circle, Dumka, DFO, Dumka, Godda and User Agency vide this office letter no. 795 dated 24.03.2025 to arrange a Power-Point Presentation of the plan in meeting scheduled on 26.03.2025 in the conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests, Dumka and Divisional Forest Officer, Dumka and DFO Godda Forest Division (DFO, Dumka and Pakur on video conferencing). Shri

GOPI RAM
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Deepak Vincent Surin (NUPPL) G.M. Project Head, Pachwara South Coal Block, Shri Rajeev Ranjan, Representative (NUPPL) and Shri Kislay Kumar, Director, Ecosofet Pvt. Ltd., Consultant were present during the presentation.

5. After deliberation on various provisions of the proposed Plan and the presentation, it was observed that:-

(i) Pachawara South Coal Block is bounded by Pachawara Central Coal Block in the North and Pachawara North Coal Block in further North. All these three Blocks form somewhat a continuum. Pachawara South Block falls in Dumka Forest Division, both Pachawara Central and Pachawara North Blocks lie in Pakur Forest Division, Bansloi river being the bifurcating boundary between Dumka and Pakur Forest division/districts. Both Pachawara Central and Pachawara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the User Agency. The User Agency has prepared the said plans which have duly been approved by the competent authorities. Notably, the said plans have been formulated restricting impact area within Pakur forest division.

(ii) The Impact Area (IA) of instant Catchment Plan falls within the surrounding area (10 km radius) of Dumka and Godda Forest Division.

(iii) During the deliberation and presentation it was informed that the Impact Area (IA) delineated for the formulation of this Catchment Area Treatment (CAT) Plan of altogether 203 number of villages, 158 in Dumka Forest Division and 45 in Godda Forest Division.

It was also informed that the areas of villages which fall partly outside the 10-15 km boundary have also been considered for prescribing management interventions under the CAT Plan. The same rational has been utilized while formulating the SMC Plan, meaning thereby, the villages falling partly within and partly outside the 10 km boundary have been considered under the SMC

GOTTE RAMESH
General Manager & Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Plan, thus bringing all villages coming within 15 km periphery of the lease boundary under line of treatment. The Plan Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla.

6. The cost of the proposed 10-year (2026-27 to 2035-36) Catchment Area Treatment Plan with respect to the activities to be carried out by DFO, Dumka Forest Division and DFO, Godda Forest Division have been estimated to be Rs. 3807.98 lakh. The summary of the proposed interventions (component wise) under the Plan is as follows:-

The Proposed financial projection under the Plan may be summarized in the following table-

Sl. No	Activity Head	Dumka Forest Division (Rs. In Lakh)	Godda Forest Division (Rs. In Lakh)	Total (Rs. In Lakh)
1.	Natural Resource Management /Catchment Area Treatment Measures	1976.69	776.11	2752.80
2.	Capacity Building Frontline Forest Staff	22.00	12.50	34.50
3.	Awareness Development Programmes	20.00	10.00	30.00
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	80.00	25.00	105.00
5.	Monitoring and Evaluation	10.00	6.00	16.00
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	115.00	55.00	170.00
7.	Administrative Cost	50.00	15.00	65.00
	Sub-total	**2273.69**	**899.61**	**3173.30**
	Escalation cost @20%	**454.73**	**179.95**	**634.68**
	Grand Total Cost	**2728.42**	**1079.56**	**3807.98**

Cost to the User Agency towards implementation of the CAT Plan is Rs. 3807.98 Lakh.

7. The Plan with a total financial outlay of **Rs.** 3807.98 **Lakh** extends over a period of 10 years and shall be utilized by the Forest Department through the

GOTTE RAMESH
General Manager (Project)
Pachwara South OCP
UPPL, Dumka (Jharkhand)

DFO, Dumka Forest Division and DFO, Godda Forest Division in accordance with the Plan prescriptions.

8. Considering the proposals under the plan submitted by the User Agency and recommendations of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man-made, determined to forest and wildlife in their area of operation.

(ii) That the total amount of **Rs.** 3807.98 **Lakh (Rupees Thirty Eight crore seven lakh and ninety eight thousand only)** shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO, Dumka Forest Division and DFO, Godda Forest Division as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, the DFO, Dumka Forest Division and DFO, Godda Forest Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/Forest Department. Regional Chief Conservator of Forests, Dumka shall supervise & closely monitor the progress of the activities undertaken by DFO, Dumka Forest Division and

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

DFO, Godda Forest Division as per the approved APO & funds released under CAMPA.

(iv) That the Conservator of Forests, Dumka Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the DFO, Dumka Forest Division and DFO, Godda Forest Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.

(vi) That both the DFOs shall ensure that no violation of duly sanctioned Working Plans of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(vii) That the instant Plan is dynamic and be revisited after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirement.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, DFO, Dumka and DFO, Godda Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owning to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

File no.- 22 वी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 वी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Territorial Circle, Dumka/ DFO, Dumka Forest Division / DFO, Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 वी०-2(2)-06/2022 Memo No. 913 dated 07.08.2025

Copy forwarded to M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, for information and necessary action.

07/08/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - VI

37

कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101

E-mail- dfo-dumka@gov.in dfodumka@gmail.com

पत्रांक– 811 दिनांक– 12-11-25

सेवा में,

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय : Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

प्रसंग : प्रधान मुख्य वन संरक्षक, झारखण्ड, रांची के कार्यालय आदेश सं0–49, 50, 51 तद्नुसार ज्ञापांक–911, 912, 913 दिनांक–07.04.2025 तथा प्रधान मुख्य वन संरक्षक, वन्यप्राणी एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची के कार्यालय आदेश सं0–16 तद्नुसार ज्ञापांक–336 दिनांक–03.04.2025

महाशय,

उपर्युक्त विषयक प्रसंग में सूचित करना है कि Pachwara South Coal Block project हेतु भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली का पत्र दिनांक–18.09.2024 द्वारा In-principle/Stage-I की स्वीकृति प्रदान की गई है। In-principle/Stage-I के शर्त्त सं0–v, viii (IWMP), vi, ix (CAT for Bansloi river & SMC Plan), ix, xix, xxiv (CAT Plan) & xxiii (De-Silting Plan) की स्वीकृति प्राप्त है। भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली के पत्र संख्या–FC-11/43/2021-FC दिनांक–07.6.2022 के आलोक में उक्त कार्यों के लिए आपके द्वारा जमा की गई राशि तथा अवशेष जमा की जानेवाली राशि निम्नवत् है :–

शर्त्त सं0	शर्त्त	स्वीकृत राशि (लाख में)	पूर्व में Adhoc CAMPA में जमा की गई राशि (लाख में)	जमा की जानेवाली अवशेष राशि (लाख में)
1	2	3	4	5
v.	The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.	5216.98000	4485.80000	731.18000
viii.	A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.			

P.T.O.

BOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

शर्त सं0	शर्त	स्वीकृत राशि (लाख में)	पूर्व में Adhoc CAMPA में जमा की गई राशि (लाख में)	जमा की जानेवाली अवशेष राशि (लाख में)
1	2	3	4	5
vi.	As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost			
ix.	User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.	3807.98000	0.00000	3807.98000
ix.	User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.	4009.59000	1121.45000	2888.14000
xix.	The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;			
xxiv.	The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and			

P.T.O.

अनुरोध है कि अवशेष राशि नियमानुसार जमा किया जाय तथा राशि जमा करने संबंधी E-Payment/ Challan की प्रति इस कार्यालय में समर्पित करना सुनिश्चित करें। आर0टी0जी0एस0 / नेफ्ट / डी0डी0 / कैश या अन्य किसी माध्यम से जमा की गई राशि को स्वीकार नहीं किया जायेगा।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ज्ञापांक– 841 दिनांक– 12-4-25

ई–मेल

प्रतिलिपि:– वन संरक्षक, प्रादेशिक अंचल, दुमका / क्षेत्रीय मुख्य वन संरक्षक, संथाल परगना, दुमका / प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची / प्रधान मुख्य वन संरक्षक, वन्यप्राणी एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची तथा प्रधान मुख्य वन संरक्षक, झारखण्ड, रांची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

GOTTE RAMESH
General Manager/Project Head
Pachwara South CCP
NUPPL, Dumka (Jharkhand)

Annx - VII

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202045	85982345	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN59823202O_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN59823202045O)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202062	85987362	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 286814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 381932000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN59823202O_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN59823202062O)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202040	85982340	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN59823202O_User_Fund_Demanded_4H380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN59823202040O)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202070	85982370	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 112[illegible] 0/-	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN59823202O_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN59823202070O)

GOTTE RAMESH
General Manager/Project In-
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

	FP[illegible]MIN[illegible]023/[illegible] (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	IN5[illegible]2023[illegible]5585[illegible]2334[illegible]	Sep[illegible]24	R[illegible] PCA: 0/- , Safety Zone: 0/- , NPV: 0/- , Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 448580000/-	[illegible] CA 0/- CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 448580000/-	Paid	Fur[illegible] Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	[illegible]ter (../W[illegible]:addata/Fundpdf/05012025192149O812_FPJHMIN598232020_User_Fund_Demanded_68933.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	5859823337	18 Sep 2024	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 61763541 8/- , NA : 0/- NA : 0/- NA : 0/- Total : 61763541 8/-	Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On :20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :20 Dec 2024 Transaction Date :21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/141220241636512671_FPJHMIN598232020_User_Fund_Demanded_84333.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager/Project Hea.
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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(HTTP://WWW.PMINDIA.GOV.IN/EN/) NIC (HTTP://WWW.NIC.IN/)

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For any Technical support, Please Contact EFCCID, NIC, New Delhi, monitoring-fc(at)nic(dot)in

Annex - VIII

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कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101

E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

पत्रांक–1088 दिनांक–17-5-25

सेवा में,

ई-मेल

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय :– Pachwara South Coal Block project in favour of M/S Neyveli Uttar Pradesh Power Limited- Request for raising the demand note for submission of cost towards the implementation of plantation activity within the safety zone of Pachwara South Coal Block after complying the clarification from PCCF NODAL.

प्रसंग :– आपका पत्र संख्या–NUPPL/PSCMP/GM/Satety zone/2025/04/15 dt.16.04.2025 एवं पत्र संख्या–NUPPL/PSOCP/GM/Satety zone/2025/04/14 dt.16.05.2025 तथा इस कार्यालय का पत्रांक–1047 दिनांक–10.05.2025

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में सूचित करना है कि भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली का पत्र दिनांक–18.09.2024 In-principle/Stage-I की शर्त्त सं0–vii तथा आपत्ति पत्र दिनांक–04.04.2025 के बिन्दु सं0–iii & viii आलोक में "Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost." हेतु **संशोधित** स्थल विशिष्ट प्राक्कलन पत्र के साथ संलग्न भेजी जा रही है।

अनुरोध है कि स्थल विशिष्ट कुल प्राक्कलित राशि–8,98,57,800.00 (आठ करोड़ अनठानवे लाख सत्तावन हजार आठ सौ) रू0 मात्र नियमानुसार जमा किया जाय तथा राशि जमा करने संबंधी E-Payment/ Challan की प्रति इस कार्यालय में समर्पित करना सुनिश्चित करें। आर0टी0जी0एस0/नेफ्ट/डी0डी0/कैश या अन्य किसी माध्यम से जमा की गई राशि को स्वीकार नहीं किया जायेगा। सक्षम प्राधिकार से उक्त योजनाओं का स्वीकृति के उपरांत वांछित अवशेष राशि प्रयोक्ता अभिकरण के द्वारा शीघ्र जमा करना अनिवार्य होगा। उक्त के क्रम में जमा की हुई राशि का साक्ष्य एवं वांछित अवशेष राशि से संबंधित वचनवद्धता समर्पित करते हुए इस कार्यालय को प्रतिवेदित करना सुनिश्चित किया जाय।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।
17/5/25

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

भारतीय स्टेट बैंक
State Bank of India
With you - all the way

e-PayOrder Details

e-PayOrder Number	AOWS606188
Debit Status	Success
Scheduled Time	21-May-2025 [06:38 PM] IST

21-May-2025

JharkhandCAMPA

Eight Crores Ninety Eight Lakhs Fifty Seven Thousand Eight Hundred only **8,98,57,800.00**

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"AOWS606188" **CMP00000001145765120**

Counterfoil Description	38831990013
Transaction Type	Fund Transfer

Debit Account Details

Account No.	Branch	Amount
00000038831990013	A7160	8,98,57,800.00

Credit Account Details

Beneficiary Name	Beneficiary A/C	Beneficiary IFSC Code	Amount	Credit Status	UTR No.
JharkhandCAMPA	150725859823363	UBIN0996335	8,98,57,800.00	Success	SBIN225141946298

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - X

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Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no.- 22 फा०-2(2)-06/2022.....

Office order No. 51 **dated** 07.04.2025

Sanction Order of the Catchment Area Treatment Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka,

The Instant Catchment Area Treatment Plan has been submitted by M/s Neyveli Uttar Pradesh Power Ltd. (referred to as "the Use Agency") in pursuance of the following condition laid by MoEF&CC under Section 2(1)(ii) of condition no. (VI), and (IX) of Stage-1 approval vide letter no. 8-37/2022-FC dated 18.09.2024 for non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

The aforesaid Term of Reference laid by the Central Government reads as follows:

Condition no. 2(1) (ii) : **Compensatory Afforestation;**

Condition No. (ii)(vi): *"As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment Area Treatment Plan for river Bansloi shall be prepared and implemented at project cost."*

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

(45)

Condition No. (ii)(ix): *" The User Agency shall prepare a Digital Elevation Model of 10 km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th , 15th , 20th , 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department Subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.."*

2. In compliance of the aforesaid condition laid by MoEF&CC, the User Agency M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL) has Submitted a Catchment Area Treatment Plan for diversion of forest land proposal of Pachhawara South Coal Block project prepared in consultation with the forest officials including DFO, Dumka and DFO, Godda Forest Division, the Conservator of Forest Territorial Circle (CF), Dumka and Regional Chief Conservator of Forest (RCCF), Dumka.

3. In the above stated background, the Regional Chief Conservator of Forests, (RCCF), Dumka vide his letter no. 366 dated 10.03.2025 submitted the Plan to office of the undersigned for its consideration for sanction.

4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forest, Dumka, CF Territorial Circle, Dumka, DFO, Dumka, Godda and User Agency vide this office letter no. 795 dated 24.03.2025 to arrange a Power-Point Presentation of the plan in meeting scheduled on 26.03.2025 in the conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests, Dumka and Divisional Forest Officer, Dumka and DFO Godda Forest Division (DFO, Dumka and Pakur on video conferencing). Shri

GOTTE RAMESH
General Manager Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

Deepak Vincent Surin (NUPPL) G.M. Project Head, Pachwara South Coal Block, Shri Rajeev Ranjan, Representative (NUPPL) and Shri Kislay Kumar, Director, Ecosofet Pvt. Ltd., Consultant were present during the presentation.

5. After deliberation on various provisions of the proposed Plan and the presentation, it was observed that:-

(i) Pachawara South Coal Block is bounded by Pachawara Central Coal Block in the North and Pachawara North Coal Block in further North. All these three Blocks form somewhat a continuum. Pachawara South Block falls in Dumka Forest Division, both Pachawara Central and Pachawara North Blocks lie in Pakur Forest Division, Bansloi river being the bifurcating boundary between Dumka and Pakur Forest division/districts. Both Pachawara Central and Pachawara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the User Agency. The User Agency has prepared the said plans which have duly been approved by the competent authorities. Notably, the said plans have been formulated restricting impact area within Pakur forest division.

(ii) The Impact Area (IA) of instant Catchment Plan falls within the surrounding area (10 km radius) of Dumka and Godda Forest Division.

(iii) During the deliberation and presentation it was informed that the Impact Area (IA) delineated for the formulation of this Catchment Area Treatment (CAT) Plan of altogether 203 number of villages, 158 in Dumka Forest Division and 45 in Godda Forest Division.

It was also informed that the areas of villages which fall partly outside the 10-15 km boundary have also been considered for prescribing management interventions under the CAT Plan. The same rational has been utilized while formulating the SMC Plan, meaning thereby, the villages falling partly within and partly outside the 10 km boundary have been considered under the SMC

GOTTE RAMESH
General Manager & Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

(47)

Plan, thus bringing all villages coming within 15 km periphery of the lease boundary under line of treatment. The Plan Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla.

6. The cost of the proposed 10-year (2026-27 to 2035-36) Catchment Area Treatment Plan with respect to the activities to be carried out by DFO, Dumka Forest Division and DFO, Godda Forest Division have been estimated to be Rs. 3807.98 lakh. The summary of the proposed interventions (component wise) under the Plan is as follows:-

The Proposed financial projection under the Plan may be summarized in the following table-

Sl. No	Activity Head	Dumka Forest Division (Rs. In Lakh)	Godda Forest Division (Rs. In Lakh)	Total (Rs. In Lakh)
1.	Natural Resource Management /Catchment Area Treatment Measures	1976.69	776.11	2752.80
2.	Capacity Building Frontline Forest Staff	22.00	12.50	34.50
3.	Awareness Development Programmes	20.00	10.00	30.00
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	80.00	25.00	105.00
5.	Monitoring and Evaluation	10.00	6.00	16.00
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	115.00	55.00	170.00
7.	Administrative Cost	50.00	15.00	65.00
	Sub-total	**2273.69**	**899.61**	**3173.30**
	Escalation cost @20%	**454.73**	**179.95**	**634.68**
	Grand Total Cost	**2728.42**	**1079.56**	**3807.98**

Cost to the User Agency towards implementation of the CAT Plan is Rs. 3807.98 Lakh.

7. The Plan with a total financial outlay of **Rs.** 3807.98 **Lakh** extends over a period of 10 years and shall be utilized by the Forest Department through the

GOTI RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

DFO, Dumka Forest Division and DFO, Godda Forest Division in accordance with the Plan prescriptions.

8. Considering the proposals under the plan submitted by the User Agency and recommendations of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man-made, determined to forest and wildlife in their area of operation.

(ii) That the total amount of **Rs.** 3807.98 **Lakh (Rupees Thirty Eight crore seven lakh and ninety eight thousand only)** shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO, Dumka Forest Division and DFO, Godda Forest Division as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, the DFO, Dumka Forest Division and DFO, Godda Forest Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/Forest Department. Regional Chief Conservator of Forests, Dumka shall supervise & closely monitor the progress of the activities undertaken by DFO, Dumka Forest Division and

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

(49)

DFO, Godda Forest Division as per the approved APO & funds released under CAMPA.

(iv) That the Conservator of Forests, Dumka Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the DFO, Dumka Forest Division and DFO, Godda Forest Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.

(vi) That both the DFOs shall ensure that no violation of duly sanctioned Working Plans of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(vii) That the instant Plan is dynamic and be revisited after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirement.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, DFO, Dumka and DFO, Godda Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owning to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

File no.- 22 वी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 वी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Territorial Circle, Dumka/ DFO, Dumka Forest Division / DFO, Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 वी०-2(2)-06/2022 Memo No. 913 dated 07.08.2025

Copy forwarded to M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, for information and necessary action.

07/08/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

Annex – XI

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	5859823450	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 380798000/- Addl CA : 0/-, CAT : 380798000/-, Addl PA : 0/-, Other Charges : 0/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958885 2_FPJHMIN598232020_User_Fund_Demanded_71629.pr Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020629	5859823629	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Soil & Moisture Conservation Plan : 258814000/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 361932000/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Wild Life Management Plan : 73118000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pr Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	5859823409	18 Sep 2024	CA: 1122681423/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 1122681423/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Other Charges : 0/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_4H380.pr Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020706	5859823706	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 112[illegible]0/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Soil & Moisture Conservation Plan : 112145000/-	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pr Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020706)

GOVIND RAMESH
Project Head

	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202033758598233318 Sep 2024			CA: 0/- , PCA: 0/- , Addl CA : 0/- , CAT : 0/- , Safety Zone: 0/- , Addl PA : 0/- , NPV: 0/- , Wild Life Management Plan : 448580000/- , Other Charges1 : 0/- , Other Charges2 : 0/- , Other Charges3 : 0/- , Total : 448580000/-	Paid	Fund Demand Verified by Nodal Officer On :07 Jan 2025 , Bank Name : Union Bank Of India , Mode of Payment : NEFT/RTGS (Challan) , Challan Generated On :07 Jan 2025 , Transaction Date :09 Jan 2025	Demand Letter (../writereaddata/Fundpdf/05012025192149C812_FP/JH/MIN/59823/2020_User_Fund_Demanded_M.111.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN59823202033758598233318 Sep 2024			CA: 0/- , PCA: 0/- , Addl CA : 0/- , CAT : 0/- , Safety Zone: 0/- , Addl PA : 0/- , NPV: 617635418/- , NA : 0/- , NA : 0/- , NA : 0/- , Total : 617635418/-	Paid	Fund Demand Verified by Nodal Officer On :20 Dec 2024 , Bank Name : Union Bank Of India , Mode of Payment : NEFT/RTGS (Challan) , Challan Generated On :20 Dec 2024 , Transaction Date :21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/14122024163651267I_FP/JH/MIN/59823/2020_User_Fund_Demanded_M.111.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN59823202033I)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

BHARAT (HTTPS://SWACHHBHARAT.MYGOV.IN/) (WWW.DIGITALINDIA.GOV.IN) (HTTPS://DATA.GOV.IN/)

india.gov.in (HTTPS://INDIA.GOV.IN/) MyGov (HTTPS://WWW.MYGOV.IN/) MeitY (HTTP://MEITY.GOV.IN/)

(HTTP://WWW.PMINDIA.GOV.IN/EN/) NIC (HTTP://WWW.NIC.IN/)

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For any Technical support, Please Contact EFCCD, NIC, New Delhi. monitoring-fc(at)nic(dot)in

Annex - XII

एन यू पी एल
NUPPL

NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA.
CIN: U40300UP2012GOI053569 **GSTIN: 09AAECN3221F1Z8**
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147

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ITUWTS NEW DELHI 2024

Lr No. NUPPL/PSOCP/GM/FC/2025/05/02 Date: 06.05.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited (NUPPL) – Constitution and finalization of team by PCCF Ranchi, comprising officials from User agency and Forest department for study and monitoring the soil erosion, water conservation, ecological restoration activities in and around the project area.
Ref:	1. In Principle approval of Forest Clearance Stage –I 2. EDS dated 04.04.2025

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

The **EDS number iv (b)** states that *"A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project."*

Hence, M/s NUPPL humbly request you to constitute and finalize a team from user agency and Forest department to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

Details of the officials from NUPPL:-

Sl. No.	Official Name	Designation
1.	Shri. Durgam Ravindra Kumar	Deputy General Manager/Mining
2.	Shri. Vinod Kumar Prasad	Additional Chief Manager/ Geology

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एन यू पी पी एल

NUPPL

NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA.
CIN: U40300UP2012GOI053569 **GSTIN: 09AAECN3221F1Z8**
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

ITUWTSA
NEW DELHI

Thanking you.

F.C.
07.11.
06-5-25

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

06/05/25

General Manager/ Project Head,
PSCMP, NUPPL.
GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

6/5

Annex - XIII

(55)

कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101

E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

पत्रांक– 1024 दिनांक– 07/5/2025

सेवा में,

ई-मेल

वन संरक्षक,
प्रादेशिक अंचल, दुमका।

विषय :– Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

प्रसंग :– भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली का पत्र दिनांक–04.04.2025 तथा General Manager/Project Head, Pachwara South Coal Mine Project, Neyveli Uttar Pradesh Power Ltd. का पत्र सं0–NUPPL/PSOCP/GM/FC/2025/05/02 दिनांक–06.05.2025

महाशय,

उपर्युक्त विषयक प्रसंग में सूचित करना है कि भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली के प्रांसगिक पत्र द्वारा आपत्ति संख्या–iv (b) "A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project." के आलोक में प्रयोक्ता अभिकरण द्वारा समर्पित प्रासंगिक पत्र की छायाप्रति पत्र के साथ संलग्न कर आवश्यक अग्रत्तर कार्रवाई हेतु समर्पित की जा रही है।

अनु0–यथोक्त

आपका विश्वासी,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ई-मेल ज्ञापांक– 1024 दिनांक– 07/5/2025

प्रतिलिपि:– क्षेत्रीय मुख्य वन संरक्षक, संथाल परगना, दुमका/प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची/प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची को अनुलग्नक की प्रति सहित सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ई-मेल ज्ञापांक– 1024 दिनांक– 07/5/2025

प्रतिलिपि– General Manager/Project Head, Pachwara South Coal Mine Project, Neyveli Uttar Pradesh Power Ltd. Shanta Bhawan, LIC Colony, Behind SBI, Dumka-814101, Jharkhand. को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

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NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA,
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

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Lr No. NUPPL/PSOCP/GM/FC/2025/05/02 Date: 06.05.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited (NUPPL) – Constitution and finalization of team by PCCF Ranchi, comprising officials from User agency and Forest department for study and monitoring the soil erosion, water conservation, ecological restoration activities in and around the project area.
Ref:	1. In Principle approval of Forest Clearance Stage –I 2. EDS dated 04.04.2025

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

The **EDS number iv (b)** states that *"A team, to be finalized by the PCCF comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project."*

Hence, M/s NUPPL humbly request you to constitute and finalize a team from user agency and Forest department to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

Details of the officials from NUPPL:-

Sl. No.	Official Name	Designation
1.	Shri. Durgam Ravindra Kumar	Deputy General Manager/ Mining
2.	Shri. Vinod Kumar Prasad	Additional Chief Manager/ Geology

(57)

NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA,
CIN: U40300UP2012GOI053569 **GSTIN: 09AAECN3221F1Z8**
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147

Thanking you.

F.C
after
06-5-26

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

06/05/26

General Manager/Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

(58)

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-1157 V.P. dated 26.03.2025 on the above mentioned subject, forwarding the information on the compliance of conditions stipulated in the *in-principle approval* dated 18.09.2024 and to say that examination of same revealed following shortcomings:

i. In compliance of condition no. (v), the copy of Wildlife Conservation Plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area along with the fund deposition details has not been submitted.
ii. In compliance of condition no. (vi), the copy of approved Catchment Area Treatment Plan for river Bansloi along with the fund deposition details has not been submitted.
iii. In compliance of condition no. (vii), the details of fund deposited with regard to the plantation inside safety zone has not been submitted.
iv. In compliance of condition no. (ix), the shortcomings observed are as under:

a. The copy of CAT Plan of 10 km radius including Chatua nala and other nearby nalas duly approved by the PCCF (HoFF) along with the fund deposition details has not been submitted.
b. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist has also not been constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.
c. The State Government has reported that the User Agency has deposited Rs. 11,24,95,000.00 with regard to SMC Plan through online in account of NA.

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF & CC, New Delhi for uploading on PARIVESH portal.

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CAMPA. However, as per details shown on the web portal, user agency has deposited Rs. 112145000/- towards SMC plan. This is contradictory and need clarification from the State Government.

v. In compliance of condition no.(x), the Water Security Plan prepared by the group of experts has not been submitted.
vi. In compliance of condition no.(xi), the KML files of the area under diversion and the accepted area for raising compensatory afforestation has not been uploaded in the e-Green watch portal of FSI.
vii. In compliance of condition no.(xiv), the schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule has not been submitted.
viii. In compliance of condition no. xvi (c), the details of the fund deposited for regeneration in the safety zone area has not been submitted.
ix. In compliance of condition no. xvii (a), the copy of the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream has not been submitted.
x. In compliance of condition no. xvii (b), the copy of the approved Plan/Scheme w.r.t Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion has not been submitted.
xi. In compliance of condition no. xvii (c), the copy of the approved Plan/Scheme w.r.t Construction of check dams, retention /toe walls to arrest sliding down of the excavated maternal along the contour has not been submitted.
xii. In compliance of condition no. (xix), the copy of the approved Plan w.r.t plantation and SMC activities to undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease along with the fund deposition details has not been submitted.
xiii. In compliance of condition no. (xx), the copy of the approved Plan w.r.t desilting of village tanks and other water bodies, located within five km from the mine lease boundary, to mitigate the impact of project on such tanks/water bodies has not been submitted.
xiv. In compliance of condition no. (xxiii), the copy of undertaking has not been submitted.
xv. In compliance of condition no. (xxiv), the copy of the approved Scheme w.r.t soil conservation measures along the fund deposition details has not been submitted.

Accordingly, it is requested to furnish the above mentioned information to this Ministry for further consideration of the proposal.

Yours sincerely,

Digitally signed by
SUNEET BHARDWAJ
Date: 04-04-2025
18:09:19

Sd/-
(Suneet Bhardwaj)
Assistant Inspector General of Forests

Annex – XIV

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कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101
E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

पत्रांक– 13 दिनांक– 03-01-2025

सेवा में,

E-mail

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय :– Pachwara South Coal Block M/s Neyveli Uttar Pradsh Power Limited- Request for Raising the demand note for submission of cost towards the implementation of the cost of approval Wildlife Management Plan & The cost of Catchment Area Treatment (CAT) Plan

प्रसंग :– आपका पत्र संख्या–NUPPL/PSCB/GM/DFO/FC/2024/12/24 dt.-23.12.2024 तथा पत्र संख्या–NUPPL/PSCB/GM /2025/01/01 dt.- 02. 01.2025

महाशय,

उपर्युक्त विषय में सूचित करना है कि Pachwara South Coal Block project in favour of M/S Neyveli Uttar Pradesh Power Limited for Pachwara South Open cast Mining Project, District Dumka हेतु भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली द्वारा स्वीकृत In-principle/Stage-I की शर्त्तों, आपके द्वारा किये गये अनुरोध तथा भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली के पत्र संख्या–FC-11/43/2021-FC दिनांक–07.6.2022 में उल्लेखित The State Government should submit Wildlife Management Plan, along with detail cost of its implementation in to the account of CAMPA along with the stage-I complince. However, in cases where it is not possible for the State to submit the complince due to delay in prepration of such plan, a lump sum quantum of following amount may be realized from the user agency and submitted along with the stage-I compliance

a. 2% of total project cost towards the cost of implementation of the wildlife management Plan and / or 0.5 % of the Project Cost towards the cost of Implementation of Soil and Moisture Conservation Plan, as the case may be, Shall be charged from the Used agency and deposited into the account of CAMPA and the same may be intimated to the MoEF & CC for the Purpose of obtaining approval under the FC Act, 1980.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NPPL, Dumka (Jharkhand)

P.T.O.

(62)

b. The Provisions provided in the WLMP or SMC shall be approved by the competent authority in the state and accordingly, the deficit amount, if any, from the money already realized to the tune of 2% and / or 0.5 % of Project Cost, shall be paid by the user agency, and same shall be deposit in the CAMPA account prior to actual working on the forest area. के आलोक में

1. Cost of implementation of the wildlife management Plan = 44.858 करोड़ रू0 (2% of total project cost)
2. Cost of implementation of Soil and Moisture Conservation Plan = 11.2145 करोड़ रू0 (0.5% of project cost)

(Total project cost =2242.90 करोड़ रू0)

नियमानुसार जमा किया जाय तथा राशि जमा करने संबंधी E-Payment/ Challan की प्रति इस कार्यालय में समर्पित करना सुनिश्चित करें। आर0टी0जी0एस0/ नेफ्ट/डी0डी0/कैश या अन्य किसी माध्यम से जमा की गई राशि को स्वीकार नहीं किया जायेगा। सक्षम प्राधिकार से उक्त योजनाओं का स्वीकृति के उपरांत वांछित अवशेष राशि प्रयोक्ता अभिकरण के द्वारा शीघ्र जमा करना अनिवार्य होगा।

उक्त के क्रम में जमा की हुई राशि का साक्ष्य एवं वांछित अवशेष राशि से संबंधित वचनवद्धता समर्पित करते हुए इस कार्यालय को प्रतिवेदित करना सुनिश्चित किया जाय।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।
03/01/25 03-01-25

GOTTE RAMESH
General Manager/Project Head
Padwars South OCP
NUPPL, Dumka (Jharkhand)

Annex – XX

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NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD and UP RAJYA VIDYUT UTPADAN NIGAM LTD)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTHOPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA.
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in TEL 06434-236147

Lr No. NUPPL/PSOCP/GM/FC/2025/04/26 Date: 29.04.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited – Submission of Schemes as per the EDS point number vii.
Ref:	In Principle approval of Forest Clearance Stage –I EDS dated 04.04.2025.

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

As per the **EDS number vii** user agency has to "*the schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule has not been submitted.*"

Hence, M/s NUPPL is hereby submitting the schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan along with an undertaking to surrender the mined out and reclaimed forest land as per schedule.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Annex-XV

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PHASED RECLAMATION PLAN & SCHEDULE OF SURRENDER OF MINED OUT & RECLAIMED FORERST LAND

in compliance with

Condition No. XIV of Stage-I

approval granted vide

Letter dt.18.09.2024

Ministry of Environment, Forests and Climate Change

(Forest Conservation Division)

for

Diversion of 455.1108 Hects of Forest Land for U/s-2 (ii) of F.C. Act'1980

within Pachwara South Coal Block of

M/S Neyveli Uttar Pradesh Power Limited.

Dist.Dumka Jharkhand.

(65)

SCHEME FOR RECLAMATION AND AFFORESTATION OF PACHWARA SOUTH COAL BLOCK OF M/S NEYVELI UTTAR PRADESH POWER LIMITED IN DUMKA DISTRICT OF JHARKHABD.

Introduction

It is mandatory to undertake the phased restoration, reclamation and rehabilitation of mined out area whether forest or non-forest by mining operation and shall complete this work before the closing of mining operation and abandonment of the mine.

Pachwara South Coal Block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The Block is allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL)- a joint venture of NLC India Limited and Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 from Ministry of Coal, Government of India. The lease area is 714.8553 Ha within which forest area is 455.1108 Ha and non-forest area is 259.7445 Ha

Mining plan was approved By Ministry of Coal Vide No-34011/2/2020 Dated 11.11.2020. Environmental Clearance has been approved on 23.09.2024 with a maximum production capacity of 9 MTPA.

Further, Stage-I approval over 455.1108 ha. of Forest Land for U/s-2 (ii) of F.C. Act'1980 has been granted by MoEF vide their Letter dt.18.09.2024, wherein it has been stipulated as per Condition No.XIV for preparation and implementation of a scheme to surrender the mined out and reclaimed forest area.

GOTTE RAMESH
General Manager(Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

The proposed land use pattern over 714.8553 Ha(455.1108 Ha forest land +259.7445 Ha Non forest land) is furnished below.

Table-1
PROPOSED LAND USE PATTERN

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed In Ha			(End of Mine In Ha)			Agricultural Land Land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Excavation Area	447.3308	196.4292	643.7600										0.0000
Backfilled Area			0.0000	371.7600	151.8600	523.6200	51.1600	107.2300			371.7600		523.6200
Excavated Void			0.0000	75.5708	44.5692	120.1400			44.5692		75.5708		120.1400
Without Plantation			0.0000										0.0000
Top Soil Dump.		6.5300	6.5300		6.5300	6.5300		6.5300					6.5300
External Dump /surface dump			0.0000										0.0000
Safety Zone	7.7800	3.0600	10.8400	7.7800	3.0600	10.8400		3.0600			7.7800		10.8400
Haul road between quarries		17.1300	17.1300		17.1300	17.1300		17.1300					17.1300
Road Diversion.		3.3100	3.3100		3.3100	3.3100				3.3100			3.3100
Diversion/ Below River Nala/Canal	0.0000	0.0000	0.0000										0.0000
Settling Pond		0.0400	0.0400		0.0400	0.0400				0.0400			0.0400
Road & Infrastructure		18.4700	18.4700		18.4700	18.4700		17.8400		0.6300			18.4700

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Sahwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

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Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
area.													
Rationalisation Area.			0.0000										0.0000
Garland Drains.		4.8900	4.8900		4.8900	4.8900				4.8900			4.8900
Embankment.		3.5600	3.5600		3.5600	3.5600				3.5600			3.5600
Green Belt.		3.0600	3.0600		3.0600	3.0600		3.0600					3.0600
Water Reservoir Near Pit			0.0000										0.0000
UG Entry.			0.0000										0.0000
Undisturbed / Mining Rights for UG.		3.2653	3.2653		3.2653	3.2653						3.2653	3.2653
Resettlement.			0.0000										0.0000
Pit Head Power Plant			0.0000										0.0000
Water Harvesting			0.0000										0.0000
Agricultural Land			0.0000										0.0000
Total	**455.1108**	**259.7445**	**714.8553**	**455.1108**	**259.7445**	**714.8553**	**51.1600**	**148.3200**	**44.5692**	**12.4300**	**455.1108**	**3.2653**	**714.8553**

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Sahnik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

In the initial phase of mining, the pit will be opened in the western part of the block and the waste material will be dumped temporarily in the eastern part of the block. The overburden generated in the initial 6 years shall be dumped in the eastern part of the Block beyond Fault F4. Height of the dump will remain 60 meter on average with 30 meter height in each tier. Concurrent backfilling will commence from the 7th year from production commencement. Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production. As per approved Mining plan and Progressive Mine closure plan the details of proposed reclamation is as follows:

Stage/ Year		Biologically Reclaimed Area (ha) - Cumulative					Forest Land (Return)	Undisturbed/ To be left for Public/ Community Use	Total
		Agriculture	Reclamation(plantation)	Water Body	Public/ Company Use	Total			
Yr 1	Development Period	-							
Yr 2									
Yr 3	Y-1	-	-	-	-	-	-	-	-
Yr 5	Y-3	-	-	-	-	-	-	-	-
Yr 7	Y-5	-	-	-	-	-	-	-	-
Yr 8	Y-6	-	-	-	-	-	-	-	-
Yr 12	Y-10	-	35.45	-	-	-	-	-	-
Yr 17	Y-15	-	76.29	-	-	-	-	-	-
Yr 22	Y-20	-	102.34	-	-	-	-	-	-
Yr 27	Y-25	-	132.87	-	-	-	-	-	-
Yr 32	Y-30	-	145.12	-	-	-	-	-	-
Yr 38	Y-36	-	161.05	-	-	-	-	-	-
Post Closure									
Yr 41	Y-39	51.16	148.32	44.5692	12.43	256.4792	455.1108	3.2663	714.8553 (=715)

The total forest land in this project is about 455.1108 Ha and is to be returned to the concerned Government authority at the end of the mine life. The distribution of the forest lands are as follows:

1. 371.76 ha – Backfilled dump and shall be covered under Plantation.
2. 7.78 ha - the part of the safety zone- shall be utilized for plantation.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NLIPPL, Dumka (Jharkhand)

Sahaik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

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3. 75.5708 ha – as a part of the last phase of mine and shall be utilized for water body creation.

At the end of the closure period, total 711.59 ha of land will be biologically reclaimed.

Phased Reclamation & Afforestation Programme

(No. of Saplings per hectare = 1600)

Reclamation programme will be carried out as per approved mining plan/scheme. However in the conceptual period total 523.62 Ha (371.76 Ha forest+158.39 Ha) area will be reclaimed by backfilling and bench plantation method and it will be done by the schemes mentioned in approved mining plan/scheme. Further 187.97 Ha (104.6192 Ha Non Forest+ 83.3508 Ha Forest) will also be reclaimed which includes plantation in safety zone, creation of water body etc. 3.2653 Ha Non forest area will not be used .Total 711.59 Ha area will be reclaimed as per approved mining plan. 11,38,544 No of saplings (1600 x 711.59) will be planted for reclamation and rehabilitation of mined out area.

Proposed Reclamation & Afforestation

The total area to be used for mining and ancillary activities is 711.59 Ha. land and this area is to be reclaimed in a phased manner. It is proposed to reclaim the above area in phase as per approved mining plan. After the complete extraction of ore, the mined-out area will be back-filled with mine wastes as well as some part of the quarry benches, not covered under backfilling will be planted with saplings on benches. In the backfilled area the surface layer will be covered with topsoil and planting will be done with care following standard practice to achieve good percentage of survival. This process will be repeated for other phases also. Likewise in overburden dump areas, the sooner one terrace has reached the permissible height, it will be stabilized by proper compaction and the second bench will be allowed to be dumped by leaving burm. The surface of the 1st bench will be properly compacted by ramming and covered with top soil stored earlier. Tree planting will be

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Dumka Forest Division, Dumka

done by digging pits of 30 cm x 30 cm x 30 cm at 2.5 mt. spacing along the burm. Species to be planted will be in consultation with the local forest officials.

Choice of species

The choice of species for a specific site always depends on the existing vegetation, if any. Accordingly the following species will suit to the site.

Sl. No.	Common Name	Botanical Name
1	Amla	*Emblica officinalis*
2	Bamboo	*Dendrocalamus strictus*
3	Karanja	*Pongamia pinnata*
4	Asan	*Terminalia tomentosa*
5	Sisoo	*Dalbergia sisoo*
6	Gambhar	*Gmelina arborea*
7	Neem	*Azadirachta indica*
8	Harida	*Terminalia chebula*
9	Bahada	*Terminalia bellerica*

RAISING OF NURSERY

Seedlings required for the plantation shall be raised in the nursery of Pachwara South Coal block of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL). The Nursery should have a capacity of raising adequate seedlings. Nursery works will be undertaken in consultation with D.F.O, Dumka Division. All the infrastructures shall be provided by M/S Neyveli Uttar Pradesh Power Ltd. (NUPPL). Work will be started one year before the year of plantation so that two-year-old seedlings will be available

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Sahelk, I.F.S.
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Dumka Forest Division, Dumka

for plantation. 20% extra seedlings shall be raised to compensate and mitigate the eventuality of seedling casualty in the nursery. Standard nursery practices shall be followed for raising of seedlings in polythene bags.

ALIGNMENT AND STACKING

Alignment, stacking and pitting will be taken up in the month of March-April, Pits of size 30cmX 30cm X 30cm will be dug maintaining a spacing of 2.5 mt @ 1600 plants per hectare.

PLANTING

The seedlings will be planted in dug out pits of 30 cm^3 maintaining a spacing of 2.5 mt between the pits @ 1600 seedlings per hectare. Plantation should be taken up after first regular shower of monsoon and should ideally be completed by the end of August. NPK/DAP fertilizer @ 30 gms per plant should be given as basal dose. Anti- termite insecticide @ 5 gms. per plant should be applied per pit. Foreign earth shall be provided in each pit to enrich the growth of seedlings within a marked period. Casualty replacement when required during the planting year and in the second year should be undertaken for which the seedlings shall be raised.

WEEDING, SOIL WORKING AND MANURING

For establishment and better growth of the planted seedlings, weeding, soil working and manuring are necessary. It is prescribed to carry out two weedings, soil working and manuring during the first year and second year of plantation and one weeding and soil working during the third year. Weeding and manuring for the first and second year shall be carried out during August- September and the second one during October- November along with soil working during which 30 gms. of NPK/DAP shall be added to the soil per plant. First weeding shall be an area weeding and the second

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Sahrik, I.F.S.
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weeding should be strip weeding. The weeding of third year will be an area weeding which shall be carried out during August.

APPLICATION OF INSECTICIDES

The plantation site after being planted with good seedlings may get infested with diseases owing to influx of insects and pests into the area in future which usually cause heavy damage to the soft, tender and avidly growing parts of the plant that heavily affects the rate of growth and sometimes causes wide spread casualty of the seedlings. To avoid such incidences, foliar spray and ground application of insecticides at regular intervals usually on a sunny day before fore noon shall be done.

FIRE LINE TRACING AND MAINTENANCE

Fire causes irreparable damage to the plantation and the forest growth during fire season and to prevent such fire out-breaks in the area, the plantation area shall be divided into suitable blocks by tracing fire lines. Boundaries of the plantation patches and these block lines will be scrapped of forest growth to a width of 3.0 mt. during Feb-March and the cut back materials and the dry leaves stacked along these fire lines shall be burnt under supervision of responsible staff of the Lessee. This operation is highly essential and the scheme proposes to carry this operation for the first three years.

COST OF BIOLOGICAL RECLAMATION

Total cost for Biological Reclamation over 711.59 hectares (@ Rs. 415587 per hectare) will be Rs 29,57,27,553/- (Rs Twenty Nine crores Fifty seven lakhs twenty seven thousand five hundred and fifty three).This cost is exclusive of the cost of backfilling of material in the exhausted pit/quarry.

M/s Neyveli Uttar Pradesh Power Limited

Project Head

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

PHASED RECLAMATION PLAN OF PACHWARA SOUTH COAL MINE, DUMKA DISTRICT, JHARKHAND



N
W
E
S

LEGEND

- GEOLOGICAL BLOCK BOUNDARY
- VILLAGE BOUNDARY
- NOTIFIED FOREST

SCALE - 1:5000

PLATE

PROJECT PROPONENT	M/S UTTAR PRADESH POWER LIMITED
JOB TITLE	MINE PLAN AND MINE CLOSURE PLAN FOR PACHWARA SOUTH COAL MINE, DUMKA, RAJMAHAL COALFIELD, JHARKHAND
SUBJECT	PHASED RECLAMATION PLAN
SCALE	
PREPARED BY	UNITED EXPLORATION INDIA PVT. LTD.

Annex - XVI

NEYVELI UTTAR PRADESH POWER LIMITED

(एन.एल.सी इंडिया लिमिटेड एंव यू.पी.राज्य विद्युत उत्पादन निगम लिमिटेड का संयुक्तउ पक्रम)

(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)

OFFICE OF THE GENERAL MANAGER/PROJECT HEAD

PACHWARA SOUTH OPEN CAST PROJECT

Shanta Bhavan, Behind SBI, LIC Colony, DUMKA- 814 101, JHARKHAND, INDIA,

CIN: U40300UP2012GOI053569 GSTIN: 20AAECN3221F1Z8

E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

Lt No. NUPPL/PSOCP/GM/FC/2025/08 Date: 14.05.2025

UNDERTAKING

This is to certify that Neyveli Uttar Pradesh Power Ltd.(NUPPL) undertakes to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/ Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

पंजीकृत कार्यालय : के.पी.419, जी. एन. एक्सटेंशन,गोमती नगर,लखनऊ-226010 (उ.प्र.) फैक्स 0522-4951065

Regd. Office: K.H.419, G. N. Extension,Gomti Nagar, Lucknow-226010 (U.P.) Tele Fax:0522-4951065

CIN: U40300UP2012GOI053569, GSTIN: 09AAECN3221F1ZS; website: www.nuppl.co.in

Annex - XVII

कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101
E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

पत्रांक–.....1088..... दिनांक–...17-5-25.....

सेवा में,

ई-मेल

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय :– Pachwara South Coal Block project in favour of M/S Neyveli Uttar Pradesh Power Limited- Request for raising the demand note for submission of cost towards the implementation of plantation activity within the safety zone of Pachwara South Coal Block after complying the clarification from PCCF NODAL.

प्रसंग :– आपका पत्र संख्या–NUPPL/PSCMP/GM/Satety zone/2025/04/15 dt.16.04.2025 एवं पत्र संख्या–NUPPL/PSOCP/GM/Satety zone/2025/04/14 dt.16.05.2025 तथा इस कार्यालय का पत्रांक–1047 दिनांक–10.05.2025

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में सूचित करना है कि भारत सरकार, वन पर्यावरण एवं जलवायु परिवर्तन मंत्रालय, इन्दिरा पर्यावरण भवन, नई दिल्ली का पत्र दिनांक–18.09.2024 In-principle/Stage-I की शर्त सं0–vii तथा आपत्ति पत्र दिनांक–04.04.2025 के बिन्दु सं0–iii & viii आलोक में "Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost." हेतु **संशोधित** स्थल विशिष्ट प्राक्कलन पत्र के साथ संलग्न भेजी जा रही है।

अनुरोध है कि स्थल विशिष्ट कुल प्राक्कलित राशि–8,98,57,800.00 (आठ करोड़ अनठानवे लाख सत्तावन हजार आठ सौ) रू0 मात्र नियमानुसार जमा किया जाय तथा राशि जमा करने संबंधी E-Payment/ Challan की प्रति इस कार्यालय में समर्पित करना सुनिश्चित करें। आर0टी0जी0एस0 / नेफ्ट / डी0डी0 / कैश या अन्य किसी माध्यम से जमा की गई राशि को स्वीकार नहीं किया जायेगा। सक्षम प्राधिकार से उक्त योजनाओं का स्वीकृति के उपरांत वांछित अवशेष राशि प्रयोक्ता अभिकरण के द्वारा शीघ्र जमा करना अनिवार्य होगा। उक्त के क्रम में जमा की हुई राशि का साक्ष्य एवं वांछित अवशेष राशि से संबंधित वचनबद्धता समर्पित करते हुए इस कार्यालय को प्रतिवेदित करना सुनिश्चित किया जाय।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।
17/5/25

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - XVIII

भारतीय स्टेट बैंक
State Bank of India
With you - all the way

(76)

e-PayOrder Details

e-PayOrder Number	AOWS606188
Debit Status	Success
Scheduled Time	21-May-2025 [06:38 PM] IST

21-May-2025

JharkhandCAMPA

Eight Crores Ninety Eight Lakhs Fifty Seven Thousand Eight Hundred only **8,98,57,800.00**

00000038831990013

SFTPH2HUploader	NEEL SARASWATI	PANKAJMEENAPSCB
Maker	Authorizer 1	Authorizer 2

"AOWS606188" **CMP00000001145765120**

Counterfoil Description	38831990013
Transaction Type	Fund Transfer

Debit Account Details

Account No.	Branch	Amount
00000038831990013	A7160	8,98,57,800.00

Credit Account Details

Beneficiary Name	Beneficiary A/C	Beneficiary IFSC Code	Amount	Credit Status	UTR No.
JharkhandCAMPA	150725859823363	UBIN0996335	8,98,57,800.00	Success	SBIN225141946298

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - XIX

(43)

NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA.
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147

Lr No. NUPPL/PSOCP/GM/FC/2025/04/27 Date: 29.04.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited – Submission of Schemes as per the EDS point number ix.
Ref:	In Principle approval of Forest Clearance Stage –I EDS dated 04.04.2025.

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

As per the **EDS number ix** user agency has not submitted "Mitigative measures to minimize soil erosion and choking of stream.."

Hence, M/s NUPPL is hereby submitting the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSCMP, NUPPL.

Annex - XIX

(28)

Scheme

For

MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAMS

in compliance

with

Condition No.XVII (a) of

Stage-I approval granted vide

Letter dt.18.09.2024

Minister of Environment, Forests and Climate Change(Forest Conservation Division)

for

Diversion of 455.1108 Hects of Forest Land for U/s-2 (ii) of F.C. Act'1980

within Pachwara South Coal Block

of

M/S Neyveli Uttar Pradesh Power Limited.

Dist.Dumka

Jharkhand.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION ANDCHOKING OF STREAMS

1. INTRODUCTION

Pachwara South Coal Block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The Block is allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL)- a joint venture of NLC India Limited and Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 from Ministry of Coal, Government of India. The lease area is 714.8553 Ha within which forest area is 455.1108 Ha and non-forest area is 259.7445 Ha

Mining plan was approved By Ministry of Coal Vide No-34011/2/2020 Dated 11.11.2020. Environmental Clearance has been approved on 23.09.2024 with a maximum production capacity of 9 MTPA.

Further, Stage-I approval over 455.1108 ha. of Forest Land for U/s-2 (ii) of F.C. Act'1980 has been granted by MoEF vide their Letter dt.18.09.2024, wherein it has been stipulated as per **Condition No.XVII(a) for preparation and implementation of a plan containing appropriate mitigative measures to minimise soil erosion and choking of streams.**

2. LOCATION

Pachwara South Coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar ,tehsil-Gopikander, Dist-Dumka of Jharkhand state. The block area covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates:

Latitude: 24° 29' 57.404" N-24° 31' 46.956" N

Longitude: 87° 27' 22.010" E-87° 29' 56.150" E

The Block is well connected with Dumka, the district head quarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area near the site and well connected with both Dumka and Pakur (district headquarters)

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Pachwara South Coal Block

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Dumka Forest Division, Dumka

through black topped Dumka-Shahibganj Road and Amrapara- Maheshpur -Pakur road respectively.

The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block and falls in between the block and district headquarter Pakur. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The altitude of the Block is ranges from 84 m to 185 m above MSL. The total mining lease hold area is 714.8553 Ha.

3. TOPOGRAPHY

The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South-western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82m (above MSL) towards northeast to about 188m (above MSL) towards south central with general ground slope from south to north towards Bansloi River, which acts as the northern boundary (Fig. No.C3-3).

A high-tension electrical line is also passing through the central part of the block. The block is also characterized by few ponds, first order seasonal streams, a Church and a School. Southern part of the block characterizes with some hillocks. Out of the total area of 714.8553 ha, 455.1108 ha are forest land.

4. SOIL TYPE

The soils of the study area have been developed mostly from massive granitic rocks and meta sedimentary formations of Precambrian age. These soils are brown in colour, medium textured, containing gravels, quartz, sand and ferruginous concretion. The pH of soil samples in the study area indicated that in agriculture land, the soil pH was slightly acidic and in the two forest land sites, the soil pH was more acidic in nature. Electrical conductivity, as the measure of current carrying capacity, gives a clear picture of the amount of soluble salts present in the soil. It plays a major role in the salinity of soils. There is a relation between electrical conductivity and salinity, i.e. lesser the EC value low will be the salinity value of soil and vice-versa. Electrical conductivity values within 800

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µmho/cm are considered as normal nature of soil. No samples of the area have crossed EC values 800µmho/cm, and thus almost all the soil samples are found to be suitable for agriculture. Soil textural form of the study area is sandy loam or silty loam in nature. The organic carbon content of the soil in terms of percentage collected from different sampling locations indicating variable organic matter content and decomposition rates.

5. CLIMATE

The area experiences tropical climate, which is hot & sub-humid. A dry and hot summer with temperatures often rises above normal. During summers, the mercury rises well above 42 degree C. As for the direction of the wind, it mostly blows from the west. The summers start from middle of March and lasts till the middle of June. Winters in the region marks the mercury dropping to about 7degree C. While the day time is pleasingly cool, with the fall of even in temperature lowers further, making the nights chilly and cold. The winter starts from December and last till the month of February. Well-distributed rainfall between mid of June to mid of September marks the rainy season. The total rainfall on the average is about 1316.8 mm (as per IMD 30 year's average data), of which 85% precipitation is during rainy season only.

6. DRAINAGE

The core zone has couple of primary & secondary nalas which act as tributary of Bansloi river. Bansloi, the main surface run-off flowing from west to east, acts as the northern boundary of the lease area. Apart from Bansloi river & its tributaries on the north, there are other nalas like Banjhi amba nala (7.5km in SW) & Tirpatia nala (9km in S) flows within the 10km radius of the study area. The ML area falls under the catchment of Bansloi River which flows along the northern boundary of the ML area. The maximum depth of Bansloi River is around 4m. Highest flood level (HFL) of Bansloi River in this part is 97-meter AMSL as per information obtained from the local public works department. The water yield of a watershed, i.e., the capacity of a water resource to serve as a long term water supply, may either be measured directly on a single outlet on the main stream or be calculated through empirical equations based on important physical properties of a particular watershed. Surface-water yield depends primarily on inflows and storage.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

The average water flow through Bansloi River is 60480 KLD. Whereas, the maximum water requirement for dust suppression, plantation and other purposes in the mining site which is planned to obtain from Bansloi River during initial 7 years is 1560 KLD, i.e. only 2.6% of the total river flow. Therefore, water intake from river Bansloi will not impact on the natural courses.

EXISTING VEGETATION

The vegetation of the applied area is composed of Arjun(*Terminalia Arjuna*), Sisham (*Dalburgia sisoo*), Asan (*Terminalia Tomentosa*), Aam (*Mangifera indica*), Jamun (*Syzygiumcuminii*), Kendu (*Diasporus Melanoxylon*), Baans (*Bamboo*), Kurum, Mahua (*Madhucaindica*), Karam (*Adina cordifolia*), Neem (*Azadirachta Indica*), Sagwan *(Tectona Grandis)* Acacia, Awla etc. ***Sal (Shorea robusta)*** is the pre-dominant species.

7. LAND USE PATTERN

During the life of the mine, as per the component wise break up the land use pattern will be as follows:

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public / Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Excavation Area	447.3308	196.4292	643.7600										0.0000
Backfilled Area			0.0000	371.7600	151.8600	523.6200	51.1600	107.2300			371.7600		523.6200
Excavated Void			0.0000	75.5708	44.5592	120.1400			44.5692		75.5708		120.1400
Without Plantation			0.0000										0.0000
Top Soil Dump.		6.5300	6.5300		6.5300	6.5300		6.5300					6.5300
External Dump /surface dump			0.0000										0.0000
Safety Zone	7.7800	3.0600	10.8400	7.7800	3.0600	10.8400		3.0600			7.7800		10.8400
Haul road between quarries		17.1300	17.1300		17.1300	17.1300		17.1300					17.1300
Road Diversion.		3.3100	3.3100		3.3100	3.3100				3.3100			3.3100
Diversion / Below River Nala/Canal	0.0000	0.0000	0.0000										0.0000
Setting Pond		0.0400	0.0400		0.0400	0.0400				0.0400			0.0400
Road & Infrastructure area.		18.4700	18.4700		18.4700	18.4700		17.8400		0.6300			18.4700
Rationalisation			0.0000										0.0000

GOTTE RAMESH
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NUPPL, Dumka (Jharkhand)

Satvik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public / Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Garland Drains.		4.8900	4.8900		4.8900	4.8900				4.8900			4.8900
Embankment.		3.5600	3.5600		3.5600	3.5600				3.5600			3.5600
Green Belt.		3.0600	3.0600		3.0600	3.0600		3.0600					3.0600
Water Reservoir Near Pit			0.0000										0.0000
UG Entry.			0.0000										0.0000
Undisturbed / Mining Rights for UG		3.2653	3.2653		3.2653	3.2653						3.2653	3.2653
Resettlement.			0.0000										0.0000
Pit Head Power Plant			0.0000										0.0000
Water Harvesting			0.0000										0.0000
Agricultural Land			0.0000										0.0000
Total	455.1108	259.7445	714.8553	455.1108	259.7445	714.8553	51.1600	148.3200	44.5692	12.4300	455.1108	3.2653	714.8553

8. FACTORS RESPONSIBLE FOR SOIL EROSION & CHOKING OF STREAMS

The mining activities and overburden dumps are the major source of drainage of soil and other substances for choking of any drainage system existing down below. The forms of erosion observed in this region include mainly rill and gully. The storm water runoffs from the uplands, mine faces and OB dump slope areas carry substantial quantity of solids in the lower order streamlets and choke the higher order streams. These lower order streamlets and gullies have high erosion capacity due to steep gradient and transportation of rock fragments with high velocity of the stream and deposition of same in the connecting high order streams due to velocity drop. Streams can also erode by undercutting their banks resulting in mass-wasting processes like slumps or slides. When the undercut material falls into the stream, the fragments are transported and deposited down below in the stream bed. The other mode of sediment transportation is very negligible.

9. OBJECTIVES OF THE SCHEME

The objectives are as follows:-

i) To fulfil Condition No.XVII (a) of the Stage-I approval granted dt.18.09.2024 of MoEF to undertake "**Mitigative measure to minimize soil erosion &**

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

choking of stream shall be implemented in accordance with the approved plan in consultation with State Forest Department".

ii) To prevent erosion of top soil.

iii) To prevent obstruction of existing natural water course.

iv) Proper Management of overburden deposited so as to prevent siltation in the down below streams.

v) To prevent overflow of eroded soils from the mining areas to the natural streams.

10. PROPOSED METHODOLOGY

To achieve the above objectives, it has been proposed to take up both biological and structural works for soil and water conservation. The vegetative measures are to be adopted mostly in the Northern part of the lease area whereas the structural works are suggested in the lower reaches such as in the garland drain around O.B. dumps. The overburden generated in the initial 6 years of mining shall be dumped in the eastern part of the Block. Height of the dump will remain 60 meter on average with 30 meter height in each tier. Concurrent backfilling will commence from the 7th year from production commencement. Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production. At the end of the mine life, there will be no external dump and this area will go for mining. The following activities are proposed to be taken up to mitigate soil erosion and choking of streams:

a. Erosion from OB dump slopes areas will be controlled by garland drain, loose boulder structures, settling tanks etc. The main purpose is to control soil erosion from OB dump and mineral stock piles.

b. Periodic Sediment/silt removal/De-silting etc will also be undertaken in the proposed settling pond as well as from garland drains demarcated at suitable location and shown in the attached plan.

11. MEASURES ALREADY ADOPTED

There is no Biological and Structural measures exist. It is a fresh mining lease and no mining activities have been taken place so far.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

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Divisional Forest Officer,
Dumka Forest Division, Dumka

12. MEASURES PROPOSED

Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production. At the end of the mine life, there will be no external dump. As there will be no dump, hence plantation along the slope of the temporary dump has not been taken into consideration. The details of proposed mitigative measures to minimize soil erosion and choking of streams in Pachwara South Coal Block of M/s Neyeveli Uttar Pradesh Power Limited are given below:

a. Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land underutilization. In these lands, vegetative measures are not adequate to keep down the erosion. Some structural measures are required to be taken before vegetative measures are adopted. Structural measures, therefore, serve as supplementary to vegetative measures. The objective behind building mechanical structures is to reduce the degree and length of the slope, reducing run-off and consequently, reducing soil erosion.

i) Plan for Construction of Loose Boulder Structure

After studying the topography and the drainage pattern it has been found that there are 10 spots where the LBCD required and accordingly it has proposed to construct **30** nos. of loose boulder structure of 4m span across the proposed garland drain along the dumps & in phase-2, settling pits will help in stabilization of silt & sediment as well as prevention of soil erosion &enrichment of vegetation & greenery development.

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka



Loose Boulder Structures

ii) Plan for Construction of Garland drain

A shallow trench (2.0 m wide x 1.50m deep) will be dug for storage of runoff accumulated for draining surface water before it is released to the agriculture land or natural water course. Details of proposed Garland drain **4830mt** shall be constructed during the ensuing seven years period with location is shown in the map.



Garland Drain around Waste Dump

iii) Construction of Retaining wall

A retaining wall is a structure designed and constructed to resist the lateral pressure of soil when there is a change in ground elevation that exceeds the angle of repose of the soil. The Retaining walls are proposed for construction over

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4850mt. Also, there is a provision for maintenance of the retaining wall for the next 4 years.



Details of Retaining walls

iv) Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of **2745mt** on the proposed temporary dumps considering the volume of OB materials &the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than28^0. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially maturate, the work will be executed.



Terracing of OB Dumps

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
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Dumka Forest Division, Dumka

v) Plan for Construction of Settling Tanks

It is a process that involves separation of solid material from slurry. Sometimes, this process is called sedimentation. When waste water is treated, a large quantum of materials is filtered out of the liquid by physical barriers. Even then, the water will contain some solids which need to be removed. A settling tank is proposed to be used to protect the surface water. It has been proposed to construct 1 **no.** of settling tank. Details of proposed 1 no. of settling Tanks are shown in the map.

vi) De-siltation

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of stream.

13. INSPECTION, MONITORING AND EVALUATION

For successful implementation of the above Mitigative measures, intensive inspection and technical guidance from State Forest Department is required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for proper execution of these programmes.

14. MOTIVATION OF PEOPLE:

The villagers of the adjoining village, are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure on this score.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer.
Dumka Forest Division, Dumka

EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency in consultation with State Forest Department. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

15. REQUIREMENT OF FUNDS

The total cost of implementation of mitigative measures will be **Rupees Two crore twenty-three lacks thirty-five thousand four hundred seventy-six) Only.** The expenditure will be made during the next seven years period. This budget will be subject to increase in amount considering the increase in cost of materials and labour charges. The tentative annual expenditure planned for next seven years for the implementation of the mitigative measures is given in the following tables:

FINANCIAL FORECAST OF THE PROJECT (714.8553 HA.)

Wage Rate Rs.

Sl. No.	Description of the Work	Fund Required (in Rs.)
	Total	
1.	**Structural Measures**	
A.	**30** nos. of Loose Boulder Structure of 4mt span @ Rs. 43577per each	1307310.00
B.	Construction of Garland drain over a length of **4830** mt @ Rs. 488 per RMT	2357040.00
C.	Construction of retaining wall over **4850** mt @ Rs1910 per RMT	9263500.00
D.	Terracing of OB dump over a length of **2745mt.** @ Rs. 817 per RMT	2242665.00
E.	Construction of **1** no. of settling tank @ Rs 14612 per each	14612.00
	Total	**15185127.00**
2.	De-siltation work for Garland drain, settling pond and check dam twice in a year on LS	500000
3.	Maintenance of retaining walls	500000
	Sub Total	**16185127.00**
4.	15% of the total cost for motivation of VSS / People involved	2427770.00
	Total	**18612897.00**
	Price escalation @ 20%	3722579.00
	GRAND TOTAL	**2.23,35,476.00**

(Rupees Two crore twenty-three lacks thirty-five thousand four hundred seventy-six) only

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

M/s Neyveli Uttar Pradesh Power Limited do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.

For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,

PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

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NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA,
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in TEL: 06434-236147

Lr No. NUPPL/PSOCP/GM/FC/2025/04/28 Date: 29.04.2025

To,

29-4-25

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited – Submission of Schemes as per the EDS point number x.
Ref:	In Principle approval of Forest Clearance Stage –I EDS dated 04.04.2025.

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

As per the **EDS number x** user agency has not submitted "Plantation of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion."

Hence, M/s NUPPL is hereby submitting the approved Plan/Scheme w.r.t Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

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Scheme
For

PLANTING OF ADEQUATE DROUGHT HARDY PLANT SPECIES AND SOWING OF SEEDS TO ARREST SOIL EROSION.

in compliance

with

Condition No.XVII (b) of

Stage-I approval granted vide

Letter dt.18.09.2024

Minister of Environment, Forests and Climate Change(Forest Conservation Division)

for

Diversion of 455.1108 Hects of Forest Land for U/s-2 (ii) of F.C. Act'1980

within Pachwara South Coal Block

of

M/S Neyveli Uttar Pradesh Power Limited.

Dist.Dumka

Jharkhand.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

SCHEME FOR PLANTING OF DROUGHT HARDY PLANT SPECIES AND SOWING OF SEEDS WITHIN MINING LEASE TO ARREST SOIL EROSION

1. INTRODUCTION

Pachwara South Coal Block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The Block is allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL)- a joint venture of NLC India Limited and Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 from Ministry of Coal, Government of India. The lease area is 714.8553 Ha within which forest area is 455.1108 Ha and non-forest area is 259.7445 Ha

Mining plan was approved By Ministry of Coal Vide No-34011/2/2020 Dated 11.11.2020. Environmental Clearance has been approved on 23.09.2024 with a maximum production capacity of 9 MTPA.

Further, Stage-I approval over 455.1108 ha. of Forest Land for U/s-2 (ii) of F.C. Act'1980 has been granted by MoEF vide their Letter dt.18.09.2024, wherein it has been stipulated as per **Condition No.XVII(b) for preparation and implementation of a plan for planting adequate drought hardy plant species and sowing of seeds to arrest soil erosion.**

LOCATION

Pachwara South Coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar ,tehsil-Gopikander, Dist-Dumka of Jharkhand state. The block area covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates:

Latitude: 24° 29' 57.404" N-24° 31' 46.956" N

Longitude: 87° 27' 22.010" E-87° 29' 56.150" E

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

The Block is well connected with Dumka, the district head quarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area near the site and well connected with both Dumka and Pakur (district headquarters) through black topped Dumka-Shahibganj Road and Amrapara- Maheshpur -Pakur

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block and falls in between the block and district headquarter Pakur.

The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The altitude of the Block is ranges from 84 m to 185 m above MSL. The total mining lease hold area is 714.8553 Ha.

2. TOPOGRAPHY

The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South-western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82m (above MSL) towards northeast to about 188m (above MSL) towards south central with general ground slope from south to north towards Bansloi River, which acts as the northern boundary (Fig. No.C3-3).

A high-tension electrical line is also passing through the central part of the block. The block is also characterized by few ponds, first order seasonal streams, a Church and a School. Southern part of the block characterizes with some hillocks. Out of the total area of 714.8553 ha, 455.1108 ha are forest land.

3. SOIL TYPE

The soils of the study area have been developed mostly from massive granitic rocks and meta sedimentary formations of Precambrian age. These soils are brown in colour, medium textured, containing gravels, quartz, sand and ferruginous concretion. The pH of soil samples in the study area indicated that in agriculture land, the soil pH was slightly acidic and in the two forest land sites, the soil pH was more acidic in nature. Electrical conductivity, as the measure of current carrying capacity, gives a clear picture of the amount of soluble salts present in the soil. It plays a major role in the salinity of soils. There is a relation between electrical conductivity and salinity, i.e. lesser the EC value low will be the salinity value of soil and vice-versa. Electrical conductivity values within 800 µmho/cm are considered as normal nature of soil. No samples of the area have crossed EC values 800µmho/cm, and thus almost all the soil samples are found to be suitable for agriculture. Soil textural form of the study area is sandy loam or silty loam in nature. The organic carbon content of the soil in terms of percentage collected from different sampling locations indicating variable organic matter content and decomposition rates.

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

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General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

4. CLIMATE

The area experiences tropical climate, which is hot & sub-humid. A dry and hot summer with temperatures often rises above normal. During summers, the mercury rises well above 42 degree C. As for the direction of the wind, it mostly blows from the west. The summers start from middle of March and lasts till the middle of June. Winters in the region marks the mercury dropping to about 7degree C. While the day time is pleasingly cool, with the fall of even in temperature lowers further, making the nights chilly and cold. The winter starts from December and last till the month of February. Well-distributed rainfall between mid of June to mid of September marks the rainy season. The total rainfall on the average is about 1316.8 mm (as per IMD 30 year's average data), of which 85% precipitation is during rainy season only.

5. DRAINAGE

The core zone has couple of primary & secondary nalas which act as tributary of Bansloi river. Bansloi, the main surface run-off flowing from west to east, acts as the northern boundary of the lease area. Apart from Bansloi river & its tributaries on the north, there are other nalas like Banjhi amba nala (7.5km in SW) & Tirpatia nala (9km in S) flows within the 10km radius of the study area.The ML area falls under the catchment of Bansloi River which flows along the northern boundary of the ML area. The maximum depth of Bansloi River is around 4m. Highest flood level (HFL) of Bansloi River in this part is 97-meter AMSL as per information obtained from the local public works department. The water yield of a watershed, i.e., the capacity of a water resource to serve as a long term water supply, may either be measured directly on a single outlet on the main stream or be calculated through empirical equations based on important physical properties of a particular watershed. Surface-water yield depends primarily on inflows and storage. The average water flow through Bansloi River is 60480 KLD. Whereas, the maximum water requirement for dust suppression, plantation and other purposes in the mining site which is planned to obtain from Bansloi River during initial 7 years is 1560 KLD, i.e. only 2.6% of the total river flow. Therefore, water intake from river Bansloi will not impact on the natural courses.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Forest Division, Dumka

EXISTING VEGETATION

The vegetation of the applied area is composed of Arjun(*Terminalia Arjuna*), Sisham (*Dalburgia sisoo*), Asan (*Terminalia Tomentosa*), Aam (*Mangifera indica*), Jamun (*Syzygiumcuminii*), Kendu (*Diasporus Melanoxylon*), Baans (*Bamboo*), Kurum, Mahua (*Madhucaindica*), Karam (*Adina cordifolia*), Neem (*Azadirachta Indica*), Sagwan *(Tectona Grandis)* Acacia, Awla etc. ***Sal (Shorea robusta)*** is the pre-dominant species.

6. LAND USE PATTERN

During the life of the mine, as per the component wise break up the land use pattern will be as follows:

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public / Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Excavation Area	447.3308	196.4202	643.7600										0.0000
Backfilled Area			0.0000	371.7600	151.8600	523.6200	51.1600	117.2300			371.7600		523.6200
Excavated Void			0.0000	75.5708	44.5692	120.1400			44.5692		75.5708		120.1400
Without Plantation			0.0000										0.0000
Top Soil Dump		6.5300	6.5300		6.6300	6.5300		6.5300					6.5300
External Dump /surface damp			0.0000										0.0000
Safety Zone	7.7800	3.0600	10.8400	7.7800	3.0600	10.8400		3.0600			7.7800		10.8400
Haul road between quarries		17.1300	17.1300		17.1300	17.1300		17.1300					17.1300
Road Diversion.		3.3100	3.3100		3.3100	3.3100				3.3100			3.3100
Diversion / Below River Nala/Canal	0.0000	0.0000	0.0000										0.0000
Settling Pond		0.0400	0.0400		0.0400	0.0400				0.0400			0.0400
Road & Infrastructure area.		18.4700	18.4700		18.4700	18.4700		17.8400		0.6300			18.4700
Rehonalisation Area.			0.0000										0.0000
Garland Drains.		4.8900	4.8900		4.8900	4.8900				4.8900			4.8900
Embankment.		3.5600	3.5600		3.5600	3.5600				3.5600			3.5600
Green Belt.		3.0600	3.0600		3.0600	3.0600		3.0600					3.0600
Water Reservoir Near Pit			0.0000										0.0000
UG Entry			0.0000										0.0000
Undisturbed / Mining Boundary		3.3653	3.3653		3.3653	3.3653						3.3653	3.3653
Residual			0.0000										0.0000

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public / Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Pit Head Power Plant			0.0000										0.0000
Water Harvesting			0.0000										0.0000
Agricultural Land			0.0000										0.0000
Total	455.1108	259.7445	714.8553	455.1108	259.7445	714.8553	51.1600	148.3200	44.5692	12.4300	455.1108	3.2653	714.8553

7. PLANTATION PLANNING DURING THE LEASE PERIOD

The overburden generated in the initial 6 years of mining shall be dumped in the eastern part of the Block. Height of the temporary dump will remain 60 meter on average with 30 meter height in each tier. Concurrent backfilling will commence from the 7th year from production commencement. Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production. At the end of the mine life, there will be no external dump and this area will go for mining. **As the dump will be rehandled, hence no plantation of drought hardy species has been planned along the temporary slope or foot of the dump area.**

8. INSPECTION, MONITORING AND EVALUATION

For successful implementation of the above Mitigative measures, intensive inspection and technical guidance from State Forest Department is required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for proper execution of these programmes.

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

9. MOTIVATION OF PEOPLE:

The villagers of the adjoining villages, are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA).

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure on this score.

EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency in consultation with State Forest Department. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

10. REQUIREMENT OF FUNDS

Plantation of drought hardy plant species and sowing of seeds along the temporary dump slope or foot of the dump area will be carried in consultation of Forest department. The financial implications arises herein will be borne by M/s NUPPL.

For **Neyveli Uttar Pradesh Power Ltd.**

Satwik, I.F.S.
Divisional Forest Officer.
Dumka Forest Division, Dumka

General Manager/Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

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NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH OPEN CAST PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA.
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in TEL: 06434-236147

Lr No. NUPPL/PSOCP/GM/FC/2025/04/29 Date: 29.04.2025

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	Pachwara South OCP of M/S Neyveli Uttar Pradesh Power Limited – Submission of Schemes as per the EDS point number xi.
Ref:	In Principle approval of Forest Clearance Stage –I EDS dated 04.04.2025.

Dear Sir,

Vide letter no.- **8-37/2022-FC; dated 18.09.2024** cited in reference above, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of **455.1108 ha** of forest land for **Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL)**, District Dumka, Jharkhand.

An EDS was raised by PCCF Nodal, Ranchi on 23.04.2025 against the FC Stage – I compliance report submitted by M/s NUPPL.

As per the **EDS number xi** user agency has not submitted "Construction of check dams, retention /toe walls to arrest sliding down of the excavated maternal along the contour."

Hence, M/s NUPPL is hereby submitting the approved Plan/Scheme w.r.t Construction of check dams, retention/toe walls to arrest sliding down of the excavated maternal along the contour.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSCMP, NUPPL.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

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Scheme
For

CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR

in compliance

with

Condition No.XVII (C) of

Stage-I approval granted vide

Letter dt.18.09.2024

Minister of Environment, Forests and Climate Change(Forest Conservation Division)

for

Diversion of 455.1108 Hects of Forest Land for U/s-2 (ii) of F.C. Act'1980

within Pachwara South Coal Block

of

M/S Neyveli Uttar Pradesh Power Limited.

Dist.Dumka

Jharkhand.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka

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SCHEME FOR CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR.

1. INTRODUCTION

Pachwara South Coal Block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The Block is allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL)- a joint venture of NLC India Limited and Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 from Ministry of Coal, Government of India. The lease area is 714.8553 Ha within which forest area is 455.1108 Ha and non-forest area is 259.7445 Ha
Mining plan was approved By Ministry of Coal Vide No-34011/2/2020 Dated 11.11.2020. Environmental Clearance has been approved on 23.09.2024 with a maximum production capacity of 9 MTPA.

Further, Stage-I approval over 455.1108 ha. of Forest Land for U/s-2 (ii) of F.C. Act'1980 has been granted by MoEF vide their Letter dt.18.09.2024, wherein it has been stipulated as per **Condition No.XVII(c) for construction of Check Dams, Retention/Toe walls etc. to arrest sliding down of the excavated material along the contour.**

1. LOCATION

Pachwara South Coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar ,tehsil-Gopikander, Dist-Dumka of Jharkhand state. The block area covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates:

Latitude: 24° 29' 57.404" N-24° 31' 46.956" N

Longitude: 87° 27' 22.010" E-87° 29' 56.150" E

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

The Block is well connected with Dumka, the district head quarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area Pachwara South Coal Block and well connected with both Dumka and Pakur (district headquarters)

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

through black topped Dumka-Shahibganj Road and Amrapara- Maheshpur -Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block and falls in between the block and district headquarter Pakur. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The altitude of the Block is ranges from 84 m to 185 m above MSL. The total mining lease hold area is 714.8553 Ha.

2. TOPOGRAPHY

The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South-western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82m (above MSL) towards northeast to about 188m (above MSL) towards south central with general ground slope from south to north towards Bansloi River, which acts as the northern boundary (Fig. No.C3-3).

A high-tension electrical line is also passing through the central part of the block. The block is also characterized by few ponds, first order seasonal streams, a Church and a School. Southern part of the block characterizes with some hillocks. Out of the total area of 714.8553 ha, 455.1108 ha are forest land.

3. SOIL TYPE

The soils of the study area have been developed mostly from massive granitic rocks and meta sedimentary formations of Precambrian age. These soils are brown in colour, medium textured, containing gravels, quartz, sand and ferruginous concretion. The pH of soil samples in the study area indicated that in agriculture land, the soil pH was slightly acidic and in the two forest land sites, the soil pH was more acidic in nature. Electrical conductivity, as the measure of current carrying capacity, gives a clear picture of the amount of soluble salts present in the soil. It plays a major role in the salinity of soils. There is a relation between electrical conductivity and salinity, i.e. lesser the EC value low will be the salinity value in soil and vice-versa. Electrical conductivity values within 800 micro mhos/cm are considered as normal nature of soil. No samples of the area have

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

crossed EC values 800µmho/cm, and thus almost all the soil samples are found to be suitable for agriculture. Soil textural form of the study area is sandy loam or silty loam in nature. The organic carbon content of the soil in terms of percentage collected from different sampling locations indicating variable organic matter content and decomposition rates.

4. CLIMATE

The area experiences tropical climate, which is hot & sub-humid. A dry and hot summer with temperatures often rises above normal. During summers, the mercury rises well above 42 degree C. As for the direction of the wind, it mostly blows from the west. The summers start from middle of March and lasts till the middle of June. Winters in the region marks the mercury dropping to about 7degree C. While the day time is pleasingly cool, with the fall of even in temperature lowers further, making the nights chilly and cold.

The winter starts from December and last till the month of February. Well-distributed rainfall between mid of June to mid of September marks the rainy season. The total rainfall on the average is about 1316.8 mm (as per IMD 30 year's average data), of which 85% precipitation is during rainy season only.

5. DRAINAGE

The core zone has couple of primary & secondary nalas which act as tributary of Bansloi river. Bansloi, the main surface run-off flowing from west to east, acts as the northern boundary of the lease area. Apart from Bansloi river & its tributaries on the north, there are other nalas like Banjhi amba nala (7.5km in SW) & Tirpatia nala (9km in S) flows within the 10km radius of the study area. The ML area falls under the catchment of Bansloi River which flows along the northern boundary of the ML area. The maximum depth of Bansloi River is around 4m. Highest flood level (HFL) of Bansloi River in this part is 97-meter AMSL as per information obtained from the local public works department. The water yield of a watershed, i.e., the capacity of a water resource to serve as a long term water supply, may either be measured directly on a single outlet on the main stream or be calculated through empirical equations based on important physical properties of a particular watershed. Surface-water yield depends primarily on inflows and storage.

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Satwik, I.F.S.
Divisional Forest Officer,

The average water flow through Bansloi River is 60480 KLD. Whereas, the maximum water requirement for dust suppression, plantation and other purposes in the mining site which is planned to obtain from Bansloi River during initial 7 years is 1560 KLD, i.e. only 2.6% of the total river flow. Therefore, water intake from river Bansloi will not impact on the natural courses.

EXISTING VEGETATION

The vegetation of the applied area is composed of Arjun(*Terminalia Arjuna*), Sisham (*Dalburgia sisoo*), Asan (*Terminalia Tomentosa*), Aam (*Mangifera indica*), Jamun (*Syzygiumcuminii*), Kendu (*Diasporus Melanoxylon*), Baans (*Bamboo*), Kurum, Mahua (*Madhucaindica*), Karam (*Adina cordifolia*), Neem (*Azadirachta Indica*), Sagwan *(Tectona Grandis)* Acacia, Awla etc. ***Sal (Shorea robusta)*** is the pre-dominant species.

6. LAND USE PATTERN

During the life of the mine, as per the component wise break up the land use pattern will be as follows:

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Undisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Excavation Area	447.3308	196.4292	643.7600										0.0000
Backfilled Area			0.0000	371.7600	151.8600	523.6200	51.1600	107.2300			371.7600		523.6200
Excavated Void			0.0000	75.5708	44.5692	120.1400			44.5692		75.5708		120.1400
Without Plantation			0.0000										0.0000
Top Soil Dump		6.5300	6.5300		6.5300	6.5300		6.5300					6.5300
External Dump /surface dump			0.0000										0.0000
Safety Zone	7.7800	3.0600	10.8400	7.7800	3.0600	10.8400		3.0600			7.7800		10.8400
Haul road between quarries		17.1300	17.1300		17.1300	17.1300		17.1300					17.1300
Road Diversion		3.3100	3.3100		3.3100	3.3100				3.3100			3.3100
Diversion / Below River Nala/Canal	0.0000	0.0000	0.0000										0.0000
Settling Pond		0.0400	0.0400		0.0400	0.0400				0.0400			0.0400
Road & Infrastructure area		18.4700	18.4700		18.4700	18.4700		17.8400		0.6300			18.4700
R/[illegible]		[illegible]	0.0000										0.0000
[illegible]		[illegible]	4.8900		4.8900	4.8900				4.8900			4.8900

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Dumka Forest Division, Dumka

Type	Proposed Land Use			Land use at End of Mine Life			Land Use (Post Closure)						
	Proposed in Ha			(End of Mine in Ha)			Agricultural Land Land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Unlisturbed	Total
	Forest Land	Non Forest Land	Total	Forest Land	Non Forest Land	Total							
Drains.		0	0		0	0				0			0
Embankment.		3.5600	3.5600		3.5600	3.5600				3.5600			3.5600
Green Belt.		3.0600	3.0600		3.0600	3.0600		3.0600					3.0600
Water Reservoir Near Pit			0.0000										0.0000
UG Entry.			0.0000										0.0000
Undisturbed / Mining Rights for UG.		3.2653	3.2653		3.2653	3.2653						3.2653	3.2653
Resettlement			0.0000										0.0000
Pit Head Power Plant			0.0000										0.0000
Water Harvesting			0.0000										0.0000
Agricultural Land			0.0000										0.0000
Total	455.1108	259.7445	714.8553	455.1108	259.7445	714.8553	31.1600	148.3200	44.5692	12.4300	455.1108	3.2653	714.8553

OBJECTIVE OF THE SCHEME

The main objective of the present scheme is to fulfill the **Condition No XVII (C)** which provides for **preparation of a plan for construction of Check Dams, Retention/Toe walls etc. to arrest sliding down of the excavated material along the contour in accordance with the approved scheme**. The different steps proposed to be adopted are as under:

a) To prevent erosion of sediment due to surface runoff.

b) To prevent of obstruction of natural water sources.

c) To complete construction activities efficiently before surface soil is exposed.

d) To prevent overflow of eroded soil from the mining areas to the natural streams and habitations.

7. PROPOSED METHODOLOGY

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Dumka Forest Division, Dumka

To achieve the above objectives, it has been proposed to take up structural works for soil and water conservation. In this Scheme, considering the topography and contours of the lease area, emphasis has been given to arrest sliding down of excavated materials along the contour by constructing check dams, retention / toe walls at specified locations within the mining lease. Locations have been properly selected within the leasehold and plans are listed in the following tables & maps.

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Pachwara South Coal Block
MIDDL Dumka (Jharkhand)

a) **The Salient features of the drainage management plan/scheme**

The overall drainage Planning has been made in such a manner which follows the existing drainage pattern the block area in order to prevent silt and sediments, a number of measures have been proposed.

The major part of the mining activities is confined to the central part of the lease hold area. Runoff water near the dump area will be channelized by garland drain so that solid waste and the force of run-off which will be restricted by a loose boulder structure and settling tank.

b) **The drainage pattern of overburden dump**

The runoff water will flow through the dump surface along the bund which will be developed as the edge of the dump . The dump surface needs to be terraced so that runoff can flow smoothly to meet the garland drain at the end for proper flow of water. Finally, the water will flow to the settling pit which. After settling down, over flow water will go through weep holes of retaining wall & finally join the garland drain. Loose boulder structures have been proposed in the garland drain of Dumps which will help to arrest the solid waste intermittently. The rain water from proposed dumps will drain down to the garland drain of proposed dumps which will help to arrest the solid waste by means of boulder structures across the garland drain as well as settling pits.

Slope of the Proposed Dump

Proposal had been given for waste generation from the proposed quarry and subsequent dumping on Dump site during the plan period as per approved scheme of mining.Dumping for the initial 6 years (the year from the commencement of production) has been planned in the eastern side of the block. About 80.63 MBCM of Overburden will be dumped temporarily within the coal bearing area of the block. Height of the dump will remain 60 meter on average with 30 meter height in each tier. Concurrent backfilling will commence from 9th year .Re-handling of the temporary surface Dump will commence from 9th year. Re-handling will continue for 13 years with capping of re-handling volume to 8.4 Mcum/Year. At the end of the mine life, there will be no external dump. The slope of the temporary dump will be maintained at an angle of 28°. The height of terraces of dump will be 10-12 m.

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c) **Management**

Re-treating fashion will be adopted to dump the total waste material generated during planned period. Two (2) terraces will be formed in the proposed dump.

Each terrace will have inward slope. The terrace will be connected to the garland drain outside the periphery of the dump. Each terrace will have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.

To control erosion in the proposed waste dumps, regular compaction, development of terraces are proposed to be done. Also, the retaining wall and garland drain for the proposed waste dump will be constructed to arrest wash-offs from the dump. It is proposed to construct both the retaining wall and garland drain at the end of 5th year plan period. No proposal has been given for the rehabilitation of the dump during planned period as it is a temporary Dump.

8. MEASURES ALREADY ADOPTED

There is no Biological and Structural measures exist. It is a fresh mining lease and no mining activities have been taken place so far.

9. MEASURES PROPOSED

Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production. At the end of the mine life, there will be no external dump. As there will be no dump, hence plantation along the slope of the temporary dump has not been taken into consideration. The details of proposed mitigative measures to minimize soil erosion and choking of streams in Pachwara South Coal Block of M/s Neyeveli Uttar Pradesh Power Limited are given below:

a. Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land underutilization. In these lands, vegetative measures are not adequate to keep down the erosion. Some structural measures are required to be taken before vegetative measures are adopted. Structural measures, therefore, serve as supplementary to vegetative measures. The objective behind building mechanical structures is to reduce the degree and length of the slope, reducing run-off and consequently controlling soil erosion.

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Divisional Forest Officer,
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i) Plan for Construction of Loose Boulder Structure

After studying the topography and the drainage pattern it has been found that there are 10 spots where the LBCD required and accordingly it has proposed to construct **30** nos. of loose boulder structure of 4m span across the proposed garland drain along the dumps & in phase-2, settling pits will help in stabilization of silt & sediment as well as prevention of soil erosion &enrichment of vegetation & greenery development.



Loose Boulder Structures

ii) Plan for Construction of Garland drain

A shallow trench (2.0 m wide x 1.50m deep) will be dug for storage of runoff accumulated for draining surface water before it is released to the agriculture land or natural water course. Details of proposed Garland drain **4830mt** shall be constructed during the ensuing seven years period with location is shown in the map.

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Garland Drain around Waste Dump

iii) Construction of Retaining wall

A retaining wall is a structure designed and constructed to resist the lateral pressure of soil when there is a change in ground elevation that exceeds the angle of repose of the soil. The Retaining walls are proposed for construction over **4850mt**. Also, there is a provision for maintenance of the retaining wall for the next 4 years.



Details of Retaining walls

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iv) Terracing of OB Dump Slope

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It is proposed to construct berm & terraces over a length of **2745mt** on the proposed temporary dumps considering the volume of OB materials &the area

earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than28^0. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially maturate, the work will be executed.



Terracing of OB Dumps

v) Plan for Construction of Settling Tanks

It is a process that involves separation of solid material from slurry. Sometimes, this process is called sedimentation. When waste water is treated, a large quantum of materials is filtered out of the liquid by physical barriers. Even then, the water will contain some solids which need to be removed. A settling tank is proposed to be used to protect the surface water. It has been proposed to construct 1 **no.** of settling tank. Details of proposed 1 no. of settling Tanks are shown in the map.

vi) De-siltation

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of

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Dumka Forest Division

10. INSPECTION, MONITORING AND EVALUATION

For successful implementation of the above Mitigative measures, intensive inspection and technical guidance from State Forest Department is required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for proper execution of these programmes.

11. MOTIVATION OF PEOPLE:

The villagers of the adjoining villages, are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure on this score.

12. EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency in consultation with State Forest Department. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

13. REQUIREMENT OF FUNDS

The financial forecast for construction of Check Dams, Retention/ Toe Walls to arrest sliding down of the excavated material along the contour by Construction of Check Dam, Retaining wall, Catch Drain, Settling Tank and Loose Boulder Structure of 4m span has already been provided in the Scheme for **Mitigative measures to minimize soil erosion and choking of streams** as per Condition **No. XVII(a) of Stage-I approval granted by MoEF in their letter Dt.11.02.2011**.The financial forecast of the project has been furnished in the table below:

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FINANCIAL FORECAST OF THE PROJECT (714.8553 HA.) Wage Rate Rs.

Sl. No.	Description of the Work	Fund Required (in Rs.)
	Total	The financial forecast has already been provided in the earlier scheme prepared in compliance with Condition No. XVII(a)
1.	**Structural Measures**	
A.	**30** nos. of Loose Boulder Structure of 4mt span @ Rs. 43577per each	
B.	Construction of Garland drain over a length of **4830** mt @ Rs. 488 per RMT	
C.	Construction of retaining wall over **4850** mt @ Rs1910 per RMT	
D.	Terracing of OB dump over a length of **2745mt.** @ Rs. 817 per RMT	
E.	Construction of **1** no. of settling tank @ Rs 14612 per each	
	Total	
2.	De-siltation work for Garland drain, settling pond and check dam twice in a year on LS	
3.	Maintenance of retaining walls	
	Sub Total	
4.	15% of the total cost for motivation of VSS / People involved	
Total		
	Price escalation @ 20%	
TOTAL	**GRAND**	

M/s Neyveli Uttar Pradesh Power Limited do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.

For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,
PSCMP, NUPPL.

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Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no.- 22 पी०-2(2)-06/2022.....

Office order No. 50 **dated** 07.04.2025

Sanction Order of the Soil and Moisture Conservation Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka,

The Instant Soil and Moisture Conservation Plan has been submitted by M/s Neyveli Uttar Pradesh Power Ltd. (referred to as "the Use Agency") in pursuance of the following conditions laid by MoEF&CC under Section 2(1)(ii) of condition no. (IX),(XIX) and (XXIV) of Stage-1 approvals vide letter no. 8-37/2022-FC dated 18.09.2024 for non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

The aforesaid Terms of Reference laid by the Central Government reads as follows:

Condition no. 2(1) (ii) : <u>Compensatory Afforestation;</u>

Condition No. (ii)(ix): *" The User Agency shall prepare a Digital Elevation Model of 10km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th , 15th , 20th , 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of*

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NUPPL, Dumka (Jharkhand)

user agency, Forest Department, Subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.."

Condition No. (xix): *"The User Agency either himself or through the State Forest Department shall undertake gap planting and Soil and Moisture Conservation activities to restock and rejuvenate the degraded open forest (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;"*

Condition No. (xxiv): *"The User Agency will undertake comprehensive Soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval;"*

2. It was informed by the User Agency that in compliance of the above-mentioned conditions, the instant integrated Soil and Moisture Conservation Plan has been prepared in consultation with the forest officials including DFO, Dumka, and Pakur, Conservator of Forest (CF) Territorial Circle Dumka and Regional Chief Conservator of Forest (RCCF), Dumka.

3. In the above stated background, the Regional Chief Conservator of Forests, Ranchi (RCCF), Dumka vide his letter no. 366 dated 10.03.2025 submitted the Plan to office of the undersigned for its consideration for sanction.

4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forests (RCCF), Dumka, CF, Territorial Circle, Dumka, DFO, Dumka, Godda and User agency, vide this office letter no. 795 dated 24.03.2025 to arrange a Power-Point Presentation of the plan in meeting scheduled on 26.03.2025 in the conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests, Dumka and Divisional Forest Officer, Dumka and DFO Godda Forest Division (DFO, Dumka and Pakur on video

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NU. L. Dumka (Jharkhand)

conferencing). Shri Deepak Vincent Surin (NUPPL) G.M. Project Head, Pachwara South Coal Block, Shri Rajeev Ranjan, Representative (NUPPL) and Shri Kislay Kumar, Director, Ecosofet Pvt. Ltd., Consultant for preparing were also present during the presentation.

5. After deliberation on various provisions of the proposed Plan and the presentation, it was observed that:-

(i) Two other coal blocks are located in close vicinity of Pachwara South Coal Block (CB) namely, Pahcawara Central and Pachwara North CB. Pachawara South Block is situated within the Dumka Forest Division/District whereas Pachawara Central and Pachawara North Blocks fall within the administrative boundary of Pakur Forest Division/District. The Bansloi river being bifurcating boundary of two district, Pakur and Dumka. Apart from the aforesaid Coal Blocks adjacent to Pachawara South Coal Blocks there is one more upcoming coal block namely Urma Paharitola Coal Block.

(ii) During the deliberation and presentation, it was informed that in compliance of conditions laid down by MoEF&CC towards Forest clearance with respect to Pachawara Central CB and Pachawara North CB, SMC and wildlife conservation plans have been formulated and approved by the competent authorities. The impact Area (IA) delineated under the above plans has been restricted to the territorial Pakur Forest Division. In the light of above background, this SMC Plan has been formulated restricting the territorial boundaries of Dumka and Godda Forest Division and within the radius of 10 km of the boundary of coal Block.

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6. The cost of the proposed 10-year (2026-27 to 2035-36) Soil & Moisture Conservation Plan with respect to the activities to be carried out by DFO, Dumka Forest Division and DFO, Godda Forest Divisions have been estimated to be Rs. 4009.59 lakh. The summary of the proposed interventions (component wise activities) under the Plan is as follows:-

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The Proposed financial projection under the Plan may be summarized in the following table-

Sl. No	Activity Head	Dumka Forest Division (Rs. In Lakh)	Godda Forest Division (Rs. In Lakh)	Total (Rs. In Lakh)
1.	Natural Resource Management /Soil and Moisture Conservation Measures	2272.60	721.22	2993.82
2.	Capacity Building Frontline Forest Staff	20.00	10.00	30.00
3.	Awareness Development Programmes	10.00	5.00	15.00
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	50.00	25.00	75.00
5.	Monitoring and Evaluation	10.00	5.00	15.00
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	100.00	50.00	150.00
7.	Administrative Cost	50.00	12.50	62.50
	Sub-total	**2512.60**	**828.72**	**3341.32**
	Escalation cost @20%	502.52	165.75	668.27
	Grand Total Cost	**3015.12**	**994.47**	**4009.59**

Cost to the User Agency towards implementation of the SMC Plan is Rs. 4009.59 Lakh.

7. The Plan with a total financial outlay of **Rs.** 4009.59 **Lakh** extends over a period of 10 years and shall be utilized by the Forest Department through the

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Pachwara South OCP
NUPPL, Dumka (Jharkhand)

DFO, Dumka Forest Division and DFO, Godda Forest Division in accordance with the Plan prescriptions.

8. Considering the proposals under the plan submitted by the User Agency and recommendation of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man-made, determined to forest and wildlife in their area of operation.

(ii) That the total amount of **Rs.** 4009.59 **Lakh (Rupees Forty crore nine lakh and fifty nine thousand only)** shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO, Dumka Forest Division and DFO, Godda Forest Division as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, the DFO, Dumka Forest Division and DFO, Godda Forest Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the

State Government/Forest Department. Regional Chief Conservator of Forests, Dumka shall supervise & closely monitor the progress of the activities undertaken by DFO, Dumka Forest Division and DFO, Godda Forest Division as per the approved APO & funds released under CAMPA.

(iv) That the Conservator of Forests, Dumka Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the DFO, Dumka Forest Division and DFO, Godda Forest Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.

(vi) That both the DFOs shall ensure that no violation of duly sanctioned Working Plans of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(vii) That the instant Plan is dynamic and be revisited after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirement.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, DFO, Dumka and DFO, Godda Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owning to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

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File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Territorial Circle, Dumka/ DFO, Dumka Forest Division / DFO, Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022 Memo No. 912 dated 07.04.2025

Copy forwarded to M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, for information and necessary action.

07/04/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annx - XXIII

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	5859823450	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN598232020_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020629	5859823629	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 288814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 361932000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	5859823409	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_4H380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020708	5859823708	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1121 0/-	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPI Dumka (Jharkhand)

	FP/J IN/ 3/2((../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	N59(020	585	334	Sep 4	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 0/- , Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 448580000/-	Addl CA : 0/- CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 448580000/-	Paid	Fund Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	Demand Letter (../writereaddata/Fundpdf/...pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	585982333	18 Sep 2024	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 617635418/- , NA : 0/- NA : 0/- NA : 0/- Total : 617635418/-	Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-		Paid	Fund Demand Verified by Nodal Officer On 20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On 20 Dec 2024 Transaction Date 21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/14122024163651267 1_FPJHMIN598232020_User_Fund_Demanded_84333.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	585982345	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN598232020_User_Fund_Demanded_71629.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020629	585982362	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 288814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 361932000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	585982340	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_41380.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020708	585982370	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1121[illegible]	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pdf) Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

5	FP/J...MIN/...23/2... (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	...N59... ...2020	585... 334...	Sep ...4	C... /-... PCA: 0/- Safety Zone: 0/- NPV: 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 44858/0000/- / CA : 0/- CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 44858000/-	Paid	Fun Demand Verified by Nodal Officer On : 07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 07 Jan 2025 Transaction Date : 09 Jan 2025	E... ...er (../w... ...ddata/Fundpdf/u501202519214908l2_rFJHMIN598232020_User_Fund_Demanded_68933.p Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	585982333	18 Sep 2024	CA: 0/- PCA: 0/- Safety Zone: 0/- NPV: 617635418/- NA : 0/- NA : 0/- NA : 0/- Total : 617635418/- Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On : 20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 20 Dec 2024 Transaction Date : 21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/14122024163651267l_FPJHMIN598232020_User_Fund_Demanded_84333.p Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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Annex - XXV (A)
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Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no.- 22 वि०-2(2)-02/2022.....

Office order No. 49 **dated** 07/04/2025

Sanction Order for the De-siltation Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachhwara South Coal Block project in favour of M/s Nayveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, (Jharkhand)- regarding.

The instant De-siltation Plan (referred to as "the Plan" here in after) has been submitted by **M/s Nayveli Uttar Pradesh Power Ltd. (NUPPL)** (referred to as "the User Agency") in pursuance of the following condition laid by MoEF&CC under Section no. 2(1)(i) of Stage-I approval vide letter no. 8-37/2022-FC-(Vol) dated 18.09.2024 for non-forestry use of 455.1108 ha in Dumka district with respect to Pachhawara South Coal Block in favour of M/s Nayveli Uttar Pradesh Power Ltd. (NUPPL),

The aforesaid Terms of Reference laid by the MoEF&CC (Central Government) reads as follows:

Condition no. (ii) : ***Compensatory Afforestation;***

Condition no.(ii) (XXIII): *"The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;."*

2. In compliance of the aforesaid condition laid by MoEF&CC, the User Agency M/s Nayveli Uttar Pradesh Power Ltd. (NUPPL) submitted a site-specific De-siltation Plan for diversion of forest land proposal of Pachhawara South Coal Block Project prepared in consultation with the forest officials including DFO Dumka Forest Division, Conservator of Forest Territorial Circle (CF), Dumka and Regional Chief Conservator of Forest RCCF, Dumka.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

3. In the above stated background, the Regional Chief Conservator of Forests, Ranchi (RCCF, Dumka) vide his letter no. 364 dated 10.03.2025 submitted the Plan to the office of the undersigned for its consideration for sanction.

4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forests, Ranchi, vide this office letter no. 795 dated 24.03.2025 to arrange a Power-Point Presentation of the plan scheduled on 26.03.2025 in the conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests (RCCF), Dumka and DFO Dumka and Godda Forest Division (on video conferencing). Shri Deepak Vincent Surin (NUPPL) G.M. Project Head, Pachwara South Coal Block, Shri Rajeev Ranjan, Representative (NUPPL) and Shri Kislay Kumar, Director, Ecosofet Pvt. Ltd., Consultant for preparing the De-siltation plan, were also present during the presentation.

5. After deliberation on various provisions of the De-siltation Plan and the presentation, it was observed that the Pachhwara South CB bounded by Pachhwara (Central) and Pachhwara North. Both Pachhwara Central and Pachhwara North located in Pakur Division. Both Pachhwara Central & Pachhwara North has forest land within - FC conditions involves preparation of SMCP & WMP. The Impact Area (IA) is Pachwara North 10 km radius and that of Pachwara Central is 10-20 km radius. Ponds located within 20 km radius were in the area falling under the 5 km radius of the block boundary has been considered as impact zone and it is also in the light FC conditions taken under the plans of Pachhawara Central & Pachhawara North taken together. Hence, ponds located within 5 km radius of Pachhwara South lease area being taken up under the plan.

A total of 44 villages are falling within 5-km radius of Pachhawara South Coal Block. A total of 176 ponds/water bodies were found in the 5-km radius of the mine lease boundary. The De-Siltation process (depth: 1.20m) of all the 176 ponds lying within 5 km periphery of the lease area has been proposed to be spread over first five years of the Plan. Next five years shall involve de-siltation of ponds by a depth of 0.40m – Ponds de-silted by 1.20m depth in year-1 shall be subjected again to de-siltation by a depth of 0.40m in Year-6 and so on, till the ponds de-siltation in Year-10, the final Year of this Plan. De-Siltation Plan with respect to the activities to be carried out by Pachhawara South Coal Block Project under the guidance of the DFO, Dumka Forest Division has been estimated to be Rs. 738.57 Lakh.

6. The summary of the proposed interventions (component wise) under the Plan is as follows:

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

(i) Estimate for De-siltation Plan of water bodies/ ponds for Dumka Forest Division:

Activity	Estimated Cost (Rs. In lakh)										Total (Rs. In lakh)
	Yr. 1	Yr.2	Yr.3	Yr.4	Yr.5	Yr.6	Yr.7	Yr.8	Yr.9	Yr.10	
De-siltation (1.20m)	80.93	89.70	89.03	90.22	68.92	-	-	-	-	-	418.80
De-siltation (0.40m)	-	-	-	-	-	34.88	38.50	36.68	36.52	30.09	176.67
Capacity Building	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Awareness Development	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Miscellaneous Expenses	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
Total	83.43	92.20	91.53	92.72	71.42	36.38	40.00	38.18	38.02	31.59	615.47
Cost Escalation @20%	16.69	18.44	18.31	18.54	14.28	7.28	8.00	7.64	7.60	6.32	123.10
Grand Total	**100.12**	**110.64**	**109.84**	**111.26**	**88.70**	**43.66**	**48.00**	**45.82**	**45.62**	**37.91**	**738.57**

Cost to the User agency towards implementation of the Pond De-Siltation Plan is Rs. 738.57 Lakh.

7. The Plan with a total financial outlay of Rs. 738.57 Lakh extends over a period of 10 years and shall be utilized by the Pachhawara South Coal Block Project in consultation with the State Forest Department through DFO, Dumka Forest Division in accordance with the Plan prescriptions.

8. Considering the proposals under the plan submitted by the User Agency and recommendation of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man -made, detrimental to forest and wildlife in their area of operation.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

(ii) That the total amount of **Rs. 738.57 (Rupees Seventy three Crore eight lakh fifty seven thousand only)** shall be utilized for the said purpose by the User Agency under the guidance of State Forest Department through the DFO, Dumka Forest Division, as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand State Forest Department.

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, Divisional Forest Officer, Dumka shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/ Forest Department. Regional Chief Conservator of Forests, Dumka shall supervise & closely monitor the progress of the activities undertaken by Divisional Forest Officer, Dumka as per the approved APO.

(iv) That the Conservator of Forests, Dumka Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the User Agency shall carry out the activities under the Plan strictly as per the duly sanctioned de-siltation plan.

(vi) That the DFO shall ensure that no violation of duly sanctioned Working Plans of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(vii) That the instant Plan is dynamic and be reviewed after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirements.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, Dumka to the effect that it will bear extra cost of the plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Dumka / DFO, Dumka and Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022 Memo No. 911 dated 07.04.2025

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07/04/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL Dumka (Jharkhand)

Office of the Principal Chief Conservator of Forests
Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-ihk@gov.in, Phone No. 0651-2481909

File no.- 22 पी०-2(2)-06/2022.....

Letter No. **dated**

Corrigendum

The Order No. 49, dated 07.04.2025 issued by this office has typing errors in name of the project, **'Pachhawara'**, **'M/s Nayveli Uttar Pradesh Power Ltd.'** and project cost written in words mentioned in paragraph 8 (ii) Rs. 738.57 **'(Rupees Seventy three crore eight lakh fifty seven thousand Only).'**

These will be replaced as **Pachhwara, M/s Neyveli Uttar Pradesh Power Ltd.** project cost in words Rs. 738.57 Lakh **(Seven Crore thirty eight lakhs fifty seven thousand Only).**

The other content of the order will remain the same.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. 1120 dated 05.05.2025

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03/05/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Office of the Principal Chief Conservator of Forests
Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no.- 22 पी०-2(2)-06/2022.....

Letter No. dated

Corrigendum

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The other content of the order will remain the same.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. 1120 dated 05.05.2025

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Dumka / DFO, Dumka and Godda Forest Division for information and necessary action.

03/05/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Office of the Principal Chief Conservator of Forests
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Email: pccf-jhk@gov.in, Phone No. 0651-2481909

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File no.- 22 पी०-2(2)-06/2022.....

Letter No. dated

Corrigendum

The Order No. 49, dated 07.04.2025 issued by this office has typing errors in name of the project, **'Pachhawara'**, **'M/s Nayveli Uttar Pradesh Power Ltd.'** and project cost written in words mentioned in paragraph 8 (ii) Rs. 738.57 **'(Rupees Seventy three crore eight lakh fifty seven thousand Only).'**

These will be replaced as **Pachhwara, M/s Neyveli Uttar Pradesh Power Ltd.** project cost in words Rs. 738.57 Lakh **(Seven Crore thirty eight lakhs fifty seven thousand Only)**.

The other content of the order will remain the same.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Dumka / DFO, Dumka and Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022 Memo No. 1120 dated 05.05.2025

Copy forwarded to M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), Dumka for information and necessary action.

05/05/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Annex - XXV(B)

कार्यालयः वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका।

Court Compound, Dumka-814101
E-mail- dfo-dumka@gov.in/dfodumka@gmail.com

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पत्रांक– 866 दिनांक– 16.4.2025

सेवा में,

ई-मेल

General Manager/Project Head,
Pachwara South Coal Mine Project,
Neyveli Uttar Pradesh Power Ltd.
Shanta Bhawan, LIC Colony,
Behind SBI, Dumka-814101, Jharkhand.

विषय :– अन्य विभागों/एजेंसियों से राशि प्राप्त कर वानिकी एवं संबद्ध कार्य करने हेतु वन प्रमंडल पदाधिकारी के स्तर पर "जमा शीर्ष–8782 (Deposit Fund)" व्यवस्था को कार्यरत करने के संबंध में।

उप–विषयः– Pachwara South Coal Block project in favor of M/S Neyveli Uttar Pradesh Power Limited-Request for raising the demand note for submission of cost towards the implementation of village De-siltation Plan.

प्रसंग :– आपका पत्र संख्या–NUPPL/PSCMP/GM/De-siltation/2025/04/13 दिनांक–15.04.2025

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में सूचित करना है कि Pachwara South Coal Block project in favor of M/S Neyveli Uttar Pradesh Power Limited अन्तर्गत De-siltation Plan का प्रधान मुख्य वन संरक्षक, झारखण्ड, रांची (HoFF) के कार्यालय आदेश सं0–49 तद्नुसार ज्ञापांक–911 दिनांक–07.04.2025 द्वारा स्वीकृति प्रदान की गई है। De-siltation Plan की कार्यावधि 10 वर्ष तथा स्वीकृत राशि–7,38,57,000.00 (सात करोड़ अड़तीस लाख सन्तावन हजार) रू0 है।

आपके प्रासंगिक पत्र के आलोक में वन प्रमंडल पदाधिकारी, दुमका वन प्रमंडल, दुमका के पक्ष में दुमका कोषागार के वन प्रेषण लोक लेखा (प्राप्तियाँ) शीर्ष–8782 में स्वीकृत राशि–7,38,57,000.00 (सात करोड़ अड़तीस लाख सन्तावन हजार) रू0 मात्र जमा कर तत्संबंधी चलान की प्रति इस कार्यालय को उपलब्ध कराना सुनिश्चित किया जाय ताकि स्वीकृत कार्य वित्तीय वर्ष 2025–26 में सुनिश्चित किया जा सके। साथ ही यह भी सुनिश्चित किया जाता है कि अगर कार्य प्रारंभ होने के समय/ पूर्व De-siltation Plan में सक्षम स्तर से संशोधन होता है, तो संशोधित अतिरिक्त राशि की मांग की जायेगी।

विश्वासभाजन,

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ई-मेल

ज्ञापांक– 866 दिनांक– 16.4.2025

प्रतिलिपिः– वन संरक्षक, प्रादेशिक अंचल, दुमका को प्रासंगिक पत्र की प्रति सहित सूचनार्थ एवं आवश्यक कार्रवाई हेतु समर्पित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

ई-मेल

ज्ञापांक– 866 दिनांक– 16.4.2025

प्रतिलिपिः– वन क्षेत्र पदाधिकारी, दुमका दामिन प्रक्षेत्र, काठीकुण्ड को प्रासंगिक पत्र की प्रति सहित सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,
दुमका वन प्रमंडल, दुमका।

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Scheme

for

DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

in compliance

with

Condition No.XX of

Stage-I approval granted vide

Letter dt.18.09.2024

Minister of Environment, Forests and Climate Change(Forest Conservation Division)

for

Diversion of 455.1108 Hects of Forest Land for U/s-2 (ii) of F.C. Act'1980

within Pachwara South Coal Block

of

M/S Neyveli Uttar Pradesh Power Limited.

Dist.Dumka

Jharkhand.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

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SCHEME FOR DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

1. INTRODUCTION

Pachwara South Coal Block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The Block is allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL)- a joint venture of NLC India Limited and Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 from Ministry of Coal, Government of India. The lease area is 714.8553 Ha within which forest area is 455.1108 Ha and non-forest area is 259.7445 Ha

Mining plan was approved By Ministry of Coal Vide No-34011/2/2020 Dated 11.11.2020. Environmental Clearance has been approved on 23.09.2024 with a maximum production capacity of 9 MTPA.

Further, Stage-I approval over 455.1108 ha. of Forest Land for U/s-2 (ii) of F.C. Act'1980 has been granted by MoEF vide their Letter dt.18.09.2024, wherein it has been stipulated as per **Condition No. (XX),** to undertake **desilting of village tanks and other water bodies located within 05 km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies.**

2. LOCATION

Pachwara South Coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar ,tehsil-Gopikander, Dist-Dumka of Jharkhand state. The block area covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates:

Latitude: 24° 29' 57.404" N-24° 31' 46.956" N

Longitude: 87° 27' 22.010" E-87° 29' 56.150" E

Satwik, I.F.S.
Divisional Forest Officer.
Dumka Forest Division

The Block is well connected with Dumka, the district head quarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area near the site and well connected with both Dumka and Pakur (district headquarters)

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL Dumka / Jharkhand

through black topped Dumka-Shahibganj Road and Amrapara- Maheshpur -Pakur road respectively.

The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block and falls in between the block and district headquarter Pakur. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The altitude of the Block is ranges from 84 m to 185 m above MSL. The total mining lease hold area is 714.8553 Ha.

3. TOPOGRAPHY

The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South-western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82m (above MSL) towards northeast to about 188m (above MSL) towards south central with general ground slope from south to north towards Bansloi River, which acts as the northern boundary (Fig. No.C3-3).

A high-tension electrical line is also passing through the central part of the block. The block is also characterized by few ponds, first order seasonal streams, a Church and a School. Southern part of the block characterizes with some hillocks. Out of the total area of 714.8553 ha, 455.1108 ha are forest land.

4. SOIL TYPE

The soils of the study area have been developed mostly from massive granitic rocks and meta sedimentary formations of Precambrian age. These soils are brown in colour, medium textured, containing gravels, quartz, sand and ferruginous concretion. The pH of soil samples in the study area indicated that in agriculture land, the soil pH was slightly acidic and in the two forest land sites, the soil pH was more acidic in nature. Electrical conductivity, as the measure of current carrying capacity, gives a clear picture of the amount of soluble salts present in the soil. It plays a major role in the salinity of soils. There is a relation between electrical conductivity and salinity, i.e. lesser the EC value low will be the salinity value of soil and vice-versa. Electrical conductivity values within 800

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µmho/cm are considered as normal nature of soil. No samples of the area have crossed EC values 800µmho/cm, and thus almost all the soil samples are found to be suitable for agriculture. Soil textural form of the study area is sandy loam or silty loam in nature. The organic carbon content of the soil in terms of percentage collected from different sampling locations indicating variable organic matter content and decomposition rates.

5. CLIMATE

The area experiences tropical climate, which is hot & sub-humid. A dry and hot summer with temperatures often rises above normal. During summers, the mercury rises well above 42 degree C. As for the direction of the wind, it mostly blows from the west. The summers start from middle of March and lasts till the middle of June. Winters in the region marks the mercury dropping to about 7degree C. While the day time is pleasingly cool, with the fall of even in temperature lowers further, making the nights chilly and cold. The winter starts from December and last till the month of February. Well-distributed rainfall between mid of June to mid of September marks the rainy season. The total rainfall on the average is about 1316.8 mm (as per IMD 30 year's average data), of which 85% precipitation is during rainy season only.

6. DRAINAGE

The core zone has couple of primary & secondary nalas which act as tributary of Bansloi river. Bansloi, the main surface run-off flowing from west to east, acts as the northern boundary of the lease area. Apart from Bansloi river & its tributaries on the north, there are other nalas like Banjhi amba nala (7.5km in SW) & Tirpatia nala (9km in S) flows within the 10km radius of the study area. The ML area falls under the catchment of Bansloi River which flows along the northern boundary of the ML area. The maximum depth of Bansloi River is around 4m. Highest flood level (HFL) of Bansloi River in this part is 97-meter AMSL as per information obtained from the local public works department. The water yield of a watershed, i.e., the capacity of a water resource to serve as a long term water supply, may either be measured directly on a single outlet on the main stream or be calculated through empirical equations based on important physical properties of a particular watershed. Surface-water yield depends primarily on inflows and storage.

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General Manager/ Project Head
Pachwara South Coal Block
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Satwik, I.F.S.
Divisional Forest Officer,
Forest Division, Dumka

The average water flow through Bansloi River is 60480 KLD. Whereas, the maximum water requirement for dust suppression, plantation and other purposes in the mining site which is planned to obtain from Bansloi River during initial 7 years is 1560 KLD, i.e. only 2.6% of the total river flow. Therefore, water intake from river Bansloi will not impact on the natural courses.

7.RAINFALL

There is a wide variation of rainfall in the catchment area and around 10 kms radius of buffer zone of this mine. The average annual rainfall of this mine area is affected by steep hills, forest cover etc. The average maximum rainfall experienced in July and September every year.

ANNUAL RAIN FALL IN DUMKA DISTRICT (1980-2010)				
SR.NO	PARAMETERS	DESCRIPTION OF THE SEASONS		
1	MONTHLY AVG IN MM	WINTER (DEC TO FEB)	MONTHS	TOTAL RAIN FALL (IN MM)
			DEC	10.1
			JAN	5.3
			FEB	11.1
			TOTAL	8.9
		SUMMER (MAR TO MAY)	MAR	21
			APRIL	29
			MAY	74.6
			TOTAL	41.5
		MONSOON (JUNE TO SEPT)	JUNE	224
			JULY	304.2
			AUG	307.3
			SEPT	211.6
			TOTAL	261.8
		POST MONSOON (OCT TO DEC)	OCT	110.2
			NOV	8.1
			DEC	10.1
			TOTAL	42.8

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Divisional Forest Officer,
Dumka Forest Division, Dumka

8.FACTORSRESPONSIBLE FOR SILTATION

Siltation is an inherent problem with ponds, lakes and almost all types of water reservoirs world over. Siltation occurs due to deposition or settling of soil eroded from the land mass, decaying fallen leaves, grass and other vegetative materials and decomposed organic materials settled on pond bottoms. Soil erosion may be attributed as the primary factor responsible for pond siltation in this area. Higher gradient and excess rainfall are the most common reasons of soil erosion. Erosion of Soil occurs from the waste dumps, excavated areas and naturally denuded ground

GOTTE RAMESH
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Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

surface. However, looking into the current problem of siltation of the village ponds, the major factors are the surface runoff containing silt particles entering into the pond. As the age of the ponds increases, new layers of silt accumulate on the older ones and the silt layers become thicker. Finally the depth of the pond decreases and it loses its water storage capacity. At this time it needs to be de-silted to recover. The best practice against siltation is to de-silt the bottom of the pond at regular intervals as well as taking adequate preventive measures.

9.SELECTION OF PONDS

For the purpose as mentioned in Condition No.XX of the Stage-I approval letter, a survey of ponds within the buffer area of 5 Kms from the lease boundary was made. Topomap showing the location of ponds is enclosed as Plate No-1. ***After discussion with the Block Development Officer and Sarpanch of local, Gram panchayet, total 2 numbers of following government ponds will be selected for de-siltation within 5 km vicinity of the lease area.***

10.POSSIBILITY OF SILTATION OF THE VILLAGE PONDS/WATER BODIES DUE TO MINING ACTIVITIES

The core zone has couple of primary & secondary nalas which act as tributary of Bansloi river. Bansloi, the main surface run-off flowing from west to east, acts as the northern boundary of the lease area. Apart from Bansloi river & its tributaries on the north, there are other nalas like Banjhi amba nala (7.5km in SW) & Tirpatia nala (9km in S) flows within the 10km radius of the study area.

As far as village ponds in the proximity of the lease are concerned, it is observed that the identified village ponds are not affected from the surface runoff water carrying any silt from the lease area as these are located either beyond the Bansloi or at higher altitude from the ground RL of the Lease.

However, siltation in these identified village tanks may occur due to possible soil erosion outside the lease area beyond the sub watershed boundary. Hence de-silting of these village ponds may be considered in subsequent phases.

Satwik, I.F.S.
Divisional Forest Officer.
Dumka Forest Division, Dumka

11.METHODOLOGY

It is proposed to carry out the total de-siltation of the selected ponds as above every five years during summer when the ponds shall dry up exposing the silts. The dried silt shall be removed manually or mechanically based on the ground

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

condition. In case of mechanical removal of silt, small excavators such as back-hoe / small hydraulic shovels or pay loader, depending upon the quantity of silt accumulation shall be used.

The work shall comprise:-

a) Total de-siltation in the five year period.

b) Implementing preventive measures during the following four years to minimize re-siltation of the ponds.

c) To prevent or slowdown future siltation, the embankment stabilization by grass turfing /stone pitching , plantation of suitable species and constructing bathing ghat is also included in the de-silting and improvement plan.

It is proposed that the ponds having accumulation of over 1000 m^3 shall be de-silted by mechanical means and the rest shall be handled manually. It is proposed to deploy one 0.9 m^3 back hoe with one 10 tonne tipper for de-silting of the pond in a period of two-three days. The machines shall be deployed in a planned manner to complete the work in a shortest time frame. Necessary advice of BDO, &Panchayat Sarpanch will be taken into account.

In case of smaller ponds, where the accumulation of silt is very small, the de-siltation operation shall be done manually by engaging sufficient manpower.

The ponds shall be allowed to dry up completely during the early summer i.e. during March and April followed by de-siltation in the above described manner.

a) 1st Year Plan & Management:

The first-year work shall also comprise the following preventive measures to minimize siltation.

- Providing embankment to the ponds where ever necessary.
- Strengthening the existing pond embankment to check external flow of surface run-off in to the pond.
- Regular removal of aquatic weed sand polythene bags /bottle thrown by villagers.
- Plantation of trees on the top of the embankment and stone pitching on the slopes to prevent bank erosion.
- Plantation of selected species like Bara, Aswatha, Lemon, Custard Apple, Amla, Papaya, Mango will be taken up.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division





Plantation of trees on the top of the embankment

b) **Subsequent 2 Years Plan and Management:** In the subsequent 2 years, the rate of siltation shall be negligible, which can be dealt by manual methods using the local labourers. This will also otherwise help in employment generation.

c) **Preventive Measures & Maintenance:** It is essential to take up preventive measures in order to minimize re-siltation of the ponds. Activities like pond bank strengthening and stabilization by way of earth work with stone patching, grass seeding and plantation of appropriate species shall be taken up in the first year followed by their maintenance in successive four years.

d) **Dewatering of village pond:** This will be carried out by engaging dewatering pump.

GOTTE RAMESH
General Manager/ Project Head
Rachwara South Coel Block
NIIPDL

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

e) **De-silting:** After pumping out the water from the pond, silts are to be removed either manually by deploying labour or excavator & dumper combination.

f) **Earthwork Excavation:** Wherever required, soil has to be removed for deepening the pond to increase water holding capacity of the pond.

g) **Bathing Ghat(separately for men and women):** In the selected Ponds, separate arrangement will be made for bathing by male and female of the Villages. Since the villagers are conscious from mythological point of view, a Tulsi (Ocimumsanctum) Chaura (Platform) has also to be provided where the villagers after bath can offer water to Sun God. The Detailed estimate is enclosed as **Annexure-2.**



Bathing Ghats

h) **Sitting Platform on the embankment of the Pond(s)** – In each Pond, a masonry platform will be provided where the villagers (age old persons and youth) can sit during summer evening. This platform will also serve the purpose of puja / karma.

i) **Planting all along the embankment of the Pond** – According to availability of land all along the pond (s), plantation of Bela, Pipal, Champa, Baula etc. will be made to form a Green belt. This Green belt will also give an aesthetic view to the area and villagers can collect leaf, fruit, flower etc. for spiritual purposes.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Satwik, I.F.S.
Divisional Forest Officer
Dumka Forest Division, Dumka



Plantation along the Ponds

12.INSPECTION AND MONITORING

For successful implementation of the above Mitigative measures, intensive inspection and technical guidance from concerned technical wing is required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for proper execution of these programmes.

13.MOTIVATION OF PEOPLE:

Local Villagers will be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure on this score.

14.EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced man and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block

Satwik, I.F.S.
Divisional Forest Officer,
Dumka Forest Division, Dumka

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REQUIREMENT OF FUNDS

The total cost of this Scheme for de-silting and improvement of the selected ponds will be borne by the User Agency.

M/s Neyveli Uttar Pradesh Power Limited do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.

For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,

PSCMP, NUPPL.

Satwik, I.F.S.
Divisional Forest Officer,
Forest Division, Dumka

GOTTE RAMESH
General Manager/ Project Head
Pachwara South Coal Block
NUPPL, Dumka (Jharkhand)

Annex - XXVI

e-Challan

Finance Department, Goverment of Jharkhand

Receiving Dept: Forest, Environment and Climate Change Department

Valid UpTo :-25/05/2025 | Remitter's Copy of Dept

GRN:-2502319777 | Date:- 16/05/2025 11:53:01

Receiving Office :- DMKFOR010-D.F.O.DUMKA-D.F.O.DUMKA

District :- Dumka | Treasury:- Dumka

Year :- 16/05/2025 | to :- 16/05/2025

Head(8782)	Amount ₹
Head Details 8782001030101 01 FOREST REMITTANCES	73857000.00

Net Payable Amount:- ₹ 73857000.00

Seven Crore Thirty Eight Lakh Fifty Seven Thousand Rupees And Zero Paisa Only

For Treasury Use Only(Dumka)

Challan No and Date: 39 (16/05/2025)

Identity Proof (Pan No.) - AAECN3221F

PAN No :- NA

Remitter Name:- PACHWARA SOUTH OPEN CAST PROJECT

Address :- SHANTA BHAVAN, LIC, DUMKA,DUMKA,814101

Remarks :- Deposit Work

JLmo - 25299 3255

Treasury Officer Signature is not reuqired

FOR USE IN TREASURY LINK BANK

CHEQUE/DD No :- dd no-275268 date-15-05-2025

Scroll No and (Date) :- ()

Bank Name :-SBI,DUMKA,COURT COMPOUND DUMKA

Note:- Bank Official are requested to update the receipt Online before Stamping

Signature & Seal of Bank

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e-Challan

Finance Department, Goverment of Jharkhand

Receiving Dept: Forest, Environment and Climate Change Department

Valid UpTo :-25/05/2025 | Remitter's Copy

GRN:-2502319777 | Date:- 16/05/2025 11:53:01

Receiving Office :- DMKFOR010-D.F.O.DUMKA-D.F.O.DUMKA

District :- Dumka | Treasury:- Dumka

Year :- 16/05/2025 | to:- 16/05/2025

Head(8782)	Amount ₹
Head Details 8782001030101 01 FOREST REMITTANCES	73857000.00

Net Payable Amount:- ₹ 73857000.00

Seven Crore Thirty Eight Lakh Fifty Seven Thousand Rupees And Zero Paisa Only

For Treasury Use Only(Dumka)

Challan No and Date: 39 (16/05/2025)

Identity Proof (Pan No) - AAECN3221F

PAN No:- NA

Remitter Name:- PACHWARA SOUTH OPEN CAST PROJECT

Address :- SHANTA BHAVAN, LIC, DUMKA,DUMKA,814101

Remarks :- Deposit Work

JLmo - 25299 3255

Treasury Officer Signature is not reuqired

FOR USE IN TREASURY LINK BANK

CHEQUE/DD No :- dd no-275268 date-15-05-2025

Scroll No and (Date) :- ()

Bank Name :-SBI,DUMKA,COURT COMPOUND DUMKA

Note:- Bank Official are requested to update the receipt Online before Stamping

Signature & Seal of Bank

Annex - XXVII

(Undertaking)

NEYVELI UTTAR PRADESH POWER LIMITED

(एन.एल.सी इंडिया लिमिटेड एंव यू.पी.राज्य विद्युत उत्पादन निगम लिमिटेड का संयुक्तउ पक्रम)

(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)

OFFICE OF THE GENERAL MANAGER/PROJECT HEAD

PACHWARA SOUTH OPEN CAST PROJECT

Shanta Bhavan, Behind SBI, LIC Colony, DUMKA- 814 101, JHARKHAND, INDIA,

CIN: U40300UP2012GOI053569 GSTIN: 20AAECN3221F1Z8

E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

Lt No. NUPPL/PSOCP/GM/FC/2025/05/08 Date: 14.05.2025

UNDERTAKING

M/s NUPPL undertakes to take up the de-siltation of the village tanks and other water bodies located within 5 KM from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies whenever required.

Yours faithfully,

For **Neyveli Uttar Pradesh Power Ltd.**

General Manager/Project Head,

PSCMP, NUPPL.

GOTTE RAMESH

General Manager/ Project Head

Pachwara South Coal Block

NUPPL, Dumka (Jharkhand)

Annex- XXVIII

141

Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

File no.- 22 वी०-2(2)-06/2022.....

Office order No. 50 **dated** 07/04/2025

Sanction Order of the Soil and Moisture Conservation Plan with reference to non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka,

The Instant Soil and Moisture Conservation Plan has been submitted by M/s Neyveli Uttar Pradesh Power Ltd. (referred to as "the Use Agency") in pursuance of the following conditions laid by MoEF&CC under Section 2(1)(ii) of condition no. (IX),(XIX) and (XXIV) of Stage-1 approvals vide letter no. 8-37/2022-FC dated 18.09.2024 for non-forestry use of 455.1108 ha of forest land for Pachhawara South Coal Block project in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

The aforesaid Terms of Reference laid by the Central Government reads as follows:

Condition no. 2(1) (ii) : **Compensatory Afforestation;**

Condition No. (ii)(ix): *" The User Agency shall prepare a Digital Elevation Model of 10km radius using LIDAR technology before commencement of mining operation and shall be repeated on 3rd, 5th, 10th , 15th , 20th , 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of*

GOTTE RAMESH
General Manager (Project Head)
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

user agency, Forest Department, Subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.."

Condition No. (xix): *"The User Agency either himself or through the State Forest Department shall undertake gap planting and Soil and Moisture Conservation activities to restock and rejuvenate the degraded open forest (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;"*

Condition No. (xxiv): *"The User Agency will undertake comprehensive Soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval;"*

2. It was informed by the User Agency that in compliance of the above-mentioned conditions, the instant integrated Soil and Moisture Conservation Plan has been prepared in consultation with the forest officials including DFO, Dumka, and Pakur, Conservator of Forest (CF) Territorial Circle Dumka and Regional Chief Conservator of Forest (RCCF), Dumka.

3. In the above stated background, the Regional Chief Conservator of Forests, Ranchi (RCCF), Dumka vide his letter no. 366 dated 10.03.2025 submitted the Plan to office of the undersigned for its consideration for sanction.

4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forests (RCCF), Dumka, CF, Territorial Circle, Dumka, DFO, Dumka, Godda and User agency, vide this office letter no. 795 dated 24.03.2025 to arrange a Power-Point Presentation of the plan in meeting scheduled on 26.03.2025 in the conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests, Dumka and Divisional Forest Officer, Dumka and DFO Godda Forest Division (DFO, Dumka and Pakur on video

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

conferencing). Shri Deepak Vincent Surin (NUPPL) G.M. Project Head, Pachwara South Coal Block, Shri Rajeev Ranjan, Representative (NUPPL) and Shri Kislay Kumar, Director, Ecosofet Pvt. Ltd., Consultant for preparing were also present during the presentation.

5. After deliberation on various provisions of the proposed Plan and the presentation, it was observed that:-

(i) Two other coal blocks are located in close vicinity of Pachwara South Coal Block (CB) namely, Pahcawara Central and Pachwara North CB. Pachawara South Block is situated within the Dumka Forest Division/District whereas Pachawara Central and Pachawara North Blocks fall within the administrative boundary of Pakur Forest Division/District. The Bansloi river being bifurcating boundary of two district, Pakur and Dumka. Apart from the aforesaid Coal Blocks adjacent to Pachawara South Coal Blocks there is one more upcoming coal block namely Urma Paharitola Coal Block.

(ii) During the deliberation and presentation, it was informed that in compliance of conditions laid down by MoEF&CC towards Forest clearance with respect to Pachawara Central CB and Pachawara North CB, SMC and wildlife conservation plans have been formulated and approved by the competent authorities. The impact Area (IA) delineated under the above plans has been restricted to the territorial Pakur Forest Division. In the light of above background, this SMC Plan has been formulated restricting the territorial boundaries of Dumka and Godda Forest Division and within the radius of 10 km of the boundary of coal Block.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

6. The cost of the proposed 10-year (2026-27 to 2035-36) Soil & Moisture Conservation Plan with respect to the activities to be carried out by DFO, Dumka Forest Division and DFO, Godda Forest Divisions have been estimated to be Rs. 4009.59 lakh. The summary of the proposed interventions (component wise activities) under the Plan is as follows:-

The Proposed financial projection under the Plan may be summarized in the following table-

Sl. No	Activity Head	Dumka Forest Division (Rs. In Lakh)	Godda Forest Division (Rs. In Lakh)	Total (Rs. In Lakh)
1.	Natural Resource Management /Soil and Moisture Conservation Measures	2272.60	721.22	2993.82
2.	Capacity Building Frontline Forest Staff	20.00	10.00	30.00
3.	Awareness Development Programmes	10.00	5.00	15.00
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	50.00	25.00	75.00
5.	Monitoring and Evaluation	10.00	5.00	15.00
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	100.00	50.00	150.00
7.	Administrative Cost	50.00	12.50	62.50
	Sub-total	**2512.60**	**828.72**	**3341.32**
	Escalation cost @20%	502.52	165.75	668.27
	Grand Total Cost	**3015.12**	**994.47**	**4009.59**

Cost to the User Agency towards implementation of the SMC Plan is Rs. 4009.59 Lakh.

7. The Plan with a total financial outlay of **Rs.** 4009.59 **Lakh** extends over a period of 10 years and shall be utilized by the Forest Department through the

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

DFO, Dumka Forest Division and DFO, Godda Forest Division in accordance with the Plan prescriptions.

8. Considering the proposals under the plan submitted by the User Agency and recommendation of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man-made, determined to forest and wildlife in their area of operation.

(ii) That the total amount of **Rs. 4009.59 Lakh (Rupees Forty crore nine lakh and fifty nine thousand only)** shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO, Dumka Forest Division and DFO, Godda Forest Division as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, the DFO, Dumka Forest Division and DFO, Godda Forest Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

State Government/Forest Department. Regional Chief Conservator of Forests, Dumka shall supervise & closely monitor the progress of the activities undertaken by DFO, Dumka Forest Division and DFO, Godda Forest Division as per the approved APO & funds released under CAMPA.

(iv) That the Conservator of Forests, Dumka Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the DFO, Dumka Forest Division and DFO, Godda Forest Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.

(vi) That both the DFOs shall ensure that no violation of duly sanctioned Working Plans of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.

(vii) That the instant Plan is dynamic and be revisited after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirement.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, DFO, Dumka and DFO, Godda Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owning to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

1152

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022/ Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Dumka / Conservator of Forest, Territorial Circle, Dumka/ DFO, Dumka Forest Division / DFO, Godda Forest Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests,
Jharkhand, Ranchi

File no.- 22 पी०-2(2)-06/2022 Memo No. 912 dated 07.04.2025

Copy forwarded to M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL), District Dumka, for information and necessary action.

07/04/2025

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

Annex - XXIX

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (In Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	585982345	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 380798000/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 380798000/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN598232020_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020625	585982362	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Wild Life Management Plan : 73118000/- Soil & Moisture Conservation Plan : 288814000/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 361932000/-	Paid	Fund Demand Verified by Nodal Officer On : 15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 16 Apr 2025 Transaction Date : 18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	585982340	18 Sep 2024	CA: 1122681423/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Other Charges : 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 1122681423/-	Paid	Fund Demand Verified by Nodal Officer On : 31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_4H380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020708	585982370	18 Sep 2024	CA: 0/-, Addl CA : 0/- PCA: 0/-, CAT : 0/- Safety Zone: 0/-, Addl PA : 0/- NPV: 0/-, Soil & Moisture Conservation Plan : 112145000/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 112[illegible] 0/-	Paid	Fund Demand Verified by Nodal Officer On : 10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 10 Jan 2025 Transaction Date : 10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
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	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020345	5985982333716	18 Sep 2024	PCA: 0/- Safety Zone: 0/- NPV: 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 44858000/-	dl C/ 0 CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 44858000/-	Paid	Fu Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name Union Bank Of India Mode of Payment NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	tter eaddata/Fundpdf/05012025192149081 2_FP/HMIN598232020_User_Fund_Demanded_68933.p Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	5985982333716	16 Sep 2024	CA: 0/- PCA: 0/- Safety Zone: 0/- NPV: 617635418/- NA : 0/- NA : 0/- NA : 0/- Total : 617635418/-	Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On 20 Dec 2024 Bank Name Union Bank Of India Mode of Payment NEFT/RTGS (Challan) Challan Generated On 20 Dec 2024 Transaction Date 21 Dec 2024	Demand Letter (../writereaddata/Fundpdf/14122024163651267 1_FP/HMIN598232020_User_Fund_Demanded_84333.p Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPL, Dumka (Jharkhand)

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Annex - xxx

Sno.	Proposal Detail	Application_No	Application No (New)	Date of IN-PRINCIPLE	Amount to be Paid/Amount Paid (in Rs.)	Payment Status	Payment Detail	Demand Letter
1	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020450	585982345	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 380798000/- Addl CA : 0/-, CAT : 380798000/-, Addl PA : 0/-, Other Charges : 0/-	Paid	Fund Demand Verified by Nodal Officer On : 07 May 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On : 08 May 2025 Transaction Date : 10 May 2025	Demand Letter (../writereaddata/Fundpdf/05052025083958852_FPJHMIN598232020_User_Fund_Demanded_71629.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020450)
2	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020629	585982362	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Soil & Moisture Conservation Plan : 26881140002/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 361932000/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Wild Life Management Plan : 73118000/-	Paid	Fund Demand Verified by Nodal Officer On :15 Apr 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :16 Apr 2025 Transaction Date :18 Apr 2025	Demand Letter (../writereaddata/Fundpdf/15042025103213567 6_FPJHMIN598232020_User_Fund_Demanded_92109.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020629)
3	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020409	585982340	18 Sep 2024	CA: 1122681423/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 1122681423/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Other Charges : 0/-	Paid	Fund Demand Verified by Nodal Officer On :31 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :31 Jan 2025 Transaction Date : 01 Feb 2025	Demand Letter (../writereaddata/Fundpdf/29012025185301379 8_FPJHMIN598232020_User_Fund_Demanded_4H380.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020409)
4	FP/JH/MIN/59823/2020 (../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020708	585982370	18 Sep 2024	CA: 0/-, PCA: 0/-, Safety Zone: 0/-, NPV: 0/-, Other Charges1 : 0/-, Other Charges2 : 0/-, Other Charges3 : 0/-, Total : 1121450[illegible]/- Addl CA : 0/-, CAT : 0/-, Addl PA : 0/-, Soil & Moisture Conservation Plan : 112145000/-	Paid	Fund Demand Verified by Nodal Officer On :10 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :10 Jan 2025 Transaction Date :10 Jan 2025	Demand Letter (../writereaddata/Fundpdf/10012025114434671 8_FPJHMIN598232020_User_Fund_Demanded_85718.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020708)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
NUPPI, Dumka (Jharkhand)

	MIN...023/...	...MIN59...3202...	...5985...	...1334...	...Sep...24	C :0/- PCA: 0/- Safety Zone: 0/- NPV: 0/- Other Charges1 : 0/- Other Charges2 : 0/- Other Charges3 : 0/- Total : 448580000/-	...l CA :0/- CAT : 0/- Addl PA : 0/- Wild Life Management Plan : 448580000/-	Paid	Fur Demand Verified by Nodal Officer On :07 Jan 2025 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :07 Jan 2025 Transaction Date :09 Jan 2025	...ter (.../w...eaddata/...undpdf/d501202519214908l2_FPJHMIN598232020_User_Fund_Demanded_68933.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020345)
6	FP/JH/MIN/59823/2020 (.../viewreport.aspx?pid=FP/JH/MIN/59823/2020) Pachwara South Coal Mine Project.	MIN598232020337	685982333	18 Sep 2024	CA: 0/- , PCA: 0/- , Safety Zone: 0/- , NPV: 617635418/- , NA : 0/- NA : 0/- NA : 0/- Total : 617635418/-	Addl CA : 0/- CAT : 0/- Addl PA : 0/- NA : 0/-	Paid	Fund Demand Verified by Nodal Officer On :20 Dec 2024 Bank Name : Union Bank Of India Mode of Payment : NEFT/RTGS (Challan) Challan Generated On :20 Dec 2024 Transaction Date :21 Dec 2024	Demand Letter (.../writereaddata/Fundpdf/14122024163651267l_FPJHMIN598232020_User_Fund_Demanded_84333.pd Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN598232020337)

GOTTE RAMESH
General Manager/Project Head
Pachwara South OCP
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CATCHMENT AREA TREATMENT PLAN

Prepared in compliance of Conditions bearing **Sl. No. vi. & ix.** laid by MoEF&CC, Govt. of India while granting Stage-I approval under Section 2 of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 vide F. No. 8-37/2022-FC dated 18th September, 2024 **for diversion of 455.1108 ha of forest land in Dumka district for Pachhwara South Coal Block** in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

Submitted by:
M/s Neyveli Uttar Pradesh Power Ltd.

Prepared by:
Rajiv Ranjan, IFS (Retd.)

EXECUTIVE SUMMARY

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited (formerly Neyveli Lignite Corporation India Limited, a Navratna Government of India Enterprise) and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited (UPRVUNL), a Government of Uttar Pradesh Enterprise – by the Ministry of Coal, Govt. of India for mining of coal. The project area is spread over 715.00 Ha in the approved Mining Plan of Pachhwara South Coal Mine Project of NUPPL. Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

The coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District.

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (Annexure-1) has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of NUPPL in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The condition, in fulfilment of which the instant Plan is being formulated, reads as under:

> "*vi. As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that mining waste water is drained to the river.* ***Catchment area treatment plan*** *for river Bansloi shall be prepared and implemented at project cost.*

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the bifurcating boundary between Dumka and Pakur forest divisions/districts. Both Pachhwara Central and

Pachhwara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of Soil and Moisture Conservation (SMC) plans and Site-specific Wildlife Conservation plans independently. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the said plans have been formulated restricting the project impact area within Pakur forest division.

Hence, it is incumbent upon the user agency to take up only those areas as the Impact Area for preparing the instant Catchment Area Treatment (CAT) plan, which do not fall within Pakur forest division so that there is no chance of any duplication in plan proposals. Further, the location of Pachhwara South Coal Block is such that if we exclude the territory of Pakur division, the area surrounding the coal block lease area would involve two divisions – Dumka and Godda.

Apart from formulation of CAT Plan, the Stage-I order of the Project also includes specific condition pertaining to formulation and implementation of SMC Plan within 10 km periphery of the lease boundary. The condition which mandates for preparation of SMC Plan finds mention in the Stage-I order in following words:

> "*ix. ……..On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chutua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost…….."*
>
> ……..
>
> …….
>
> *xxiv. The User Agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approva*l."

The scope of the aforesaid conditions in regard to formulation of both CAT and SMC plans was thoroughly discussed with the field forest officials including RCCF, Dumka. In order to do justice with the said conditions in letter and spirit it was decided to formulate SMC plan within 10 km radius as specifically mentioned in the Stage-I order; and CAT plan within 10-15 km radius around the lease area. The activities prescribed within 10 km area under the SMC plan shall also aim towards the treatment of the Bansloi river catchment. Thus, both the SMC Plan (within 10 km radius) and CAT Plan (within 10-15 km radius), taken together shall effectively contribute towards meeting the larger goal of catchment area treatment of Bansloi river.

Chapter 9 of the "*Consolidated Guidelines and Clarifications issued under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023*" dated 29th December, 2023, issued by MoEF&CC lays down that the measures proposed under the Catchment Area Treatment Plan (CAT Plan), among other provisions, should focus on arresting soil erosion, improving effective drainage in the area, and rejuvenation of the degraded eco system in the catchment. It is evident, therefore, that the broad objectives of CAT plans and SMC plans are similar in nature. Therefore, the instant CAT Plan has been formulated following the general principles of Area-Specific Soil and Moisture Conservation as well as drainage line treatment.

The Impact Area delineated for the formulation of this CAT plan consists of altogether 203 number of villages, 158 in Dumka Forest Division and 45 in Godda Forest Division. It would be relevant to mention here that the areas of villages which fall partly outside the 15 km boundary have also been considered for prescribing management interventions under the CAT plan. The same rationale has been utilised while formulating the SMC Plan, meaning thereby, the villages falling partly within and partly outside the 10 km boundary have been considered under the SMC plan, thus bringing all villages coming within 15 km periphery of the lease boundary under line of treatment.

The Project Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla. These rivers are fed by various streams and streamlets/drains. Out of these, the most important river is Bansloi which originates from Bans Hill in Sahebganj district of Jharkhand and flows through Pakur district of Jharkhand and Birbhum and Murshidabad districts of West Bengal before draining into the Ganges north of Jangipur. It flows from west to east with a few ephemeral streamlets like Darno river, Baroscorna nala, Okri jor nala & Makar kandi nala descending from the catchment area of the Bansloi River forming the drainage system of the area.

The methodology adopted in formulation of the CAT plan involved mapping in great detail the drainage network (rivers, streams and streamlets) including respective stream orders, village boundaries, forest division boundaries etc. Based on the location of rivers and their feeder streams and drains, the whole Impact Area has been divided into different stream corridors. However, since the area cuts across two forest divisions, the stream corridors have been delineated so as to restrict these along forest division boundaries in order to help facilitate smoother implementation of the interventions prescribed here. For convenience in carrying out field surveys etc., stream corridors have been constituted in such a manner that it consists of a set of villages. In other words, a corridor has been delineated in accordance with village boundaries and in most of the cases more than one village constitute any particular stream corridor. However, the villages located

partly on the fringe of 15 km boundary within the Impact Area, have been included in whole as a part of the respective stream corridor.

It may be noted here that the delineation in the above explained manner is similar to that of micro-watershed framework. The extensive field survey has been undertaken in all villages where streams have been found as well as in those villages which are bereft of any stream as such. The primary concern was to fix the locations of structural/engineering measures as well as other biological interventions with the objective of soil and moisture conservation in the area. Since the survey has been done in all villages irrespective of whether any stream is located in a particular village or not, it is just academic whether we call it stream corridor or micro-watershed.

Based on the above scheme, altogether nine stream corridors have been identified and numbers have been assigned to each stream corridor with prefix as the initial letter of the forest division name. Thus, Dumka Forest Division part of the Impact Area contains six stream corridors designated with nomenclature as D/CAT/I, D/CAT/II, D/CAT/III, D/CAT/IV, D/CAT/V and D/CAT/VI whereas Godda Forest Division part houses three corridors namely G/CAT/I, G/CAT/II and G/CAT/III.

The instant Plan primarily focusses on catchment area treatment over the identified Impact Area. Following are the broad objectives of these measures:

- To control runoff and thus prevent soil erosion as also to reduce soil compaction through biological and engineering measures.
- To maintain or to improve soil fertility;
- To conserve water;
- To harvest excess water wherever feasible;
- To rehabilitate degraded forest areas through afforestation wherever technically feasible and facilitating natural regeneration of plants;
- Ecosystem conservation resulting from water retaining properties of soil;
- Promotion of non-conventional energy devices to reduce pressure on forest; and
- Employment generation through community participation and conservation.

After detailed survey of each and every village falling within the Impact Area, particularly from the viewpoint of the aforesaid objectives, various interventions have been categorized into following broad heads:

(A) Natural Resource Management/Soil and Moisture Conservation Measures.

(B) Capacity Building of Frontline Forest staff.

(C) Awareness Development Programmes.

(D) Development of Alternative Livelihoods

(E) Promotion of Renewable/Alternative Energy Consumption

(F) Development and Implementation of appropriate Monitoring and Evaluation Framework.

(G) Infrastructural strengthening aimed towards implementation as well as monitoring and evaluation of the Plan.

The total cost to the User Agency towards implementation of the proposed CAT Plan is Rs. **3802.474 Lakh** spread over 10 years (2026-27 to 2035-36). The fund allocation under different heads has been made as per norms for preparation of such plans and in consultation with the concerned forest officials.

The proposed financial projection under the Plan may be summarized in the following table.

Sl. No.	**Activity Head**	**Dumka Forest Division (Rs. in Lakh)**	**Godda Forest Division (Rs. in Lakh)**	**Total (Rs. in Lakh)**
1.	Natural Resource Management/ Soil and Moisture Conservation Measures	**1976.69**	**776.11**	**2752.80**
2.	Capacity Building of Frontline Forest Staff	**22.00**	**12.50**	**34.50**
3.	Awareness Development Programmes	**20.00**	**10.00**	**30.00**
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	**80.00**	**25.00**	**105.00**
5.	Monitoring and Evaluation	**10.00**	**6.00**	**16.00**
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	**115.00**	**55.00**	**170.00**
7.	Administrative Cost	**50.00**	**15.00**	**65.00**
8.	Total	**2273.69**	**899.61**	**3173.30**
9.	Cost Escalation Provision @ 20%	**454.73**	**179.95**	**634.68**
10.	**Grand Total**	**2728.42**	**1079.56**	**3807.98**

Cost to the User Agency towards implementation of the CAT Plan = Rs. 3807.98 Lakh

----------xxx----------

ACKNOWLEDGEMENT

This Catchment Area Treatment Plan could not have been prepared without the committed collaboration of Mr. Satwik, IFS, Divisional Forest Officer, Dumka Forest Division, Mr. Wagh Pavan Shaligram, IFS, Divisional Forest Officer, Godda Forest Division, Mr. Maun Prakash, IFS, the then Divisional Forest Officer, Godda Forest Division, and the frontline forest staff of Dumka and Godda forest divisions. Also, the interaction with Mr. Satish Chandra Rai, IFS, Regional Chief Conservator of Forests, Dumka Region and Mr. Umesh Sahani, IFS, Conservator of Forests, Dumka Circle played a vital role in shaping this Plan particularly in terms of its effective implementation in future.

I am grateful to Mr. Kislay Kumar (M/s. Ecos Offset Ltd.) and his team members who carried out an intensive survey of the Impact Area in question. Without their active support and sincere efforts this Plan could not have seen light of the day.

I owe special thanks to the officials of M/s NUPPL and M/s MIPL GCL Infracontract Pvt. Ltd., the MDO of the project who took utmost care to ensure all logistic support while undertaking field surveys.

Rajiv Ranjan IFS (Retd.)

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1. INTRODUCTION

1.1. ABOUT THE PROJECT

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited (formerly Neyveli Lignite Corporation India Limited, a Navratna Government of India Enterprise) and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited (UPRVUNL), a Government of Uttar Pradesh Enterprise – by the Ministry of Coal, Govt. of India for mining of coal. Coal from this project will be supplied to Ghatampur Thermal Power Plant, a Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. This is a new upcoming project, hence a Greenfield Project.

The project area is spread over 715.00 Ha in the approved Mining Plan of Pachhwara South Coal Mine Project of NUPPL. The net geological reserve of the block is about 354.82 MT and mineable reserve of the block is about 258.91 MT. With due mining losses, the extractable reserve comes to about 252.44 Million tons. The Ministry of Coal has approved the normative capacity for coal production at 9.00 MTPA with peak rated capacity at 13.50 MTPA. The land schedule authenticated by DFO, Dumka states that 455.1108 ha falls under 'forest land' category and remaining 259.7445 ha falls under non forest category. With the rated capacity of 9 MTPA (normative), life of the mine will be around 38 years including two years of pre-mining activity.

Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

1.2. LOCATION OF THE PROJECT

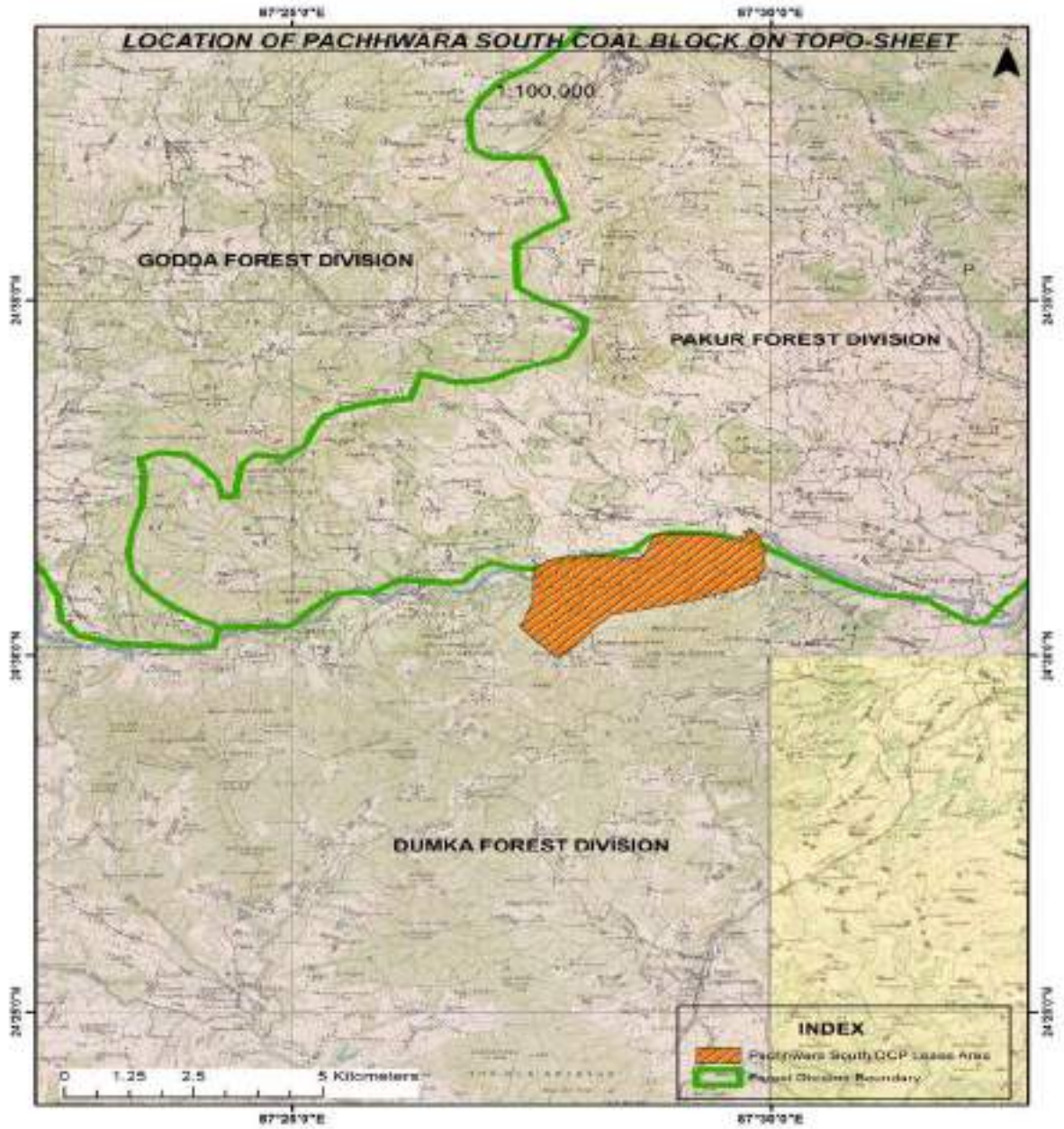
Pachhwara South Coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District. The coal block area is covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates as follows:

Latitude: 24° 29' 57.404" N – 24° 31' 46.956" N

Longitude: 87° 27' 22.010" E – 87° 29' 56.150" E

The Block is well connected with Dumka, the district headquarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area and well connected with both Dumka and Pakur (district headquarters) through black-topped Dumka-Shahibganj Road and Amrapara-Maheshpur-Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The location of Pachhwara South Coal Block is being shown in the following map on topo-sheet.

Map 1: Location of Pachhwara South Coal Block



1.3. FORMULATION OF CATCHMENT AREA TREATMENT PLAN – BACKGROUND

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (**Annexure-1**), has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of M/s Neyveli Uttar Pradesh Power Ltd. in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The condition, in fulfilment of which the instant Plan is being formulated, are as follows:

> "*vi. As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that mining waste water is drained to the river.* ***Catchment area treatment plan*** *for river Bansloi shall be prepared and implemented at project cost……"*

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the boundary of the Dumka and Pakur forest divisions/districts. Both the Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearance has been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of Soil and Moisture Conservation (SMC) plans and Site-specific Wildlife Conservation plans independently. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the said plans have been formulated restricting the project impact area within Pakur forest division.

Hence, it is incumbent upon the user agency to take up only those areas as the Impact Area for preparing the instant Catchment Area Treatment (CAT) plan, which do not fall within Pakur forest division so that there is no chance of any duplication in plan proposals. Further, the location of Pachhwara South Coal Block is such that if we exclude the territory of Pakur division, the area surrounding the coal block lease area would involve two divisions – Dumka and Godda.

It would be relevant to mention here that in compliance of conditions mentioned at Sl. No. ix. and xxiv. laid by MoEF&CC, the user agency has also been mandated to prepare SMC plan with respect to the area falling within the lease area in 10 km radius.

1.4. SOIL AND MOISTURE CONSERVATION PLAN VIS-A-VIS CATCHMENT AREA TREATMENT PLAN

Chapter 9 of the "*Consolidated Guidelines and Clarifications issued under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023*" dated 29th December, 2023 (MoEF&CC) lays down that the measures proposed under the Catchment Area Treatment Plan (CAT Plan), among other provisions, should focus on arresting soil erosion, improving effective drainage in the area, and rejuvenation of the degraded eco system in the catchment. The said guidelines prescribe following general principles which ought to be kept in focus while formulating CAT plans:

(i) In the dense forest areas major concentration should be on soil & water conservation including water harvesting for which various water harvesting structures like check dams, gully plugging, gabion dams, contour trenches and vegetative structures should be made.

(ii) In the open forest areas besides taking up soil & water conservation measures, plantation of local indigenous tree and shrub species, including rare/medicinal plants, should be done. In higher altitudes plantation of Chir pine should be avoided.

(iii) The CAT plan should include a component of fodder development on the civil soyam forest or on revenue/private lands in order to meet the requirement of fodder/small timber/fire wood for the local population with a view to reduce pressure on the forests.

(iv) The CAT Plan should have a socio-economic component including supply of CNG connections to the project affected families to be implemented through Joint Forest Management Committees (the nomenclature may vary among the States/UTs).

(v) The infrastructure component like construction of buildings, vehicles, salaries of staff etc. may be provided based on a careful analysis of the need for the same with detailed justification and should constitute a very small percentage (say up to 5%) of the total cost of the CAT plan.

(vi) CAT plan shall be approved by the Principal CCF & HoFF or any other officer authorized by him for the purpose.

(vii) Regular monitoring is essential for effective implementation of the CAT Plan. The Chief Project Officer of the User Agency must be associated in implementation as well as monitoring of the progress of CAT plan. For this, a committee with following composition may be constituted at State level for quarterly review of progress of implementation of various CAT plans and take immediate steps to ensure the same:

1. *PCCF & HoFF - Chairman*
2. *Secretary (Agriculture) or his representative - Member*
3. *Secretary (Animal Husbandry) or his representative - Member*
4. *Project Officer-User Agency - Member*

5. *Concerned Conservator of Forests - Member*
6. *Nodal Officer (FC) o/o PCCF -Member Secretary*

The aforesaid guidelines indicate that activities aimed towards Soil & Moisture Conservation are an integral part of Catchment Area Treatment. Further, a CAT Plan is an important and essential plan for enhancing and maintaining the ecological health of the catchment area of any river located in the Impact Area of any development project, more particularly of nature like opencast mining. The CAT Plan thus is expected to primarily cover site-specific biological and engineering measures for conservation of soil & moisture and management of water regime. Among other provisions, the measures primarily focus on arresting soil erosion, improving effective drainage in the area, and rejuvenation of the degraded eco system in the catchment.

Soil and Moisture Conservation (SMC) involves activities that maintain or enhance the productive capacity of land in areas affected by or prone to soil erosion. Soil erosion implies the movement of soil from one part of the land to another through the action of wind or water. Thus, soil erosion by water is caused by raindrop impact surface sealing, and crust formation leading to high runoff rate and amount, high runoff velocity on long and undulating slopes, and low soil strength of structurally weak soils with high moisture content due to frequent rains. Soil erosion by wind is caused by lack of vegetation cover, dry pulverized soils, strong wind speeds, and poor land management practices such as continuous tillage and over-grazing. **However, the main objective of Soil & Moisture conservation is essentially drainage line treatment and ancillary structural and engineering measures as well as augmentation in vegetation cover and quality thereof to improve soil and water regime of any particular selected area of study.**

From the discussion in the foregoing paras it is quite evident that **the broad objectives of CAT plans and SMC plans are similar in nature. Therefore, the instant CAT Plan is being formulated following the general principles of Area-Specific Soil and Moisture Conservation as well as drainage line treatment.** Needless to mention, the prime objective of the instant Plan is to compensate the negative impacts of the open cast mining activities over the immediate surroundings of the mining lease area.

1.5. DISCUSSION ON REQUIREMENT OF FORMULATION OF CAT PLAN AS WELL AS SMC PLAN UNDER STAGE-I CLEARANCE CONDITIONS

Apart from the formulation of CAT Plan, the Stage-I order of the Project also includes specific condition pertaining to formulation and implementation of SMC Plan within 10 km periphery of

the lease boundary. The condition which mandates for preparation of SMC Plan finds mention in the Stage-I order in following words:

> "*ix. ……..On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chutua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost…….*"
>
> ……..
>
> …….
>
> *xxiv. The User Agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approva*l."

The scope of the conditions laid under Stage-I order issued in favour of the project particularly in regard to formulation of both CAT and SMC plans was thoroughly discussed with the field forest officials including RCCF, Dumka. In order to do justice with the said conditions in letter and spirit it was decided to formulate SMC plan within 10 km radius as specifically mentioned in the Stage-I order; and CAT plan within 10-15 km radius around the lease area. The activities prescribed within 10 km area under the SMC plan shall also aim towards the treatment of the Bansloi river catchment. Thus, both the SMC Plan (within 10 km radius) and CAT Plan (within 10-15 km radius), taken together shall effectively contribute towards meeting the larger goal of catchment area treatment of Bansloi river.

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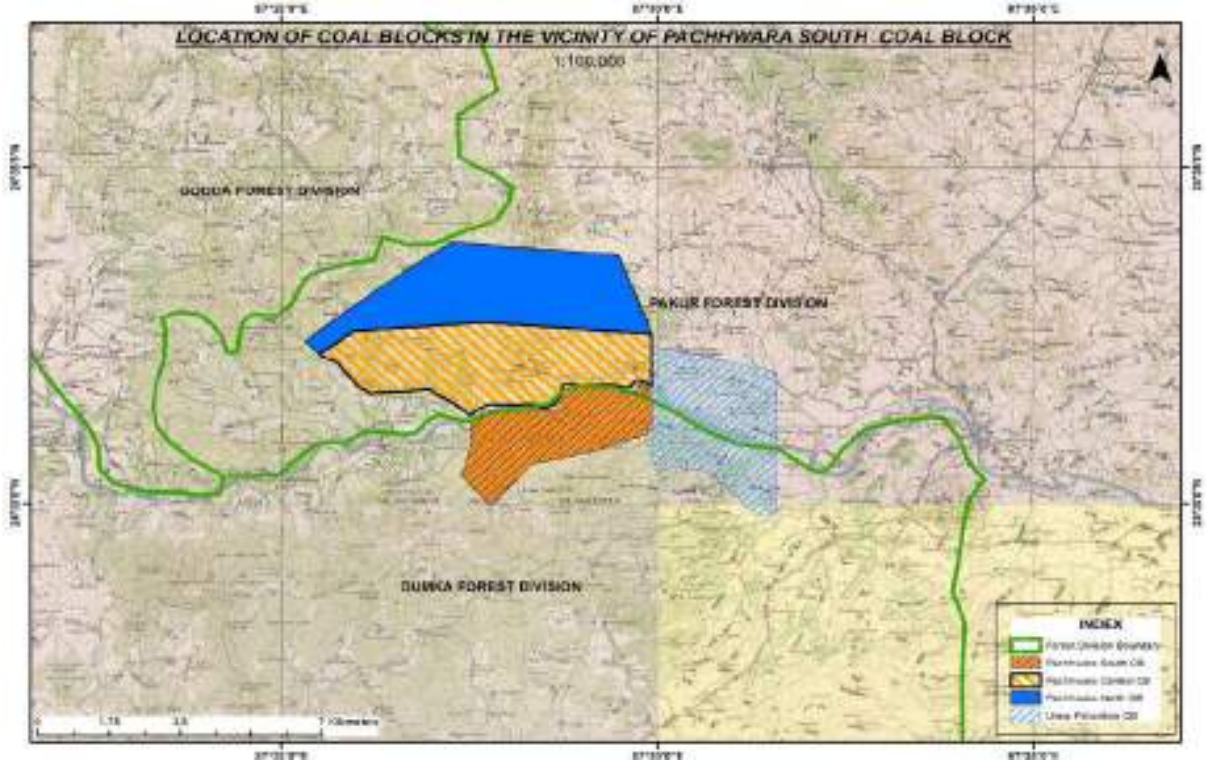
2. PROJECT IMPACT AREA

2.1. DEFINING THE IMPACT AREA/ZONE OF INFLUENCE OF THE PROJECT

The Impact Area or Zone of Influence (ZoI) around development footprints, in the instant case open cast mining, is the area indirectly affected by human activities, and is more difficult to define. The distance a ZoI may extend around a feature, and its effect on soil and water ecosystem, varies depending on the nature of the development feature and the level of activity associated with the feature. Conventionally 10 km buffer around any development feature is taken as the standard practice for planning interventions towards conservation needs oriented towards any particular objective or a set of objectives.

While defining the Impact Area of the instant Project it is important to note that two other coal blocks are located in close vicinity of Pachhwara South Coal Block (CB), namely Pachhwara Central and Pachhwara North CBs. Pachhwara South Block is situated within Dumka Forest Division/District whereas Pachhwara Central and Pachhwara North blocks fall within the administrative boundary of Pakur Forest Division/District, the Bansloi river being the bifurcating boundary of the two districts. Apart from the aforesaid coal blocks adjacent to Pachhwara South coal block, there is one more upcoming coal block namely Urma Paharitola Coal Block. All the four coal blocks are being depicted in the following map on topo-sheet.

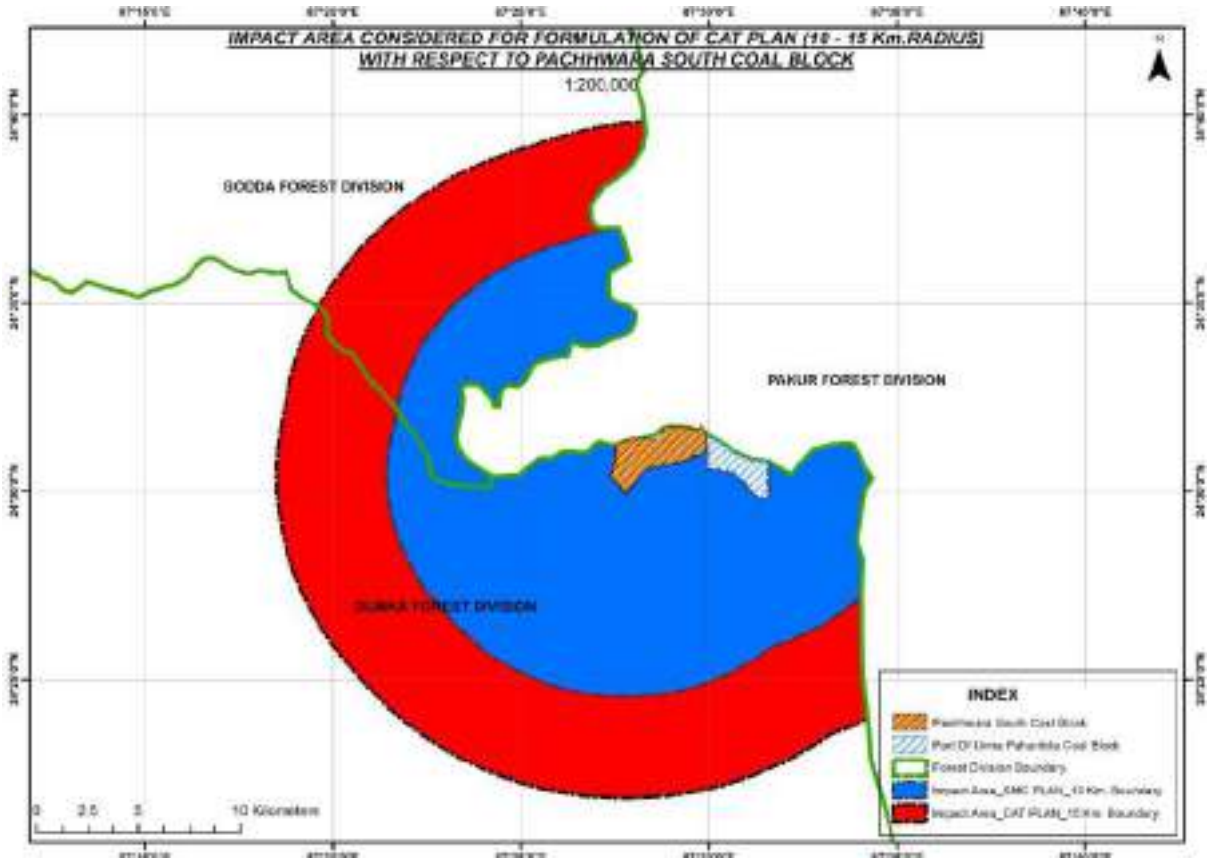
Map 2: Location of Existing Coal Blocks in the Vicinity of Pachhwara South Coal Block



It is to be noted that in compliance of conditions laid by MoEF&CC towards forest clearance with respect to Pachhwara Central CB and Pachhwara North CB, SMC and Wildlife Conservation plans have been formulated and approved by respective competent authorities. And the impact area delineated under the said plans has been restricted to the territory of Pakur forest division. Further, for formulation of SMC and Wildlife Conservation plans, the Impact Area for Pachhwara North has been taken to be the area within 10 km radius from the lease area whereas the same for Pachhwara Cenral it is the area between 10 and 20 km radius from the boundary of the lease area.

Therefore, in the best interest of the conservation needs of the area, the instant CAT plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions and within 10 and 15 km radius from the boundary of the lease area of Pachhwara South CB. The impact area so delineated is being shown in the following map.

Map 3: Impact Area considered for Formulation of Catchment Area Treatment Plan



2.1.1. Villages Enclaved within the Impact Area and Corresponding Administrative Units of the Forest Department

The Impact Area consists of altogether 203 number of villages, 158 in Dumka Forest Division and 45 in Godda Forest Division. It would be pertinent to mention here that the areas of villages which fall partly outside the 15 km boundary have also been considered for prescribing management interventions under the CAT plan. The same rationale has been utilised while formulating the SMC Plan, meaning thereby, the villages falling partly within and partly outside the 10 km boundary have been considered under the SMC plan, thus bringing all villages coming within 15 km periphery of the lease boundary under line of treatment.

The geographical extent of the Impact Area under this Plan is about 272.12 sq.km. The names of the villages are being tabulated hereunder in accordance with the sub-units of forest administration, namely Forest Range, Beat and Sub-Beat.

Table 1: Impact Area Villages Falling within 10 and 15 Km Radius of the Coal Block and their Corresponding Forest Administrative Units – Dumka Forest Division

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/ Thana No.	Forest Land (ha)
Kathikund	**Gopikandar**	**Gopikandar East**	1.	Amarpani	Gopikandar-54	-
			2.	Banspahari	Gopikandar-43	7.71
			3.	Barabathan	Gopikandar-51	-
			4.	Bengduba	Gopikandar-50	-
			5.	Bhalki	Gopikandar-47	10.68
			6.	Bhelaghati	Gopikandar-26	-
			7.	Chhota Bathanpahari	Gopikandar-52	-
			8.	Chirapathar	Gopikandar-27	0.98
			9.	Daldali	Gopikandar-28	-
			10.	Dhawadangal	Gopikandar-45	-
			11.	Duaria	Gopikandar-29	2.02
			12.	Gogajor	Gopikandar-46	-
			13.	Kolajora	Gopikandar-53	3.68
			14.	Mahualo	Gopikandar-25	31.11
			15.	Murosal	Gopikandar-44	-
			16.	Paharpur	Gopikandar-57	-
			17.	Pindargaria	Gopikandar-49	-
			18.	Piparjoria	Gopikandar-48	-
			19.	Surjadih	Gopikandar-58	-
			20.	Tengjor	Gopikandar-56	14.83
		Gopikandar West	21.	Nicha Pujadih	-	-
			22.	Puranakhora	-	-
			23.	Sarkhi	-	-
		Karudih	24.	Barapathar	Karudih-03	62.41

			25.	Karipahari	Karudih-13	16.19
			26.	Roldih	Karudih-01	-
			27.	Sidpahari	Karudih-02	31.45
	Kathikund	**Kathikund East**	28.	Amtala	Kathikund-32	-
			29.	Bandubera	Kathikund-35	0.74
			30.	Dalahi	Kathikund-34	3.98
			31.	Datunkati Pahar	-	-
			32.	Gamrah	Kathikund-40	37.99
			33.	Jamni	Kathikund-31	23.65
			34.	Katratanr	Kathikund-27	-
			35.	Manjhdiha	Kathikund-37	8.15
			36.	Nakti	Kathikund-30	36.42
			37.	Nijhor	Kathikund-39	15.19
			38.	Nijhor Pahar	-	-
			39.	Salaipahari	Kathikund-33	-
			40.	Taldih	Kathikund-36	24.03
			41.	Talpahari	Kathikund-28	-
			42.	Telgani	Kathikund-43	-
			43.	Ukhrapahari	Kathikund-38	28.33
		Kathikund West	44.	Asanbani	Kathikund-23	6.37
			45.	Asanpahari	Kathikund-21	62.82
			46.	Bara Kathikund	Kathikund-20	-
			47.	Chaudhari	Kathikund-29	16.33
			48.	Chhota Kathikund	Kathikund-04	15.18
			49.	Dhaniyapahari	Kathikund-09	1.84
			50.	Dhankutta	Kathikund-22	30.96
			51.	Dudhia	Kathikund-26	19.27
			52.	Gadharap	Kathikund-24	22.61
			53.	Jilli	Kathikund-10	-
			54.	Kadarmara	Kathikund-08	-
			55.	Kairasol	Kathikund-03	20.27
			56.	Kanrapahari	Kathikund-01	8.76
			57.	Lakraphela	Kathikund-25	-
			58.	Mahuadangal	Kathikund-07	18.00
			59.	Ratanpur	Kathikund-02	12.95
			60.	R.F.	-	-
			61.	Sibatala	Kathikund-17	-
		Saldaha	62.	Chhotatetumath	Saldaha-01	115.85
			63.	Bathanpahari	Saldaha-2	84.78
			64.	Chhota Bhalki	Saldaha-10	22.55
	Narganj	**Baskia**	65.	Bagjhopa	Narganj-06	19.83
			66.	Bara Narganj	Narganj-31	-
			67.	Bokwa	Narganj-07	8.30
			68.	Chakmuha	Narganj-11	3.47
			69.	Chhota Narganj	Narganj-13	1.28
			70.	Lakrapahari	Narganj-12	-
			71.	Majurnach	Narganj-02	23.16
			72.	Nonadangal	Narganj-10	-
			73.	Pindari	Narganj-08	-
		Narganj	74.	Bara Sarwapani	Narganj-58	6.88
			75.	Bhuibhanga Pahar	-	-
			76.	Burhidangal	Narganj-59	44.48

			77.	Ghatchora	Narganj-60	25.88
		Lakhanpur	78.	Bajrisol	Narganj-29	11.01
			79.	Balijor	Narganj-28	1.42
			80.	Bamarjhanti	Narganj-19	41.93
			81.	Charakpathar	Narganj-14	0.05
			82.	Kasikul	Narganj-16	9.53
			83.	Raibandh	Narganj-18	13.51
			84.	R.F.		
			85.	Sahritola	Narganj-30	11.16
			86.	Sultanabad	Narganj-17	8.97
			87.	Tilatanr	Narganj-15	2.88
		Bora Pahari	88.	Chaparia Pahar	-	-
			89.	Dewas Pahar	-	-
Hizla West	**Nonihat**	**Amdiha**	90.	Agoiabahal	-	-
			91.	Ampara	-	-
			92.	Amrapahari	-	-
			93.	Anguthiya	-	-
			94.	Baliakhara	-	-
			95.	Bansduma	-	-
			96.	Bara Aamjola	-	-
			97.	Bara Chapar	-	-
			98.	Baratanr	Guhiajori-2	5.89
			99.	Barhnia Chhota	-	-
			100.	Bhuskibari	-	-
			101.	Dahujor	-	-
			102.	Dhawa	-	-
			103.	Dholapathar	-	-
			104.	Dola	-	-
			105.	Duarpahari	-	-
			106.	Dunakuppi	-	-
			107.	Garrapahari	-	-
			108.	Gorro	-	-
			109.	Heth Barachapar	-	-
			110.	Jhanjhar	-	-
			111.	Jiruliya	Choto-44	7.54
			112.	Jiyapani	-	-
			113.	Khairasol	Kathikund-3	20.27
			114.	Karudih	-	-
			115.	Kobri	-	-
			116.	Kolachak	-	-
			117.	Kongmara	-	-
			118.	Kubriam	Dudhwa-26	16.89
			119.	Kunda	-	-
			120.	Kuramba	Dodho-31	21.46
			121.	Kurwa	-	-
			122.	Kusbana	-	-
			123.	Kusbedia	-	-
			124.	Kusdiha	-	-
			125.	Latta	Amarpur-43	123.29
			126.	Mahuapathar	-	-
			127.	Majurnach	-	-
			128.	Manrro	-	-
			129.	Mathdola	-	-
			130.	Milan Pahari	-	-

			131.	Nawadih	Choto-50	6.88
			132.	Nawadih	Matihani-2	13.48
			133.	Niche Garhar	-	-
			134.	Panjanpahari	Masanjor-22	883.35
			135.	Pararia	-	-
			136.	Parasbad	-	-
			137.	Pardaniduma	-	-
			138.	Pindari	-	-
			139.	Pipra	Bara-13	50.49
			140.	Poraipani	-	-
			141.	Punsia	-	-
			142.	Sabeduma	-	-
			143.	Saharpur	Jagatpur-26	14.87
			144.	Sapdahar	-	-
			145.	Saraipani	-	-
			146.	Sijua	Amarpur-36	24.19
			147.	Sarwapani	-	-
			148.	Siltha	-	-
			149.	Simalpahari	-	-
			150.	Suripalan	Masanjor-16	2.44
			151.	Upar Garahan	-	-
	Khasmahal	**Majhiyara**	152.	Baghapathar	Guhiajori-20	11.29
			153.	Chakmoha	Guhiajori-25	1.08
			154.	Dhogria	Rangamasalia-34	34.81
			155.	Mahuadangal	Guhiajori-21	7.14
			156.	Murlidum	Guhiajori-19	16.18
			157.	Phitkoria	-	-
			158.	Sijuadum	Guhiajori-24	6.88

Table 2: Impact Area Villages Falling within 10 and 15 Km Radius of the Coal Block and their Corresponding Forest Administrative Units – Godda Forest Division

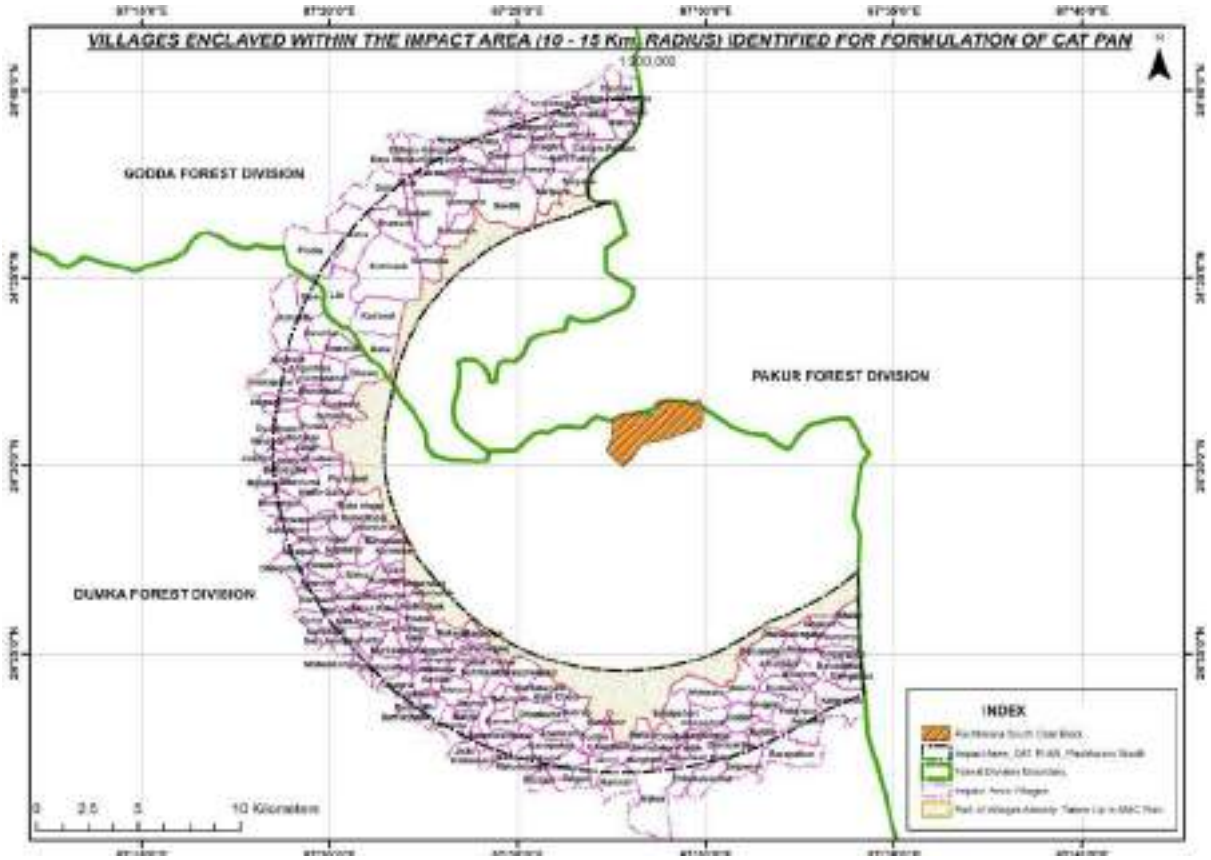
Range	Beat	Sub-Beat	S. No.	Village	Thana/Than a No.	Forest Land (ha)
Godda	**Godda**	**Belbathan**	1.	Bhawani	Godda-575	82.60
			2.	Dulu	Godda-574	15.24
	Poreyahat	**Pindrahat**	3.	Asna	Poreyahat	-
			4.	Boha	Poreyahat-204	34.64
			5.	Kairasol	Poreyahat-207	38.94
			6.	Liti	Poreyahat-205	31.67
			7.	Pindra	Poreyahat-201	66.18
			8.	Sidhbank	Poreyahat-206	194.16
Sundarpahari	**Sundarpahari**	**Chandna**	9.	Bara Haripur	Sundarpahari-07	-
	Damru	**Damruhat**	10.	Asantari	Sundarpahari-09	13.93
			11.	Asripara	Sundarpahari	-
			12.	Bariyarpur	Mahagama-14	11.12
			13.	Chandradih	Sundarpahari-23	11.54
			14.	Chhota Haripur	Sundarpahari-15	25.04
			15.	Damruhat	Sundarpahari-11	56.01
			16.	Dulu	Sundarpahari-08	9.45
			17.	Dumki	Sundarpahari-12	7.98

			18.	Gardi	Sundarpahari-24	5.42
			19.	Goradih	Sundarpahari-02	182.27
			20.	Kairabani	Sundarpahari-13	-
			21.	Khepadih	Sundarpahari-22	4.96
			22.	Kusmaha	Mahagama-10	112.91
			23.	Malikundi	Sundarpahari-26	35.15
			24.	Parariya	Sundarpahari	-
			25.	Singarsi	Sundarpahari	-
			26.	Tetaria	Sundarpahari-21	10.86
		Bokrabandh	27.	Barmasia	Sundarpahari-01	86.56
			28.	Patomdih	Sundarpahari-03	64.78
		Garsingla	29.	Balami	Sundarpahari-02	-
			30.	Bara Paktari	Sundarpahari	-
			31.	Bara Palma	Sundarpahari	-
			32.	Chamdade	Sundarpahari-3	-
			33.	Chamer	Sundarpahari	-
			34.	Charchari	Sundarpahari	-
			35.	Chhota Paktari	Sundarpahari	-
			36.	Dumli	Sundarpahari	-
			37.	Gargawan	Sundarpahari	-
			38.	Ghaghri	Sundarpahari-25	90.50
			39.	Jambia	Sundarpahari	-
			40.	Nandopara	Sundarpahari	-
			41.	Nadgoda	Sundarpahari	-
			42.	Rakha	Sundarpahari	-
			43.	Salgama	Sundarpahari-10	-
			44.	Telo	Sundarpahari-33	-
			45.	Tetariya	Sundarpahari-01	30.20

N.B. – The villages which are partly falling within 10 km radius of the boundary of the lease area have not been included in the above tables. The interventions with respect to such villages have been prescribed under the SMC plan. However, the total area of the villages falling partly within 15 km radius have been taken up under the instant CAT plan.

The villages located within the Impact Area are being shown in the following map:

Map 4: Villages Enclaved within the Impact Area



2.1.2. Description of Notified Forest Land within the Impact Area and Corresponding Prescriptions under the Working Plan

The prescriptions made under the Working Plan of the two forest divisions involved here are quite relevant for preparing the CAT plan. These prescriptions are being presented in the following tables.

Table 3: Working Plan Prescriptions with respect to Villages (within 10-15 Km radius) having notified Forest land – Dumka Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	CWSWC*	RCSWC*	PCPWC*	PWC*	TWC*
Kathikund/ Gopikandar/ Gopikandar East	Amarpani	Gopikandar-54	-	-	-	-	-	-
	Banspahari	Gopikandar-43	7.71	-	7.71	-	-	-
	Barabathan	Gopikandar-51	-	-	-	-	-	-
	Bengduba	Gopikandar-50	-	-	-	-	-	-
	Bhalki	Gopikandar-47	10.68	-	10.68	-	-	-
	Bhelaghati	Gopikandar-26	-	-	-	-	-	-
	Chhota Bathanpahari	Gopikandar-52	-	-	-	-	-	-
	Chirapathar	Gopikandar-27	0.98	-	0.98	-	-	-
	Daldali	Gopikandar-28	-	-	-	-	-	-

	Dhawadangal	Gopikandar-45	-	-	-	-	-	-
	Duaria	Gopikandar-29	2.02	-	2.02	-	-	-
	Gogajor	Gopikandar-46	-	-	-	-	-	-
	Kolajora	Gopikandar-53	3.68	-	3.68	-	-	-
	Mahualo	Gopikandar-25	31.11	7.43	16.32	-	7.36	-
	Murosal	Gopikandar-44	-	-	-	-	-	-
	Paharpur	Gopikandar-57	-	-	-	-	-	-
	Pindargaria	Gopikandar-49	-	-	-	-	-	-
	Piparjoria	Gopikandar-48	-	-	-	-	-	-
	Surjadih	Gopikandar-58	-	-	-	-	-	-
	Tengjor	Gopikandar-56	14.83	-	14.83			
Kathikund/ Gopikandar/ Gopikandar West	Nicha Pujadih	-	-	-	-	-	-	-
	Puranakhora	-	-	-	-	-	-	-
	Sarkhi	-	-	-	-	-	-	-
Kathikund/ Gopikandar/ Karudih	Barapathar	Karudih-03	62.41	2.32	30.14	21.03	8.92	-
	Karipahari	Karudih-13	16.19	-	16.19	-	-	-
	Roldih	Karudih-01	-	-	-	-	-	-
	Sidpahari	Karudih-02	31.45	17.46	13.99	-	-	-
Kathikund/ Kathikund/ Kathikund East	Amtala	Kathikund-32	-	-	-	-	-	-
	Bandubera	Kathikund-35	0.74	-	0.74	-	-	-
	Dalahi	Kathikund-34	3.98	-	3.98	-	-	-
	Datunkati Pahar	-	-	-	-	-	-	-
	Gamrah	Kathikund-40	37.99	-	-	37.99	-	-
	Jamni	Kathikund-31	23.65	-	-	23.65	-	-
	Katratanr	Kathikund-27	-	-	-	-	-	-
	Manjhdiha	Kathikund-37	8.15	-	8.15	-	-	-
	Nakti	Kathikund-30	36.42	9.25	20.85	-	6.32	-
	Nijhor	Kathikund-39	15.19	-	-	-	15.19	-
	Nijhor Pahar	-	-	-	-	-	-	-
	Salaipahari	Kathikund-33	-	-	-	-	-	-
	Taldih	Kathikund-36	24.03	8.71	15.32	-	-	-
	Talpahari	Kathikund-28	-	-	-	-	-	-
	Telgani	Kathikund-43	-	-	-	-	-	-
	Ukhrapahari	Kathikund-38	28.33	9.32	10.39	-	8.62	-
Kathikund/ Kathikund/ Kathikund West	Asanbani	Kathikund-23	6.37	-	-	-	6.37	-
	Asanpahari	Kathikund-21	62.82	25.35	-	-	37.47	-
	Bara Kathikund	Kathikund-20	-	-	-	-	-	-
	Chaudhari	Kathikund-29	16.33	-	-	16.33	-	-
	Chhota Kathikund	Kathikund-04	15.18	-	-	15.18	-	-
	Dhaniyapahari	Kathikund-09	1.84	-	1.84	-	-	-
	Dhankutta	Kathikund-22	30.96	18.22	-	-	12.74	-
	Dudhia	Kathikund-26	19.27	7.10	12.17	-	-	-
	Gadharap	Kathikund-24	22.61	13.46	9.15	-	-	-
	Jilli	Kathikund-10	-	-	-	-	-	-
	Kadarmara	Kathikund-08	-	-	-	-	-	-
	Kairasol	Kathikund-03	20.27	-	-	20.27	-	-
	Kanrapahari	Kathikund-01	8.76	-	8.76	-	-	-
	Lakraphela	Kathikund-25	-	-	-	-	-	-
	Mahuadangal	Kathikund-07	18.00	-	-	18.00	-	-
	Ratanpur	Kathikund-02	12.95	-	-	12.95	-	-
	R.F.	-	-	-	-	-	-	-
	Sibatala	Kathikund-17	-	-	-	-	-	-
Kathikund/ Kathikund/ Saldaha	Chhotatetumath	Saldaha-01	115.85	12.57	73.81	-	29.47	-
	Bathanpahari	Saldaha-2	84.78	31.34	20.77	-	32.67	-
	Chhota Bhalki	Saldaha-10	22.55	-	13.21	-	9.34	-
Kathikund/ Narganj/ Baskia	Bagjhopa	Narganj-06	19.83					
	Bara Narganj	Narganj-31	-	-	-	-	-	-
	Bokwa	Narganj-07	8.30	-	8.30	-	-	-

	Chakmuha	Narganj-11	3.47	-	3.47	-	-	-
	Chhota Narganj	Narganj-13	1.28	-	1.28	-	-	-
	Lakrapahari	Narganj-12	-	-	-	-	-	-
	Majurnach	Narganj-02	23.16	12.15	-	-	11.01	-
	Nonadangal	Narganj-10	-	-	-	-	-	-
	Pindari	Narganj-08	-	-	-	-	-	-
Kathikund/ Narganj/ Narganj	Bara Sarwapani	Narganj-58	6.88	-	6.88	-	-	-
	Bhuibhanga Pahar	-	-	-	-	-	-	-
	Burhidangal	Narganj-59	44.48	20.16	-	-	24.32	-
	Ghatchora	Narganj-60	25.88	12.02	-	-	13.86	-
Kathikund/ Narganj/ Lakhanpur	Bajrisol	Narganj-29	11.01	-	11.01	-	-	-
	Balijor	Narganj-28	1.42	-	1.42	-	-	-
	Bamarjhanti	Narganj-19	41.93	-	-	41.93	-	-
	Charakpathar	Narganj-14	0.05	-	0.05	-	-	-
	Kasikul	Narganj-16	9.53	-	9.53	-	-	-
	Raibandh	Narganj-18	13.51	-	-	13.51	-	-
	R.F.	-	-	-	-	-	-	-
	Sahritola	Narganj-30	11.16	-	11.16	-	-	-
	Sultanabad	Narganj-17	8.97	-	8.97	-	-	-
	Tilatanr	Narganj-15	2.88	-	2.88	-	-	-
Kathikund/ Narganj/ Bora Pahari	Chaparia Pahar	-	-	-	-	-	-	-
	Dewas Pahar	-	-	-	-	-	-	-
Hizla West/ Nonihat/ Amdiha	Agoiabahal	-	-	-	-	-	-	-
	Ampara	-	-	-	-	-	-	-
	Amrapahari	-	-	-	-	-	-	-
	Anguthiya	-	-	-	-	-	-	-
	Baliakhara	-	-	-	-	-	-	-
	Bansduma	-	-	-	-	-	-	-
	Bara Aamjola	-	-	-	-	-	-	-
	Bara Chapar	-	-	-	-	-	-	-
	Baratanr	Guhiajori-2	5.89	-	-	5.89	-	-
	Barhnia Chhota	-	-	-	-	-	-	-
	Bhuskibari	-	-	-	-	-	-	-
	Dahujor	-	-	-	-	-	-	-
	Dhawa	-	-	-	-	-	-	-
	Dholapathar	-	-	-	-	-	-	-
	Dola	-	-	-	-	-	-	-
	Duarpahari	-	-	-	-	-	-	-
	Dunakuppi	-	-	-	-	-	-	-
	Garrapahari	-	-	-	-	-	-	-
	Gorro	-	-	-	-	-	-	-
	Heth Barachapar	-	-	-	-	-	-	-
	Jhanjhar	-	-	-	-	-	-	-
	Jiruliya	Choto-44	7.54	-	7.54	-	-	-
	Jiyapani	-	-	-	-	-	-	-
	Khairasol	Kathikund-3	20.27	-	-	20.27	-	-
	Karudih	-	-	-	-	-	-	-
	Kobri	-	-	-	-	-	-	-
	Kolachak	-	-	-	-	-	-	-
	Kongmara	-	-	-	-	-	-	-
	Kubriam	Dudhwa-26	16.89	-	16.89	-	-	-
	Kunda	-	-	-	-	-	-	-
	Kuramba	Dodho-31	21.46	-	21.46	-	-	-
	Kurwa	-	-	-	-	-	-	-
	Kusbana	-	-	-	-	-	-	-
	Kusbedia	-	-	-	-	-	-	-
	Kusdiha	-	-	-	-	-	-	-
	Latta	Amarpur-43	123.29	32.12	32.44	23.41	35.32	-

	Mahuapathar	-	-	-	-	-	-	-
	Majurnach	-	-	-	-	-	-	-
	Manrro	-	-	-	-	-	-	-
	Mathdola	-	-	-	-	-	-	-
	Milan Pahari	-	-	-	-	-	-	-
	Nawadih	Choto-50	6.88	-	-	6.88	-	-
	Nawadih	Matihani-2	13.48	-	-	13.48	-	-
	Niche Garhar	-	-	-	-	-	-	-
	Panjanpahari	Masanjor-22	883.35	59.68	341.39	187.32	208.48	86.48
	Pararia	-	-	-	-	-	-	-
	Parasbad	-	-	-	-	-	-	-
	Pardaniduma	-	-	-	-	-	-	-
	Pindari	-	-	-	-	-	-	-
	Pipra	Bara-13	50.49	-	50.49	-	-	-
	Poraipani	-	-	-	-	-	-	-
	Punsia	-	-	-	-	-	-	-
	Sabeduma	-	-	-	-	-	-	-
	Saharpur	Jagatpur-26	14.87	-	14.87	-	-	-
	Sapdahar	-	-	-	-	-	-	-
	Saraipani	-	-	-	-	-	-	-
	Sijua	Amarpur-36	24.19	-	24.19	-	-	-
	Sarwapani	-	-	-	-	-	-	-
	Siltha	-	-	-	-	-	-	-
	Simalpahari	-	-	-	-	-	-	-
	Suripalan	Masanjor-16	2.44	-	-	2.44	-	-
	Upar Garahan	-	-	-	-	-	-	-
Hizla West/ Khasmahal/ Majhiyara	Baghapathar	Guhiajori-20	11.29	-	11.29	-	-	-
	Chakmoha	Guhiajori-25	1.08	-	-	1.08	-	-
	Dhogria	Rangamasalia-34	34.81	-	34.81	-	-	-
	Mahuadangal	Guhiajori-21	7.14	-	-	7.14	-	-
	Murlidum	Guhiajori-19	16.18	-	16.18	-	-	-
	Phitkoria	-	-	-	-	-	-	-
	Sijuadum	Guhiajori-24	6.88	-	6.88	-	-	-

*CWSWC – Coppice with Standard Working Circle
*RCSWC – Rehabilitation -cum- Soil & Moisture Conservation Working Circle
*PCPWC – Plantation and Pastureland Working Circle
*PWC – Protection Working Circle
*TWC – Tasar Working Circle

Table 4: Working Plan Prescriptions with respect to Villages (within 10-15 Km radius) having notified Forest land – Godda Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	IWC*	RCSWC*	PLWC*	PRWC*	TWC*
Godda/ Godda/ Belbathan	Bhawani	Godda-575	82.60	49.20	10.60	22.80	-	-
	Dulu	Godda-574	15.24	-	-	-	15.24	-
Godda/ Poreyahat/ Pindrahat	Asna	-	-	-	-	-	-	-
	Boha	Poreyahat-204	34.64	-	18.30	16.34	-	-
	Kairasol	Poreyahat-207	38.94	-	27.26	11.68	-	-
	Liti	Poreyahat-205	31.67	-	12.00	7.00	12.67	-
	Pindra	Poreyahat-201	66.18	33.00	-	13.30	19.90	-
	Sidhbank	Poreyahat-206	194.16	-	-	-	-	194.16
Sundarpahari/ Sundarpahari/ Chandna	Bara Haripur	Sundarpahari-07	-	-	-	-	-	-
Sundarpahari/	Asantari	Sundarpahari-09	13.93	5.50	-	8.40	-	-

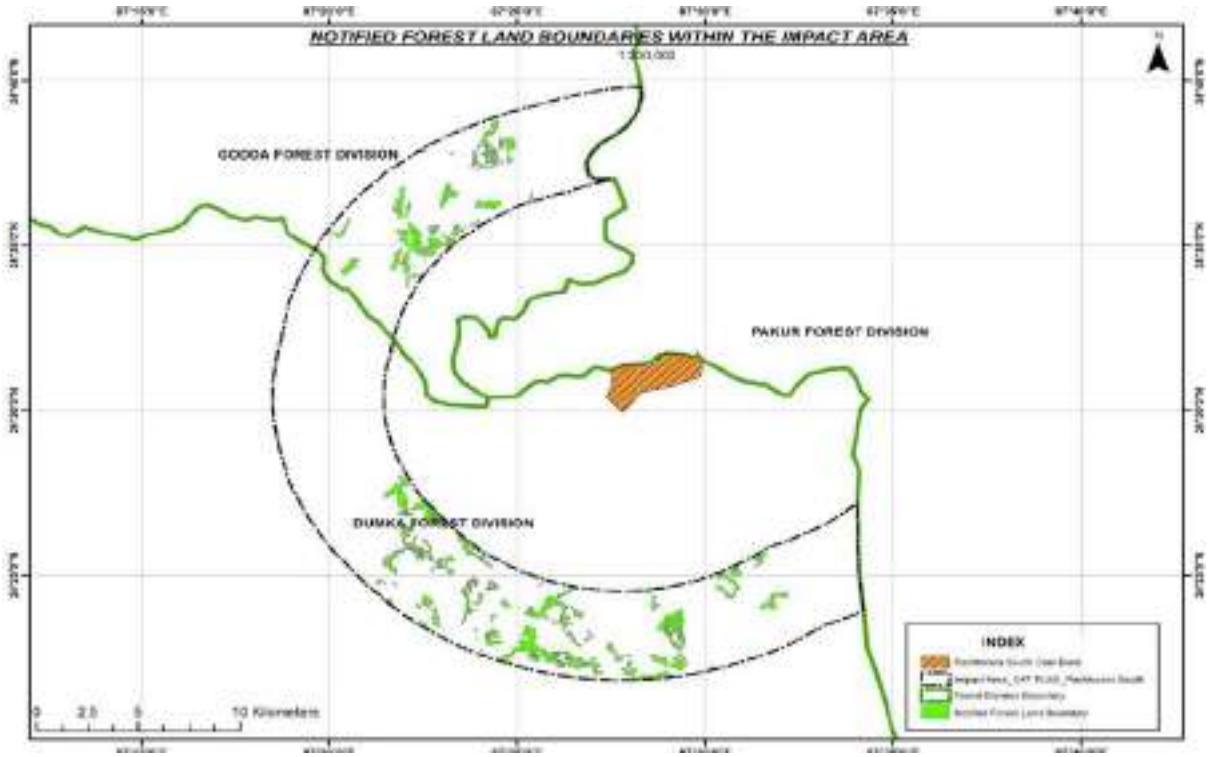
Damru/ Damruhat	Asripara		-	-	-	-	-	-
	Bariyarpur	Mahagama-14	11.12	-	8.10	3.02	-	-
	Chandradih	Sundarpahari-23	11.54	5.00	6.54	-	-	-
	Chhota Haripur	Sundarpahari-15	25.04	-	-	-	25.04	-
	Damruhat	Sundarpahari-11	56.01	-	31.21	-	24.80	-
	Dulu	Sundarpahari-08	9.45	-	9.45	-	-	-
	Dumki	Sundarpahari-12	7.98	-	-	-	7.98	-
	Gardi	Sundarpahari-24	5.42	5.42	-	-	-	-
	Goradih	Sundarpahari-02	182.27	-	-	-	182.27	-
	Kairabani	Sundarpahari-13	-	-	-	-	-	-
	Khepadih	Sundarpahari-22	4.96	-	2.96	2.00	-	-
	Kusmaha	Mahagama-10	112.91	79.01	6.00	20.00	7.90	-
	Malikundi	Sundarpahari-26	35.15	35.15	-	-	-	-
	Parariya	-	-	-	-	-	-	-
	Singarsi	-	-	-	-	-	-	-
	Tetaria	Sundarpahari-21	10.86	-	7.86	3.00	-	-
Sundarpahari/ Damru/ Bokrabandh	Barmasia	Sundarpahari-01	86.56	69.30	-	8.80	8.46	-
	Patomdih	Sundarpahari-03	64.78	-	51.80	-	12.98	-
Sundarpahari/ Damru/ Garsingla	Balami	Sundarpahari-02	-	-	-	-	-	-
	Bara Paktari	-	-	-	-	-	-	-
	Bara Palma	-	-	-	-	-	-	-
	Chamdade	Sundarpahari-03	-	-	-	-	-	-
	Chamer	-	-	-	-	-	-	-
	Charchari	-	-	-	-	-	-	-
	Chhota Paktari	-	-	-	-	-	-	-
	Dumli	-	-	-	-	-	-	-
	Gargawan	-	-	-	-	-	-	-
	Ghaghri	Sundarpahari-25	90.50	-	90.50	-	-	-
	Jambia	-	-	-	-	-	-	-
	Nandopara	-	-	-	-	-	-	-
	Nadgoda	-	-	-	-	-	-	-
	Rakha	-	-	-	-	-	-	-
	Salgama	Sundarpahari-10	-	-	-	-	-	-
	Telo	Sundarpahari-33	-	-	-	-	-	-
	Tetariya	Sundarpahari-01	30.20	-	-	30.20	-	-

*IWC – Improvement Working Circle
*RCSWC – Rehabilitation – cum- Soil Conservation Working Circle
*PLWC – Plantation Working Circle
*PRWC – Protection Working Circle
*TWC – Tasar Working Circle

2.1.3. Forest Boundaries and Forest Cover within the Impact Area

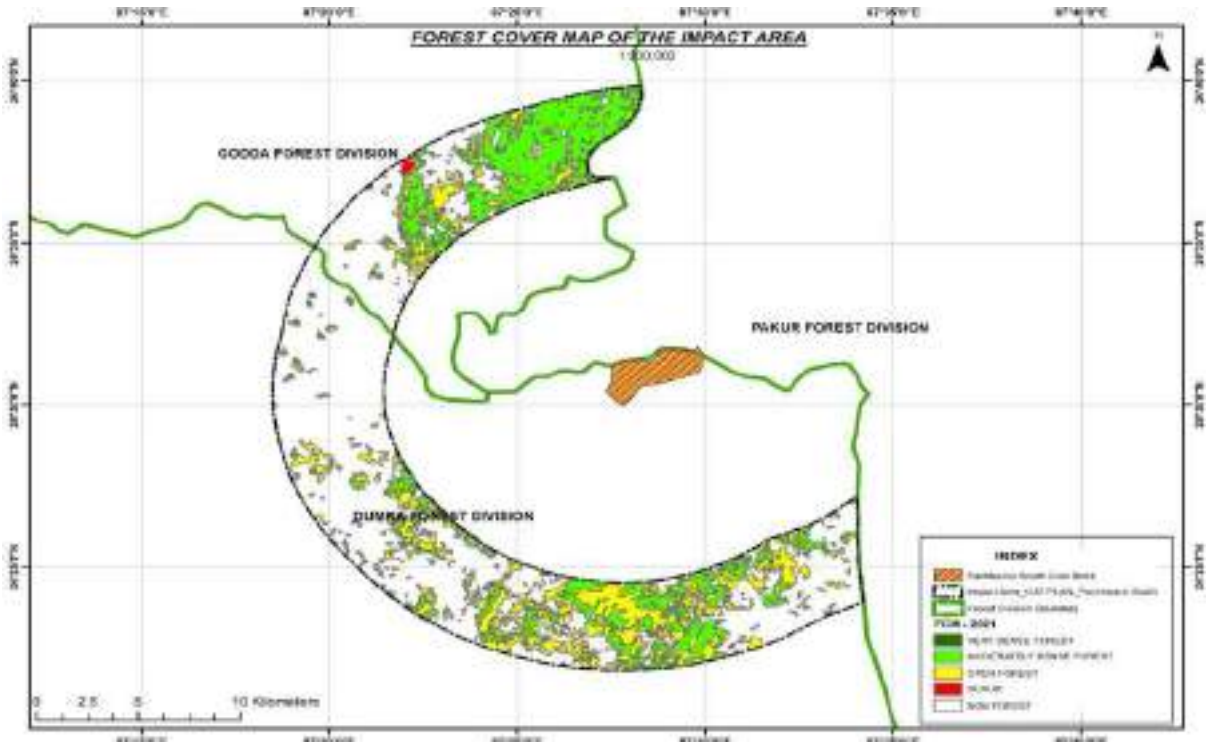
The Notified Forest land boundaries are being shown in the following map.

Map 5: Notified Forest Land Boundaries within the Impact Area



The Forest Cover Map (FSI, 2021) of the Impact Area is as follows.

Map 6: Forest Cover Map of the Impact Area (FSI, 2021)



According to the forest cover map of the Impact Area, the area under different tree canopy density classes are as under.

Table 5: Impact Area under Different Tree Canopy Density Classes

Sl. No.	Forest Density Class	Tree Canopy Density	Area (ha)
1.	Very Dense Forest	≥ 70%	7.655
2.	Moderately Dense Forest	≥ 40%; < 70%	5574.560
3.	Open Forest	< 40%; ≥ 10%	5042.980
4.	Scrub Forest	< 10%	58.515
5.	Non-Forest	-	16249.900

2.2. ECOSYSTEM AND BIODIVERSITY STATUS OF THE IMPACT AREA

Biodiversity constitutes the most important working component of a natural ecosystem. It helps maintain ecological processes, creates soils, recycles nutrients, has a moderating effect on the climate, degrades waste, controls diseases and above all, provides an index of health of an ecosystem. Providing food, medicines and a wide range of useful products, it is the natural wealth that exists on land, in freshwater etc. Plant diversity alone offers more than just food security and healthcare for the one-quarter of humanity who live their lives at or near subsistence levels; it provides them with a roof over their heads and fuel to cook, and, on an average, meets 90 per cent of their material needs.

2.2.1. Forest Flora

The forests of Dumka and Godda forest divisions broadly conform to Northern Tropical Dry Deciduous Forest and may be classified as 5-B as per Champion and Seth (1968) classification. According to the classification of forest types of India, the forests of Dumka and Godda Divisions fall into the following sub-types:

- Northern Dry Peninsular Sal Forest–5B/C-1 type
- Northern Tropical Dry Mixed Deciduous Forest– 5B/C-2 type
- Tropical Dry Deciduous Scrub Forest–5B/DS-1 type

Most of the forests are situated along the northern aspects where slope is moderate to steep. The primary associate species found in the Sal forests are Terminalia chebula, Semicarpus anacardium, along with occasional bamboo brakes. Miscellaneous forests are situated both on plains as well as hills where soil is shallow and degraded, on the warmer aspects and in comparatively drier localities (such as hill slopes and hill tops having poor soil and moisture content). Here, the primary species

are Dhaura, Asan, Kend, Galgal, Piar, Amla and so on. Scattered Semal trees are found in moister localities. Sal occurs near the foot-hill and in well drained moist localities. The areas coming under Tropical Dry Deciduous Scrub category are home to thorny species such as Flacouria indica, Carissa spinerum, Randia species, Euphorbia species, Acacia species, zyzyphus species, Zinosa species, Boswellia, Anogeissus, Aegle marmelos, Butea monosperma, Daiospyros, Madhuca, Nyctanthes etc. The tree species are mostly malformed and have stunted growth. The bamboos occur scattered around the fringes of the forests and mainly along the hill slopes. However, bamboos are of generally poor quality.

2.2.2. Forest Fauna

No Sensitive Ecological Habitat like National Park, Wild Life Sanctuary, Tiger Reserve or Elephant Reserve is located within the Impact Area.

2.2.2.1. Herpetofauna

Two species of amphibians viz. Common Toad (Duttaphrynus melanostictus) and Indian Bullfrog (Hoplobatrachus tigerinus) etc. are found in the study area. All the species are listed as species of Least Concern as per IUCN Classification (IUCN Version 2017-3). Six species of reptiles have been reported from the study area. The list includes Indian Cobra (Naja naja), Common Krait (Bungarus caeruleus), Indian Rat Snake (Ptyas mucosus), Russel's Viper (Daboia russellii), Checkered Keelback (Xenochrophis piscator) and Oriental Garden Lizard (Calotes versicolor). The list includes four Schedule II species as per the Wildlife Protection Act, 1972 viz. Indian Cobra, Indian Rat Snake, Russel's Viper and Checkered Keelback.

2.2.2.2. Avifauna

A total of 39 species have been recorded from the study area. The species list includes terrestrial and aquatic birds.

Terrestrial birds include Asian Pied Starling, House Crow (Corvus splendens), Shikra (Accipiter badius), Common Myna (Acridotheres tristis), Paddyfield Pipit (Anthus rufulus), House Swift (Apus nipalensis), Common Pigeon (Columba livia), Asian Palm Swift (Cypsiurus balasiensis), Ashy Prinia, Black Drongo (Dicrurus macrocercus), Asian Koel (Eudynamys scolopaceus), Coppersmith Barbet (Psilopogon haemacephalus), Little Green bee-eater (Merops orientalis), Black Kite (Milvus migrans), Black Winged Kite (Elanus caeruleus), House sparrow (Passer domesticus), Baya weaver (Ploceus philippinus), Indian Silverbill, Plain Prinia (Prinia inornata), Rose-ringed Parakeet (Psittacula krameri), Red-vented Bulbul (Pycnonotus cafer), Indian Robin

(Copsychus fulicatus), Spotted Dove, Eurasian Collared Dove (Streptopelia decaocto), Jungle babbler (Turdoides striata),etc.

Aquatic birds include White-breasted Waterhen (Amaurornis phoenicurus), Grey Heron (Ardea cinerea), Indian Pond Heron (Ardeola grayii), Purple Heron (Ardea purpurea), Cattle Egret (Bubulcus ibis), Intermediate Egret (Ardea intermedia), Pied Kingfisher (Ceryle rudis), Little Egret (Egretta garzetta), White- throated Kingfisher (Halcyon smyrnensis), Little Cormorant (Microcarbo niger), Purple Swamphen (Porphyrio porphyrio), Red-wattled Lapwing (Vanellus indicus) etc. Shikra (Accipiter badius), Black Kite (Milvus migrans) and Black Winged Kite (Elanus caereleus) are listed as Schedule I as per Wildlife Protection Act, 1972.

All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.2.2.3. Mammals

A total of 6 species of mammals are reported from the study area. The mammals reported are: Five-striped Palm Squirrel (Funambulus pennantii), Golden Jackal (Canis aureus), Common Grey Mongoose (Herpestes edwardsii), Rhesus macaque (Macaca mulatta), Indian Flying Fox (Pteropus giganteus), Lesser Bandicoot Rat (Bandicota bengalensis) etc. Large mammals were reported to be absent in the study area. The list includes three Schedule II species namely Golden Jackal, Common Grey Mongoose and Rhesus macaque. All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.3. DEMOGRAPHIC PROFILE OF VILLAGES FALLING WITHIN THE IMPACT AREA

The demographic profile of the villages involved in the Impact Area is being presented in the following table.

Table 6: Demographic profile of the villages falling within the Impact Area

Forest Division	CD Block	Village	Area (ha)	Total Population	Sex Ratio*	Total no. of households	Total Literacy (%)
DUMKA	**Gopikandar**	Amarpani	111.26	167	965	36	41.79
		Banspahari	241.63	304	912	71	44.94
		Barabathan	90.00	78	814	19	65.67
		Barapathar	343.00	748	1044	163	59.90
		Bengduba	121.00	380	990	97	45.51
		Bhalki	120.75	268	1197	52	39.52
		Bhelaghati	192.69	408	934	98	34.59

		Chhota Bathanpahari	112.18	103	981	24	49.41
		Chirapathar	153.00	414	1000	107	61.76
		Daldali	182.28	483	1013	103	45.24
		Dhawadangal	147.28	232	966	48	27.27
		Duaria	216.00	468	1099	96	46.73
		Gogajor	76.01	91	978	22	38.89
		Karipahari	333.00	705	1123	160	55.06
		Kolajora	109.68	173	1163	39	27.75
		Mahualo	293.00	312	1108	74	35.26
		Majdiha	51.00	298	948	68	57.05
		Murosal	101.91	221	1085	54	19.00
		Paharpur	124.00	380	854	84	34.21
		Pindargaria	121.57	116	1000	21	25.00
		Piparjoria	184.79	533	945	107	28.52
		Roldih	97.00	279	788	55	44.44
		Sidpahari	214.74	351	1053	71	20.80
		Surjadih	295.49	877	1002	190	56.21
		Tengjor	154.00	636	969	126	24.84
	Kathikund	Amtala	123.00	226	1036	43	32.30
		Asanbani	69.42	158	881	31	50.00
		Asanpahari	224.23	663	1973	121	68.17
		Bagjhopa	81.08	176	1047	40	40.91
		Bajrisol	86.00	198	904	41	55.05
		Balijor	97.94	325	958	63	50.46
		Bamarjhanti	138	125	1049	18	31.20
		Bandubera	26.31	74	1000	16	22.97
		Bara Kathikund	109.70	270	862	63	51.85
		Bara Narganj	65.00	253	977	53	43.48
		Bara Sarwapani	187.00	352	966	84	48.86
		Bokwa	114.71	201	1030	45	24.88
		Burhidangal	165.00	299	1076	60	47.16
		Chakmuha	82.00	317	969	61	51.10
		Chaudhari	93.57	118	1034	31	49.15
		Chhota Kathikund	65.71	27	929	6	77.78
		Chhota Narganj	76.80	214	1078	50	32.24
		Chhota Tetulmath	173.30	157	725	26	50.32
		Charakpathar	96.00	175	988	34	30.29
		Dalahi	113.00	186	1067	44	16.13
		Datunkati Pahar					
		Dhaniyapahari	79.02	180	1118	45	39.44
		Dhankutta	244.54	304	961	58	52.96
		Dudhiya	107.72	186	738	42	32.80
		Gadharap	194.00	282	843	69	57.45
		Gamrah	260.55	441	951	102	12.24
		Ghatchora	85.00	166	886	36	33.13
		Jamni	218.28	165	1063	37	52.12
		Jilli	109.20	281	912	65	38.08
		Kadarmara	63.22	88	1095	22	55.68
		Kairasol	150.00	278	1155	60	39.93
		Kanrapahari	99.00	86	1000	16	53.49
		Kasikul	64.00	134	1062	29	62.69
		Katratanr	7.90	31	1385	8	16.13

		Lakra Pahari	106.00	363	1241	69	30.30
		Lakraphela	7.80	90	915	22	20.00
		Mahuadangal	63.57	-	-	-	-
		Majurnach	73.23	260	926	58	24.23
		Nakti	197.49	443	1051	102	54.18
		Nijhor	638.47	207	990	44	25.60
		Nonadangal	82.00	158	1135	34	46.20
		Phitkoria	133.47	402	1010	73	44.03
		Pindari	166.08	174	776	37	40.80
		Raibandh	102.00	139	853	30	51.08
		Ratanpur	102.39	216	1000	42	34.72
		Sahritola	184.00	303	968	63	25.08
		Salaipahari	17.00	123	864	29	14.63
		Sibatala	98.80	573	1984	93	72.95
		Sijua					
		Sultanabad	81.00	154	949	29	57.14
		Taldih	163.15	440	1085	92	39.77
		Talpahari	12.46	54	1160	13	42.59
		Telgani	118.17	174	977	34	51.15
		Tilatanr	180.00	476	1017	93	51.89
		Ukhrapahari	97.00	132	1400	29	49.24
	Ramgarh	Agciabahal	43.00	-	-	-	-
		Ampara	74.00	460	1018	95	46.52
		Amrapahari	233.00	872	995	184	50.80
		Anguthiya	168.03	370	1229	69	21.89
		Baliakhara	233.00	717	986	142	31.24
		Bansduma	137.00	275	964	65	49.82
		Barachapar					
		Baratanr	168.00	410	1040	84	66.59
		Bhuskibari	88.00	261	1023	49	39.85
		Dahujor	117.00	435	1005	99	60.92
		Dhawa	127.00	1555	978	342	73.89
		Dholapathar	176.64	551	968	118	55.17
		Dola	93.00	269	1261	60	49.81
		Duarpahari	161.00	331	1018	69	38.07
		Dunakuppi					
		Garrapahari	161.00	394	950	82	31.47
		Gorro					
		Heth Barachapar	120.00	340	1099	70	34.41
		Jhanjhar	107.00	620	975	121	55.97
		Jirulia	69.00	87	977	18	34.48
		Jiyapani	64.00	353	908	92	60.91
		Khairasol	99.00	331	1082	65	40.18
		Karudih	456.00	1681	1030	369	43.19
		Kobri					
		Kolhachak	40.00	-	-	-	-
		Kongmara					
		Kubriam	55.00	75	1419	18	56.00
		Kunda	85.00	305	1075	65	45.25
		Kuramba	153.00	142	1029	35	39.44
		Kusbana	157.00	386	949	80	38.08

		Kusbedia	143.00	318	1106	75	26.73
		Kusdiha	200.00	656	1000	144	44.05
		Latta	58.00	-	-	-	-
		Mahuapathar	146.00	411	948	99	54.50
		Majurnach	152.00	352	853	72	43.18
		Manrro	105.00	243	992	53	40.33
		Mathtola	46.00	162	33	1132	58.02
		Milan Pahari	125.00	299	1007	66	24.08
		Nawadih	126.00	281	965	57	25.62
		Niche Garhar					
		Pararia	80.00	140	918	36	31.43
		Parasbad	93.00	-	-	-	-
		Pardaniduma	109.00	135	929	25	45.93
		Pindari	138.00	329	994	62	53.50
		Pipra	186.00	558	1007	121	35.66
		Poraipani	161.00	763	903	169	60.68
		Punsia	215.00	634	1019	133	27.60
		Sabeduma	170.00	260	1016	54	31.15
		Saharpur	101.00	183	989	42	25.68
		Sapdahar	145.00	156	1026	34	49.36
		Saraipani	99.00	157	1013	37	49.68
		Saruabani					
		Sarwapani	139.00	298	863	64	18.79
		Siltha	193.00	990	926	201	55.15
		Simalpahari					
		Upar garahan	72.00	152	1027	31	43.42
	Dumka	Baghapathar	160.73	350	1083	73	52.57
		Bara Aamjola	130.27	271	1038	56	51.29
		Chakmoha	53.07	207	1010	40	41.55
		Dhogria	152.00	400	970	69	38.00
		Kurwa	116.00	191	1247	48	15.71
		Mahuadangal	107.00	249	1092	65	16.47
		Murlidum	80.58	147	1162	31	25.85
		Sijuadum	70.27	77	1081	18	45.45
		Suripalan	149.00	152	949	35	34.21
GODDA	**Sundarpahari**	Asantari	42.00	-	-	-	-
		Asripara	61.68	44	833	14	20.45
		Balami	51.44	196	1154	38	5.10
		Bara Haripur	102.00	248	1157	54	17.34
		Bara Paktari	204.89	278	1138	60	0.36
		Bara Palma	197.00	306	962	67	7.19
		Bariyarpur	228.00	421	1064	96	28.98
		Barmasia	164.00	134	1062	33	5.97
		Chamdade	103.44	140	2889	29	7.14
		Chamer	147.25	287	939	60	28.92
		Chandradih	140.00	102	855	23	34.31
		Charchari	141.47	160	758	39	27.50
		Chhota Haripur	169.00	250	1137	55	21.60
		Chhota Paktari	92.21	76	1000	18	6.58
		Damruhat	218.00	640	957	132	50.31
		Dulu	45.00	19	727	5	15.79
		Dumki	63.00	113	982	22	53.98
		Dumli	125.00	139	1044	32	38.13
		Gardi	80.00	69	1156	17	24.64

		Gargawan	53.35	116	1231	29	10.34
		Ghaghri	141.00	97	865	21	19.59
		Goradih	550.92	630	994	145	22.70
		Jambia	97.00	-	-	-	-
		Kairabani	17.00	68	838	17	30.88
		Khepadih	99.00	174	851	38	26.44
		Kusmaha	647.00	710	1034	149	25.63
		Malikundi	129.00	32	1133	8	3.13
		Nandopara					
		Nadgoda	112.90	195	970	40	26.15
		Parariya	224.00	167	835	40	25.15
		Patomdih	209.00	321	1058	77	26.17
		Rakha	147.00	121	1283	28	2.48
		Salgama	104.89	141	1311	29	10.64
		Singarsi					
		Telo	74.83	52	857	13	25.00
		Tetariya	133.00	219	1047	47	45.21
		Tetaria	184.00	212	1038	48	45.28
	Poreyahat	Asna	251.00	624	897	135	41.19
		Boha	405.00	874	925	185	42.45
		Kairasol	372.00	897	959	187	41.25
		Liti	377.52	631	1003	120	39.14
		Pindra	539.00	2459	952	463	48.07
		Sidhbank	820.00	1485	1118	312	34.75
	Godda	Bhawani	242.00	542	1117	119	30.81
		Dulu	358.00	887	958	190	29.65

*Sex Ratio means no. of females per 1000 males

The demographic profiles of Dumka and Godda districts are being shown in the following table.

Table 7: Demographic Profile of Dumka and Godda Districts

District	Total Population (No.)	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy
Dumka	13,21,442	6,68,514	6,52,928	6.02	21.87	93.18	6.82	61.02
Godda	13,13,551	6,77,927	6,35,624	8.80	10.71	94.90	5.10	56.40

The demographic profile of the CD blocks involved in the Impact Area is being presented in the following table.

Table 8: Demographic Profile of CD Blocks involved in the Impact Area

District	CD Block	Total Population	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy (%)
Dumka	**Gopikandar**	42,063	20,999	21,064	1.58	84.58	100.00	-	50.12
	Kathikund	71,458	35,598	35,860	2.45	63.54	100.00	-	54.08
	Ramgarh	1,59,911	79,944	79,967	4.77	47.85	100.00	-	55.45
	Dumka	1,63,201	82,585	80,616	6.73	42.83	94.50	5.50	74.73
Godda	**Sundarpahari**	65,463	32,895	32,568	2.14	38.44	100.00	-	43.62
	Poreyahat	1,87,489	95,814	91,675	6.59	16.08	100.00	-	56.33
	Godda	2,70,255	1,40,618	1,29,637	8.59	5.69	93.00	7.00	64.17

2.4. LIVELIHOOD STATUS OF THE POPULATION RESIDING IN THE IMPACT AREA

The Impact Area is predominantly agricultural in character. The main occupation of the people is cultivation. Kharif and Rabi are the main agricultural crops. The demographic profile of both Dumka and Godda districts is predominantly rural in character, with high level of poverty and low percentage of working population. The major crops grown are Paddy, Maize, Pulses, Oilseeds and Wheat. Paddy is grown intensively whereas other crops are grown by lesser number of farmers.

Rainfed farming system is the traditional practice followed by the farmers of the area. The Major crops grown in the district are rice, pulses such as moong, black-gram, pigeon pea and horse gram. Wheat is grown during rabi season and mustard and linseed, and pulses e.g. gram are also grown on stored or residual soil moisture. In some places, potato is also grown under irrigated condition. During the last five years there has been a marked increase in area under vegetables at some places in the district.

The important cropping patterns followed in different parts of Dumka and Godda are as follows: (a) Mono-cropping : Rice/Maize/Pigeon Pea/Groundnut/Horse gram. In some areas, farmers follow inter-cropping of Maize with Pigeon pea/Cow pea. (b) Double cropping : Rice wheat, Rice-Mustard, Maize-Wheat, Maize-Mustard, Rice-Potato, Rice-Vegetable, Maize-Vegetables. At few places, where irrigation water is available in summer also, farmers take rice and / vegetables at very scanty level.

Most of the cultivated lands suffer from soil erosion which results in poor soil fertility. In spite of having high rainfall (1000-1100 mm/year), farmers of these areas lack awareness about High Yield Varieties (HYVs). A study has revealed that poverty can be significantly reduced in sustainable manner by introduction of HYVs of paddy – a prominent crop of the region. Further, motivation of farmers towards crop diversification like wheat, chickpea and groundnut cultivation may a go a long way towards food security and improved socio-economic condition of the villagers.

In a project report entitled "Up-scaling Livelihood of Forest Communities through Enhanced Farm Productivity and Efficient Support Systems in Godda District of Jharkhand" prepared by Agricultural Finance Corporation (ICAR) in 2014, it has been observed that people would harvest bamboo culms either to sell them in the market or to use in house making and basket making. A need to diversify products from traditional to contemporary Bamboo crafts has been highlighted. The study has further noted that forest areas of Sunderpahari and Godda forest ranges have abundant Sal (Shorea robusta) trees. Traditionally, local people collect Sal leaves, make the plates

manually and sell to the local traders @ Rs.20 per 100 plates. Local traders mechanize them and further sell in the market at higher price ranging from Rs. 60 to Rs. 90 per 100 plates. Hence, mechanization of leaf plates may contribute significantly towards livelihood augmentation. Forests of Godda and Sundarpahari ranges have ample trees and plants that provide different kinds of NTFPs. Some of them are edible fruits viz., Jackfruit (Artocarpus heterophyllus), Mango (Mangifera indica), Amra (Spondia pinnata), Aonla (Embelica officianlis), etc. Traditionally local people collect these fruits either for self-consumption or selling in the local market at throwaway prices. In order to generate higher market returns these fruits may be processed, preserved, packed, labelled and sold in the market in form of pickle etc. Multilayer Vegetable Cropping System (MVCS) also needs to be introduced. Under MVCS better results were recorded compared to traditional as well as hybrid varieties under sole crop. Nutritional security for the people living in disadvantaged area may be effectively addressed through providing a small kit of vegetables seeds to grow them in the backyard. In addition, improved varieties of crops may be provided to the farmers. Vermi-composting may also be introduced. Use of vermi-compost could help in enhancing land fertility and provide a better alternative to the traditional use of dung. Nurseries may also be developed / established on the farmers land which is not used for cultivation purpose and lying vacant. The seedlings of plants such as Mango, Aonla, Bamboo, etc. could be raised in the nursery. In addition, seedlings of Coriander, Chilli, Cauliflower, etc. may also be grown in the poly house built within the nursery premises.

2.4.1. Occupational Profile of the Residents in the Impact Area

The occupational profile of the CD Blocks constituting the Impact area are being profiled in the following table:

Table 9: Occupational Profile of the CD Blocks Constituting the Impact Area

District	CD Block	Total Population	Total No. of Workers	No. of Main Workers	Main Workers (%)	No. of Marginal Workers	Marginal Workers (%)	Non-working Persons
Dumka	**Gopikandar**	42,063	23,406	8,044	34.37	15,362	65.63	18,657
	Kathikund	71,458	34,846	13,251	38.03	21,595	61.97	36,612
	Ramgarh	1,59,911	82,265	21,738	26.42	60,527	73.58	77,646
	Dumka	1,63,201	68,029	26,165	38.46	41,864	61.54	95,172
Godda	**Sundarpahari**	65,463	35,347	11,515	32.58	23,832	67.42	30,116
	Poreyahat	1,87,489	81,334	42,008	51.65	39,326	48.35	1,06,155
	Godda	2,70,255	70,412	42,417	60.24	27,995	39.76	1,99,843

(Census, 2011)

A main worker is defined as a person who is engaged in any economically productive work for at least 183 days in a year. The main workers include 10 categories of workers as defined by the Census Department, consisting of cultivators, agricultural labourers, those engaged in live-stock,

forestry, fishing, mining and quarrying; manufacturing, processing and repairs in household industry; and other than household industry, construction, trade and commerce, transport and communication and other services.

The marginal workers are those workers engaged in some work for a period of less than six months during the reference year prior to the census survey. A marginal worker is defined as one who engaged in only economically productive work for less than 183 days in a year.

The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc.; institutional inmates or all other nonworkers who do not fall under the above categories.

The data in the above table shows that percentage of the number of marginal workers to the number of total workers in all the CD blocks except Poreyahat, is quite high as these blocks are predominantly rural in character. Poreyahat CD block has some industrial installations which explains for significantly lesser percentage of marginal workers. Overall, it may be concluded that the Impact Area is affected by acute lack of employment opportunities. This is also being reflected through the fact that migration of residents to other urban destinations is quite common in the area.

2.4.2. Dependence on Forests in terms of Energy (Especially Fuelwood) and Fodder Needs

The dependency of the villagers on forest for various products is quite significant. The maximum dependency of the households on forest is for fuel wood, followed by fodder, NTFP, tendu/kendu leaves, timber and bamboo.

Most of the households use timber, fodder and bamboo for their personal use. Only a small percentage of the households do marketing of these produces. Tendu/kendu leaves are collected by the households for marketing. Fuel wood and NTFPs are collected by the households both for personal use as well as for marketing. It is notable that those households whose income from main activity is relatively less, are engaged in selling forest produce and supplementing their income.

2.5. PHYSIOGRAPHY, GEOMORPHOLOGY, GEOLOGY AND CLIMATE OF THE IMPACT AREA

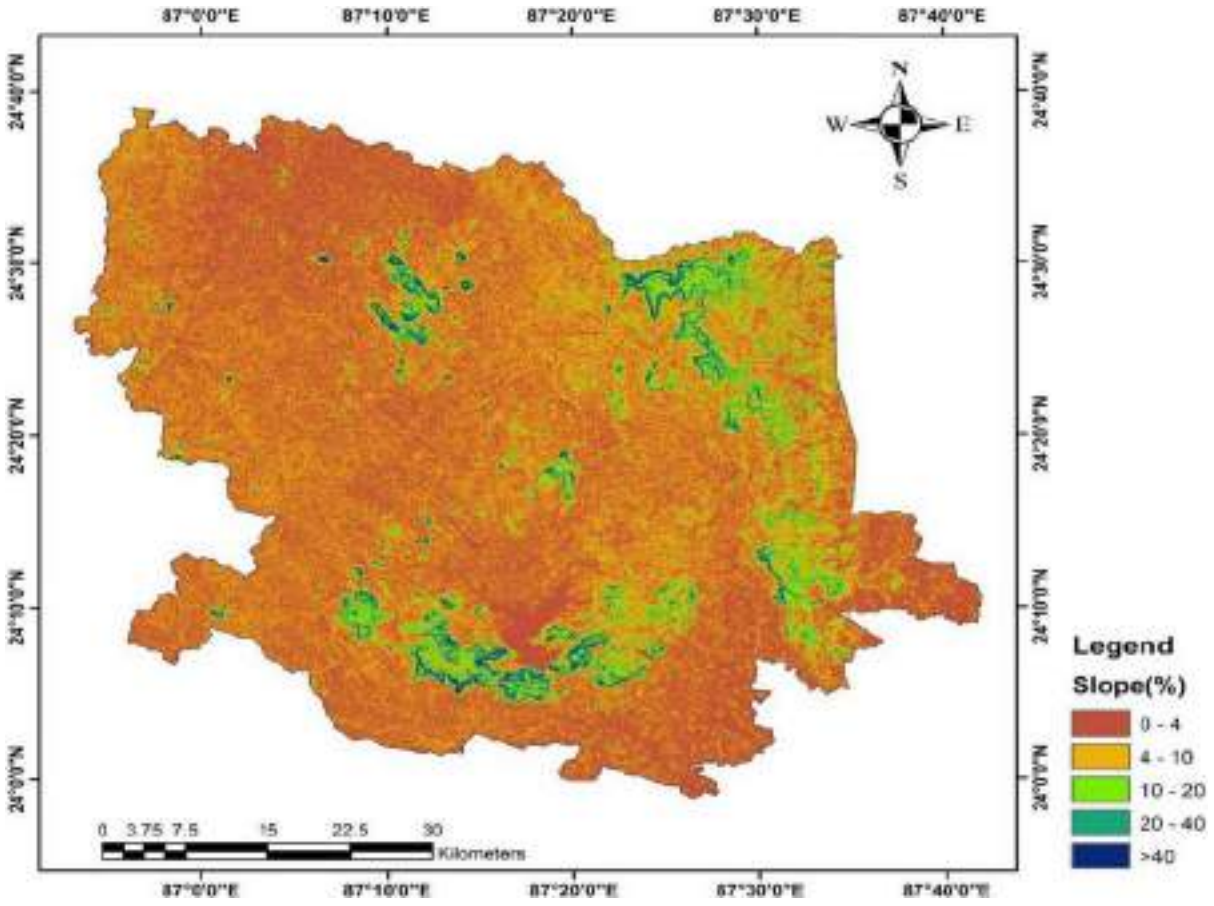
The Impact Area is majorly located in Dumka District, CD blocks involved therein being Gopikandar, Kathikund and Ramgarh. Only a small portion of Godda district, adjacent to Dumka district, is a part of the Impact Area. **In fact, the physiography, geomorphology, geology and**

climate of both the districts are similar. Therefore, the details/data of the said characteristics pertaining to Dumka district have been taken into consideration while formulating the instant Plan.

2.5.1. Physiography, Type of Terrain and Topography

Topographically Dumka district is an upland tract with a hilly backbone running from north to south. The general elevation of the area is between 150 m to 640 m above msl. The prominent hills are Rajmahal hills, Ramgarh hills, Karakata and Sapchala hills. Among the loftiest peaks are: Mahuagachi (528 m), Korcho hills (640 m), Karakata (210 m). The general slope of the district is from North West to South East. The hills in many parts are covered with dense forests, while in the valleys small villages surrounded by cultivated clearing are found. The slope of the district is being shown in the following map.

Map 7: Slope Map of Dumka District



2.5.2. Geomorphology

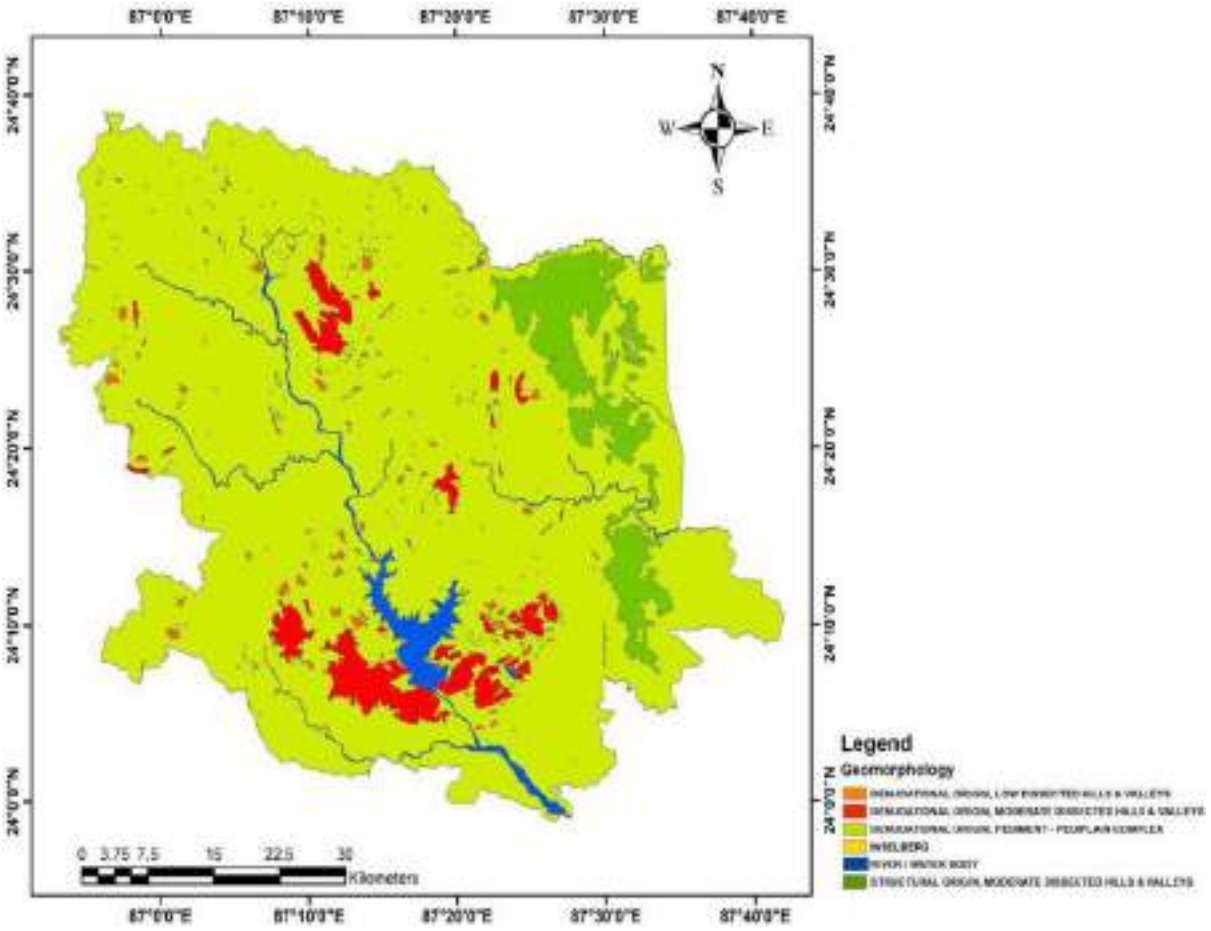
The landscape of Dumka district to a large extent comprises of long undulated ridges forming rugged and coarse dissected topography between which runs the drainage channels. The trough in

between the undulations is full of rich alluvial soil. Geomorphologically, the district can be broadly be divided into three well defined, physically identifiable and genetically significant units:

(a) the hilly area;
(b) the rolling country or valleys; and
(c) the pediplained flat country.

The indicative geomorphology is being depicted as follows.

Map 8: Geomorphological map of Dumka District



2.5.3. Geology

Geologically, Dumka district is represented by Chhotanagpur Granite-Gneiss of Archaean age to Proterozoic and Eastern Ghat super Group of Archean age, which are overlain by Gondwana Super Group, Rajmahal basaltic lava flows (Upper Jurrassic to lower cretaceous age) with intertrappean beds and at places Laterites.

The Chhotanagpur Gneissic complex is largely represented as lithological unit in the area and covers the major part of the district uninterruptedly. They form more or less gently undulating

plains and high grounds pediments and buried pediments, seldom giving rise to small hillocks mounds. They are mostly biotite gneisses and granite gneisses and in general coarse grained with porphroblastic texture and traversed by pegmatitite and quartz vein of various dimensions. It contains enclave of amphibolites and mica schists. These rocks are highly folded and have very steep foliation dip. These gneissic rocks have been intruded by numerous dykes. Eastern Ghat Super Group is represented by Patches of acid to basic charnockite and Khondalite/Garnet Sillimanite-Biotite Gneiss.

The pre-cambrian formations are overlain by Gondwana formations. Gondwanas are represented by Barakar, Talchir and Dubrajpur formations in the form of a strip running roughly in the NW-SE direction. However isolated patches of this formation are also found to occur in the central part of the district. Talchir formations consist of sandstone and shales. Barakar formation consists of white to fawn colored coarse grained sandstone, grits with occasional conglomerates and carbonaceous shales, thin lenticles and streaks of coal are found in this formation.

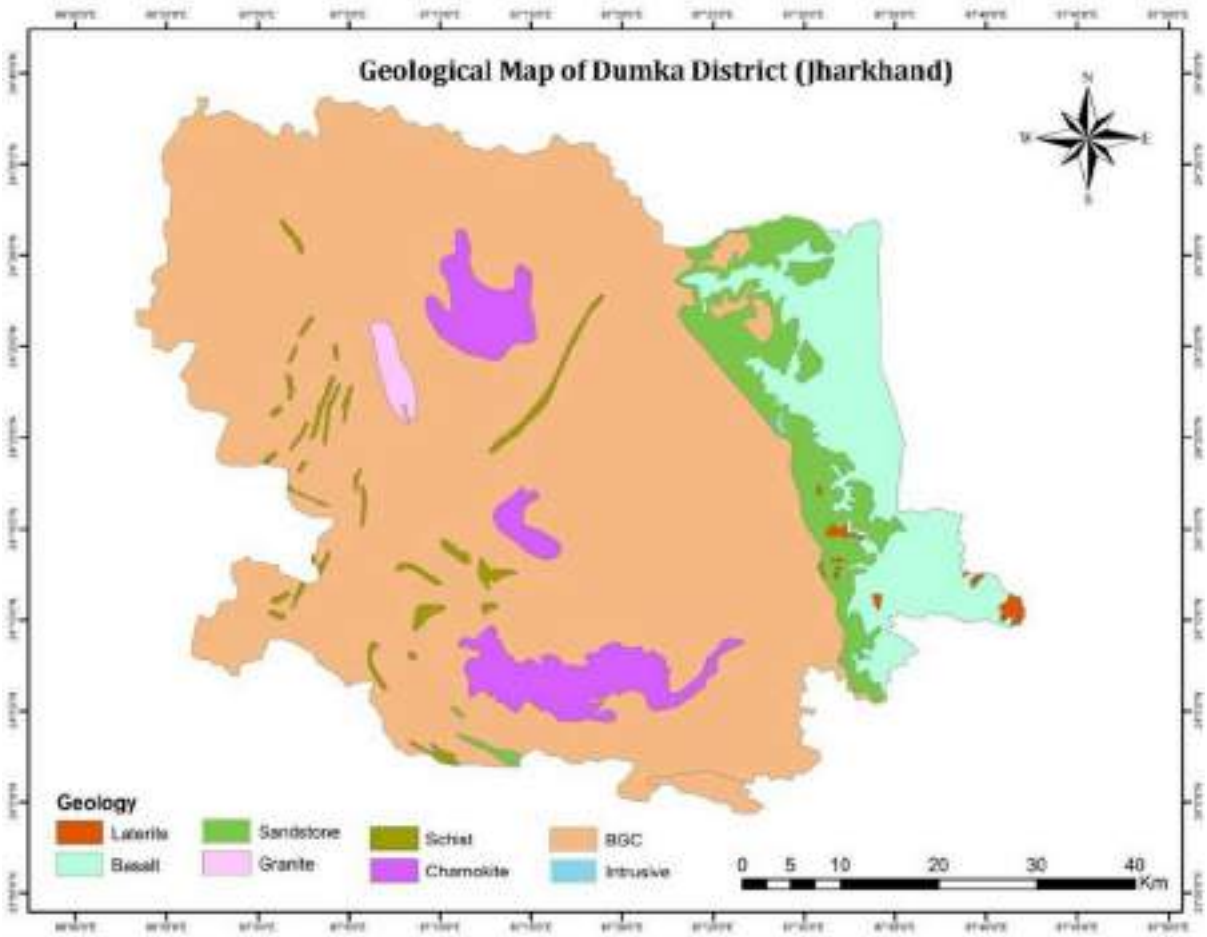
The pre-cambrian formations/Gondwana formations are further overlapped by Rajmahal Traps consisting of basaltic lava flows with sedimentary intertrappeans. The basaltic rocks are hard and fine to medium grained. Some of the lava flows are vesicular and cavities being filled by calcite and chalcedony. The non vesicular lava flows are hard, tough, compact and fine to medium grained in nature. The vesicular types are comparatively soft and break easily. In general the Rajmahal traps show vertical to horizontal joints trending E-W and N-S. Typical columnar joints are also common. These rocks are weathered with characteristic spherical exfoliation which give rise to large rounded boulders as the outcrops.

The Laterites are found in patches over Rajmahal traps. The alluvium patches are generally seen along major streams. Narrow, discontinuous patches of alluvium particularly in granitic country are identified. They comprise of medium to coarse grained sand associated with silt and clay. Occasionally calcareous nodules are also found to occur. They are light grey to brownish in colour. The thickness of the alluvium varies from place to place and is largely controlled by topography of the basement crystalliones.

In the district, the rocks are highly deformed and metamorphosed. The exposure of granite and other associated rocks show intricate folding. Based on morphotectonic analysis, the area has undergone several phases of tectonic deformations which led to various sets of fractures, fissures, faults etc which leads to lineaments. Based on lineament study of the area, various sets of fractures have been identified.

The indicative Geological map of the district is being shown as below.

Map 9: Geological Map of Dumka District



2.5.4. Hydrogeology

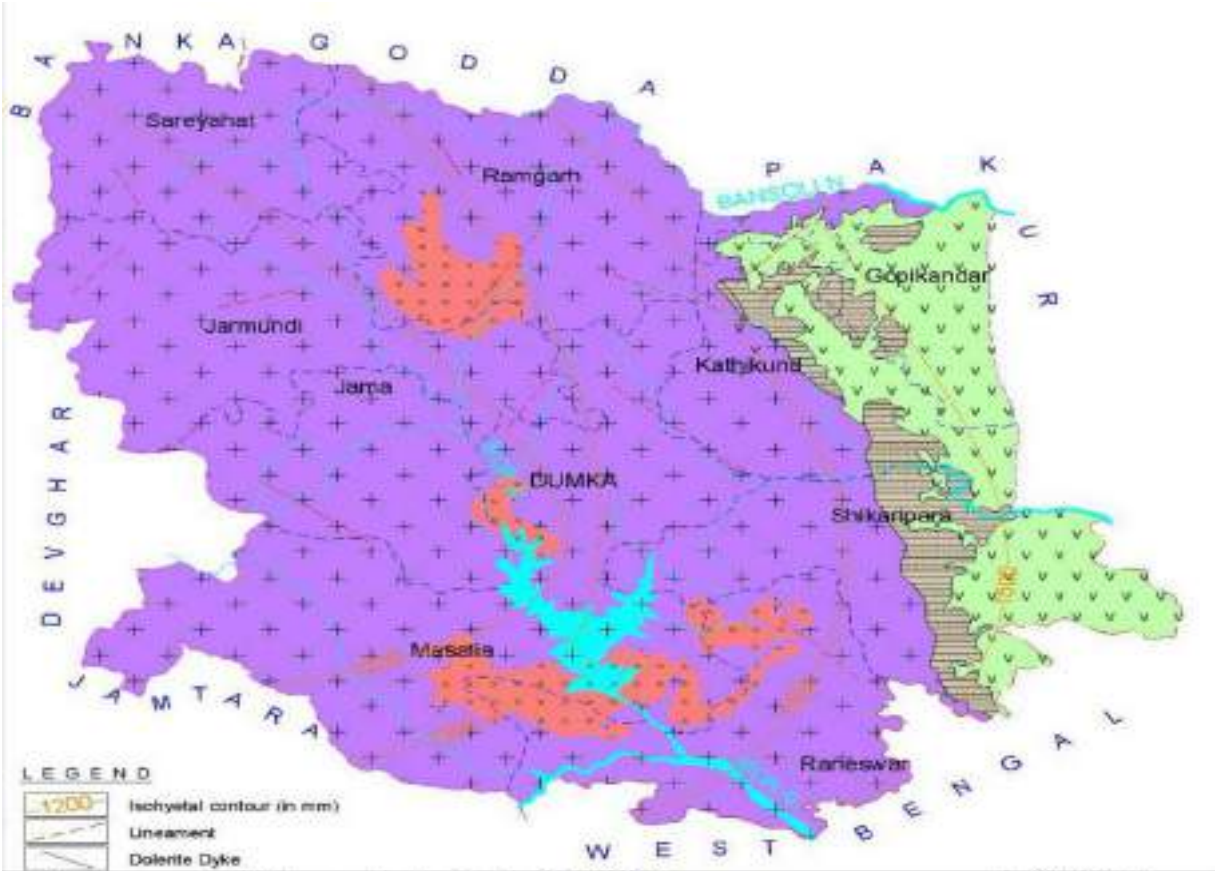
Ground water in the district is replenished mainly by the atmospheric precipitation. The depth to water and water level fluctuation depends mainly on the amount and distribution of rainfall, geomorphological set up, lithology etc. The occurrence and movement of Ground Water in the area is broadly governed by geological frameworks, i.e. nature of rock formations including their porosity and permeability. A fracture system roughly corresponds to a hydraulic system in the rock. A rock which has been exposed to a two-phase brittle deformation can also constitute one hydraulic system if there is a good connection between the two fracture systems. Based on morpho-genetic, geological diversities and relative ground water potentialities of the aquifers, the district can be broadly divided into following three Hydrogeological units:

- Consolidated or Fissured formations – Pre-cambrians and Rajmahal Trap
- Semi-Consolidated formations -Gondwanas
- Unconsolidated or Porous formations - Laterites and Alluvium

- In major part of this district, Fissured formations, i.e. hard rock form the principal aquifers, which include mainly Chhotanagpur Granite gneissic complex and Rajmahal Traps. However, in isolated areas Gondwana formations, laterites, as well as valley fill materials along the vicinity of the rivers also form potential aquifers.

Hydrogeological map of Dumka district is being presented as below.

Map 10: Hydrogeological Map of Dumka District



Age Group	Lithology	Symbol	Hydrogeological Condition	Ground Water Potential
Middle Jurassic to lower cretaceous	Rajmahal Trap with intertrappeans		Groundwater restricted to weathered residium/ Fractures, Joints. Groundwater occurs under unconfind and semi confined to confined state of disposition.	Limited yield prospect upto 20 m³/hr.
Upper Carbonefereous to Lower Jurassic (Gondwana)	Sandstone and Shale		Groundwater restricted to fractures, fissures and joints ground water occurs ground water table and semi confined to confined condition	Limited yield prospect Upto 10 m³/ hr.
Archean To Proterozoic	Granite-Gneiss with enclaves of Metamorphics		Groundwater restricted to weathered zone and inter connected fractures zones having secondary porosity. Groundwater occurs under water table and semi confined to confined state of disposition.	Moderate to good yield Upto 50 m³/ hr.
Archean	Charnockites, Khondalites		Groundwater restricted to weathered zone and fractured zone. Groundwater occurs under water table and semi-confined condition mostly occurs as dykes.	Very Limited yield prospect below 10m³/ h

2.5.5. Climate and Rainfall

The climate of Dumka district has been divided into three different seasons. The winter commences from middle November and extends up to middle of March, December and January being the coldest months. The winter is characterized by heavy dew, thick fog and associated cold wave. The winter is followed by summer which lasts up to middle June. The heat is sometimes oppressive but generally nights are pleasant due to cool breeze. The monsoon sets in by the middle

of June and continues up to end of September. The beginning of monsoon is marked by the strong dust storms from north-west with thunder and lightning. Normal atmospheric temperature recorded in the district is of the order of 42^0C to 46^0C in summer. In winter the minimum temperature goes down to about 4^0C. The relative humidity varies from 50 – 60%.

The district receives its share of rainfall mainly by south–west monsoon during rainy period and from the retreating monsoon during the inter-monsoon period which originates in the Bay of Bengal. The district receives 80% of the annual rainfall during monsoon period. Rainy season sets in the middle of June and continues till middle of October. The rainfall generally decreases from South – East to North – West. The Decadal average monsoon rainfall (2008 to 2018) of the district is 1043.67 mm and block wise it varies from 776.12 to 1351.07 mm. The rainfall data for the period of 2008–19 has been worked out and analysed. Decadal annual monsoon rainfall, standard deviation and coefficient of variation are given in the following table.

Table 10: Analytical Data of Monsoon Rainfall (2008-2018) of Dumka District

Sl. No.	CD Block	Decadal Average Monsoon Rainfall (mm)	Standard Deviation#	Coefficient of Variation (%)##
1.	Dumka	1351.07	515.03	38.12
2.	Jama	776.12	256.02	32.99
3.	Jarmundi	1196.22	191.68	16.02
4.	Saraiyahat	1270.81	391.93	30.84
5.	**Ramgarh***	999.86	314.48	31.45
6.	**Gopikandar***	934.88	242.19	25.91
7.	**Kathikund***	855.02	404.63	47.32
8.	Sikaripara	869.34	190.66	21.93
9.	Raneshwar	1125.38	260.82	23.18
10.	Masalia	1058.00	203.69	19.25

*Part of Blocks shown in bold and marked with asterisk constitute the Impact Area

#Standard deviation (SD) is a statistical measure that indicates the amount of variation or dispersion in a dataset. In the context of decadal average rainfall data, it quantifies how much the rainfall in a specific decade deviates from the average rainfall over multiple decades. If the standard deviation of these values is calculated and found to be high (e.g., 150 mm), it suggests that there are significant fluctuations in the rainfall over time, and the region may need to plan for both drought and flood conditions. In contrast, if the standard deviation is low (e.g., 50 mm), it suggests more consistency in rainfall, and planning could focus on managing steady water supply needs without significant concern for extreme fluctuations.

##The coefficient of variation (CV) in decadal average rainfall data is a measure of how much rainfall varies from the mean rainfall. It is calculated by dividing the standard deviation by the

mean and multiplying by 100. The CV is usually expressed as a percentage. The CV is a statistical parameter that is commonly used to measure the temporal variability of rainfall. A higher CV indicates a greater amount of dispersion around the mean. This parameter can be used to analyse rainfall patterns over decades.

The data in the above table clearly suggest that all across Dumka district there is significant fluctuation in rainfall over time and hence requires measures suitable for conservation of rain water.

2.6. SOIL TYPES

Soils in Dumka district has formed as a result of in-situ weathering of the crystalline basement. Climate, topography and vegetation have all contributed in the formation of soils. The following different types of soil occur in the entire district.

- **Alluvial Soil**: All the river channels in this district are covered with alluvial soil of recent origin, deposited over crystalline bed rocks. Alluvial fills are also found in patches away from the river channels. Thickness of these fills depends upon the topographical control. The alluvial material consists mainly of silt and sand mixed with clay, silty material dominating over clayey material. These are yellowish – grey in colour.
- **Grey eroded scarp Soil**: This covers almost the entire area as a thin capping over granitic/ gneissic rocks.
- **Lateritic Soil**: Pallety, nodular, ferruginous, brownish laterites of Pleistocene age are found to occur as patches. The lateritic soil has been formed by the process of laterization of the weathering material aided by favourable climate and the local topography. They are highly permeable with poor holding capacity. However laterite formed due to the weathering of Rajmahal trap are generally brown to reddish in colour, porous, pitted and show vermicular cavities, and are good repository of ground water.
- **Forest soil**: Forest soil is confined to the forested area and has a surface layer of organic matter.

The pH value of all the soils varies from 5 – 6.5 indicating that these soils are acidic in nature. Undulating terrain and porous character of the soil have resulted in soil erosion all over the area.

2.7. GROUND WATER STATUS

Based on the morpho-genetic and geological diversities, and relative Ground Water potentialities of the aquifer belonging to different geological formations, the district of Dumka can be broadly sub – divided into two hydrogeological units.

- Fissured Formation
- Porous Formation

A total of 16 National Hydrograph Stations (NHS) have been established by Central Ground Water Board (CGWB) for the study of behaviour of the water level and their fluctuation.

- **Pre-monsoon depth to water level**: On the basis of the depth to water level of the year 2012, the pre-monsoon depth to water level varies between 4.45 to 12.3 mbgl (metre below ground level). Majority of the wells (85%) fall in the water level range of 5– 10 mbgl. About 10% wells fall in the water level range from 2 – 5 mbgl.
- **Post-monsoon depth to water level**: The post-monsoon depth to water level ranges between 3.10 to 8.4 mbgl. About 69% of the wells fall in the water level ranges between 2 – 5 mbgl and 31% of the wells fall in the depth to water level ranges between 5 -10 mbgl.
- **Seasonal Fluctuation**: From the pre-monsoon and post-monsoon depth to water level data collected during May 2012 and November 2012 respectively, water level fluctuation were computed for all NHS of the district. The water level fluctuation between pre monsoon and post monsoon period of the district varies from 1.64 to 6.75 m. About 33% wells are showing water level fluctuation between 0 – 4 m and while 67% wells show fluctuation > 4.0 m.

2.7.1. Salient Observations/Recommendations made by CGWB to enhance Groundwater potential in Dumka District

- Ground Water quality is generally potable, except few patches. Nitrate value has been found beyond permissible limit in 11 dug well samples and 12 samples of hand pump. Also, Fluoride value has been observed beyond permissible limit in 3 samples of dug well and 2 samples of bore well (hand pump). Purification/filtration of Nitrate and Fluoride may be adopted.
- Based on Ground water Resources estimation 2017, the stage of ground water development in Dumka district is 24.26% and the entire district comes under safe category. Therefore, there is sufficient scope for further ground water development.

- Three major ground water related issues in Dumka district are **low ground water development, low ground water potential and nitrate/ fluoride contamination in the area**.
- Ground Water Management strategy suggested are construction of 71681 dug wells and 11947 shallow bore wells in the feasible areas in the district to enhance the overall ground water development to 70%. This would bring an additional area of 28672 ha under assured irrigation.
- To suggest a sustainable ground water management plan there are two options – Supply Side Management Options (local water harvesting techniques) & Demand Side Management Options (real water-savings).
- The supply side interventions envisage construction of 2276 no. of Check Dams/Nala bunds, 363 no. of Percolation Tanks and 6267 no. of building Rooftop Rainwater Harvesting (RTRWH) in the areas feasible for construction of recharge structures based on the long term water level scenario and recharge potential of the aquifer. The implementation of water conservation through artificial recharge measures will have a positive impact on drinking water sources of the area. It will ensure that the wells do not go dry during summer/lean/stress period in the areas of implementation and sufficient ground water availability is there in the wells even during the summer season. Thus, not only the drinking and domestic water sources will be strengthened but additional irrigation potential can be created through artificial recharge structures.
- The demand side intervention envisages the real water savings. The main demand side interventions may be:
    (i) Promoting improved irrigation technologies (drip or sprinkler irrigation, etc.);
    (ii) Crop choice management and diversification (promote less intensive crops like pulses and horticulture),
    (iii) Promoting treated municipal waste water for irrigation and construction use,
    (iv) Managing energy and irrigation nexus (providing quality power supply when needed through separate feeders, high voltage distribution lines, solar pumps, etc.). The government should encourage and provide incentive for the use of drip irrigation and sprinkler system.

2.8. LAND USE AND LAND COVER (LULC)

The two main characteristics on the basis of which land is classified are land use (LU) and land cover (LC). Land Cover can be defined as observed physical features on the Earth's Surface, which

transforms to Land Use when a socio-economic function is added to it. Given the fact that increasing anthropogenic activities around the biosphere are causing large-scale alterations of the Earth's land surface, land-use and land-cover (LULC) change is an important indicator for monitoring environmental changes and a vital input for informed decision making in the context of land management.

In India, land-use and land-cover (LULC) statistics are maintained by National Remote Sensing Centre (NRSC), Department of Space (DOS) through a component on National Land Use/ Land Cover (LULC) mapping of the Natural Resources Census (NRC) Project of National Natural Resources Repository (NRR) Program. LULC datasets are made available on a periodic basis by NRSC on a 1:50,000 scale, where the LULC data is grouped as per the classes described in the following table.

Table 11: Grouping of Land Use and Land Cover (LULC) Classes

Sl. No.	Level-I	Level-II
I.	Built-up	Urban
		Rural
		Mining
II.	Agriculture	Crop Land
		Plantation
		Fallow
		Current Shifting Cultivation
III.	Forest	Evergreen/Semi-Evergreen
		Deciduous
		Forest Plantation
		Scrub Forest
		Swamp/Mangroves
IV.	Grass/Grazing	Grass/Grazing
V.	Barren/Unculturable/Wasteland	Salt Affected Land
		Gullied/Ravinous Land
		Scrub Land
		Sandy Area
		Barren Rocky
		Rann
VI.	Wetlands/Water Bodies	Inland Wetland
		Coastal Wetland
		River/Stream/Canals
		Water Bodies
VII.	Snow and Glacier	Snow

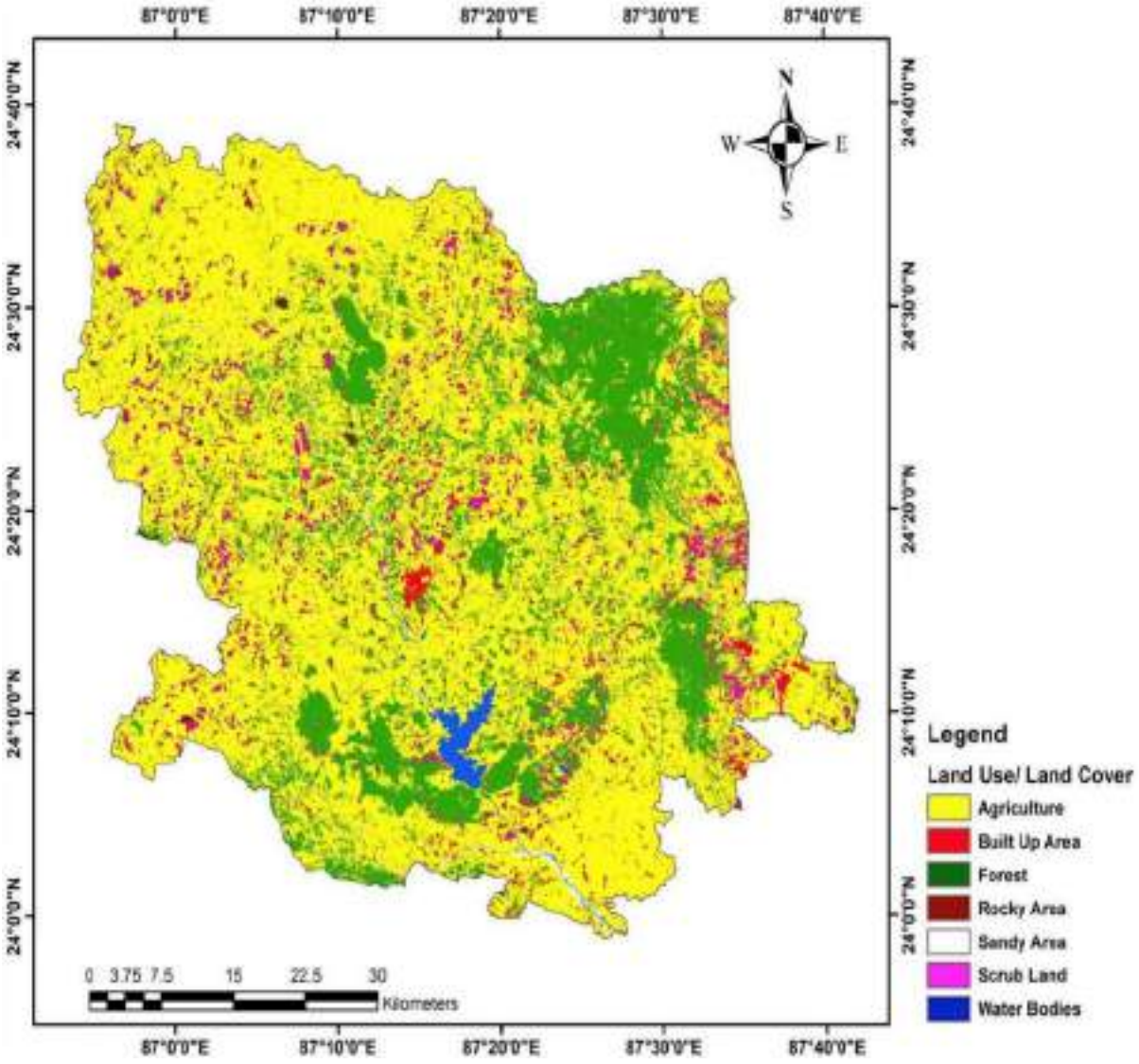
2.8.1. Land Use and Land Cover of Dumka District

There is dominance of cultivation over other uses of land in plains whereas the significance of forest in high land attains almost the same significance as that of agricultural land use. The forests are store house of manifold resources like fuel, timber, herbs and are source of raw materials from farm to factories. Moreover, forests are linked with the culture and socio-economic conditions of

the aborigines. Their survival depends on the existence of forests as they are rain bringer, soil binder and pasture preserver.

Out of total geographical area of the district i.e., 3716 Sq km, nearly 15 % area comes under net sown area,13% under forests and the rest area falls under barren, cultivable waste, pasture and other agricultural use. An indicative map of the Land Use in Dumka district is being shown below.

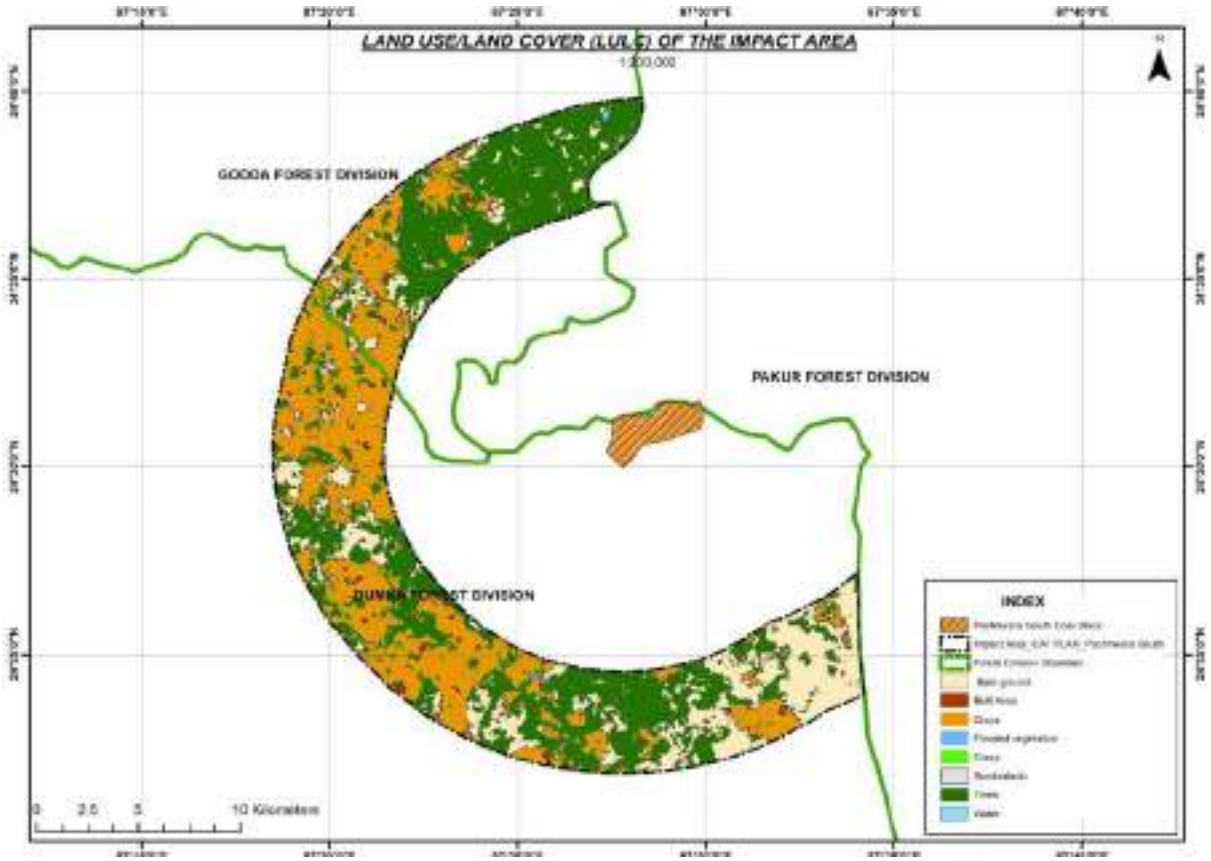
Map 11: Land Use Map of Dumka District



2.8.2. Land Use and Land Cover of the Impact Area

The Land Use and Land Cover map of the Impact Area may be depicted through the following map.

Map 12: Land Use/Land Cover of the Impact Area



The corresponding areas against different kinds of land use/land cover in the Impact Area are being tabulated as follows.

Table 12: Land Use and Land Cover of the Impact Area

Sl. No.	Land Use Class	Area (ha)	Percentage (%)
1.	Bare Ground	6260.240	23.00
2.	Built Area	276.402	1.02
3.	Crops	9409.31	34.58
4.	Flooded Vegetation	182.790	0.67
5.	Grass	192.151	0.71
6.	Shrub/Scrub	131.595	0.48
7.	Trees	10740.200	39.47
8.	Water	18.961	0.07
Total Area		**27211.649**	**100.00**

The LULC data of the Impact Area shows that the Impact Area is predominantly covered by trees and crops.

2.9. LAND DEGRADATION

Several definitions of land degradation have been suggested by different authorities to express the degree of deterioration of land or land potential. In general, it implies temporary or permanent recession from a higher to a lower status of productivity through deterioration of physical, chemical and biological aspects of land. The physical processes which contribute to land degradation are mainly water and wind erosion, compaction, crusting and water logging. The chemical processes include Salinization, alkalization, acidification, pollution and nutrient depletion. The biological processes, on the other hand are related to the reduction of organic matter content in the soil, degradation of vegetation and impairment of activities of micro-flora and fauna. Generally, land degradation is defined as a human-induced or natural process that negatively affects the land to function effectively. It is the temporary or permanent lowering of the productive capacity of land.

Thus, land degradation is the loss of biodiversity and productivity that arises from the physical, chemical and biological degradation of the land. It affects the entire natural environment, resulting in losses of ecosystem services that have far reaching effects on human welfare and the global economy. It also has a close connection with other major global issues, particularly climate change and biodiversity.

Degraded land is a threat multiplier for communities, as it reduces people's ability to use their land and limits their access to resources. The main anthropogenic factors contributing to land degradation include deforestation and land clearing for economic use and to cope with increasing urbanization. In some instances, the economic demand for agricultural land has led not only to land clearing but also over-cultivation, over-grazing, insufficient crop rotations and the overuse of agrochemicals. These practices are focused on short-term production and profitability in order to meet the demand of growing populations. There is an urgent need to stop and reverse the process of land.

To sum up, major causes of land degradation are:

- Overgrazing
- Over cultivation of crop land
- Water logging and salinization of irrigated land
- Deforestation
- Pollution and industrial cause

2.9.1. Impact of Land Degradation

Land degradation has numerous environmental, economic, social and ecological consequences. Every ecosystem on the Earth is affected by some or other form of land degradation. When land

is degraded, the ecology is damaged. There can be rather serious effects in terms of soil erosion, loss of soil fertility and thus reduced plant growth or crop productivity, clogging up of rivers and drainage systems, extensive floods and water shortages.

Carbon sequestration is an important function of soil, as it can retain three times as much carbon as the atmosphere if soil quality can be managed. Practices that degrade land, however, contribute one-third of anthropogenic greenhouse gases, and conversely, reversing land degradation can help to slow the rate of climate change.

2.9.2. Category-wise Estimation of Land Degradation in Dumka District

The nationwide land degradation mapping has been taken up by ISRO along with partner institutions from State remote sensing centres (Jharkhand Space Application Centre, JSAC for the State of Jharkhand), ISRO/ DOS centres and academia. The project has been taken up under Natural Resources Census (NRC) program of ISRO for generating information on land degradation at 1:50,000 scale using multi-temporal Resourcesat-1/2 LISS-III data.

The first cycle of mapping was carried out using Resourcesat-1 multi-temporal LISS-III data of 2005-06 and the second cycle of land degradation mapping on 1:50,000 scale was carried out using Resourcesat-2 multi-temporal LISS-III data for 2015-16. The overall approach to map land degradation on 1:50,000 scale is based on visual interpretation using the multitemporal LISS-III data. A detailed classification scheme has been evolved by NRSC to objectively analyse the satellite data.

Following the detailed mapping of the whole country National Remote Sensing Centre, ISRO has published "Status of Land Degradation in India 2015-16" in the year 2019. According to this report, the status of decadal change in land degradation in terms of the identified land categories is being tabulated in the following table to understand the ground situation in Dumka district.

Table 13: Status of Decadal Change in Land Degradation in Dumka District

Land Degradation Class	Degraded Land Categories	Area Estimated (2005-06) ha	Area Estimated (2015-16) ha	Increase (+)/ Decrease (-) ha
A1	Water Erosion – Sheet – Slight	1647	1605	(-) 42
A2	Water Erosion – Sheet – Moderate	23992	23774	(-) 218
A3	Water Erosion – Sheet – Severe	2663	2645	(-) 18
A5	Water Erosion – Gullies	1000	1000	0
G2	Mining & Dump Areas	787	1155	(+) 368
G3	Brick Kiln Areas	8	16	(+) 8
H2	Barren Rocky/Stony Waste	901	901	0
H3	Miscellaneous – Riverine Sands	149	149	0
Total		31147	31245	(+) 98

It is to be noted that the above estimation has been made via visual interpretation of satellite imageries. The table indicates that there has been significant deterioration in land status due to mining and ancillary activities. Though there has been slight improvement in land category with reference to water erosion, yet increasing anthropogenic factors require ample caution on this front.

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3. METHODOLOGY ADOPTED IN FORMULATION OF CATCHMENT AREA TREATMENT PLAN

3.1. INTRODUCTION

A catchment is defined as an area that collects precipitation and drains it into a network of water channels. This network often drains into a larger outlet, such as a river, reservoir, or body of water. Catchments are usually open systems and precipitation and other materials flow freely into and out of the system. As the water flows over the landscape, it finds its way into streams and down into the soil, eventually feeding the river. Some of this water stays underground and continues to slowly feed the streams/river in times of low rainfall. Every inch of land on the earth forms part of a catchment.

The idea of catchments is useful, as it is the standard functioning unit of the landscape: water, soil, plants and animals are all linked together within a catchment, and any activity that occurs within a catchment will affect the whole catchment. Healthy catchments are important for human survival, as it is where our food is grown and where all the water that humans consume comes from.

Catchments, also known as watersheds and drainage basins, are fundamental units of the terrestrial landscape. Their boundaries are system boundaries for hydrological, geomorphological, and ecological processes. In brief, all precipitation that falls on a catchment drains to a single low, outlet point. This movement of water creates physical connections between all parts of a catchment. As a result, activities in one part of a catchment can influence water movement in another.

Each catchment contains a stream network that channels surface water to the catchment outlet. Depending on the size of the catchment, these streams range in number from one or two to tens of thousands. Each catchment has a main stream into which tributaries deposit water and sediment. The smallest tributaries, farthest from the catchment outlet, are called headwater streams. These are the streams where rivers begin. Although they carry smaller volumes of water, they often cover a significant portion of the total length of streams in a catchment, and play important roles in recharging groundwater, containing flood water, improving water quality, and providing fish and wildlife habitat.

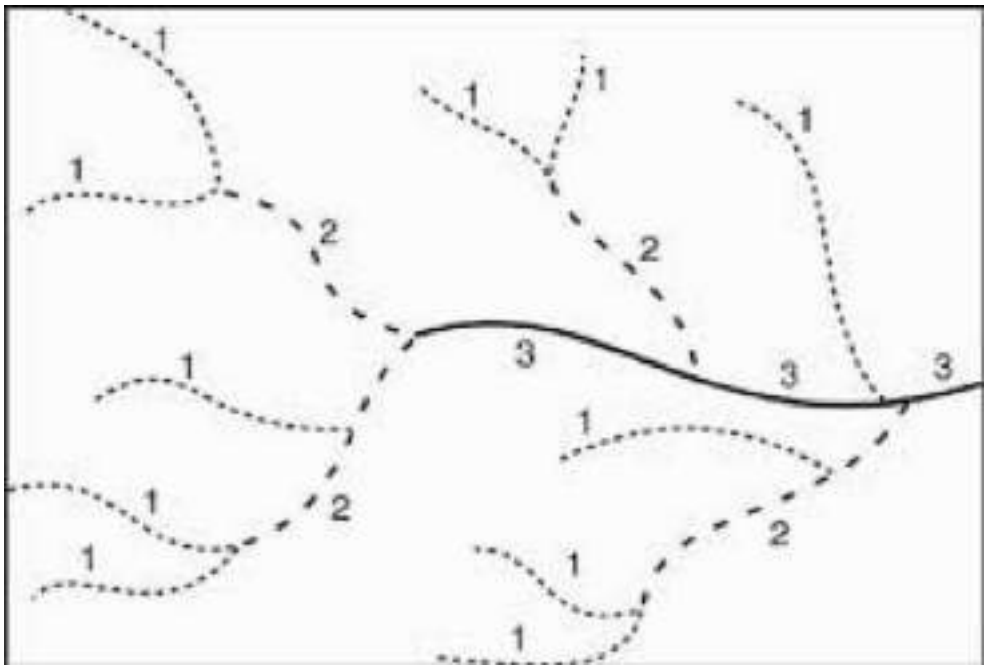
3.2. STREAM ORDER

The basic principle of Catchment Area Treatment is to use and treat the land accordingly to economically sustain available water resources and drainage line treatment is the most important activity to be carried out particularly in hilly areas. To decide the type of interventions while

planning the drainage line treatment of a plethora of streams all across the treatment area under consideration it is most important to assess the complexity of stream networks in the area. One way of assessing the complexity of a stream network is by ordering the streams in a catchment into a hierarchy. The most common method used to define stream order is the Strahler method. Starting at the uppermost points in the catchment, all headwater, or unbranched tributary streams are given a stream order of 1, and called first-order streams. When two first-order streams join, the stream order increases to 2 (second-order). When two second-order streams join, the stream order increases to 3, and so on. Notably, the stream order does not increase if two streams of different orders join. The highest stream order becomes the catchment order.

Generally, the depth of 1st order stream is quite shallow. Action should be taken from the 1st order stream first for harvesting of available rain water by erection of earthen bund, Loose Boulder Structures etc.

A schematic diagram of stream order is being shown in the following figure.



3.3. CATCHMENT AREA TREATMENT PLAN

The soil erosion in catchment areas and the subsequent deposition in rivers, lakes and reservoirs are of great concern for two reasons. Firstly, rich fertile soil is eroded from the catchment areas. Secondly, there is a reduction in reservoir capacity as well as degradation of downstream water quality. Soil being one of the potential resources of a catchment, demands proper conservation and management.

The Catchment Area Treatment Plan broadly means a management plan for treatment of erosion prone area of the catchment through agronomic, biological and mechanical measures. The objective of a well-designed CAT plan should not only be to control the sedimentation of the reservoir but also to provide a life support system to the local population through their active involvement in soil conservation and livelihood works. The development of CAT plan for a watershed or catchment essentially comprises the prioritization of erosion prone sub-watersheds or areas, selection of suitable conservation measures, implementation and impact assessment.

3.3.1. Drainage Network

In geomorphology, a drainage system is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. Geomorphologists and hydrologists often view streams as being part of drainage basins. A drainage basin is the topographic region from which a stream receives runoff, through flow, and groundwater flow. Drainage basins are divided from each other by topographic barriers called a watershed. A watershed represents all of the stream tributaries that flow to some location along the stream channel. The number, size, and shape of the drainage basins found in an area varies and the larger the topographic map.

Since the Impact Area of the Project involves two districts, namely Dumka and Godda, the drainage systems in both the districts are being briefly discussed here.

3.3.2. Drainage Network of Dumka District

Dumka district is highly dissected with rivers of varying magnitude. The Brahmani, Bansloi, Mayurakshi, and their numerous tributaries form the main drainage of the district. These streams are ephemeral in nature. Most of these stream courses are structurally controlled. Mor river with its tributaries carry the drainage to the western part of the district which finally meet the Bhagirathi river below Murshidabad, West Bengal. The Brahmani raises in the west of the Dudhua hills in the north of the Dumka district. Dendritic drainage pattern, a typical of hard rock terrain has developed over the district. However, radial drainage is also developed locally in some areas. All these drainage are having rapid surface runoff. Surface flow of most of the rivers dries up during summer; however there is sub-surface flow for a considerable part of the year, which indicates the effluent nature of the rivers. The drainage map of Dumka district is shown below.

Map 13: Drainage Network of Dumka District

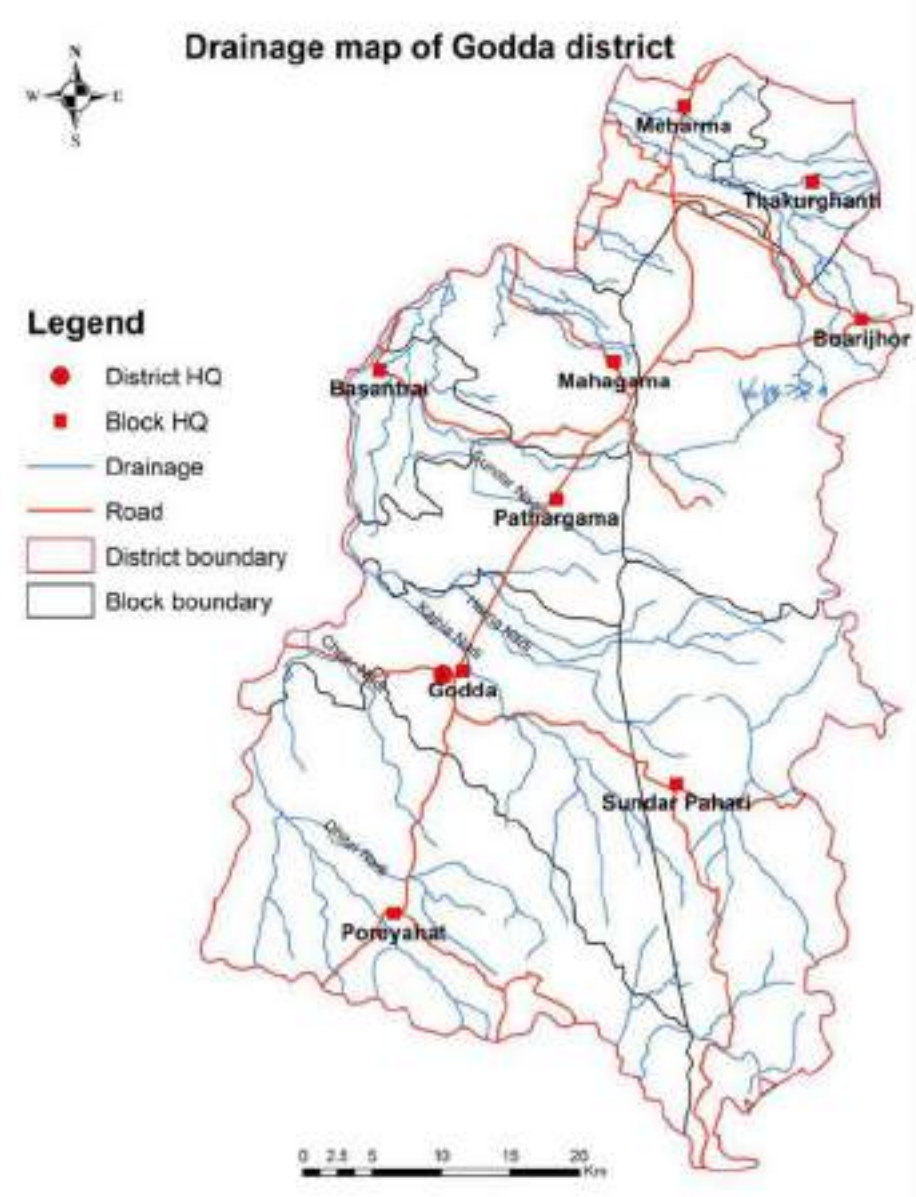


3.3.3. Drainage Network of Godda District

The principal rivers of the district are Kajhia, Burigeria , Harna, Sunder, Sapin, Kao, Cheer, Gerua, Gumani, Bansloi and their tributaries. Most of these are ephemeral in character. The general trend of the drainage is SE-NW. The structural features particularly the foliation and joints exert

profound impact upon the drainage and control the drainage pattern of the district. The drainage map of Godda district is shown below.

Map 14: Drainage Network of Godda District

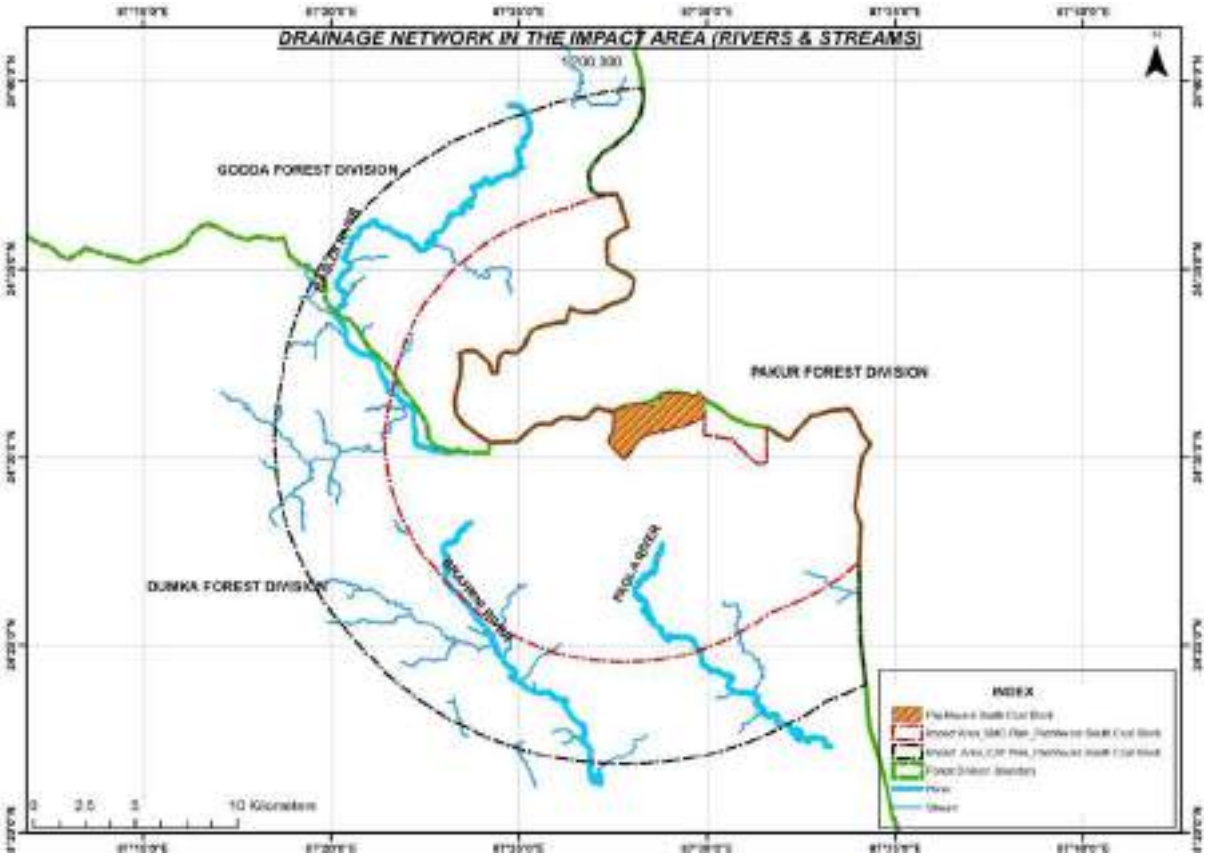


3.3.4. Drainage Network of the Project Impact Area

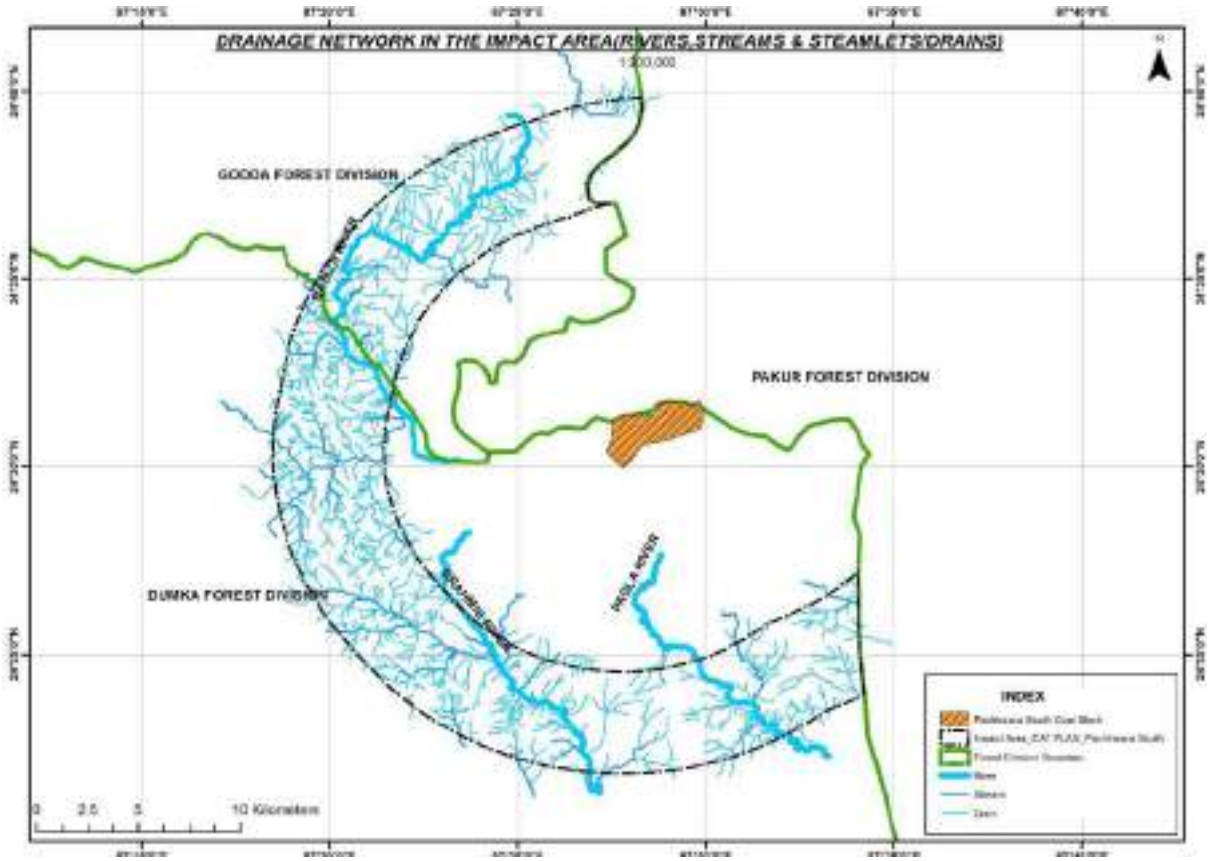
The Project Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla. These rivers are fed by various streams and streamlets/drains. Out of these, the most important river is Bansloi which originates from Bans Hill in Sahebganj district of Jharkhand and flows through Pakur district of Jharkhand and Birbhum and Murshidabad districts of West Bengal before draining into the Ganges north of Jangipur. It flows from west to east with a few ephemeral streamlets like Darno river, Baroscorna nala, Okri jor nala & Makar kandi nala descending from the catchment area of the Bansloi River forming the drainage system of the area.

The drainage network in the Impact Area is being shown in the following maps:

Map 15: Drainage Network of the Project Impact Area (Rivers & Streams)



Map 16: Drainage Network of the Project Impact Area (Rivers, Streams & Drains)



3.4. METHODOLOGY ADOPTED IN FORMULATION OF CATCHMENT AREA TREATMENT PLAN

At the outset, the village boundaries and the stream/river locations within the Impact Area were studied on GIS domain. To have an overall picture of the drainage pattern within the Impact Area, GIS maps have been prepared including the layers of;

- The drainage network – rivers/streams;
- The drainage network – rivers/streams/streamlets (drains);
- Stream Orders of all the streams/streamlets;
- The village boundaries and the rivers/streams network;
- Forest Division boundaries

3.4.1. Delineation of Stream Corridors in the Impact Area

Based on the location of rivers and their feeder streams and drains, the whole Impact Area has been divided into different stream corridors. However, since the area cuts across two forest divisions, the stream corridors have been delineated so as to restrict these along forest division

boundaries in order to help facilitate smoother implementation of the interventions prescribed here.

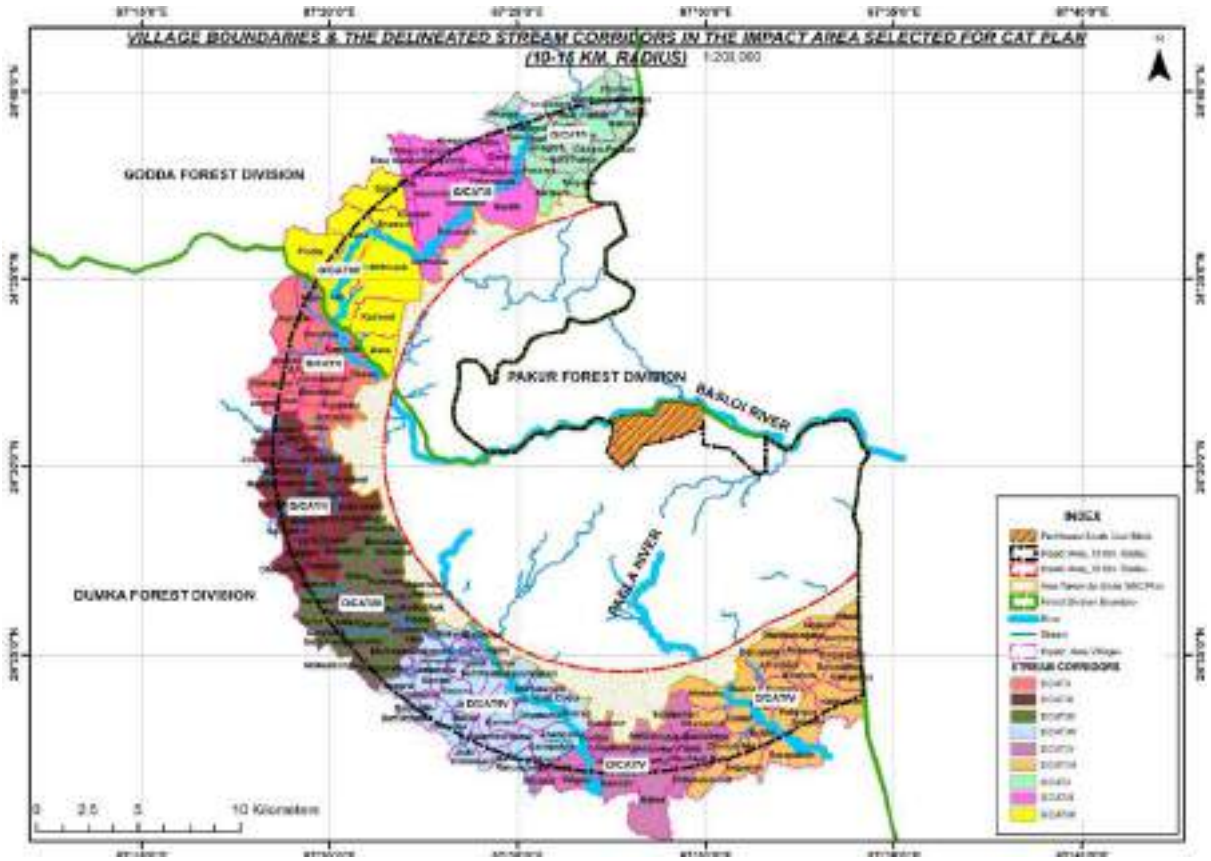
For convenience in carrying out field surveys etc., stream corridors have been constituted in such a manner that it consists of a set of villages. In other words, a corridor has been delineated in accordance with village boundaries and in most of the cases more than one village constitute any particular stream corridor. However, the villages located partly on the fringe of 15 km boundary within the Impact Area, have been included in whole as a part of the respective stream corridor.

It may be noted here that the delineation in the above explained manner is similar to that of micro-watershed framework. The extensive field survey has been undertaken in all villages where streams have been found as well as in those villages which are bereft of any stream as such. The primary concern was to fix the locations of structural/engineering measures as well as other biological interventions with the objective of soil and moisture conservation in the area. Since the survey has been done in all villages irrespective of whether any stream is located in a particular village or not, it is just academic whether we call it stream corridor or watershed.

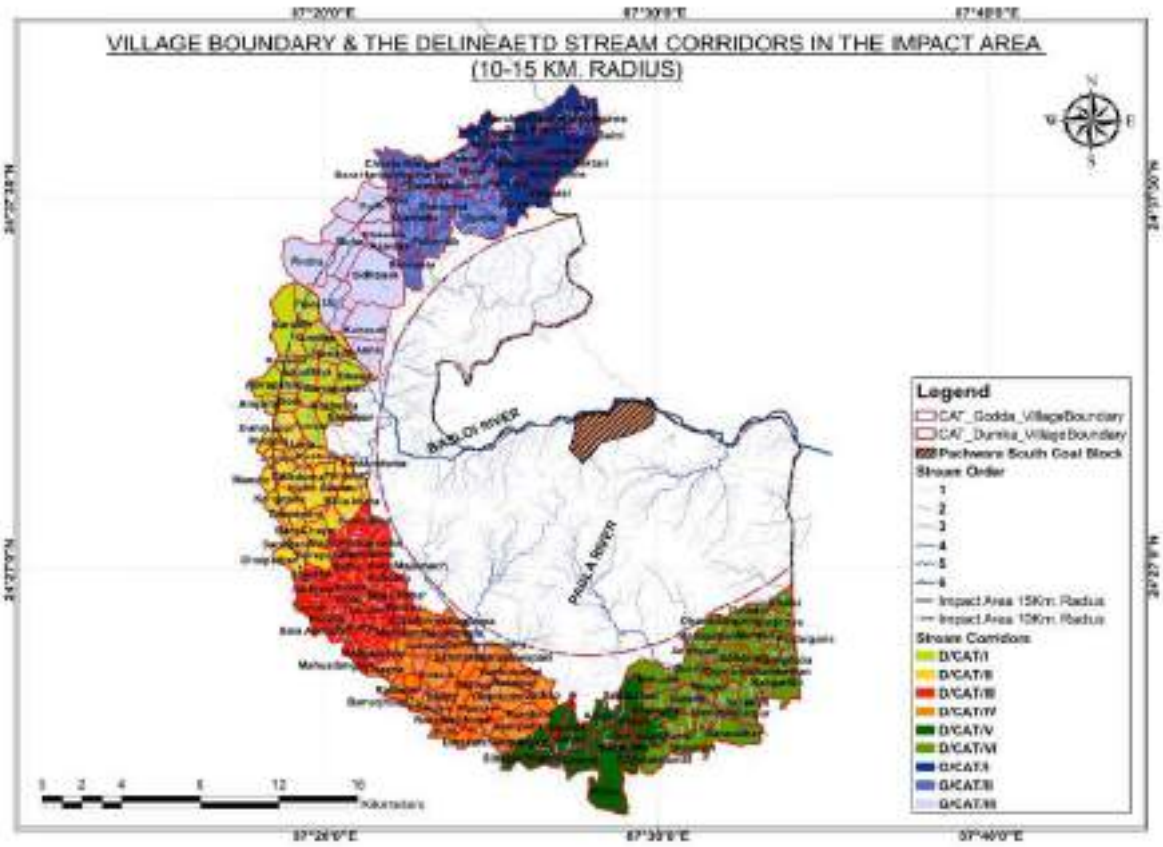
Based on the above scheme, altogether nine stream corridors have been identified and numbers have been assigned to each stream corridor with prefix as the initial letter of the forest division name. Thus, Dumka Forest Division part of the Impact Area contains six stream corridors, designated with nomenclature as D/CAT/I, D/CAT/II, D/CAT/III, D/CAT/IV, D/CAT/V and D/CAT/VI whereas Godda Forest Division part houses three corridors namely G/CAT/I, G/CAT/II and G/CAT/III.

The delineation of stream corridors is being depicted in the following map.

Map 17: Delineation of Stream Corridors within the Impact Area



Map 18: Delineated Stream Corridors and the Stream Orders in the Impact Area



3.4.2. Stream Corridor-wise List of Villages

The list of stream corridors and the names of villages included therein is as follows:

Table 14: Stream Corridor-wise List of Villages

Forest Division	Stream Corridor	Sl. No.	Village	Thana/ Thana No.	Forest Range/Beat
DUMKA	**D/CAT/I**	1.	Ampara	-	Hizla West/Nonihat
		2.	Amrapahari	-	-do-
		3.	Anguthiya	-	-do-
		4.	Bhuskibari	-	-do-
		5.	Dhawa	-	-do-
		6.	Dola	-	-do-
		7.	Garrapahari	-	-do-
		8.	Khairasol	Kathikund-3	-do-
		9.	Karudih	-	-do-
		10.	Kusbedia	-	-do-
		11.	Kusdiha	-	-do-
		12.	Nawadih	Choto-50	-do-
		13.	Pipra	Bara-13	-do-
		14.	Punsia	-	-do-
		15.	Saharpur	Jagatpur-26	-do-
	D/CAT/II	1.	Balia Khara	-	-do-
		2.	Bansduma	-	-do-
		3.	Barachapar	-	-do-
		4.	Dholpathar	-	-do-
		5.	Dunakuppi	-	-do-
		6.	Heth Barachapar	-	-do-
		7.	Jhanjhar	-	-do-
		8.	Jirulia	Choto-44	-do-
		9.	Jiyapani	-	-do-
		10.	Kongmara	-	-do-
		11.	Kusbana	-	-do-
		12.	Latta	Amarpur-43	-do-
		13.	Manrro	-	-do-
		14.	Mathdola	-	-do-
		15.	Niche Garhar	-	-do-
		16.	Parasbad	-	-do-
		17.	Poraipani	-	-do-
		18.	Sabeduma	-	-do-
		19.	Saraipani	-	-do-
		20.	Saruabani	-	-do-
		21.	Sarwapani	-	-do-
		22.	Upar garahan	-	-do-
	D/CAT/III	1.	Agoiabahal	-	Hizla West/Nonihat
		2.	Baghapathar	Guhiyajori-20	Hizla West/Khasmahal
		3.	Bansduma	-	Hizla West/Nonihat
		4.	Bara Aamjola	-	-do-
		5.	Baratanr	Guhiajori-02	-do-
		6.	Dahujor	-	-do-
		7.	Duarpahari	-	-do-
		8.	Gorro	-	-do-
		9.	Kobri	-	-do-

		10.	Kolachak	-	-do-
		11.	Kubriam	Dudhwa-26	-do-
		12.	Kunda	-	-do-
		13.	Kurwa	-	-do-
		14.	Kuramba	Dodho-31	-do-
		15.	Mahuadangal	Kathikund-07	Hizla West/Khasmahal
		16.	Majurnach	-	Hizla West/Nonihat
		17.	Milan Pahari	-	-do-
		18.	Murlidum	Guhiajori-19	Hizla West/Khasmahal
		19.	Nawadih	Mathiani-02	-do-
		20.	Pararia	-	-do-
		21.	Pindari	-	-do-
		22.	Sapdahar	-	-do-
		23.	Sijua	Amarpur-36	-do-
		24.	Sijuadum	Guhiajori-24	Hizla West/Khasmahal
		25.	Siltha	-	Hizla West/Nonihat
		26.	Simalpahari	-	-do-
		27.	Suripalan	Masanjor-16	-do-
	D/CAT/IV	1.	Asanbani	Kathikund-23	Kathikund/Kathikund
		2.	Asanpahari	Kathikund-21	-do-
		3.	Bagjhopa	Narganj-06	Kathikund/Narganj
		4.	Bajrisol	Narganj-29	-do-
		5.	Balijor	Narganj-28	-do-
		6.	Bamarjhanti	Narganj-19	-do-
		7.	Bara Kathikund	Kathikund-20	Kathikund/Kathikund
		8.	Bara Narganj	Narganj-31	Kathikund/Narganj
		9.	Bara Sarwapani	Narganj-58	-do-
		10.	Bokwa	Narganj-07	-do-
		11.	Burhidangal	Narganj-59	-do-
		12.	Chakmuha	Guhiajori-25	Hizla West/Khasmahal
		13.	Charakpathar	Narganj-14	Kathikund/Narganj
		14.	Chhota Kathikund	Kathikund-04	Kathikund/Kathikund
		15.	Chhota Narganj	Narganj-13	Kathikund/Narganj
		16.	Dhaniyapahari	Kathikund-09	Kathikund/Kathikund
		17.	Dhogria	Rangamasaliya-34	Hizla West/Khasmahal
		18.	Dhankutta	Kathikund-22	Kathikund/Kathikund
		19.	Gadharap	Kathikund-24	-do-
		20.	Ghatchora	Narganj-60	Kathikund/Narganj
		21.	Jilli	Kathikund-10	Kathikund/Kathikund
		22.	Kadarmara	Kathikund-08	-do-
		23.	Kairasol	Kathikund-03	-do-
		24.	Kanrapahari	Kathikund-01	-do-
		25.	Kasikul	Narganj-16	Kathikund/Narganj
		26.	Lakrapahari	Narganj-12	-do-
		27.	Mahuadangal	Kathikund-07	Hizla West/Nonihat
		28.	Nonadangal	Narganj-10	Kathikund/Narganj
		29.	Phitkoria	-	Hizla West/Khasmahal
		30.	R. F.	-	Kathikund/Narganj
		31.	Raibandh	Narganj-18	Kathikund/Narganj
		32.	Ratanpur	Kathikund-02	Kathikund/Kathikund
		33.	Sahritola	Narganj-30	Kathikund/Narganj
		34.	Sultanabad	Narganj-17	-do-
		35.	Tilatanr	Narganj-15	-do-
	D/CAT/V	1.	Amtala	Kathikund-32	Kathikund/Kathikund

		2.	Bandubera	Kathikund-35	-do-
		3.	Chaudhari	Kathikund-29	Kathikund/Kathikund
		4.	Dalahi	Kathikund-34	-do-
		5.	Datunkati Pahar	-	-do-
		6.	Dudhia	Kathikund-26	-do-
		7.	Gamrah	Kathikund-40	-do-
		8.	Jamni	Kathikund-31	-do-
		9.	Katratanr	Kathikund-27	-do-
		10.	Manjhdiha	Kathikund-37	-do-
		11.	Nakti	Kathikund-30	-do-
		12.	Nijhor	Kathikund-39	-do-
		13.	Salaipahari	Kathikund-33	-do-
		14.	Sibatala	Kathikund-17	-do-
		15.	Taldih	Kathikund-36	-do-
		16.	Talpahari	Kathikund-28	-do-
		17.	Telgani	Kathikund-43	-do-
		18.	Ukhrapahari	Kathikund-38	-do-
	D/CAT/VI	1.	Amarpani	Gopikandar-54	Kathikund/Gopikandar
		2.	Banspahari	Gopikandar-43	-do-
		3.	Barabathan	Gopikandar-51	-do-
		4.	Barapathar	Karudih-03	-do-
		5.	Bengduba	Gopikandar-50	-do-
		6.	Bhalki	Gopikandar-47	-do-
		7.	Bhelaghati	Gopikandar-26	-do-
		8.	Chhota Bathanpahari	Gopikandar-52	-do-
		9.	Chhotatetumath	Saldaha-01	Kathikund/Kathikund
		10.	Chirapathar	Gopikandar-27	Kathikund/Gopikandar
		11.	Daldali	Gopikandar-28	Kathikund/Gopikandar
		12.	Dhawadangal	Gopikandar-45	-do-
		13.	Duaria	Gopikandar-29	-do-
		14.	Dumariya	Gopikandar-55	-do-
		15.	Gogajor	Gopikandar-46	-do-
		16.	Karipahari	Karudih-13	-do-
		17.	Kolajora	Gopikandar-53	-do-
		18.	Mahualo	Gopikandar-25	-do-
		19.	Murosal	Gopikandar-44	-do-
		20.	Paharpur	Gopikandar-57	-do-
		21.	Pindargaria	Gopikandar-49	-do-
		22.	Piparjoria	Gopikandar-48	-do-
		23.	Roldih	Karudih-01	-do-
		24.	Sidpahari	Karudih-02	-do-
		25.	Surjadih	Gopikandar-58	-do-
		26.	Tengjor	Gopikandar-56	-do-
GODDA	**G/CAT/I**	1.	Asripara	-	Sundarpahari/Damru
		2.	Balami	Sundarpahari-02	-do-
		3.	Bara Paktari	-	-do-
		4.	Bara Palma	-	-do-
		5.	Chamdare	Sundarpahari-03	-do-
		6.	Chamer	-	-do-
		7.	Charchari	-	-do-
		8.	Chhota Paktari	-	-do-
		9.	Dumli	-	-do-
		10.	Garganwa	-	-do-
		11.	Ghaghri	Sundarpahari-25	-do-

		12.	Jambia	-	-do-
		13.	Nandopara	-	-do-
		14.	Nadgoda		-do-
		15.	Pararia	-	-do-
		16.	Rakha	-	-do-
		17.	Salgama	Sundarpahari-10	-do-
		18.	Singarsi	-	-do-
		19.	Telo	Sundarpahari-33	-do-
		20.	Tetariya	Sundarpahari-02	-do-
	G/CAT/II	1.	Asantari	Sundarpahari-09	-do-
		2.	Bara Haripur	Sundarpahari-07	Sundarpahari/Sundarpahari
		3.	Bariyarpur	Mahgama-14	Sundarpahari/Damru
		4.	Barmasia	Sundarpahari-01	-do-
		5.	Chandradih	Sundarpahari-23	-do-
		6.	Chhota Haripur	Sundarpahari-15	-do-
		7.	Damruhat	Sundarpahari-11	-do-
		8.	Dulu	Godda-574	Godda/Godda
		9.	Dumki	Sundarpahari-12	Sundarpahari/Damru
		10.	Gardi	Sundarpahari-24	-do-
		11.	Goradih	Sundarpahari-04	-do-
		12.	Kairabani	Sundarpahari-13	-do-
		13.	Khepadih	Sundarpahari-22	-do-
		14.	Kusmaha	Mahgama-10	-do-
		15.	Malikundi	Sundarpahari-26	-do-
		16.	Patomdih	Sundarpahari-03	-do-
		17.	Tetaria	Sundarpahari-21	-do-
	G/CAT/III	1.	Asna	-	Godda/Poreyahat
		2.	Bhawani	Godda-575	Godda/Godda
		3.	Boha	Poreyahat-204	Godda/Poreyahat
		4.	Dulu	Sundarpahari-08	Sundarpahari/Damru
		5.	Kairasol	Poreyahat-207	Godda/Poreyahat
		6.	Liti	Poreyahat-205	-do-
		7.	Pindra	Poreyahat-201	-do-
		8.	Sidhbank	Poreyahat-206	-do-

3.4.3. Field Survey Exercise

The field survey of the whole area has been carried out by teams consisting of the following members:

Table 15: Qualifications & Experience of the Survey Team Members

Sl. No.	Name	Qualification	Experience
1.	Kislay Kumar	M. Sc. Ecology	10 years
2.	Anzar Anis	M. Tech. Geoinformatics	4 years
3.	Vicky Mahto	M. Sc. Botany	3 years
4.	Lamboder Mahto	B. Sc. Zoology (Hons.)	2 years
5.	Vikas Kumar Sen	B. A.	2 years
6.	Biswa Darshi Behera	M. Sc. Geoinformatics	Fresher
7.	Sugandha Ganguli	M. Sc. Geoinformatics	Fresher
8.	Sujata Nath	M. Sc. Geoinformatics	Fresher

The participation of villagers during survey has been ensured by the respective teams in the areas allotted to them.

3.5. SNAPSHOTS OF FIELD SURVEY EXERCISE






Latitude: 24.422708
Longitude: 87.372280
Elevation: 175.62±6.84 m
Accuracy: 6.40 m
Time: 17-12-2024 11:07:12
Note: Check Dam Desiltition 10*4(Sujua)


Latitude: 24.482198
Longitude: 87.335844
Elevation: 171.86±8.13 m
Accuracy: 6.97 m
Time: 13-12-2024 13:44:31


Latitude: 24.425230
Longitude: 87.373109
Elevation: 181.52±3.00 m
Accuracy: 5.84 m
Time: 17-12-2024 10:55:38
Note: Gully Plugging 2*1(Sujua)


Latitude: 24.425922
Longitude: 87.378254
Elevation: 170.72±3.00 m
Accuracy: 6.55 m
Time: 14-12-2024 10:25:42
Note: Check Dam 25*3m(Pindari)


Latitude: 24.444234
Longitude: 87.330055
Elevation: 204.71±3.00 m
Accuracy: 4.69 m
Time: 14-12-2024 14:06:04
Note: Lbs6*2(Baratanr)




Latitude: 24.49953
Longitude: 87.320668
Altitude: 105.14±3 m
Accuracy: 3.8 m
Time: 13-12-2024 11:34
Note: jiruliya check dam 25*3


Latitude: 24.482715
Longitude: 87.351479
Elevation: 159.76±5 m
Accuracy: 6.1 m
Time: 13-12-2024 13:21
Note: Balia Khara Check dam 18*3


Latitude: 24.550460
Longitude: 87.317274
Elevation: 155.70±3.00 m
Accuracy: 5.09 m
Time: 12-12-2024 14:08:49
Note: Lbs 6*2(Kairasol)


Latitude: 24.421692
Longitude: 87.361302
Elevation: 210.40±3.00 m
Accuracy: 7.98 m
Time: 17-12-2024 12:06:33
Note: Gully Plugging (Murlidum)

4. OBJECTIVES AND BRIEF OUTLINE OF THE PROPOSALS UNDER THE CATCHMENT AREA TREATMENT PLAN

4.1. OBJECTIVES OF THE PROPOSALS

The instant Plan primarily focusses on catchment area treatment over the identified Impact Area. Following are the broad objectives of these measures:

- To control runoff and thus prevent soil erosion as also to reduce soil compaction through biological and engineering measures.
- To maintain or to improve soil fertility;
- To conserve water;
- To harvest excess water wherever feasible;
- To rehabilitate degraded forest areas through afforestation wherever technically feasible and facilitating natural regeneration of plants;
- Ecosystem conservation resulting from increased vegetal cover and water retaining properties of soil;
- To meet the fuel and fodder requirements of local people;
- Promotion of non-conventional energy devices to reduce pressure on forest; and
- Employment generation through community participation and conservation.

4.2. ACTIVITIES PRESCRIBED UNDER THE PLAN

After detailed survey of each and every village falling within the Impact Area, various interventions may be categorized into following broad heads particularly from the viewpoint of the aforesaid objectives:

(A) Natural Resource Management/Soil and Moisture Conservation Measures.
(B) Capacity Building of Frontline Forest staff.
(C) Awareness Development Programmes.
(D) Development of Alternative Livelihoods
(E) Promotion of Renewable/Alternative Energy Consumption
(F) Development and Implementation of appropriate Monitoring and Evaluation Framework.
(G) Infrastructural strengthening aimed towards implementation as well as monitoring and evaluation of the Plan.

4.2.1. Soil and Moisture Conservation Measures

The treatment of any area with the objective of soil and moisture conservation broadly may be categorized into following two sub-heads:

(a) Vegetative measures
    (i) Grass sowing/pitching;
    (ii) Pastureland development;
    (iii) Assisted Natural Regeneration (ANR); Silvicultural operations; Rehabilitation of degraded forests;
    (iv) Plantation on barren forest lands;
    (v) Gabion plantation along streams/rivers, around ponds and check dams.

(b) Structural/Engineering measures
    (i) Trenches;
    (ii) Stream Bank Stabilization;
    (iii) Earthen Dams;
    (iv) Silt detention dams;
    (v) Ponds/Ahars – creation and de-siltation/renovation of existing ponds;
    (vi) Check dams – Temporary/Brushwood/Boulder/Loose Boulder/Masonry.

4.2.1.1. Vegetative Measures

Some of the vegetative measures are being enlisted as follows:

(a) **Grass Sowing/pitching**: Suitable grass species preferably fodder grass is planted in rows across the slope. It can also be planted on the berm of bunds. The fibrous root system of grass offers better protection of the top soil and filters the run off to trap the sediments. Well established grass species reduce erosion by moderating the impact of raindrops and also increase the infiltration opportunity time. The grass thus planted could be used as fodder for livestock, which could also be an alternate source of income to the farming community.

(b) **Plantation on Barren Forest land**: Plantation activities along with soil and moisture conservation measures may be taken up in forest areas which are almost bereft of any root stock. Such barren lands could be regenerated only with artificial plantation methods.

(c) **Gabion plantation along streams/rivers, around ponds and check dams**: Plantation in gabions along streams/rivers in the area which are generally subject to heavy erosion along their banks could be one of the methods to stabilize the stream banks. Further, such plantation around the newly created/renovated (desilted) ponds/percolation tanks/check

dams can serve the purpose of arresting the erosion around the water structures. Such plantation would also serve the aesthetic/cultural/religious purpose.

4.2.1.2. Structural/Engineering Measures

Some of the structural/engineering measures are being enlisted as follows:

(a) **Trenches/Water Absorption Trenches**: Trenches are constructed along the contour by excavating the soil. Contour trenches are effective measure for soil and moisture conservation in varying rainfall, soil types and depths, and sloping conditions. The trenches break the slope, reduce the velocity of surface run-off and store the excess runoff. These are of two types:

- Continuous contour trench
- Staggered trench

Water absorption Trenches do help recharge the ground water and may be constructed on 10% and beyond slope areas.

(b) **Stream Bank Stabilization**: Due to undulating topography, substantial quantities of rainwater flow through the drains during heavy rainfall. The existing drains are silted and flow of water through the drains is restricted resulting in severe bank erosion, overflow and spreading of water through adjacent land causing damage. Stream bank stabilization is done by constructing retaining walls of different configurations and design. By stabilizing the stream banks, the flow can be regulated, scouring of banks can be avoided and drainage congestion can be averted. It is being proposed to go for stream bank stabilization at more vulnerable places.

(c) **Construction of Ponds**: Ponds are mainly meant for the purpose of storing the surface runoff. The ponds and water harvesting structures constructed in the low-lying areas contribute to the conservation of excess rain water and the replenishment of ground water. These water harvesting structures are constructed as masonry/earthen structures. The impounded water also provides irrigation to the lands in the adjacent areas. It increases the soil moisture regime around the structure for increased crop production and recharge the ground water. Grass/fruit bearing/fodder trees could be planted on the berm of such ponds which provide additional income by way of fodder /fruit apart from providing better reinforcement.

(d) **De-siltation/renovation of Existing Ponds**: Majority of the ponds in the Impact Area require de-siltation and renovation etc. to strengthen the banks etc. Increasing the depth of ponds shall augment the water storage in these structures. Further, bamboo gabion

plantation on the berm of such ponds and plantation of fruit/fodder species should be taken up around ponds.

(e) **Check Dams**: The function of the check dams is to flatten the steep gradient of the gully by constructing a series of checks. The check dams convert the longitudinal gradient into a series of steps with low risers and long flat treads. These structures could be divided into two categories:

(i) **Temporary Check Dams**: These are constructed in small and medium gullies and intended to function until the vegetation cover in the gully gets established and provides permanent protection. The temporary dams trap water and soil and thus facilitate vegetation growth. These are usually made of brush, wire, poles or loose rock. To obtain satisfactory results from structural measures, a series of check dams should be constructed for each portion of the gully bed. Because they are less likely to fall, low check dams are more desirable than high ones. After the low dams silt up and rot away, vegetation can control the low overfalls much more easily than on high dams.

Boulder Check dams: Boulder check dams placed across the gully are used mainly to control channel erosion and to stabilize gully heads. In a gully system or multiple-gully system all the main gully channels of continuous gullies can be stabilized by boulder check dams. The maximum total height of the dam is two m. Foundation depth must be at least half of effective height.

Loose Stone Check Dam: Loose stone check dams made of relatively small rocks are placed across the gully. The main objectives for these dams are to control channel erosion along the gully bed, and to stop waterfall erosion by stabilizing gully heads. Loose stone check dams are used to stabilize the incipient and small gullies and the branch gullies of a continuous gully or gully network.

(ii) **Permanent Check Dams**: Masonry Check Dams: Masonry check dams constructed with cement mortar and non-disintegrating stones are generally used in torrent control. The main objective of the dam is to hold fine and coarse material carried by flowing water in the gully or torrent.

4.2.2. Capacity Building of Frontline Forest Staff

Implementation of all Soil and Moisture Conservation initiatives under this Plan has to be carried out by the frontline forest staff under the overall supervision of the forest officials of Dumka/Godda Forest Division. Though the frontline forest staff is trained for implementation of similar programmes, yet the need of further specialised training is being felt. Needless to

mention here that capacity building is also important for maintenance of structures and other common goods created during the implementation of the Plan.

The Impact Area constitutes a part of Kathikund & Hizla West ranges of Dumka Forest Division and Godda and Sundarpahari Ranges of Godda Forest Division. However, to ensure efficient and effective implementation of soil and water conservation programmes in other areas of the forest division in future, it would be more appropriate to involve all the frontline forest staff of the two divisions in capacity building initiatives under this Plan.

With the aforesaid objectives in mind, training and workshops with hands-on field exercises are being proposed to be taken up under this Plan. The workshops shall be organised at division level as well as at the range level. The divisional forest administration shall have the liberty of selection of individual trainers and institutions to be roped in capacity building programmes. The structure of the programmes may be decided in active participation of all the stakeholders.

The activities proposed for capacity building of the forest frontline staff may include the following:

- Workshops at division and range levels;
- Structured training on various activities proposed under the Plan;
- Demonstration of various technological aspects such as Remote Sensing and GIS tools to the staff. The remote sensing products such as land use/land cover maps, NDVI maps for baseline, mid-term and end of the project period shall help in understanding the impact of the project;
- Exposure Visit of the staff to the areas successfully treated;
- Publication and use of mass media to build awareness over larger community and wider areas.

The various topics of training programmes are being identified as follows:

(a) Developing strategy for soil conservation and water resource development;
    - Types of Soil Erosion
    - Preliminary Survey
    - Mapping and Site Investigation
    - Upstream-downstream concept
(b) Practical Application of GPS for survey;
(c) Importance, Planning and Designing of various Soil and Moisture Conservation Measures;
(d) Selection of activities and structures in different field situations keeping in focus the requirement of soil moisture regime as well as the need of community;

- Ridge to Valley Approach
- Decentralised planning
- Continuous Contour Trench (CCT)
- Contour Staggered trenches (CST)
- Contour Bunding with Field Outlet
- Graded Bunds/ Field Bunds
- Land Levelling
- Grassland development
- Terracing
- Farm Pond
- Ground water recharge

(e) Vegetative measures for soil and water conservation

(f) Drainage line treatment

- Vegetative measures
- Gully Plug
- Gabion Structure
- Check Dam
- Earthen Nala Bunding / Earthen Dam etc.

(g) Participatory monitoring and impact evaluation of Soil and Water Conservation Projects.

4.2.3. Awareness Development Programmes

Awareness amongst villagers and other stakeholders towards the importance of soil and water conservation issues is one of the most important aspects of the success of any plan intended to arrest degradation of soil and water resources of any area. However, the traditional knowledge of the villagers towards these issues cannot be ignored. The senior citizens of the villages generally have tremendous understanding of the importance of conservation of soil and water. But the younger generation more specifically needs to be sensitized towards the perils of not paying adequate attention to conservation needs.

It is an established fact that the degradation of land, water and soil resources adversely affects agriculture. For example, land degradation leads to the deterioration of soil quality. A reduction in land and soil productivity endangers the sustainability of agriculture, environmental stability and quality, and also has an adverse impact on economic and social development. Without taking up appropriate soil, water and land management measures, the cost of arresting land degradation will

get higher and yields will persistently decline thereby increasing recurrence of food insecurity even at the village level.

Some of the activities identified to meet the abovesaid objectives are:

- Organising regular educational and sensitisation meetings to enhance community awareness on water catchment conservation, forests and wetlands;
- Strengthening the capacities of communities, corporates and other stakeholders in the conservation and management of water catchment areas;
- Involving JFMCs in awareness campaigns;
- Organising marches with the help of community leadership etc.;
- Establishing Eco Clubs in schools; etc.

4.2.4. Development of Alternative Livelihoods

Both Dumka and Godda districts are largely characterised as rural districts as most of the population resides in villages. Agriculture is the predominant activity in the districts and is the means for livelihood for about 80% of the population. The pattern of agriculture practices in the district is mono crop because of rain fed farming. The dependency on rainfall for agriculture purposes is evident from the fact that almost all area is dependent on rain for agriculture purpose.

Alternative livelihoods can be defined as livelihood activities that supplement people's basic income. These activities usually depend on people's spare time, their skills, resources and art. A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Issues such as capacity building, transfer of appropriate management practices, and strengthening community-based organizations come to mind. In our case JFMCs are the most crucial entities which could play a pivotal role in development of sustainable alternative livelihood options.

During field survey exercise conducted during the formulation of the instant Plan, some of the livelihood options identified are being enlisted as under:

- Sal Plate making;
- Bee keeping;
- Mushroom cultivation;
- Orchard creation;
- Distribution of vegetable seeds kits;

- Establishment of Village Nurseries;
- Vermicomposting;
- Poultry farming;
- Development of fisheries;
- Distribution of Sewing machines and training;
- Training in Computers;
- Training in vehicle driving etc.

These activities have been identified in active consultation and participation of the local villagers. The infrastructure as well as training etc. required to build on such infrastructure shall be provided by the Forest Department so as to make the system sustainable. However, it may be noted here that the activities may not be limited to the aforesaid categories. It could be further diversified to include other activities as well in consultation with the stakeholders.

4.2.5. Promotion of Renewable/Alternative Energy Consumption

Provision of solar powered street lights in villages and distribution of solar lanterns shall be taken up to enhance the living standards of villagers.

Wood, agricultural residues and cattle-dung cakes are the primary energy sources for cooking in rural areas. Traditional chulhas, commonly in use in rural areas, however, are inefficient and environmentally undesirable. In contrast, improved chulhas are scientifically designed for optimal regulation of heat flow and better fuel utilization. Improved chulhas have heat transfer efficiency of 20-35% as compared to 8-10% in case of traditional chulhas. Therefore, supply of Improved Chulhas (Cook Stoves) amongst villagers is being considered as appropriate intervention in order to conserve available bio-resources of the area. It would be pertinent to mention here that providing LPG connection to villagers has not proved to be a sustainable approach as the villagers generally are not in a position to afford the high prices of cooking gas cylinders.

4.2.6. Development and Implementation of Appropriate Monitoring and Evaluation System

Monitoring is a process of continuous assessment of plan/project activities in the context of implementing schedules. It takes care of day-to-day progress and management of the project. It is the regular observation and recording of activities taking place in the project and also a process of routinely gathering information or data on all aspects of the project. It involves checking on how

the project activities are progressing. The gathered data are used in making decisions for improving project performance.

Evaluation gathers information from the observed data on monitoring and these are presented in a form which is easy to understand. Evaluation may require some additional studies to obtain data which are available for monitoring.

Numerous monitoring tools may be considered to determine the values of indicators over time. Some of the commonly used tools are as follows:

- Community workshops arranged to evaluate the extent of performance and achievement.
- Community may evaluate some technical indicators such as sediment yield etc.
- Geographical information system (GIS)
- Observation and measurements of field indicators such as soil denudation, advance or reduction in gullies, land use pattern and changes, channel scouring etc.
- Remote sensing satellite imaginaries and aerial photographs of the treated area taken before the implementation of the Plan and thereafter periodically.
- Video monitoring
- Hydro-meteorological data measurements

Evaluation of the Plan is a multi-dimensional task which is generally performed at different times during the implementation of the Plan. Typically, quantitative evaluations reflect a simplistic view that reality takes a single form that can be perceived and measured objectively. On the other hand, qualitative evaluations reflect a more constructive view, implying that reality can have multiple versions. It has been found better to mix both the qualitative and quantitative methods of evaluation. This comes from the fact that purely quantitative and purely qualitative approaches to the program evaluation, both have limitations. The strengths of each evaluation often compensate for the weaknesses of the other evaluation.

The quantitative evaluation attempts to attribute changes in various outcome variables to the treatment and determine whether such effects are statistically significant. An experimental approach is often considered as an acceptable standard for quantitative evaluation of watershed programs. Yet, in many cases the results of such a study may not extrapolate beyond the project examined.

There are many situations wherein an experimental approach to quantitative program evaluation may not be possible. In such situations, various approaches have been used, each with their own strengths and limitations.

The first approach is called a "before/after" study. The evaluator measures the levels of outcome indicators in the area before and after the treatment. This is a fairly weak but feasible approach that involves an unlikely assumption that there have been no other significant changes during the study period. A second approach consisting of a "with/without" study, is useful when no baseline data are available.

Thus, there are clearly multiple challenges associated with using quantitative evaluation methods for evaluation of a project involving catchment area treatment. Most challenges are introduced by the fact that soil and water conservation projects are not amenable to the same controlled conditions as in the experiments which provide the data for a simplistic analysis.

In contrast to quantitative evaluation, qualitative evaluators typically place less emphasis on measurement and more on context and on understanding the subtle manifestations. In general, a qualitative approach tends to be flexibly structured and uses open-ended questions in an inductive fashion. The objective is not to obtain a numerical estimate of some phenomenon, but to develop an in-depth understanding of an issue by probing, clarifying, and listening to stakeholders talk about a topic in their own words. The in-depth nature of the qualitative approach means that a study's scale is usually smaller than that found in quantitative research.

As with quantitative evaluation, sampling issues in qualitative evaluation also raise questions about biases in data. While quantitative researchers use random sampling whenever possible, qualitative researchers use several strategies to increase the internal validity of their findings. In qualitative evaluation, data collection and analysis become inseparable; as such evaluators collect much of the data themselves, rather than relegating this task to field assistants.

Thus, in sum and substance, the monitoring and evaluation functions may include:

(a) Internal monitoring by the Forest Department through Pakur Forest Division.
(b) Progress monitoring:
    (i) GIS/Web based online monitoring;
    (ii) Self-monitoring by communities;
    (iii) External monitoring by independent agencies
(c) Evaluation based on Key Performance Indicators (KPIs)

The technical Key Performance Indicators (KPI) may be identified as follows:

- The extent of soil loss and runoff,
- The amount of discharge in the stream and the amount of sediments in flowing water at the outlet point,
- The increase in the yield of wells and rise in water table,
- Average annual water flow and flood peak,
- Changes in soil moisture,
- Concentration of suspended sediments,
- Annual sediment yield,
- Turbidity of water,
- Biological and chemical properties of water, pH, annual reservoir sedimentation, pesticide concentration, etc.
- Stabilization of slopes
- Areas of treated gullies
- Number and depth of gullies
- Soil fertility
- Organic matter content of soil, etc.

As for the stages of plan evaluation, commonly four stages are prescribed in standard project evaluation methods:

(a) Baseline Evaluation: This is evaluation at the initial stage. The data on the indicators are used as benchmark for evaluation. A reliable baseline data on different selected parameters is provided for this evaluation.
(b) Mid-term Evaluation: This evaluation is proposed to be done in the middle of the plan implementation. The purpose of such mid-term evaluation is to check the effectiveness of each individual activity. This evaluation quantifies the short and mid-term benefits of the project.
(c) Terminal Evaluation: This evaluation shall be done at the end of the plan period. It indicates the efficiency of project implementation, accuracy of the project estimates, etc.
(d) Post-Terminal Evaluation: This evaluation may be carried out after 5 to 15 years of the end of the plan period. Long-term effects and impacts become visible in this post-terminal evaluation. However, as far as the instant plan is concerned, this evaluation may not be

possible and even if it is taken up, the results would not reflect the reality for the reason that the Impact area may be subject to similar other interventions through different schemes of the Forest Department.

4.2.7. Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan

Under this head following are being proposed under the Plan:

- Procurement of vehicles on hire/purchase for intensive supervision of works under the Plan as per need.
- Purchase of Drone System and other equipment like GPS, Mobile phones, instruments meant for monitoring soil moisture etc. as per requirement.
- Purchase of software/hardware/peripherals etc.
- Development of appropriate IT/mobile applications for monitoring & evaluation of the plan.
- Engagement of IT/GIS professionals etc.

The detailed Plan under this head shall be chalked out by the concerned DFO as per need assessment and the sub-components of this head shall not be restricted to the abovementioned subjects only.

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5. SITE-SPECIFIC DESCRIPTION OF THE PROPOSALS UNDER THE PLAN – DUMKA FOREST DIVISION

5.1. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-1 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 16: Site-Specific Physical and Financial Proposals under the Plan in Year-1

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/I	**Amrapara**	Gully Plugging	24.5249	87.3092	2m L x 1m H	14147
		Gully Plugging	24.5249	87.3091	2m L x 1m H	14147
		Gully Plugging	24.5251	87.3091	2m L x 1m H	14147
		LBS*	24.5311	87.3063	6m L x 2m H	109476
		LBS	24.5238	87.3053	8m L x 2m H	145560
		Stop Dam	24.5276	87.3068	15m L x 3m H	1836548
		Stop Dam (De-siltation)**	24.5301	87.3067	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.5265	87.3065	15m L x 3m H	100000
	Anguthiya	Gully Plugging	24.5493	87.3245	2m L x 1m H	14147
		Gully Plugging	24.5495	87.3246	2m L x 1m H	14147
		Gully Plugging	24.5497	87.3250	2m L x 1m H	14147
		LBS	24.5485	87.3264	6m L x 2m H	109476
		LBS	24.5473	87.3264	6m L x 2m H	109476
		LBS	24.5456	87.3265	6m L x 2m H	109476
		LBS	24.5498	87.3260	8m L x 2m H	145560
		LBS	24.55	87.3212	6m L x 2m H	109476
		LBS	24.5447	87.3262	6m L x 2m H	109476
		Stop Dam	24.5499	87.3263	18m L x 3m H	1971110
		WAT#	24.5491	87.3235	0.80 ha	15474
		WAT	24.5466	87.3223	8.00 ha	154740
	Dhawa	LBS	24.5405	87.3433	5m L x 2m H	91435
		LBS	24.5422	87.3444	5m L x 2m H	91435
		LBS	24.5378	87.3472	5m L x 2m H	91435
		LBS	24.5383	87.3501	5m L x 2m H	91435
		LBS	24.5389	87.3525	5m L x 2m H	91435

		LBS	24.542	87.3480	5m L x 2m H	91435
	Garnapahari	LBS	24.5396	87.3328	5m L x 2m H	91435
		LBS	24.5385	87.3318	5m L x 2m H	91435
		LBS	24.5357	87.3319	5m L x 2m H	91435
	Khairasol	Gully Plugging	24.5492	87.3156	2m L x 1m H	14147
		Gully Plugging	24.5491	87.3151	2m L x 1m H	14147
		Gully Plugging	24.5504	87.3168	2m L x 1m H	14147
		LBS	24.5511	87.3155	6m L x 2m H	109476
		LBS	24.5506	87.3169	8m L x 2m H	145560
		LBS	24.5505	87.3160	6m L x 2m H	109476
		LBS	24.5508	87.3159	6m L x 2m H	109476
		LBS	24.5505	87.3173	6m L x 2m H	109476
		Stop Dam	24.5506	87.3181	20m L x 3m H	2060818
	Karudih	LBS	24.5705	87.3192	6m L x 2m H	109476
		LBS	24.5516	87.3146	6m L x 2m H	109476
	Kusbedia	LBS	24.5208	87.3421	5m L x 2m H	91435
		LBS	24.5215	87.3425	5m L x 2m H	91435
		LBS	24.5218	87.3434	5m L x 2m H	91435
		LBS	24.5250	87.3442	5m L x 2m H	91435
		LBS	24.5243	87.3445	5m L x 2m H	91435
		LBS	24.5238	87.3454	5m L x 2m H	91435
		LBS	24.5219	87.3469	5m L x 2m H	91435
		LBS	24.5216	87.3478	5m L x 2m H	91435
	Kusdiha	Gully Plugging	24.5580	87.3250	2m L x 1m H	14147
		LBS	24.5514	87.3265	8m L x 2m H	145560
		LBS	24.5559	87.3291	8m L x 2m H	145560
		Stop Dam	24.5577	87.3306	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.5552	87.3290	20m L x 3m H	100000
	Nawadih	LBS	24.5571	87.3353	6m L x 2m H	109476
		LBS	24.5571	87.3359	5m L x 2m H	91435
		LBS	24.5560	87.3364	5m L x 2m H	91435
		LBS	24.5552	87.3363	5m L x 2m H	91435
		LBS	24.5547	87.3368	5m L x 2m H	91435
		LBS	24.5545	87.3375	5m L x 2m H	91435
	Pipra	Gully Plugging	24.5705	87.3196	2m L x 1m H	14147

		LBS	24.5715	87.3209	6m L x 2m H	109476
		LBS	24.5715	87.3216	6m L x 2m H	109476
		LBS	24.5708	87.3202	6m L x 2m H	109476
	Punsia	Gully Plugging	24.5090	87.3284	2m L x 1m H	14147
		LBS	24.5084	87.3308	12m L x 2m H	217726
		LBS	24.5105	87.3309	6m L x 2m H	109476
		LBS	24.5086	87.3308	6m L x 2m H	109476
		LBS	24.5140	87.3300	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5174	87.3293	10m L x 3m H	75000
D/CAT/II	**Baliakhara**	Earthen Check Dam	24.4766	87.3467	40m L x 3m H	525385
		Gully Plugging	24.4765	87.3477	2m L x 1m H	14147
		Gully Plugging	24.4767	87.3478	2m L x 1m H	14147
		Gully Plugging	24.4768	87.3482	2m L x 1m H	14147
		LBS	24.4821	87.3515	8m L x 2m H	145560
		LBS	24.4821	87.3519	8m L x 2m H	145560
		LBS	24.4815	87.3526	8m L x 2m H	145560
		LBS	24.4831	87.3521	6m L x 2m H	109476
		LBS	24.4837	87.3528	6m L x 2m H	109476
		LBS	24.4839	87.3535	5m L x 2m H	91435
		LBS	24.4850	87.3534	6m L x 2m H	109476
		LBS	24.4853	87.3522	6m L x 2m H	109476
		LBS	24.4863	87.3516	6m L x 2m H	109476
		LBS	24.4878	87.3521	6m L x 2m H	109476
		LBS	24.4775	87.3481	6m L x 2m H	109476
		LBS	24.4772	87.3485	6m L x 2m H	109476
		LBS	24.4802	87.3493	6m L x 2m H	109476
		Stop Dam	24.4827	87.3515	18m L x 3m H	1971110
		WAT	24.4746	87.3468	8.00 ha	154736
	Bansduma	Earthen Check Dam	24.4958	87.3147	50m L x 3m H	630022
		LBS	24.4958	87.3133	8m L x 2m H	145560
		LBS	24.4974	87.3174	6m L x 2m H	109476
		Stop Dam	24.4987	87.3186	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.4972	87.3151	20m L x 3m H	100000
	Bara Chapar	Gully Plugging	24.4661	87.3316	2m L x 1m H	14147
		Gully Plugging	24.4664	87.3317	2m L x 1m H	14147

		Gully Plugging	24.4666	87.3319	2m L x 1m H	14147
		Gully Plugging	24.4669	87.3322	2m L x 1m H	14147
		WAT	24.4666	87.3371	10.00 ha	193420
	Dholpathar	WAT	24.4568	87.3130	0.80 ha	15474
		WAT	24.4606	87.3129	6.00 ha	116052
	Dunakuppi	Gully Plugging	24.5189	87.3106	2m L x 1m H	14147
		LBS	24.5186	87.3105	6m L x 2m H	109476
		LBS	24.5179	87.3101	6m L x 2m H	109476
		LBS	24.5176	87.3098	6m L x 2m H	109476
		LBS	24.5172	87.3095	6m L x 2m H	109476
		LBS	24.5156	87.3085	8m L x 2m H	145560
		LBS	24.5193	87.3110	6m L x 2m H	109476
		LBS	24.5206	87.3106	6m L x 2m H	109476
		LBS	24.5214	87.3105	6m L x 2m H	109476
		LBS	24.5224	87.3105	6m L x 2m H	109476
	Heth Barachapar	Earthen Check Dam	24.4677	87.3374	30m L x 3m H	420747
		LBS	24.4796	87.3356	6m L x 2m H	109476
		LBS	24.4831	87.3364	6m L x 2m H	109476
		WAT	24.4798	87.3387	3.00 ha	58026
	Jhanjhar	Gully Plugging	24.5075	87.3117	2m L x 1m H	14147
		LBS	24.5090	87.3108	6m L x 2m H	109476
		LBS	24.5103	87.3104	10m L x 2m H	181643
		Stop Dam (De-siltation)	24.5076	87.3142	18m L x 3m H	100000
	Jirulia	LBS	24.4992	87.3193	8m L x 2m H	145560
		LBS	24.5013	87.3195	8m L x 2m H	145560
		LBS	24.5047	87.3162	5m L x 2m H	91435
		Stop Dam	24.5031	87.3178	25m L x 3m H	2280495
LBS (Loose Boulder Structures) – 78 nos.						87,19,569
Gully Plugging – 21 nos.						2,97,087
Earthen Check Dams – 3 nos.						15,76,154
Stop Dams – 7 nos.						1,40,62,301
Water Absorption Trenches (WAT) – 36.60 ha						7,07,922
De-siltation of Existing Stop Dams – 8 nos.						5,75,000
Total (Dumka Forest Division) – SMC Works (Year-1)						**2,59,38,033.00**

GODDA FOREST DIVISION						
G/CAT/I	**Asripara**	Gully Plugging	24.62610	87.42920	2m L x 1m H	14147
		Gully Plugging	24.62610	87.42970	2m L x 1m H	14147
		Gully Plugging	24.62580	87.43030	2m L x 1m H	14147
		LBS	24.62860	87.43280	6m L x 2m H	109476
		LBS	24.62890	87.43310	6m L x 2m H	109476
		LBS	24.62890	87.43360	6m L x 2m H	109476
		LBS	24.62920	87.43390	6m L x 2m H	109476
		LBS	24.62890	87.43640	6m L x 2m H	109476
	Balmi	Gully Plugging	24.65750	87.47060	2m L x 1m H	14147
		Gully Plugging	24.65820	87.47080	2m L x 1m H	14147
		Gully Plugging	24.65810	87.46780	2m L x 1m H	14147
		Gully Plugging	24.65770	87.46760	2m L x 1m H	14147
		Gully Plugging	24.65725	87.46696	2m L x 1m H	14147
		LBS	24.65690	87.47090	6m L x 2m H	109476
	Bara Paktari	Gully Plugging	24.65170	87.45730	2m L x 1m H	14147
		LBS	24.65220	87.45490	5m L x 2m H	91435
		LBS	24.65070	87.45790	5m L x 2m H	91435
		LBS	24.65610	87.45090	6m L x 2m H	109476
		LBS	24.65630	87.45240	6m L x 2m H	109476
		LBS	24.65760	87.45260	5m L x 2m H	91435
		LBS	24.65710	87.44747	12m L x 2m H	217726
		LBS	24.65828	87.44279	12m L x 2m H	217726
		LBS	24.65875	87.44548	12m L x 2m H	217726
	Bara Palma	Gully Plugging	24.63750	87.44650	2m L x 1m H	14147
		Gully Plugging	24.63770	87.44670	2m L x 1m H	14147
		LBS	24.63270	87.43690	5m L x 2m H	91435
		LBS	24.63290	87.43960	5m L x 2m H	91435
		LBS	24.63102	87.44150	5m L x 2m H	91435
		LBS	24.63210	87.44630	5m L x 2m H	91435
		LBS	24.64280	87.44840	5m L x 2m H	91435
		LBS	24.64320	87.44880	6m L x 2m H	109476
		LBS	24.64360	87.44820	5m L x 2m H	91435
		LBS	24.64430	87.44698	5m L x 2m H	91435
		LBS	24.64350	87.44590	5m L x 2m H	91435

	Chamdare	LBS	24.65220	87.41901	6m L x 2m H	109476
		LBS	24.65140	87.41940	6m L x 2m H	109476
		LBS	24.65070	87.41940	6m L x 2m H	109476
		LBS	24.64890	87.41970	6m L x 2m H	109476
		LBS	24.64770	87.42020	6m L x 2m H	109476
		LBS	24.64470	87.42120	6m L x 2m H	109476
		LBS	24.64360	87.42080	6m L x 2m H	109476
		LBS	24.64138	87.41877	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.65159	87.41921	10m L x 3m H	75000
	Chamer	Gully Plugging	24.66980	87.45840	2m L x 1m H	14147
		Gully Plugging	24.66994	87.45607	2m L x 1m H	14147
		LBS	24.67030	87.45710	6m L x 2m H	109476
		LBS	24.66997	87.45610	6m L x 2m H	109476
		LBS	24.67020	87.45820	6m L x 2m H	109476
		LBS	24.66272	87.45668	12m L x 2m H	217726
	Charchari	LBS	24.66020	87.44299	6m L x 2m H	109476
		LBS	24.66030	87.44160	6m L x 2m H	109476
		LBS	24.66120	87.44140	5m L x 2m H	91435
		LBS	24.66170	87.44170	5m L x 2m H	91435
		LBS	24.66180	87.44210	6m L x 2m H	109476
		LBS	24.66195	87.44240	6m L x 2m H	109476
		LBS	24.65740	87.44050	5m L x 2m H	91435
	Chhota Paktari	Gully Plugging	24.63680	87.45140	2m L x 1m H	14147
		Gully Plugging	24.63740	87.45180	2m L x 1m H	14147
		Gully Plugging	24.63810	87.45230	2m L x 1m H	14147
		LBS	24.63720	87.45120	12m L x 2m H	217726
		LBS	24.63430	87.45210	5m L x 2m H	91435
		LBS	24.64020	87.45190	5m L x 2m H	91435
		LBS	24.64260	87.46020	5m L x 2m H	91435
	Dumli	Gully Plugging	24.65410	87.44160	2m L x 1m H	14147
		Gully Plugging	24.65601	87.43990	2m L x 1m H	14147
		Gully Plugging	24.65570	87.43990	2m L x 1m H	14147
		Gully Plugging	24.64910	87.43960	2m L x 1m H	14147
		Gully Plugging	24.65352	87.43161	3m L x 1m H	20608
		Gully Plugging	24.65391	87.43300	3m L x 1m H	20608

		Gully Plugging	24.65446	87.43383	3m L x 1m H	20608
		Gully Plugging	24.65486	87.43471	3m L x 1m H	20608
		LBS	24.65470	87.44130	5m L x 2m H	91435
		LBS	24.65560	87.44070	5m L x 2m H	91435
		LBS	24.65630	87.44020	5m L x 2m H	91435
		LBS	24.65440	87.44160	5m L x 2m H	91435
		LBS	24.65530	87.43950	5m L x 2m H	91435
		LBS	24.65450	87.43830	5m L x 2m H	91435
		LBS	24.65474	87.43573	5m L x 2m H	91435
		WAT	24.64680	87.43480	1.60 ha	30947
		WAT	24.64860	87.44180	1.60 ha	30947
	Garganwa	Gully Plugging	24.64110	87.44040	2m L x 1m H	14147
		LBS	24.63920	87.44030	5m L x 2m H	91435
		LBS	24.64030	87.44003	6m L x 2m H	109476
		LBS	24.64120	87.44010	6m L x 2m H	109476
		LBS	24.64150	87.44102	5m L x 2m H	91435
	Ghaghri	Gully Plugging	24.64020	87.42890	2m L x 1m H	14147
		LBS	24.64270	87.42790	5m L x 2m H	91435
		LBS	24.64320	87.42690	5m L x 2m H	91435
		LBS	24.64160	87.42420	5m L x 2m H	91435
		LBS	24.63670	87.43360	6m L x 2m H	109476
		LBS	24.63720	87.43280	6m L x 2m H	109476
	Jambia	Gully Plugging	24.64670	87.44670	2m L x 1m H	14147
		Gully Plugging	24.64670	87.44650	2m L x 1m H	14147
		Gully Plugging	24.64620	87.44540	2m L x 1m H	14147
		LBS	24.64710	87.44150	5m L x 2m H	91435
		LBS	24.64730	87.44730	5m L x 2m H	91435
		LBS	24.64680	87.44140	5m L x 2m H	91435
	Nandopara	Gully Plugging	24.66111	87.44937	2m L x 1m H	14147
		Gully Plugging	24.66137	87.45008	2m L x 1m H	14147
		Gully Plugging	24.66162	87.45070	2m L x 1m H	14147
		Gully Plugging	24.66928	87.45311	2m L x 1m H	14147
		Gully Plugging	24.66978	87.45397	2m L x 1m H	14147
		Gully Plugging	24.67012	87.45491	2m L x 1m H	14147
		Gully Plugging	24.67051	87.45225	2m L x 1m H	14147

		Gully Plugging	24.67131	87.45277	2m L x 1m H	14147
		LBS	24.66220	87.44330	5m L x 2m H	91435
		LBS	24.66250	87.44360	5m L x 2m H	91435
		LBS	24.66280	87.44400	6m L x 2m H	109476
		LBS	24.66310	87.44420	6m L x 2m H	109476
		LBS	24.66380	87.44380	5m L x 2m H	91435
		LBS	24.66540	87.44450	5m L x 2m H	91435
		LBS	24.66630	87.44510	5m L x 2m H	91435
		LBS	24.66090	87.44720	6m L x 2m H	109476
		LBS	24.66110	87.44850	5m L x 2m H	91435
		LBS	24.66040	87.45586	12m L x 2m H	217726
		LBS	24.66171	87.45628	12m L x 2m H	217726
		LBS	24.66775	87.44701	5m L x 2m H	91435
		LBS	24.66865	87.44868	5m L x 2m H	91435
		LBS	24.66940	87.45062	5m L x 2m H	91435
	Nadgoda	Gully Plugging	24.64770	87.42430	2m L x 1m H	14147
		Gully Plugging	24.64800	87.42470	2m L x 1m H	14147
		Gully Plugging	24.64790	87.42700	2m L x 1m H	14147
		Gully Plugging	24.64760	87.42740	2m L x 1m H	14147
		Gully Plugging	24.64710	87.42797	2m L x 1m H	14147
		Gully Plugging	24.65308	87.42931	2m L x 1m H	14147
		Gully Plugging	24.65308	87.42799	2m L x 1m H	14147
	Pararia	Gully Plugging	24.63470	87.43170	2m L x 1m H	14147
		Gully Plugging	24.63530	87.43250	2m L x 1m H	14147
		Gully Plugging	24.62941	87.43131	3m L x 1m H	20608
		Gully Plugging	24.62966	87.43091	3m L x 1m H	20608
		Gully Plugging	24.63066	87.43139	3m L x 1m H	20608
		Gully Plugging	24.63073	87.43185	3m L x 1m H	20608
		LBS	24.62950	87.42160	6m L x 2m H	109476
		LBS	24.63050	87.42110	6m L x 2m H	109476
		LBS	24.63050	87.42120	8m L x 2m H	145560
		LBS	24.62898	87.42060	6m L x 2m H	109476
		LBS	24.62980	87.42220	6m L x 2m H	109476
		LBS	24.63110	87.42330	6m L x 2m H	109476
		LBS	24.63110	87.42440	8m L x 2m H	145560

		LBS	24.63198	87.42610	8m L x 2m H	145560
		LBS	24.63480	87.42940	6m L x 2m H	109476
	Rakha	Gully Plugging	24.65000	87.46660	2m L x 1m H	14147
		LBS	24.64940	87.46730	6m L x 2m H	109476
		LBS	24.64950	87.46690	6m L x 2m H	109476
		LBS	24.65630	87.45990	5m L x 2m H	91435
		LBS	24.65670	87.46070	6m L x 2m H	109476
		LBS	24.65740	87.46240	5m L x 2m H	91435
		LBS	24.65780	87.46370	5m L x 2m H	91435
		LBS	24.65570	87.46330	5m L x 2m H	91435
	Salgama	Gully Plugging	24.66000	87.47110	2m L x 1m H	14147
		Gully Plugging	24.66000	87.47140	2m L x 1m H	14147
		LBS	24.66160	87.46950	6m L x 2m H	109476
	Singarsi	LBS	24.62200	87.44520	6m L x 2m H	109476
		LBS	24.62250	87.44550	6m L x 2m H	109476
		LBS	24.62890	87.44830	5m L x 2m H	91435
		LBS	24.62920	87.44780	5m L x 2m H	91435
		LBS	24.62980	87.44710	5m L x 2m H	91435
	Telo	Gully Plugging	24.65430	87.41890	2m L x 1m H	14147
		Gully Plugging	24.65340	87.41890	2m L x 1m H	14147
		Gully Plugging	24.65420	87.41890	2m L x 1m H	14147
		Gully Plugging	24.65410	87.41860	2m L x 1m H	14147
		Gully Plugging	24.65410	87.41860	2m L x 1m H	14147
		Gully Plugging	24.65399	87.41850	2m L x 1m H	14147
		Gully Plugging	24.64620	87.41450	2m L x 1m H	14147
	Tetaria	Gully Plugging	24.65550	87.41760	2m L x 1m H	14147
		Gully Plugging	24.65590	87.41690	2m L x 1m H	14147
		Gully Plugging	24.63948	87.40386	2m L x 1m H	14147
		Gully Plugging	24.63988	87.40461	2m L x 1m H	14147
		LBS	24.66320	87.41590	6m L x 2m H	109476
		LBS	24.66290	87.41580	6m L x 2m H	109476
		LBS	24.66410	87.41595	6m L x 2m H	109476
LBS (Loose Boulder Structures) – 104 nos.						1,13,85,538
Gully Plugging – 64 nos.						9,57,096
Earthen Check Dams						-

Stop Dams	-
Water Absorption Trenches (WAT) – 3.20 ha	61,894
De-siltation of Existing Stop Dams – 1 no.	75,000
Total (Godda Forest Division) – SMC Works (Year-1)	**1,24,79,528.00**

***L.B.S. stands for Loose Boulder Structure. This is also referred to as L.B.C.D. i.e., Loose Boulder Check Dam.**

**** A lumpsum cost for de-siltation/repair of stop dams has been taken into account.**

#W.A.T. – Water Absorption Trench – This work shall be done primarily on suitable forest land. However, suitable common land may also be taken up in case of non-availability of forest land.

5.2. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-2 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 17: Site-Specific Physical and Financial Proposals under the Plan in Year-2

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/II	**Kongmara**	LBS	24.4816	87.3136	6m L x 2m H	109476
		LBS	24.4786	87.3106	6m L x 2m H	109476
		LBS	24.4800	87.3117	6m L x 2m H	109476
		Stop Dam	24.4844	87.3167	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.4824	87.3147	25m L x 3m H	100000
		Stop Dam (De-siltation)	24.4777	87.3096	10m L x 3m H	75000
	Kusbana	LBS	24.5071	87.3309	6m L x 2m H	109476
		LBS	24.5066	87.3308	6m L x 2m H	109476
		LBS	24.5073	87.3306	6m L x 2m H	109476
		LBS	24.5063	87.3327	6m L x 2m H	109476
		LBS	24.5058	87.3339	6m L x 2m H	109476
		LBS	24.5037	87.3372	6m L x 2m H	109476
		LBS	24.5004	87.3360	10m L x 2m H	181643
		Stop Dam	24.5050	87.3359	20m L x 3m H	2060818
	Latta	Gully Plugging	24.5086	87.3227	2m L x 1m H	14147
		Gully Plugging	24.5085	87.3226	2m L x 1m H	14147
		Gully Plugging	24.5086	87.3228	2m L x 1m H	14147
	Manrro	LBS	24.4886	87.3049	6m L x 2m H	109476
		LBS	24.4886	87.3047	8m L x 2m H	145560
		LBS	24.4952	87.3054	8m L x 2m H	145560
		LBS	24.4959	87.3045	8m L x 2m H	145560
		Stop Dam	24.4906	87.3070	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4946	87.3117	18m L x 3m H	100000
		Stop Dam (De-siltation)	24.4949	87.3074	20m L x 3m H	100000
		Stop Dam (De-siltation)	24.4968	87.3040	10m L x 3m H	75000
	Mathdola	Stop Dam (De-siltation)	24.5148	87.3069	30m L x 3m H	100000
		Stop Dam	24.5128	87.3085	20m L x 3m H	2060818

	Niche Garhar	Gully Plugging	24.4894	87.3347	2m L x 1m H	14147
		Gully Plugging	24.4940	87.3341	2m L x 1m H	14147
		Gully Plugging	24.4940	87.3342	2m L x 1m H	14147
		Gully Plugging	24.4928	87.3341	2m L x 1m H	14147
		Gully Plugging	24.4966	87.3350	2m L x 1m H	14147
		Gully Plugging	24.4928	87.3340	2m L x 1m H	14147
		LBS	24.4952	87.3345	6m L x 2m H	109476
		LBS	24.4843	87.3374	6m L x 2m H	109476
		LBS	24.4960	87.3347	6m L x 2m H	109476
		LBS	24.4969	87.3345	6m L x 2m H	109476
		LBS	24.4972	87.3348	6m L x 2m H	109476
		LBS	24.4863	87.3370	6m L x 2m H	109476
		LBS	24.4881	87.3363	6m L x 2m H	109476
		LBS	24.4858	87.3319	6m L x 2m H	109476
		LBS	24.4867	87.3324	6m L x 2m H	109476
		LBS	24.4883	87.3323	6m L x 2m H	109476
		LBS	24.4894	87.3330	6m L x 2m H	109476
		LBS	24.4929	87.3338	6m L x 2m H	109476
		LBS	24.4809	87.3359	6m L x 2m H	109476
		LBS	24.4947	87.3358	6m L x 2m H	109476
		LBS	24.4937	87.3367	6m L x 2m H	109476
		LBS	24.4994	87.3321	8m L x 2m H	145560
		Stop Dam	24.4822	87.3358	15m L x 3m H	1836548
		Stop Dam	24.4915	87.3328	20m L x 3m H	2060818
		Stop Dam	24.4934	87.3337	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.4924	87.3334	10m L x 3m H	75000
	Sabeduma	Gully Plugging	24.4875	87.3214	2m L x 1m H	14147
		LBS	24.4883	87.3201	8m L x 2m H	145560
		LBS	24.4889	87.3222	8m L x 2m H	145560
		LBS	24.4936	87.3248	5m L x 2m H	91435
		LBS	24.4917	87.3239	8m L x 2m H	145560
		LBS	24.4957	87.3241	6m L x 2m H	109476
		Stop Dam	24.4967	87.3231	20m L x 3m H	2060818
		Stop Dam	24.4875	87.3200	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.4868	87.3190	10m L x 3m H	75000

	Saruabani	LBS	24.4739	87.3145	6m L x 2m H	109476
		LBS	24.4727	87.3136	6m L x 2m H	109476
		LBS	24.4676	87.3211	5m L x 2m H	91435
	Sarwapani	LBS	24.4817	87.3189	6m L x 2m H	109476
		LBS	24.4800	87.3206	6m L x 2m H	109476
		LBS	24.4717	87.3203	6m L x 2m H	109476
		Stop Dam	24.4820	87.3175	20m L x 3m H	2060818
		Stop Dam	24.4747	87.3206	18m L x 3m H	1971110
	Upar Garahan	Gully Plugging	24.4752	87.3293	2m L x 1m H	14147
					LBS (Loose Boulder Structures) – 41 nos.	47,77,189
					Gully Plugging – 11 nos.	1,55,617
					Earthen Check Dams	-
					Stop Dams – 11 nos.	2,20,41,042
					Water Absorption Trenches (WAT)	-
					De-siltation of Existing Stop Dams – 8 nos.	7,00,000
					Total (Dumka Forest Division) – SMC Works (Year-2)	**2,76,73,848.00**
					GODDA FOREST DIVISION	
G/CAT/II	**Asantari**	LBS	24.61460	87.36970	8m L x 2m H	145560
		LBS	24.61510	87.36980	8m L x 2m H	145560
		LBS	24.61360	87.36998	6m L x 2m H	109476
		LBS	24.60510	87.37180	6m L x 2m H	109476
		LBS	24.60530	87.37140	6m L x 2m H	109476
	Bara Haripur	Earthen Check Dam	24.64030	87.36730	50m L x 3m H	630022
		Gully Plugging	24.64620	87.36190	2m L x 1m H	14147
		Gully Plugging	24.64610	87.36150	2m L x 1m H	14147
		Gully Plugging	24.64580	87.36110	2m L x 1m H	14147
		Stop Dam	24.63305	87.36964	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.62927	87.37016	10m L x 3m H	75000
	Bariyarpur	LBS	24.63370	87.38390	6m L x 2m H	109476
		LBS	24.63380	87.38350	6m L x 2m H	109476
		LBS	24.63440	87.38180	6m L x 2m H	109476
		LBS	24.63460	87.38120	6m L x 2m H	109476
		LBS	24.63340	87.38400	6m L x 2m H	109476
		LBS	24.63360	87.38380	6m L x 2m H	109476
		Stop Dam	24.64219	87.38363	25m L x 3m H	2280495

		Stop Dam (De-siltation)	24.64462	87.37987	25m L x 3m H	100000
	Barmasia	Gully Plugging	24.59310	87.37860	2m L x 1m H	14147
		Gully Plugging	24.59320	87.37870	2m L x 1m H	14147
		Gully Plugging	24.59328	87.37905	2m L x 1m H	14147
		Gully Plugging	24.59327	87.37914	2m L x 1m H	14147
		Gully Plugging	24.59327	87.37914	2m L x 1m H	14147
		LBS	24.59560	87.37810	8m L x 2m H	145560
		LBS	24.59560	87.37630	8m L x 2m H	145560
		LBS	24.59430	87.37870	8m L x 2m H	145560
		Stop Dam	24.59360	87.37790	20m L x 3m H	2060818
		Stop Dam	24.59190	87.37380	18m L x 3m H	1971110
	Chandradih	Gully Plugging	24.62820	87.40303	2m L x 1m H	14147
		Gully Plugging	24.62820	87.40305	2m L x 1m H	14147
		Gully Plugging	24.62820	87.40320	2m L x 1m H	14147
		Gully Plugging	24.62820	87.40360	2m L x 1m H	14147
		LBS	24.62820	87.40250	5m L x 2m H	91435
		LBS	24.62795	87.40270	6m L x 2m H	109476
		LBS	24.62810	87.40320	5m L x 2m H	91435
		LBS	24.63150	87.40460	5m L x 2m H	91435
		LBS	24.63230	87.40220	6m L x 2m H	109476
		LBS	24.62995	87.40296	6m L x 2m H	109476
		LBS	24.62770	87.40310	5m L x 2m H	91435
		LBS	24.62650	87.40570	6m L x 2m H	109476
		LBS	24.62620	87.40550	6m L x 2m H	109476
		LBS	24.62660	87.40760	6m L x 2m H	109476
		LBS	24.62880	87.40730	5m L x 2m H	91435
		LBS	24.63010	87.40696	6m L x 2m H	109476
		LBS	24.63060	87.41010	6m L x 2m H	109476
		LBS	24.63120	87.40498	6m L x 2m H	109476
		LBS	24.62910	87.40640	5m L x 2m H	91435
LBS (Loose Boulder Structures) – 29 nos.						32,46,978
Gully Plugging – 12 nos.						1,69,764
Earthen Check Dams – 1 no.						6,30,022
Stop Dams – 4 nos.						81,48,971
Water Absorption Trenches (WAT)						-

De-siltation of Existing Stop Dams – 2 nos.	1,75,000
Total (Godda Forest Division) – SMC Works (Year-2)	**1,23,70,735.00**

5.3. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-3 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 18: Site-Specific Physical and Financial Proposals under the Plan in Year-3

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/III	**Agoiabahal**	LBS	24.4453	87.3387	6m L x 2m H	109476
		LBS	24.4446	87.3390	6m L x 2m H	109476
		LBS	24.4454	87.3346	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.4449	87.3382	20m L x 3m H	100000
	Baghapathar	Gully Plugging	24.4134	87.3567	2m L x 1m H	14147
		Gully Plugging	24.4132	87.3567	2m L x 1m H	14147
		Gully Plugging	24.4137	87.3547	2m L x 1m H	14147
		Gully Plugging	24.4143	87.3543	2m L x 1m H	14147
		Gully Plugging	24.4145	87.3549	2m L x 1m H	14147
		LBS	24.4150	87.3549	5m L x 2m H	91435
	Bansduma	Gully Plugging	24.4597	87.3524	2m L x m H	14147
		LBS	24.4644	87.3546	6m L x 2m H	109476
		LBS	24.4661	87.3550	6m L x 2m H	109476
		LBS	24.4604	87.3522	6m L x 2mH	109476
		LBS	24.4607	87.3524	6m L x 2m H	109476
		LBS	24.4614	87.3526	6m L x 2m H	109476
		LBS	24.4623	87.3527	6m L x 2m H	109476
		LBS	24.4558	87.3476	5m L x 2m H	91435
		Stop Dam (De-siltation)	24.4598	87.3512	18m L x 3m H	100000
	Bara Aamjola	LBS	24.4272	87.3464	8m L x 2m H	145560
		LBS	24.4268	87.3461	8m L x 2m H	145560
		Stop Dam	24.4275	87.3456	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4268	87.3412	18m L x 3m H	100000
	Baratanr	LBS	24.4442	87.3301	6m L x 2m H	109476
		LBS	24.4446	87.3304	6m L x 2m H	109476
	Dahujor	LBS	24.4291	87.3622	6m L x 2m H	109476
	Duarpahari	LBS	24.4710	87.3623	6m L x 2m H	109476

		LBS	24.4744	87.3609	6m L x 2m H	109476
		LBS	24.4690	87.3619	6m L x 2m H	109476
		LBS	24.4699	87.3587	6m L x 2m H	109476
		LBS	24.4699	87.3595	6m L x 2m H	109476
		LBS	24.4700	87.3605	6m L x 2m H	109476
		LBS	24.4711	87.3606	6m L x 2m H	109476
		LBS	24.4796	87.3530	8m L x 2m H	145560
		Stop Dam	24.4747	87.3578	20m L x 3m H	2060818
		Stop Dam	24.4733	87.3554	25m L x 3m H	2280495
		Stop Dam	24.4728	87.3596	18m L x 3m H	1971110
		Stop Dam	24.4764	87.3539	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.4684	87.3562	18m L x 3m H	100000
	Kobri	Earthen Check Dam	24.4554	87.3614	30m L x 3m H	420747
		Earthen Check Dam	24.4547	87.3608	40m L x 3m H	525385
		Gully Plugging	24.4515	87.3619	2m L x 1m H	14147
		Gully Plugging	24.4516	87.3620	2m L x 1m H	14147
		Gully Plugging	24.4521	87.3626	2m L x 1m H	14147
		Gully Plugging	24.4520	87.3624	2m L x 1m H	14147
		LBS	24.4546	87.3594	6m L x 2m H	109476
		LBS	24.4548	87.3596	6m L x 2m H	109476
	Kolachak	Gully Plugging	24.4405	87.3665	2m L x 1m H	14147
		Gully Plugging	24.4405	87.3660	2m L x 1m H	14147
		LBS	24.4406	87.3665	8m L x 1m H	145560
		WAT	24.4399	87.3663	8.00 ha	154736
	Kunda	LBS	24.4441	87.3420	6m L x 2m H	109476
		LBS	24.4432	87.3446	5m L x 2m H	91435
		LBS	24.4397	87.3435	6m L x 2m H	109476
		LBS	24.4411	87.3447	6m L x 2m H	109476
		LBS	24.4422	87.3465	5m L x 2m H	91435
		LBS	24.4412	87.3462	5m L x 2m H	91435
		Stop Dam (De-siltation)	24.4436	87.3413	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.4432	87.3428	12m L x 3m H	75000
	Kuramba	Earthen Check Dam	24.4573	87.3583	30m L x 3m H	420747
		Earthen Check Dam	24.4598	87.3593	30m L x 3m H	420747
		Gully Plugging	24.4609	87.3601	2m L x 1m H	14147

		Gully Plugging	24.4607	87.3606	2m L x 1m H	14147
		Gully Plugging	24.4673	87.3637	2m L x 1m H	14147
		Gully Plugging	24.4669	87.3639	2m L x 1m H	14147
		Gully Plugging	24.4663	87.3645	2m L x 1m H	14147
		Gully Plugging	24.4666	87.3651	2m L x 1m H	14147
		Gully Plugging	24.4663	87.3651	2m L x 1m H	14147
		Gully Plugging	24.4662	87.3658	2m L x 1m H	14147
		LBS	24.4678	87.3631	6m L x 2m H	109476
		LBS	24.4690	87.3623	6m L x 2m H	109476
	Kurwa	LBS	24.4280	87.3477	6m L x 2m H	109476
		LBS	24.4277	87.3490	6m L x 2m H	109476
		LBS	24.4271	87.3494	6m L x 2m H	109476
		LBS	24.4268	87.3502	6m L x 2m H	109476
		LBS	24.4272	87.3506	6m L x 2m H	109476
		LBS	24.4263	87.3557	8m L x 2m H	145560
		Stop Dam	24.4278	87.3483	15m L x 3m H	1836548
		Stop Dam	24.4270	87.3523	30m L x 3m H	2509359
	Mahuadangal	Gully Plugging	24.4076	87.3472	2m L x 1m H	14147
	Majurnach	Earthen Check Dam	24.4407	87.3669	40m L x 3m H	525385
		Gully Plugging	24.4421	87.3711	2m L x 1m H	14147
		Gully Plugging	24.4419	87.3711	2m L x 1m H	14147
		Gully Plugging	24.4414	87.3715	2m L x 1m H	14147
		Gully Plugging	24.4409	87.3671	2m L x 1m H	14147
		Gully Plugging	24.4407	87.3668	2m L x 1m H	14147
		LBS	24.4401	87.3709	6m L x 2m H	109476
		LBS	24.4406	87.3668	6m L x 2m H	109476
		WAT	24.4405	87.3703	2.40 ha	46421
		WAT	24.4493	87.3651	1.20 ha	23210
	Milan Pahari	Gully Plugging	24.4335	87.3618	2m L x 1m H	14147
		LBS	24.4334	87.3614	6m L x 2m H	109476
		LBS	24.4336	87.3614	6m L x 2m H	109476
		LBS	24.4340	87.3619	8m L x 2m H	145560
		LBS	24.4393	87.3541	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.4409	87.3511	30m L x 3m H	100000
		Stop Dam (De-siltation)	24.4408	87.3492	15m L x 3m H	100000

		Stop Dam (De-siltation)	24.4367	87.3573	30m L x 3m H	100000
	Murlidum	Gully Plugging	24.4217	87.3613	2m L x 1m H	14147
		Gully Plugging	24.4218	87.3613	2m L x 1m H	14147
		Gully Plugging	24.4219	87.3612	2m L x 1m H	14147
		Gully Plugging	24.4219	87.3611	2m L x 1m H	14147
		Gully Plugging	24.4221	87.3609	2m L x 1m H	14147
		Gully Plugging	24.4215	87.3615	2m L x 1m H	14147
		Gully Plugging	24.4213	87.3614	2m L x 1m H	14147
		LBS	24.4264	87.3593	8m L x 2m H	145560
		WAT	24.4219	87.3611	4.00 ha	77368
	Nawadih	LBS	24.4453	87.3326	6m L x 2m H	109476
		LBS	24.4455	87.3331	6m L x 2m H	109476
		LBS	24.4456	87.3338	6m L x 2m H	109476
		LBS	24.4448	87.3308	6m L x 2m H	109476
		LBS	24.4264	87.3593	8m L x 2m H	145560
	Pararia	Gully Plugging	24.4300	87.3353	2m L x 1m H	14147
		Gully Plugging	24.4299	87.3353	2m L x 1m H	14147
		Gully Plugging	24.4301	87.3348	2m L x 1m H	14147
					LBS (Loose Boulder Structures) – 53 nos.	60,36,779
					Gully Plugging – 37 nos.	5,23,439
					Earthen Check Dams – 5 nos.	23,13,011
					Stop Dams – 7 nos.	1,45,55,696
					Water Absorption Trenches (WAT) – 15.60 ha	3,01,735
					De-siltation of Existing Stop Dams – 9 nos.	8,75,000
Total (Dumka Forest Division)						**2,46,05,660.00**
GODDA FOREST DIVISION						
G/CAT/II	**Chhota Haripur**	Gully Plugging	24.63680	87.37530	2m L x 1m H	14147
		Gully Plugging	24.63680	87.37520	2m L x 1m H	14147
		LBS	24.63725	87.37302	12m L x 2m H	217726
		LBS	24.63680	87.37160	8m L x 2m H	145560
		LBS	24.63712	87.37185	8m L x 2m H	145560
		LBS	24.63800	87.37390	6m L x 2m H	109476
		LBS	24.64150	87.37470	8m L x 2m H	145560
		LBS	24.63500	87.36980	6m L x 2m H	109476
		LBS	24.63720	87.37705	10m L x 2m H	181643

		Stop Dam	24.64342	87.37594	15m L x 3m H	1836548
		Stop Dam	24.63715	87.37255	25m L x 3m H	2280495
		Stop Dam	24.62980	87.37260	15m L x 3m H	1836548
		WAT	24.63310	87.37497	2 ha	38684
	Damruhat	Gully Plugging	24.62170	87.39780	2m L x 1m H	14147
		Gully Plugging	24.62160	87.39820	2m L x 1m H	14147
		Gully Plugging	24.62140	87.39840	2m L x 1m H	14147
		Gully Plugging	24.61040	87.38740	2m L x 1m H	14147
		Gully Plugging	24.61000	87.38790	2m L x 1m H	14147
		LBS	24.62170	87.39504	8m L x 2m H	145560
		LBS	24.61840	87.39640	6m L x 2m H	109476
		LBS	24.62010	87.39720	6m L x 2m H	109476
		LBS	24.62040	87.39860	6m L x 2m H	109476
		LBS	24.62495	87.39668	5m L x 2m H	91435
		LBS	24.61140	87.38850	5m L x 2m H	91435
		LBS	24.60930	87.38810	6m L x 2m H	109476
		LBS	24.60760	87.38730	6m L x 2m H	109476
		Stop Dam	24.62260	87.39540	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.62418	87.39618	10m L x 3m H	75000
	Dulu	LBS	24.61995	87.36720	6m L x 2m H	109476
		LBS	24.61910	87.36710	6m L x 2m H	109476
		LBS	24.62882	87.36350	8m L x 2m H	145560
		LBS	24.62998	87.35637	10m L x 2m H	181643
		LBS	24.63064	87.35470	10m L x 2m H	181643
		LBS	24.63226	87.35647	10m L x 2m H	181643
		Stop Dam	24.62320	87.34852	15m L x 3m H	1836548
		Stop Dam	24.62895	87.35244	15m L x 3m H	1836548
		Stop Dam	24.62350	87.36640	15m L x 3m H	1836548
LBS (Loose Boulder Structures) – 21 nos.						28,40,252
Gully Plugging – 7 nos.						99,029
Earthen Check Dams						-
Stop Dams – 7 nos.						1,32,99,783
Water Absorption Trenches (WAT) – 2.00 ha						38,684
De-siltation of Existing Stop Dams – 1 no.						75,000
Total (Godda Forest Division) – SMC Works (Year-3)						**1,63,52,748.00**

5.4. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-4 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 19: Site-Specific Physical and Financial Proposals under the Plan in Year-4

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/III	**Pindari**	Earthen Check Dam	24.4357	87.3716	50m L x 3m H	630022
		Earthen Check Dam	24.4319	87.3693	80m L x 3m H	943935
		Gully Plugging	24.4306	87.3789	2m L x 1m H	14147
		Gully Plugging	24.4306	87.3790	2m L x 1m H	14147
		Gully Plugging	24.4287	87.3784	2m L x 1m H	14147
		Gully Plugging	24.4284	87.3783	2m L x 1m H	14147
		Gully Plugging	24.4284	87.3782	2m L x 1m H	14147
		Gully Plugging	24.4270	87.3792	2m L x 1m H	14147
		Gully Plugging	24.4257	87.3787	2m L x 1m H	14147
		LBS	24.4296	87.3656	8m L x 2m H	145560
		LBS	24.4298	87.3667	8m L x 2m H	145560
		LBS	24.4325	87.3661	8m L x 2m H	145560
		LBS	24.4310	87.3789	6m L x 2m H	109476
		LBS	24.4301	87.3787	6m L x 2m H	109476
		LBS	24.4300	87.3787	6m L x 2m H	109476
		LBS	24.4298	87.3787	6m L x 2m H	109476
		LBS	24.4296	87.3787	6m L x 2m H	109476
		LBS	24.4293	87.3788	6m L x 2m H	109476
		LBS	24.4290	87.3788	6m L x 2m H	109476
		LBS	24.4287	87.3788	6m L x 2m H	109476
		LBS	24.4284	87.3788	6m L x 2m H	109476
		LBS	24.4270	87.3790	6m L x 2m H	109476
		LBS	24.4265	87.3791	10m L x 2m H	181643
		LBS	24.4247	87.3784	6m L x 2m H	109476
		LBS	24.4245	87.3785	6m L x 2m H	109476
		LBS	24.4337	87.3647	6m L x 2m H	109476
		LBS	24.4320	87.3652	6m L x 2m H	109476

		Stop Dam	24.4259	87.3783	25m L x 3m H	2280495
		WAT	24.4285	87.3783	6.00 ha	116052
	Sapdahar	LBS	24.4561	87.3422	5m L x 2m H	91435
		LBS	24.4572	87.3417	5m L x 2m H	91435
		LBS	24.4577	87.3406	5m L x 2m H	91435
		LBS	24.4584	87.3397	5m L x 2m H	91435
	Sijua	Earthen Check Dam	24.4242	87.3684	40m L x 3m H	525385
		Gully Plugging	24.4237	87.3727	2m L x 1m H	14147
		Gully Plugging	24.4238	87.3729	2m L x 1m H	14147
		Gully Plugging	24.4239	87.3730	2m L x 1m H	14147
		Gully Plugging	24.4240	87.3730	2m L x 1m H	14147
		Gully Plugging	24.4241	87.3729	2m L x 1m H	14147
		Gully Plugging	24.4243	87.3729	2m L x 1m H	14147
		Gully Plugging	24.4245	87.3730	2m L x 1m H	14147
		Gully Plugging	24.4246	87.3729	2m L x 1m H	14147
		Gully Plugging	24.4247	87.3729	2m L x 1m H	14147
		Gully Plugging	24.4252	87.3731	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3730	2m L x 1m H	14147
		Gully Plugging	24.4234	87.3732	2m L x 1m H	14147
		Gully Plugging	24.4242	87.3683	2m L x 1m H	14147
		LBS	24.4234	87.3725	6m L x 2m H	109476
		LBS	24.4247	87.3729	6m L x 2m H	109476
		LBS	24.4227	87.3723	10m L x 2m H	181643
		LBS	24.4277	87.3711	12m L x 2m H	217726
		Stop Dam (De-siltation)	24.4254	87.3724	15m L x 3m H	100000
		LBS	24.4221	87.3715	6m L x 2m H	109476
		WAT	24.4244	87.3729	2.40 ha	46421
	Sijuadum	Gully Plugging	24.4245	87.3679	2m L x 1m H	14147
		Gully Plugging	24.4245	87.3678	2m L x 1m H	14147
	Siltha	LBS	24.4427	87.3483	6m L x 2m H	109476
	Simalpahari	LBS	24.4423	87.3618	5m L x 2m H	91435
		LBS	24.4426	87.3620	5m L x 2m H	91435
		LBS	24.4418	87.3625	5m L x 2m H	91435
		LBS	24.4382	87.3605	5m L x 2m H	91435
	Suripalan	LBS	24.4271	87.3322	5m L x 2m H	91435

		LBS	24.4270	87.3342	5m L x 2m H	91435
		LBS	24.4271	87.3361	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.4264	87.3363	15m L x 3m H	100000
D/CAT/IV	**Asanbani**	LBS	24.3854	87.4330	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.3758	87.4420	15mL x 3m H	100000
	Asanpahari	Gully Plugging	24.3778	87.4376	2m L x 1m H	14147
		Gully Plugging	24.3779	87.4377	3m L x1m H	20608
		Gully Plugging	24.3779	87.4378	2m L x 1m H	14147
		Gully Plugging	24.3779	87.4378	3m L x1m H	20608
		Gully Plugging	24.3779	87.4379	3m L x1m H	20608
		Gully Plugging	24.3775	87.4382	3m L x1m H	20608
		Gully Plugging	24.3775	87.4383	2m L x 1m H	14147
		Gully Plugging	24.3775	87.4388	2m L x 1m H	14147
		Gully Plugging	24.3762	87.4394	3m L x1m H	20608
		Gully Plugging	24.3763	87.4393	2m L x 1m H	14147
		Gully Plugging	24.3765	87.4389	2m L x 1m H	14147
		Gully Plugging	24.3765	87.4390	2m L x 1m H	14147
		Gully Plugging	24.3769	87.4381	2m L x 1m H	14147
		Gully Plugging	24.3781	87.4374	2m L x 1m H	14147
		Gully Plugging	24.3781	87.4374	3m L x1m H	20608
		Gully Plugging	24.3780	87.4371	2m L x 1m H	14147
		Gully Plugging	24.3779	87.4371	2m L x 1m H	14147
		Gully Plugging	24.3781	87.4370	2m L x 1m H	14147
		Gully Plugging	24.3782	87.4362	2m L x 1m H	14147
		Gully Plugging	24.3783	87.4362	2m L x 1m H	14147
		Gully Plugging	24.3787	87.4363	2m L x 1m H	14147
		Gully Plugging	24.3786	87.4350	2m L x 1m H	14147
		Gully Plugging	24.3778	87.4236	2m L x 1m H	14147
		LBS	24.3779	87.4379	6m L x 2m H	109476
		LBS	24.3777	87.4381	6m L x 2m H	109476
		LBS	24.3777	87.4383	6m L x 2m H	109476
		LBS	24.3775	87.4391	5m L x 2m H	91435
		LBS	24.3774	87.4394	8m L x 2m H	145560
		LBS	24.3770	87.4394	6m L x 2m H	109476
		LBS	24.3770	87.4393	5m L x 2m H	91435

		LBS	24.3769	87.4396	5m L x 2m H	91435
		LBS	24.3768	87.4400	6m L x 2m H	109476
		LBS	24.3785	87.4365	5m L x 2m H	91435
		LBS	24.3754	87.4406	6m L x 2m H	109476
		LBS	24.3783	87.4336	6m L x 2m H	109476
		WAT	24.3780	87.4370	1.20 ha	23210
	Bagjhopa	Gully Plugging	24.4296	87.3949	2m L x 1m H	14147
		Gully Plugging	24.4296	87.3946	2m L x 1m H	14147
		Gully Plugging	24.4268	87.3975	2m L x 1m H	14147
		Gully Plugging	24.4268	87.3984	2m L x 1m H	14147
		Gully Plugging	24.4269	87.3977	2m L x 1m H	14147
		Gully Plugging	24.4269	87.3985	2m L x 1m H	14147
		Gully Plugging	24.4259	87.4005	2m L x 1m H	14147
		Gully Plugging	24.4268	87.3988	2m L x 1m H	14147
		Gully Plugging	24.4245	87.4025	2m L x 1m H	14147
		Gully Plugging	24.4238	87.4024	2m L x 1m H	14147
		Gully Plugging	24.4258	87.4009	2m L x 1m H	14147
		Gully Plugging	24.4250	87.4025	2m L x 1m H	14147
		Gully Plugging	24.4245	87.4024	2m L x 1m H	14147
		Gully Plugging	24.4238	87.4024	2m L x 1m H	14147
		Gully Plugging	24.4236	87.4029	2m L x 1m H	14147
		Gully Plugging	24.4235	87.4029	2m L x 1m H	14147
		Gully Plugging	24.4233	87.4026	2m L x 1m H	14147
		LBS	24.4236	87.3950	5m L x 2m H	91435
		LBS	24.4233	87.3974	5m L x 2m H	91435
		LBS	24.4221	87.3993	6m L x 2m H	109476
		LBS	24.4285	87.3972	6m L x 2m H	109476
		LBS	24.4247	87.3941	6m L x 2m H	109476
		LBS	24.4288	87.3972	6m L x 2m H	109476
		LBS	24.4282	87.3979	6m L x 2m H	109476
		LBS	24.4297	87.3966	6m L x 2m H	109476
		LBS	24.4267	87.3999	6m L x 2m H	109476
		LBS	24.4270	87.3982	6m L x 2m H	109476
		LBS	24.4219	87.4033	6m L x 2m H	109476
		LBS	24.4223	87.4029	6m L x 2m H	109476

		LBS	24.4227	87.4026	6m L x 2m H	109476
		Stop Dam	24.4256	87.4009	18m L x 3m H	1971110
		WAT	24.4299	87.3942	0.80 ha	15474
		WAT	24.4224	87.4032	2.00 ha	38684
	Bajrisol	Gully Plugging	24.3922	87.3995	2m L x 1m H	14147
		Gully Plugging	24.3914	87.3993	2m L x 1m H	14147
		Gully Plugging	24.3921	87.3997	2m L x 1m H	14147
		LBS	24.3927	87.4002	8m L x 2m H	145560
		LBS	24.3929	87.3999	8m L x 2m H	145560
		LBS	24.3943	87.4006	6m L x 2m H	109476
		LBS	24.3945	87.4006	6m L x 2m H	109476
		WAT	24.3980	87.3954	1.20 ha	23210
	Bamarjhanti	LBS	24.3977	87.3811	8m L x 2m H	145560
		Gully Plugging	24.3917	87.3822	2m L x 1m H	14147
		Gully Plugging	24.3923	87.3822	2m L x 1m H	14147
		Gully Plugging	24.3916	87.3834	2m L x 1m H	14147
		LBS	24.3921	87.3823	5m L x 2mH	91435
		LBS	24.3918	87.3835	12m L x 2mH	217726
		LBS	24.3953	87.3839	6m L x 2mH	109476
		LBS	24.3956	87.3833	6m L x 2mH	109476
		LBS	24.3961	87.3831	6m L x 2mH	109476
		LBS	24.3939	87.3839	6m L x 2mH	109476
		LBS	24.3903	87.3806	6m L x 2mH	109476
		LBS	24.3906	87.3800	6m L x 2mH	109476
		WAT	24.3884	87.3750	4 ha	77368
	Bara Kathikund	LBS	24.3734	87.4179	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.3678	87.4177	10m L x 3m H	75000
	Bara Narganj	Stop Dam	24.4160	87.4034	15m L x 3m H	1836548
		Gully Plugging	24.4153	87.4081	2m L x 1m H	14147
		LBS	24.4184	87.4039	6m L x 2m H	109476
		LBS	24.4184	87.4042	6m L x 2m H	109476
	Bara Sarwapani	Earthen Check Dam	24.4063	87.4226	190m L x 3m H	2094947
		LBS	24.4018	87.4185	6m L x 2m H	109476
		LBS	24.4022	87.4192	6m L x 2m H	109476
		LBS	24.4038	87.4207	6m L x 2m H	109476

		LBS	24.4052	87.4217	6m L x 2m H	109476
	Bokwa	Gully Plugging	24.4190	87.3880	2m L x 1m H	14147
		LBS	24.4197	87.3869	6m L x 2m H	109476
		Stop Dam	24.4188	87.3856	30m L x 3m H	2509359
	Burhidangal	Stop Dam	24.3971	87.4203	20m L x 3m H	2060818
					LBS (Loose Boulder Structures) – 82 nos.	93,55,925
					Gully Plugging – 70 nos.	10,29,056
					Earthen Check Dams – 4 nos.	41,94,289
					Stop Dams – 5 nos.	1,06,58,330
					Water Absorption Trenches (WAT) – 17.60 ha	3,40,419
					De-siltation of Existing Stop Dams – 4 nos.	3,75,000
Total (Dumka Forest Division) – SMC Works (Year-4)						**2,59,53,019.00**
GODDA FOREST DIVISION						
G/CAT/II	**Dumki**	Gully Plugging	24.63140	87.39810	2m L x 1m H	14147
		Gully Plugging	24.63198	87.39660	2m L x 1m H	14147
		Gully Plugging	24.63195	87.39640	2m L x 1m H	14147
		Gully Plugging	24.63090	87.39620	2m L x 1m H	14147
		Gully Plugging	24.63020	87.39610	2m L x 1m H	14147
		Gully Plugging	24.63150	87.39850	2m L x 1m H	14147
		Gully Plugging	24.62870	87.39800	2m L x 1m H	14147
		Gully Plugging	24.62820	87.39720	2m L x 1m H	14147
		LBS	24.63356	87.39883	5m L x 2m H	
		LBS	24.63173	87.39697	6m L x 2m H	109476
		LBS	24.63010	87.39720	6m L x 2m H	109476
		LBS	24.62840	87.39690	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.63255	87.39783	25m L x 3m H	100000
	Gardi	Earthen Check Dam	24.63620	87.41150	20m L x 3m H	316110
		Gully Plugging	24.64210	87.41050	2m L x 1m H	14147
		Gully Plugging	24.64201	87.41050	2m L x 1m H	14147
		Gully Plugging	24.64204	87.41050	2m L x 1m H	14147
		Gully Plugging	24.63840	87.40940	2m L x 1m H	14147
		Gully Plugging	24.63830	87.40940	2m L x 1m H	14147
		Gully Plugging	24.63810	87.40940	2m L x 1m H	14147
		Gully Plugging	24.63790	87.40940	2m L x 1m H	14147
		Gully Plugging	24.63790	87.41160	2m L x 1m H	14147

		Gully Plugging	24.63760	87.41140	2m L x 1m H	14147
		Gully Plugging	24.63760	87.41140	2m L x 1m H	14147
		Gully Plugging	24.63750	87.41140	2m L x 1m H	14147
		Gully Plugging	24.63699	87.41120	2m L x 1m H	14147
		Gully Plugging	24.63670	87.41080	2m L x 1m H	14147
		Gully Plugging	24.63660	87.41030	2m L x 1m H	14147
		Gully Plugging	24.63670	87.41010	2m L x 1m H	14147
		Gully Plugging	24.63720	87.40950	2m L x 1m H	14147
		Gully Plugging	24.63710	87.40950	2m L x 1m H	14147
		Gully Plugging	24.63710	87.41140	2m L x 1m H	14147
		Gully Plugging	24.63840	87.40950	2m L x 1m H	14147
		Gully Plugging	24.63780	87.41160	2m L x 1m H	14147
		Gully Plugging	24.63760	87.41150	2m L x 1m H	14147
		Gully Plugging	24.63750	87.41150	2m L x 1m H	14147
		Gully Plugging	24.63740	87.41150	2m L x 1m H	14147
		Gully Plugging	24.63730	87.41150	2m L x 1m H	14147
		LBS	24.64210	87.41050	6m L x 2m H	109476
		LBS	24.63780	87.40930	6m L x 2m H	109476
		LBS	24.63390	87.41070	6m L x 2m H	109476
		LBS	24.63850	87.40950	6m L x 2m H	109476
	Gordih	Earthen Check Dam	24.60891	87.40659	30m x 3m H	420747
		Gully Plugging	24.60645	87.41619	3m L x 1m H	20608
		Gully Plugging	24.61681	87.42432	2m L x 1m H	14147
		LBS	24.62460	87.39970	5m L x 2m H	91435
		LBS	24.61830	87.41100	6m L x 2m H	109476
		LBS	24.61740	87.41240	5m L x 2m H	91435
		LBS	24.61450	87.41460	6m L x 2m H	109476
		LBS	24.61430	87.41770	5m L x 2m H	91435
		LBS	24.61360	87.41970	5m L x 2m H	91435
		LBS	24.61190	87.42010	6m L x 2m H	109476
		LBS	24.61780	87.41870	6m L x 2m H	109476
		LBS	24.62297	87.41770	5m L x 2m H	91435
		LBS	24.61790	87.42280	5m L x 2m H	91435
		LBS	24.61870	87.42498	5m L x 2m H	91435
		LBS	24.62390	87.40850	5m L x 2m H	91435

		Stop Dam	24.62139	87.40421	15m L x 3m H	1836548
	Kairabani	Gully Plugging	24.62910	87.38620	2m L x 1m H	14147
		LBS	24.62950	87.38680	5m L x 2m H	91435
	Khepadih	Gully Plugging	24.63940	87.39870	2m L x 1m H	14147
		Gully Plugging	24.63690	87.40010	2m L x 1m H	14147
		Gully Plugging	24.63690	87.40010	2m L x 1m H	14147
		Gully Plugging	24.63680	87.40040	2m L x 1m H	14147
		Gully Plugging	24.63660	87.40150	2m L x 1m H	14147
		Gully Plugging	24.63430	87.39920	2m L x 1m H	14147
		LBS	24.63670	87.40110	5m L x 2m H	91435
		LBS	24.63610	87.40090	5m L x 2m H	91435
		LBS	24.63380	87.40090	5m L x 2m H	91435
		LBS	24.63532	87.40073	5m L x 2m H	91435
		LBS	24.63496	87.40070	5m L x 2m H	91435
		LBS	24.63450	87.40040	5m L x 2m H	91435
		LBS	24.63490	87.40210	5m L x 2m H	91435
		LBS	24.63350	87.40230	5m L x 2m H	91435
	Kusmuha	Earthen Check Dam	24.60674	87.37646	30m L x 3m H	420747
	Malikundi	Gully Plugging	24.63660	87.41150	2m L x 1m H	14147
		Gully Plugging	24.63620	87.41160	2m L x 1m H	14147
		LBS	24.62490	87.41240	6m L x 2m H	109476
		LBS	24.62780	87.41660	6m L x 2m H	109476
		LBS	24.63680	87.41690	6m L x 2m H	109476
		LBS	24.63560	87.41580	6m L x 2m H	109476
		LBS	24.63720	87.41700	6m L x 2m H	109476
		LBS	24.62530	87.41530	6m L x 2m H	109476
		Stop Dam	24.63230	87.41650	20m L x 3m H	2060818
		Stop Dam	24.62500	87.41110	18m L x 3m H	1971110
	Patomdih	Gully Plugging	24.59930	87.38020	2m L x 1m H	14147
		Stop Dam	24.60870	87.39140	20m L x 3m H	2060818
		Stop Dam	24.60240	87.38340	18m L x 3mH	1971110
		WAT	24.60920	87.39050	1.20 ha	23210
		WAT	24.60630	87.38920	1.00 ha	19342
	Tetaria	Gully Plugging	24.64760	87.40730	2m L x 1m H	14147
		Gully Plugging	24.64698	87.40773	2m L x 1m H	14147

		Gully Plugging	24.64720	87.40700	2m L x 1m H	14147
		Gully Plugging	24.64720	87.40690	2m L x 1m H	14147
		Gully Plugging	24.64550	87.40670	2m L x 1m H	14147
		Gully Plugging	24.64760	87.40730	2m L x 1m H	14147
		Gully Plugging	24.64760	87.40740	2m L x 1m H	14147
		Gully Plugging	24.64750	87.40730	2m L x 1m H	14147
		Gully Plugging	24.64750	87.40730	2m L x 1m H	14147
		Gully Plugging	24.64740	87.40720	2m L x 1m H	14147
		Gully Plugging	24.64736	87.40704	2m L x 1m H	14147
		Gully Plugging	24.64736	87.40696	2m L x 1m H	14147
		Gully Plugging	24.64550	87.40680	2m L x 1m H	14147
		Gully Plugging	24.64550	87.40690	2m L x 1m H	14147
		Gully Plugging	24.64540	87.40660	2m L x 1m H	14147
		Gully Plugging	24.64540	87.40640	2m L x 1m H	14147
		Gully Plugging	24.64530	87.40610	2m L x 1m H	14147
		Gully Plugging	24.64510	87.40590	2m L x 1m H	14147
		Gully Plugging	24.64520	87.40570	2m L x 1m H	14147
		Gully Plugging	24.64503	87.40570	2m L x 1m H	14147
		Gully Plugging	24.63948	87.40386	2m L x 1m H	14147
		Gully Plugging	24.63988	87.40461	2m L x 1m H	14147
		LBS	24.64770	87.40740	6m L x 2m H	109476
		LBS	24.64770	87.40740	6m L x 2m H	109476
		LBS	24.64750	87.40750	6m L x 2m H	109476
		LBS	24.64540	87.40650	6m L x 2m H	109476
		LBS	24.64700	87.40770	6m L x 2m H	109476
		LBS	24.64690	87.40780	6m L x 2m H	109476
		LBS	24.64410	87.40330	6m L x 2m H	109476
		LBS	24.64490	87.40540	6m L x 2m H	109476
LBS (Loose Boulder Structures) – 43 nos.						42,91,295
Gully Plugging – 66 nos.						9,40,163
Earthen Check Dams – 3 nos.						11,57,604
Stop Dams – 5 nos.						99,00,404
Water Absorption Trenches (WAT) – 2.20 ha						42,552
De-siltation of Existing Stop Dams – 1 no.						1,00,000
Total (Godda Forest Division) – SMC Works (Year-4)						**1,64,32,018.00**

5.5. SITE-SPECIFIC PROPOSALS FOR UNDER THE PLAN YEAR-5 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 20: Site-Specific Physical and Financial Proposals under the Plan in Year-5

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/IV	**Chakmuha**	LBS	24.4090	87.3719	6m L x 2m H	109476
		LBS	24.4091	87.3723	5m L x 2m H	91435
		LBS	24.4098	87.3725	5m L x 2m H	91435
		LBS	24.4103	87.3751	5m L x 2m H	91435
		LBS	24.4101	87.3767	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.4098	87.3776	30m L x 3m H	100000
		Stop Dam (De-siltation)	24.4078	87.3709	30m L x 3m H	100000
	Chhota Kathikund	Earthen Check Dam	24.3754	87.4187	150m L x 3m H	1676397
		Earthen Check Dam	24.3781	87.4163	75m L x 3m H	891616
		Gully Plugging	24.3770	87.4131	2m L x 1m H	14147
		LBS	24.3719	87.4136	6m L x 2m H	109476
		LBS	24.3720	87.4147	6m L x 2m H	109476
		LBS	24.3721	87.4159	6m L x 2m H	109476
		LBS	24.3711	87.4159	6m L x 2m H	109476
		Stop Dam	24.3725	87.4164	18m L x 3m H	1971110
	Chhota Narganj	Stop Dam	24.4170	87.3956	15 m L x 3m H	1836548
		Stop Dam	24.4184	87.3897	20 m L x 3m H	2060818
		Gully Plugging	24.4190	87.3880	2m L x 1m H	14147
		Gully Plugging	24.4192	87.3880	2m L x 1m H	14147
	Charakpathar	LBS	24.4156	87.3936	6m L x 2m H	109476
		LBS	24.4151	87.3933	6m L x 2m H	109476
		LBS	24.4148	87.3931	6m L x 2m H	109476
	Dhogria	Gully Plugging	24.4034	87.3561	2m L x 1m H	14147
		Gully Plugging	24.4034	87.3551	2m L x 1m H	14147
		Gully Plugging	24.4034	87.3561	2m L x 1m H	14147
		Gully Plugging	24.4035	87.3562	2m L x 1m H	14147
		Gully Plugging	24.4041	87.3586	2m L x 1m H	14147

		Gully Plugging	24.4007	87.3594	2m L x 1m H	14147
		WAT	24.4040	87.3572	0.80 ha	15474
	Dhaniyapahari	Gully Plugging	24.3777	87.4007	2m L x 1m H	14147
		Stop Dam	24.3752	87.3981	25m L x 3m H	2280495
		WAT	24.3779	87.4017	1 ha	19342
	Dhankutta	Earthen Check Dam	24.3867	87.4306	30m L x 3m H	420747
		Gully Plugging	24.3948	87.4161	2m L x 1m H	14147
		Gully Plugging	24.3947	87.4162	2m L x 1m H	14147
		Gully Plugging	24.3946	87.4163	2m L x 1m H	14147
		Gully Plugging	24.3949	87.4168	2m L x 1m H	14147
		Gully Plugging	24.3950	87.4168	2m L x 1m H	14147
		Gully Plugging	24.3867	87.4298	2m L x 1m H	14147
		Gully Plugging	24.3867	87.4298	2m L x 1m H	14147
		Gully Plugging	24.3876	87.4346	2m L x 1m H	14147
		Gully Plugging	24.3877	87.4347	2m L x 1m H	14147
		Gully Plugging	24.3877	87.4348	2m L x 1m H	14147
		Gully Plugging	24.3875	87.4348	2m L x 1m H	14147
		Gully Plugging	24.3876	87.4350	2m L x 1m H	14147
		Gully Plugging	24.3877	87.4245	2m L x 1m H	14147
		LBS	24.3954	87.4168	6m L x 2m H	109476
		LBS	24.3867	87.4300	8m L x 2m H	145560
		LBS	24.3854	87.4301	6m L x 2m H	109476
		LBS	24.3857	87.4305	12m L x 2m H	217726
		LBS	24.3878	87.4346	6m L x 2m H	109476
		LBS	24.3873	87.4241	6m L x 2m H	109476
		WAT	24.3869	87.4304	8.00 ha	154736
	Gadhrap	Gully Plugging	24.3850	87.4486	2m L x 1m H	14147
		Gully Plugging	24.3850	87.4485	2m L x 1m H	14147
		Gully Plugging	24.3850	87.4486	2m L x 1m H	14147
		Gully Plugging	24.3853	87.4483	2m L x 1m H	14147
		Gully Plugging	24.3850	87.4481	2m L x 1m H	14147
		Gully Plugging	24.3847	87.4479	2m L x 1m H	14147
		Gully Plugging	24.3844	87.4478	2m L x 1m H	14147
		Gully Plugging	24.3842	87.4482	2m L x 1m H	14147
		Gully Plugging	24.3978	87.4420	3m L x 1m H	20608

		Gully Plugging	24.3978	87.4422	3m L x 1m H	20608
		Gully Plugging	24.3979	87.4422	3m L x 1m H	20608
		Gully Plugging	24.3980	87.4423	3m L x 1m H	20608
		Gully Plugging	24.3982	87.4423	3m L x 1m H	20608
		LBS	24.3849	87.4488	6m L x 2m H	109476
	Ghatchora	LBS	24.3994	87.4381	6m L x 2m H	109476
		LBS	24.3992	87.4375	6m L x 2m H	109476
		LBS	24.3986	87.4372	6m L x 2m H	109476
		LBS	24.4011	87.4392	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.4002	87.4387	15m L x 3m	100000
		WAT	24.4002	87.4391	1.20 ha	23210
		WAT	24.4013	87.4387	1.20 ha	23210
	Jilli	LBS	24.3763	87.3930	8m L x 2m H	145560
		Stop Dam	24.3764	87.3939	25m L x 3m H	2280495
		Stop Dam (De-siltation)	24.3747	87.3908	18m L x 3m H	100000
	Kadarmara	LBS	24.3717	87.4011	6m L x 2m H	109476
		Stop Dam	24.3705	87.3994	25m L x 3m H	2280495
	Kairasol	Earthen Check Dam	24.3832	87.4122	30m L x 3m H	420747
		Earthen Check Dam	24.3829	87.4088	60m L x 3m H	734660
		Gully Plugging	24.3826	87.4097	2m L x 1m H	14147
		Gully Plugging	24.3826	87.4099	2m L x 1m H	14147
		LBS	24.3827	87.4097	5m L x 2m H	91435
		LBS	24.3839	87.4108	6m L x 2m H	109476
		LBS	24.3836	87.4109	6m L x 2m H	109476
		WAT	24.3833	87.4053	50.00 ha	967100
	Kanrapahari	Gully Plugging	24.3992	87.4037	2m L x 1m H	14147
		Gully Plugging	24.3992	87.4036	2m L x 1m H	14147
		Gully Plugging	24.3991	87.4035	2m L x 1m H	14147
		WAT	24.4007	87.4048	28.00 ha	541576
	Kasikul	Gully Plugging	24.4014	87.3808	2m L x 1m H	14147
		Gully Plugging	24.4018	87.3805	2m L x 1m H	14147
		WAT	24.4024	87.3789	1.6 ha	30947
					LBS (Loose Boulder Structures) – 28 nos.	31,73,582
					Gully Plugging – 43 nos.	6,40,626
					Earthen Check Dams – 5 nos.	41,44,167

					Stop Dams – 6 nos.	1,27,09,961
					Water Absorption Trenches (WAT) – 91.80 ha	17,75,595
					De-siltation of Existing Stop Dams – 4 nos.	4,00,000
Total (Dumka Forest Division) – SMC Works (Year-5)						**2,28,43,931.00**
GODDA FOREST DIVISION						
G/CAT/III	**Asna**	Gully Plugging	24.55780	87.34910	2m L x 1m H	14147
		LBS	24.55596	87.34720	6m L x 2m H	109476
		LBS	24.55360	87.34740	6m L x 2m H	109476
		LBS	24.55720	87.34770	6m L x 2m H	109476
	Bhawani	LBS	24.60783	87.35450	6m L x 2m H	109476
		LBS	24.60720	87.35424	8m L x 2m H	145560
		LBS	24.59970	87.36450	6m L x 2m H	109476
		LBS	24.59950	87.36380	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.60476	87.35897	10m L x 3m H	75000
		WAT	24.60320	87.36370	1.20 ha	23210
		WAT	24.60370	87.36840	1.20 ha	23210
	Boha	LBS	24.60960	87.33820	6m L x 2m H	109476
		LBS	24.60930	87.33770	6m L x 2m H	109476
		LBS	24.60820	87.33680	8m L x 2m H	145560
		LBS	24.58661	87.34184	6m L x 2m H	109476
		LBS	24.58751	87.34402	6m L x 2m H	109476
		Stop Dam	24.60407	87.35052	20m L x 3m H	2060818
		Stop Dam	24.59041	87.34058	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.60042	87.34582	30m L x 3m H	100000
	Dulu	Gully Plugging	24.61750	87.33970	2m L x 1m H	14147
		Gully Plugging	24.61790	87.34010	2m L x 1m H	14147
		Gully Plugging	24.61810	87.34030	2m L x 1m H	14147
		Gully Plugging	24.61790	87.34140	2m L x 1m H	14147
		Gully Plugging	24.61760	87.34190	2m L x 1m H	14147
		LBS	24.61680	87.36700	6m L x 2m H	109476
		LBS	24.62830	87.36070	6m L x 2m H	109476
		LBS	24.62790	87.35890	6m L x 2m H	109476
		LBS	24.62630	87.36030	6m L x 2m H	109476
	Kairasol	LBS	24.57160	87.36140	6m L x 2m H	109476
	Liti	LBS	24.57360	87.34170	6m L x 2m H	109476

		LBS	24.58180	87.33821	8m L x 2m H	145560
		Stop Dam	24.57575	87.33569	20m L x 3m H	2060818
		Stop Dam	24.57835	87.33629	20m L x 3m H	2060818
	Pindra	Gully Plugging	24.59160	87.33290	2m L x 1m H	14147
		Gully Plugging	24.59140	87.33304	2m L x 1m H	14147
		Gully Plugging	24.59130	87.33330	2m L x 1m H	14147
		Gully Plugging	24.59130	87.33340	2m L x 1m H	14147
	Sidhbank	LBS	24.57390	87.36210	6m L x 2m H	109476
		LBS	24.57405	87.36203	6m L x 2m H	109476
		LBS	24.58850	87.35320	6m L x 2m H	109476
		LBS	24.58910	87.35480	6m L x 2m H	109476
		LBS	24.58819	87.34577	6m L x 2m H	109476
		LBS	24.58871	87.34917	6m L x 2m H	109476
		LBS	24.58887	87.34788	6m L x 2m H	109476
		LBS	24.58895	87.35683	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.58870	87.35370	20m L x 3m H	100000
LBS (Loose Boulder Structures) – 27 nos.						30,64,104
Gully Plugging – 10 nos.						1,41,470
Earthen Check Dams						-
Stop Dams – 4 nos.						82,43,272
Water Absorption Trenches (WAT) – 2.40 ha						46,420
De-siltation of Existing Stop Dams – 3 nos.						2,75,000
Total (Godda Forest Division) – SMC Works (Year-5)						**1,17,70,266.00**

5.6. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-6 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 21: Site-Specific Physical and Financial Proposals under the Plan in Year-6

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/IV	**Lakrapahari**	Gully Plugging	24.4178	87.3887	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3887	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3888	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3888	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3888	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3888	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3889	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3889	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3886	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3876	2m L x 1m H	14147
		Gully Plugging	24.4177	87.3875	2m L x 1m H	14147
		Gully Plugging	24.4175	87.3875	2m L x 1m H	14147
		Gully Plugging	24.4172	87.3869	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3871	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3871	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3872	2m L x 1m H	14147
		Gully Plugging	24.4179	87.3872	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3874	2m L x 1m H	14147
		Gully Plugging	24.4178	87.3874	2m L x 1m H	14147
		Gully Plugging	24.4181	87.3878	2m L x 1m H	14147
		Gully Plugging	24.4183	87.3877	2m L x 1m H	14147
		Gully Plugging	24.4182	87.3873	2m L x 1m H	14147
		Gully Plugging	24.4181	87.3873	2m L x 1m H	14147
		Gully Plugging	24.4179	87.3858	2m L x 1m H	14147
		Gully Plugging	24.4179	87.3858	2m L x 1m H	14147
		Gully Plugging	24.4179	87.3856	2m L x 1m H	14147
		Gully Plugging	24.4180	87.3855	2m L x 1m H	14147

		Gully Plugging	24.4181	87.3855	2m L x 1m H	14147
		Gully Plugging	24.4185	87.3856	2m L x 1m H	14147
		Gully Plugging	24.4186	87.3857	2m L x 1m H	14147
		LBS	24.4103	87.3824	8m L x 2m H	145560
		LBS	24.4103	87.3819	8m L x 2m H	145560
		LBS	24.4100	87.3803	6m L x 2m H	109476
		LBS	24.4097	87.3796	6m L x 2m H	109476
		LBS	24.4103	87.3840	6m L x 2m H	109476
		LBS	24.4134	87.3850	6m L x 2m H	109476
		LBS	24.4138	87.3851	6m L x 2m H	109476
		LBS	24.4142	87.3856	6m L x 2m H	109476
		LBS	24.4158	87.3863	6m L x 2m H	109476
		LBS	24.416	87.3867	6m L x 2m H	109476
		LBS	24.4159	87.387	6m L x 2m H	109476
		LBS	24.4178	87.3885	6m L x 2m H	109476
		LBS	24.4177	87.3879	6m L x 2m H	109476
		LBS	24.4179	87.3877	6m L x 2m H	109476
		LBS	24.4177	87.3876	6m L x 2m H	109476
		LBS	24.417	87.3875	6m L x 2m H	109476
		LBS	24.4168	87.3873	6m L x 2m H	109476
		LBS	24.4178	87.3876	6m L x 2m H	109476
		LBS	24.4181	87.3874	5m L x 2m H	91435
		LBS	24.4181	87.3874	5m L x 2m H	91435
		LBS	24.4182	87.3841	5m L x 2m H	91435
		Stop Dam	24.4100	87.3809	20m L x 3m H	2060818
		Stop Dam	24.4108	87.3845	20m L x 3m H	2060818
		Stop Dam	24.4147	87.3857	20m L x 3m H	2060818
		Stop Dam	24.4164	87.3873	18m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4124	87.3851	20m L x 3m H	100000
		Stop Dam (De-siltation)	24.4180	87.3884	20m L x 3m H	100000
	Mahuadangal	Earthen Check Dam	24.3723	87.4094	30m L x 3m H	420747
		Earthen Check Dam	24.3746	87.4116	30m L x 3m H	420747
		WAT	24.3718	87.4093	2.00 ha	38684
	Nonadangal	Gully Plugging	24.4251	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4251	87.3752	2m L x 1m H	14147

		Gully Plugging	24.4251	87.3753	2m L x 1m H	14147
		Gully Plugging	24.4252	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3752	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3753	2m L x 1m H	14147
		Gully Plugging	24.4255	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4255	87.375	2m L x 1m H	14147
		Gully Plugging	24.4255	87.375	2m L x 1m H	14147
		Gully Plugging	24.4256	87.375	2m L x 1m H	14147
		Gully Plugging	24.4257	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4258	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4258	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4258	87.3751	2m L x 1m H	14147
		Gully Plugging	24.4258	87.375	2m L x 1m H	14147
		Gully Plugging	24.4258	87.3749	4m L x 1m H	27068
		Gully Plugging	24.4257	87.3749	2m L x 1m H	14147
		Gully Plugging	24.4256	87.3749	2m L x 1m H	14147
		Gully Plugging	24.4256	87.3748	2m L x 1m H	14147
		Gully Plugging	24.4255	87.3749	2m L x 1m H	14147
		Gully Plugging	24.4254	87.3749	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3747	2m L x 1m H	14147
		Gully Plugging	24.4254	87.3748	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3748	2m L x 1m H	14147
		Gully Plugging	24.4253	87.3749	2m L x 1m H	14147
		Gully Plugging	24.4210	87.3771	2m L x 1m H	14147
		Gully Plugging	24.4211	87.3771	2m L x 1m H	14147
		Gully Plugging	24.4212	87.3772	2m L x 1m H	14147
		Gully Plugging	24.4213	87.3773	2m L x 1m H	14147
		Gully Plugging	24.4215	87.3777	2m L x 1m H	14147
		Gully Plugging	24.4208	87.3781	2m L x 1m H	14147
		Gully Plugging	24.4206	87.3787	2m L x 1m H	14147
		Gully Plugging	24.4206	87.3788	2m L x 1m H	14147
		Gully Plugging	24.4206	87.3789	2m L x 1m H	14147
		Gully Plugging	24.4207	87.3791	2m L x 1m H	14147
		Gully Plugging	24.4208	87.3791	2m L x 1m H	14147
		Gully Plugging	24.4208	87.3793	2m L x 1m H	14147

		Gully Plugging	24.4208	87.3793	2m L x 1m H	14147
		Gully Plugging	24.4207	87.3802	2m L x 1m H	14147
		Gully Plugging	24.4211	87.3815	3m L x 1m H	20608
		Gully Plugging	24.4210	87.3815	2m L x 1m H	14147
		Gully Plugging	24.4211	87.3816	2m L x 1m H	14147
		Gully Plugging	24.4210	87.3816	2m L x 1m H	14147
		Gully Plugging	24.4211	87.3819	2m L x 1m H	14147
		Gully Plugging	24.4210	87.382	2m L x 1m H	14147
		Gully Plugging	24.4210	87.3821	2m L x 1m H	14147
		Gully Plugging	24.4211	87.3821	2m L x 1m H	14147
		LBS	24.4191	87.3833	8m L x 2m H	145560
		LBS	24.4190	87.3851	8m L x 2m H	145560
		LBS	24.4250	87.3751	6m L x 2m H	109476
		LBS	24.4204	87.3798	6m L x 2m H	109476
		LBS	24.4203	87.3797	6m L x 2m H	109476
		LBS	24.4205	87.3801	6m L x 2m H	109476
		LBS	24.4205	87.3801	6m L x 2m H	109476
		LBS	24.4206	87.3802	6m L x 2m H	109476
		LBS	24.4207	87.3804	6m L x 2m H	109476
	Phitkoria	Gully Plugging	24.3918	87.3837	2m L x 1m H	14147
		Gully Plugging	24.3917	87.3838	2m L x 1m H	14147
		Gully Plugging	24.3918	87.3838	2m L x 1m H	14147
		Gully Plugging	24.3916	87.3839	2m L x 1m H	14147
		Gully Plugging	24.3915	87.3840	2m L x 1m H	14147
		Gully Plugging	24.3915	87.3841	2m L x 1m H	14147
		Gully Plugging	24.3910	87.3845	2m L x 1m H	14147
		Gully Plugging	24.3910	87.3845	2m L x 1m H	14147
		Gully Plugging	24.3915	87.3837	2m L x 1m H	14147
		Gully Plugging	24.3914	87.3868	2m L x 1m H	14147
		Gully Plugging	24.3913	87.3871	2m L x 1m H	14147
		Gully Plugging	24.3919	87.3856	2m L x 1m H	14147
		Gully Plugging	24.3919	87.3856	2m L x 1m H	14147
		LBS	24.3909	87.3846	8m L x 2m H	145560
		LBS	24.3910	87.3853	6m L x 2m H	109476
		LBS	24.3907	87.3855	6m L x 2m H	109476

		LBS	24.3911	87.3861	6m L x 2m H	109476
		LBS	24.3912	87.3865	6m L x 2m H	109476
		LBS	24.3912	87.3873	6m L x 2m H	109476
		LBS	24.3789	87.3911	10m L x 2m H	181643
		LBS	24.3786	87.3910	6m L x 2m H	109476
		LBS	24.3779	87.3910	8m L x 2m H	145560
		LBS	24.3797	87.3911	6m L x 2m H	109476
		LBS	24.3833	87.3908	6m L x 2m H	109476
		LBS	24.3837	87.3903	6m L x 2m H	109476
		LBS	24.3844	87.3898	8m L x 2m H	145560
		LBS	24.3881	87.3885	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.3800	87.3916	15m L x 3m H	100000
		LBS	24.3892	87.3884	6m L x 2m H	109476
		LBS	24.3908	87.3867	8m L x 2m H	145560
		LBS	24.3911	87.3861	8m L x 2m H	145560
		LBS	24.3928	87.3878	6m L x 2m H	109476
		Stop Dam	24.3792	87.3908	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.3908	87.3878	20m L x 3m H	100000
		Stop Dam (De-siltation)	24.3851	87.3895	15m L x 3m H	100000
	Raibandh	Gully Plugging	24.3917	87.3714	2m L x 1m H	14147
		LBS	24.3891	87.3669	6m L x 2m H	109476
		Gully Plugging	24.3887	87.3716	2m L x 1m H	14147
		Gully Plugging	24.3882	87.3715	2m L x 1m H	14147
		Gully Plugging	24.3924	87.3726	2m L x 1m H	14147
		WAT	24.3891	87.3713	6.00 ha	116052
	Ratanpur	LBS	24.3960	87.4165	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.3948	87.4155	15m L x 3m H	100000
	R. F.	LBS	24.3976	87.3804	8m L x 2m H	145560
		Gully Plugging	24.3814	87.4100	2m L x 1m H	14147
		Gully Plugging	24.3811	87.4097	2m L x 1m H	14147
		Gully Plugging	24.3808	87.4094	2m L x 1m H	14147
		Gully Plugging	24.3806	87.4092	3m L x 1m H	20608
		Gully Plugging	24.3931	87.3785	2m L x 1m H	14147
		Gully Plugging	24.3928	87.3783	2m L x 1m H	14147
		Gully Plugging	24.3935	87.3785	2m L x 1m H	14147

		LBS	24.3818	87.4101	6m L x 2m H	109476
	Sultanabad	Gully Plugging	24.4027	87.3750	2m L x 1m H	14147
		Gully Plugging	24.4019	87.3748	2m L x 1m H	14147
		Gully Plugging	24.4046	87.3771	2m L x 1m H	14147
		Gully Plugging	24.4056	87.3751	2m L x 1m H	14147
		WAT	24.4012	87.3734	1.60 ha	30947
		WAT	24.4035	87.3750	8.00 ha	154736
	Tilatanr	WAT	24.3953	87.393	0.80 ha	15474
LBS (Loose Boulder Structures) – 52 nos.						60,71,636
Gully Plugging – 105 nos.						15,11,278
Earthen Check Dams – 2 nos.						8,41,494
Stop Dams – 5 nos.						99,90,112
Water Absorption Trenches (WAT) – 18.40 ha						3,55,893
De-siltation of Existing Stop Dams – 6 nos.						6,00,000
Total (Dumka Forest Division) – SMC Works (Year-6)						**1,93,70,413.00**

5.7. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-7 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 22: Site-Specific Physical and Financial Proposals under the Plan in Year-7

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/V	**Amtala**	Gully Plugging	24.3871	87.4726	2m L x 1m H	14147
		LBS	24.3864	87.4722	6m L x 2m H	109476
		LBS	24.3866	87.4721	6m L x 2m H	109476
		LBS	24.3867	87.4721	6m L x 2m H	109476
		LBS	24.3867	87.4722	6m L x 2m H	109476
		LBS	24.3870	87.4725	6m L x 2m H	109476
	Bandubera	LBS	24.3777	87.4871	6m L x 2m H	109476
	Chaudhari	Gully Plugging	24.3789	87.4569	2m L x 1m H	14147
		Gully Plugging	24.3789	87.4570	2m L x 1m H	14147
		LBS	24.3792	87.4567	6m L x 2m H	109476
		WAT	24.3804	87.4568	1.20 ha	23210
	Dalahi	Gully Plugging	24.3764	87.4827	2m L x 1m H	14147
		Gully Plugging	24.3754	87.4820	2m L x 1m H	14147
		WAT	24.3754	87.4821	2.40 ha	46421
	Dudhia	Gully Plugging	24.3740	87.4499	2m L x 1m H	14147
		Gully Plugging	24.3743	87.4497	2m L x 1m H	14147
		LBS	24.3742	87.4497	6m L x 2m H	109476
		LBS	24.3739	87.4492	6m L x 2m H	109476
		LBS	24.3744	87.4503	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.3852	87.4497	15m L x 3m H	100000
	Gamrah	Earthen Check Dam	24.3556	87.4667	140m L x 3m H	1571760
	Jamni	Gully Plugging	24.3714	87.4666	2m L x 1m H	14147
		Gully Plugging	24.3714	87.4666	2m L x 1m H	14147
		Gully Plugging	24.3714	87.4667	2m L x 1m H	14147
		Gully Plugging	24.3713	87.4668	2m L x 1m H	14147
		Gully Plugging	24.3713	87.4669	2m L x 1m H	14147
		WAT	24.3710	87.4664	0.80 ha	15474

	Katratanr	Gully Plugging	24.3884	87.4563	2m L x 1m H	14147
		Gully Plugging	24.3884	87.4563	2m L x 1m H	14147
		Gully Plugging	24.3883	87.4564	2m L x 1m H	14147
		Gully Plugging	24.3883	87.4567	2m L x 1m H	14147
		Gully Plugging	24.3886	87.4567	2m L x 1m H	14147
		LBS	24.3914	87.4566	6m L x 2m H	109476
	Manjhdiha	LBS	24.3681	87.4792	6m L x 2m H	109476
		Stop Dam	24.3688	87.4775	15m L x 3m H	1836548
		WAT	24.3669	87.4797	1.20 ha	23210
	Nakti	Earthen Check Dam	24.3723	87.4371	50m L x 3m H	630022
		Gully Plugging	24.3726	87.4379	2m L x 1m H	14147
		Gully Plugging	24.3728	87.4381	2m L x 1m H	14147
		Gully Plugging	24.3730	87.4381	2m L x 1m H	14147
	Nijhor	Earthen Check Dam	24.3429	87.4656	220m x 3m H	2408859
		LBS	24.3678	87.4635	6m L x 2m H	109476
	Salaipahari	Gully Plugging	24.3887	87.4827	2m L x 1m H	14147
		Gully Plugging	24.3890	87.4827	2m L x 1m H	14147
		WAT	24.3890	87.4827	4.00 ha	77368
	Taldih	WAT	24.3782	87.492	4.00 ha	77368
	Talpahari	Gully Plugging	24.3872	87.4572	2m L x 1m H	14147
		Gully Plugging	24.3875	87.4572	2m L x 1m H	14147
	Telgani	Gully Plugging	24.3637	87.4460	2m L x 1m H	14147
		Gully Plugging	24.3638	87.4461	2m L x 1m H	14147
		Gully Plugging	24.3638	87.4458	2m L x 1m H	14147
		LBS	24.3635	87.4472	6m L x 2m H	109476
		LBS	24.3635	87.4460	6m L x 2m H	109476
		LBS	24.3642	87.4447	6m L x 2m H	109476
		Stop Dam	24.3574	87.4484	30m L x 3m H	2509359
	Ukhrapahari	Earthen Check Dam	24.3727	87.4812	20m L x 3m H	316110
		LBS	24.3704	87.4671	6m L x 2m H	109476
		LBS	24.3706	87.4678	6m L x 2m H	109476
		LBS	24.3722	87.4678	8m L x 2m H	145560
		LBS	24.3733	87.4675	6m L x 2m H	109476
		Stop Dam	24.3699	87.4704	18m L x 3m H	1971110
					LBS (Loose Boulder Structures) – 20 nos.	22,25,604

Gully Plugging – 27 nos.	3,81,969
Earthen Check Dams – 4 nos.	49,26,751
Stop Dams – 3 nos.	63,17,017
Water Absorption Trenches (WAT) – 13.60 ha	2,63,051
De-siltation of Existing Stop Dams – 1 no.	1,00,000
Total (Dumka Forest Division) – SMC Works (Year-7)	**1,42,14,392.00**

5.8. SITE-SPECIFIC PROPOSALS UNDER THE PLAN FOR YEAR-8 (ACTIVITY HEAD: SOIL & MOISTURE CONSERVATION)

Table 23: Site-Specific Physical and Financial Proposals under the Plan in Year-8

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/CAT/VI	**Amarpani**	LBS	24.4088	87.5259	6m L x 2m H	109476
		LBS	24.4066	87.5250	6m L x 2m H	109476
		LBS	24.4053	87.5248	6m L x 2m H	109476
		LBS	24.4042	87.5245	6m L x 2m H	109476
	Banspahari	Earthen Check Dam	24.4184	87.5287	50m L x 3m H	630022
		Stop Dam (De-siltation)	24.4108	87.5210	30m L x 3m H	100000
		Stop Dam (De-siltation)	24.4089	87.5228	30m L x 3m H	100000
		Stop Dam (De-siltation)	24.4131	87.5191	18m L x 3m H	100000
	Barabathan	Earthen Check Dam	24.4081	87.5570	20m L x 3m H	316110
	Barapathar	Gully Plugging	24.3752	87.5305	2m L x 1m H	14147
	Bengduba	LBS	24.4056	87.5639	6m L x 2m H	109476
	Bhalki	LBS	24.4378	87.5615	5m L x 2m H	91435
		LBS	24.4394	87.5654	12m L x 2m H	217726
		LBS	24.4399	87.5667	6m L x 2m H	109476
	Bhelaghati	LBS	24.3900	87.5044	8m L x 2m H	145560
	Chhota Bathanpahari	LBS	24.4077	87.5484	6m L x 2m H	109476
		LBS	24.4076	87.5483	6m L x 2m H	109476
		LBS	24.4069	87.5500	6m L x 2m H	109476
	Chhota Tetumath	Gully Plugging	24.3575	87.5008	2m L x 1m H	14147
		Gully Plugging	24.3572	87.5009	2m L x 1m H	14147
		Gully Plugging	24.3575	87.5011	2m L x 1m H	14147
		LBS	24.3632	87.4957	6m L x 2m H	109476
	Chirapathar	Gully Plugging	24.3706	87.5047	2m L x 1m H	14147
		LBS	24.3803	87.5158	6m L x 2m H	109476
		LBS	24.3784	87.5149	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.3772	87.5141	18m x 3m H	100000
		Stop Dam (De-siltation)	24.3751	87.5111	18m x 3m H	100000

	Duaria	Stop Dam	24.3981	87.5089	25m L x 3m H	2280495
		Stop Dam	24.3953	87.5147	25m L x 3m H	2280495
		Stop Dam (De-siltation)	24.3986	87.5210	30m L x 3m H	100000
	Dumariya	Earthen Check Dam	24.4006	87.5331	20m L x 3m H	316110
		Earthen Check Dam	24.4003	87.5353	20m L x 3m H	316110
		Stop Dam (De-siltation)	24.4027	87.5253	20m L x 3m H	
		WAT	24.4017	87.5313	4.00 ha	77368
	Gogajor	WAT	24.4282	87.5507	1.20 ha	23210
	Karipahari	LBS	24.3994	87.5699	6m L x 2m H	109476
		LBS	24.3993	87.5694	6m L x 2m H	109476
	Kolajora	Gully Plugging	24.4078	87.5469	2m L x 1m H	14147
	Mahuala	Earthen Check Dam	24.3978	87.4919	70m L x 3m H	839297
		Gully Plugging	24.3998	87.5020	2m L x 1m H	14147
		Gully Plugging	24.3997	87.5026	2m L x 1m H	14147
		Gully Plugging	24.3996	87.5027	2m L x 1m H	14147
		Gully Plugging	24.3997	87.5028	2m L x 1m H	14147
		Gully Plugging	24.3995	87.5048	2m L x 1m H	14147
		Gully Plugging	24.3993	87.5047	2m L x 1m H	14147
		Gully Plugging	24.3993	87.5047	2m L x 1m H	14147
		LBS	24.3998	87.5031	5m L x 2m H	91435
		LBS	24.3931	87.5067	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.3935	87.5081	20m L x 3m H	100000
	Murosal	Gully Plugging	24.4147	87.5339	2m L x 1m H	14147
		Gully Plugging	24.4147	87.5342	2m L x 1m H	14147
		Gully Plugging	24.4148	87.5344	2m L x 1m H	14147
	Roldih	Gully Plugging	24.3817	87.5183	2m L x 1m H	14147
		Gully Plugging	24.3811	87.5177	2m L x 1m H	14147
		LBS	24.3845	87.5204	8m H x 2m H	145560
		LBS	24.3815	87.5181	6m H x 2m H	109476
		Stop Dam	24.3858	87.5217	18m L x 3m H	1971110
	Sidpahari	Gully Plugging	24.3655	87.5125	2m L x 1m H	14147
		Gully Plugging	24.3659	87.5112	2m L x 1m H	14147
	Surjadih	Earthen Check Dam	24.3891	87.5441	130m L x 3m H	1467122
	Tengjor	Earthen Check Dam	24.3953	87.5263	85m L x 3m H	996253
		Gully Plugging	24.3975	87.5217	2m L x 1m H	14147

		Gully Plugging	24.3981	87.5221	3m L x 1m H	20608
		LBS	24.3989	87.5222	8m L x 2m H	145560
LBS (Loose Boulder Structures) – 22 nos.						26,24,976
Gully Plugging – 22 nos.						3,17,695
Earthen Check Dams – 7 nos.						48,81,024
Stop Dams – 3 nos.						65,32,100
Water Absorption Trenches (WAT) – 5.20 ha						1,00,578
De-siltation of Existing Stop Dams – 8 nos.						7,00,000
Total (Dumka Forest Division) – SMC Works (Year-8)						**1,51,56,373.00**

5.9. ABSTRACT OF EXPENDITURES UNDER THE PLAN – DUMKA FOREST DIVISION

Table 24: Year-wise Financial Forecast of the CAT Plan – Dumka Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in Lakh)
		Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year 10	
A.	**Natural Resource Management/Soil and Moisture Conservation Measures – Refer Para 5.2.1.**											
A.1.	Strengthening of Forest Protection Network (Seed Money to 36 JFMCs*****) @ Rs. 5.00 Lakh/JFMC – 6 JFMCs/year	30.00	30.00	30.00	30.00	30.00	25.00	-	-	-	-	175.00
A.2.	LBS (Loose Boulder Structures)	87.20	47.77	60.37	93.56	31.74	60.72	22.26	26.25	-	-	429.87
A.3.	Gully Plugging	2.97	1.56	5.23	10.29	6.41	15.11	3.82	3.18	-	-	48.57
A.4.	Earthen Check Dams	15.76	-	23.13	41.94	41.44	8.41	49.27	48.81	-	-	228.76
A.5.	Stop Dams	140.62	220.41	145.56	106.58	127.10	99.90	63.17	65.32	-	-	968.66
A.6.	Water Absorption Trenches (WAT)	7.08	-	3.02	3.40	17.76	3.56	2.63	1.01	-	-	38.46
A.7.	De-siltation of Existing Stop Dams	5.75	7.00	8.75	3.75	4.00	6.00	1.00	7.00	-	-	43.25
A.8.	Contour trenches (200 ha) – 50 ha each in Year-1,2 &3. @ 55md/ha	11.03	11.03	11.03	11.03	-	-	-	-	-	-	44.12
											Total (NRM/SMC)	**1976.69**
B.	**Capacity Building of Frontline Forest Staff – Refer Para 5.2.2.**	3.00	2.50	2.50	2.50	2.50	2.50	2.50	2.00	2.00	-	**22.00**
C.	**Awareness Development Programmes – Refer Para 5.2.3.**	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	**20.00**
D.	**Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption – Refer Para 5.2.4. & 5.2.5.**	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	-	-	**80.00**
E.	**Monitoring and Evaluation – Refer Para 5.2.6.**	0.50	1.00	1.50	1.50	1.50	1.50	1.00	0.50	0.50	0.50	**10.00**
F.	**Infrastructural Strengthening – Manpower, Mobility (Purchase/hire), Purchase of equipment/software/drones etc.; Development of appropriate IT applications for M&E etc.; Engagement of IT/GIS professionals etc. – Refer Para 5.2.7.**	25.00	20.00	10.00	10.00	10.00	10.00	10.00	10.00	5.00	5.00	**115.00**
G.	**Administrative Cost**	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	**50.00**
H.	**Total**	345.91	358.27	318.09	331.55	289.45	249.70	172.65	181.07	14.50	12.50	**2273.69**
I.	**Cost Escalation Provision @ 20%**	69.18	71.65	63.62	66.31	57.89	49.94	34.53	36.21	2.90	2.50	**454.73**
Grand Total (Dumka Forest Division)		**415.09**	**429.92**	**381.71**	**397.86**	**347.34**	**299.64**	**207.18**	**217.28**	**17.40**	**15.00**	**2728.42**

***A total of 70 JFMCs are registered in the Impact Area falling under Dumka Forest Division. 35 JFMCs, which have substantial forest area under control, are proposed to be funded with Seed money under the instant plan. Rest of 36 JFMCs are being proposed to be funded through the Wildlife Management Plan.**

5.10. ABSTRACT OF EXPENDITURES UNDER THE PLAN – GODDA FOREST DIVISION

Table 25: Year-wise Financial Forecast of the CAT Plan – Godda Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in Lakh)
		Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year 10	
A.	**Natural Resource Management/Soil and Moisture Conservation Measures – Refer Para 5.2.1.**											
A.1.	Strengthening of Forest Protection Network (Seed Money to 13 JFMCs**) @ Rs. 5.00 Lakh/JFMC	20.00	20.00	20.00	-	-	-	-	-	-	-	60.00
A.2.	LBS (Loose Boulder Structures)	113.86	32.47	28.40	42.91	30.64	-	-	-	-	-	248.28
A.3.	Gully Plugging	9.57	1.70	0.99	9.40	1.41	-	-	-	-	-	23.07
A.4.	Earthen Check Dams	-	6.30	-	11.58	-	-	-	-	-	-	17.88
A.5.	Stop Dams	-	81.49	133.00	99.00	82.43	-	-	-	-	-	395.92
	Water Absorption Trenches (WAT)	0.62	-	0.39	0.43	0.46	-	-	-	-	-	1.90
A.6.	De-siltation of Existing Stop Dams	0.75	1.75	0.75	1.00	2.75	-	-	-	-	-	7.00
A.7.	Contour trenches (100 ha) in Year-1 @ 55md/ha	11.03	11.03	-	-	-	-	-		-	-	22.06
											Total (NRM/SMC)	**776.11**
B.	**Capacity Building of Frontline Forest Staff – Refer Para 5.2.2.**	3.00	2.50	2.50	2.50	2.00	-	-	-	-	-	**12.50**
C.	**Awareness Development Programmes – Refer Para 5.2.3.**	2.00	2.00	2.00	2.00	2.00						**10.00**
D.	**Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption – Refer Para 5.2.4. & 5.2.5.**	5.00	5.00	5.00	5.00	5.00	-	-	--	-	-	**25.00**
E.	**Monitoring and Evaluation – Refer Para 5.2.6.**	0.50	1.00	1.50	1.50	1.50	-	-	-	-	-	**6.00**
F.	**Infrastructural Strengthening – Manpower, Mobility (Purchase/hire), Purchase of equipment/software/drones etc.; Development of appropriate IT applications for M&E etc.; Engagement of IT/GIS professionals etc. – Refer Para 5.2.7.**	15.00	10.00	10.00	10.00	10.00	-	-	-	-	-	**55.00**
G.	**Administrative Cost**	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	**15.00**
H.	**Total**	184.33	178.24	207.53	188.33	141.19	-	-	-	-	-	**899.61**
I.	**Cost Escalation Provision @ 20%**	36.87	35.65	41.52	37.67	28.24	-	-	-	-	-	**179.95**
Grand Total (Godda Forest Division)		**221.20**	**213.89**	**249.04**	**226.00**	**169.43**	**-**	**-**	**-**	**-**	**-**	**1079.56**

****A total of 24 JFMCs are registered in the Impact Area falling under Godda Forest Division. 12 JFMCs, which have substantial forest area under control, are proposed to be funded with Seed money under the instant plan.**

5.11. ABSTRACT OF EXPENDITURES UNDER THE CAT PLAN

Table 26: Abstract of Financial Forecast under the CAT Plan

Sl. No.	Activity Head	Dumka Forest Division (Rs. in Lakh)	Godda Forest Division (Rs. in Lakh)	Total (Rs. in Lakh)
1.	Natural Resource Management/ Soil and Moisture Conservation Measures	**1976.69**	**776.11**	**2752.80**
2.	Capacity Building of Frontline Forest Staff	**22.00**	**12.50**	**34.50**
3.	Awareness Development Programmes	**20.00**	**10.00**	**30.00**
4.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	**80.00**	**25.00**	**105.00**
5.	Monitoring and Evaluation	**10.00**	**6.00**	**16.00**
6.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	**115.00**	**55.00**	**170.00**
7.	Administrative Cost	**50.00**	**15.00**	**65.00**
8.	Total	**2273.69**	**899.61**	**3173.30**
9.	Cost Escalation Provision @ 20%	**454.73**	**179.95**	**634.68**
10.	**Grand Total**	**2728.42**	**1079.56**	**3807.98**

Cost to the User Agency towards implementation of the CAT Plan = Rs. 3807.98 Lakh

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5.12. NOTABLE POINTS REGARDING IMPLEMENTATION OF THE PLAN

Following points are worth noting while implementing the Plan:

- The coordinates of the structures have been provided after gross survey of the area. However, during implementation of the Plan, a situation may arise where the implementing agency may take a view to change the location and specification of a particular structure as per need and convenience of the implementing agency. This may be allowed by the authorities with due care and diligence.
- The Plan may be revised every three years depending upon the feedback of the implementing agency and taking into consideration the properly assessed gap between the expected outcome and the actual results. Though it is somewhat difficult to assess the gaps in an objective manner, the experience of the field staff and villagers' views may come in handy at times. As for the cost of revision of the CAT Plan, the User Agency shall submit an undertaking to the respective DFOs to the effect that the cost of revision of the Plan shall be borne by them.
- Though provision of a flat rate of 20% has been made towards cost escalation in the Plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the respective DFOs to the effect that they will deposit extra cost of the Plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.
- The Plan has been formulated taking into consideration the available Schedule of Rates, copies of which are being annexed with the Plan. Since the Plan is expected to begin its journey not any time before the next financial year i.e., 2026-27 when it is expected to be included in the State APO (CAMPA), cost escalation of 20% has been provided for, against the estimates for Year 1 too.
- The Plan should not be taken as the last word. The DFOs may be given sufficient amplitude to change the locations, specifications and numbers of the structural interventions. The Divisional Forest administration may devise a framework in consultation with superior authorities so as to facilitate the implementation of the Plan considering all the site-specific technical as well as community demands.
- While estimating the cost of various activities under the Plan, departmental schedule of rates has been followed. However, these are based on some broad assumptions. The

implementing agency is expected to prepare site-specific estimates considering the rates approved by the Department against specific items required for a specific activity.

- For successful implementation of the Plan, it would be desirable that a comprehensive APO is prepared after the funds are received. It is a common practice that the amount estimated in the instant Plan for a specific year is not received by the implementing agency in full. Therefore, prioritisation of works would be an exercise which may call for due care and diligence in the interest of meeting the objectives under the Plan.

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6. REFERENCES

1. https://www.censusindia.co.in/district/
2. https://vill.co.in/jharkhand
3. https://villageinfo.in
4. https://cgwb.gov.in
5. https://bhuvan.nrsc.gov.in/home/index.php
6. https://jsac.jharkhand.gov.in
7. https://pmksy.gov.in
8. https://naip.icar.gov.in/download/77735/AFC_final.pdf/AFC_final.pdf

ANNEXURES

Annexure 1: Stage-I Forest Clearance Order issued in favour of Pachhwara South Coal Block Project

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-3464 V.P. dated 29.11.2022 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the propcsal of the State Government & on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand subject to fulfilment of the following conditions:

i. Legal status of the diverted forest land shall remain unchanged;

ii. **Compensatory Afforestation:**

a. *Details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion including the area for safety zone/green belt shall be submitted by the State Government along with the compliance report of the Stage-I approval.*
b. *The non-forest land to be identified shall be transferred and mutated in favour*

of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval.

c. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

iii. **Net Present Value:**

a. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

b. At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

iv. *Trees should be felled in a phased manner and when become absolutely necessary and under strict supervision of State Forest Department and wherever feasible suitable species should be transplanted.*

v. *The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.*

vi. *As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*

vii. *Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost.*

viii. *A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*

ix. *User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be*

repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

x. *As recommended by the State, the Water security plan prepared by the group of experts shall be adhered to.*

xi. The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;

xii. All the funds received from the user agency under the project shall be transferred/depsoted in CAMPA account only through **e-portal** (https://parivesh.nic.in/); Amount depsoted through other mode will not be accepted as compliance of the Stage-I clearance;

xiii. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent Reclamation Plan as per the approved Mining Plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

xiv. The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

xv. The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

xvi. Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:

a. User agency shall ensure demarcation of safety zone (7.5 meter strip all

along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the State Forest Department;

b. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
c. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department; and
d. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

xvii. Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department:

a. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;
b. Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved Plan/scheme;
c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;
d. Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and
e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

xviii. The validity of approval granted under the Adhiniyam shall be for a period co-terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;

xx. The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

xxi. The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;

xxii. Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

xxiv. The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and

xxv. Under no circumstances, approval granted for the use of forest land for underground mining, shall subsequently be converted to opencast mining operations.

xxvi. The R&R Plan shall be implemented as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones;

xxvii. The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled;

xxviii. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

xxix. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

xxx. No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

xxxi. The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;\The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;

xxxii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

xxxiii. No damage to the flora and fauna of the adjoining area shall be caused;

xxxiv. The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;

xxxv. The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

xxxvi. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency; and

xxxvii. Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 as issued by this Ministry's letter dated 29.12.2023;

xxxviii. The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Signed by
Dheeraj Mittal
Date: 18-09-2024 14:10:45

Yours sincerely,

(Dr. Dheeraj Mittal)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi for uploading on PARIVESH portal.

Annexure 2: Estimate – Loose Boulder Structure (5m Length x 2m Height)

LOOSE BOULDER STRUCTURE 5m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	5	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	5.5		6.05		33.275	9.74	Sq. Mt.	₹ 323.93
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	5	1.50	5.50	2.00	35.00	1640.17	Cu.Mt.	₹ 57,405.81
		Sub Total								**58932.74**
		Less Total of MR /Analysis								-58608.81
		Sub Total of SOR (A)								323.93
		Less-CP @ 9.09% of (A)						323.93	9.09%	-29.45
		Sub Total(B)								294.49
		Total of MR /Analysis								58608.81
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					35.00	878.25	Cu.Mt.	₹ 30,738.79
		Sub Total(C)								**89642.08**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 89,642.08
		Add contengency & consultancy @ 2%								₹ 1,792.84
		Grand Total								₹ 91,434.92
		Say								₹ 91,435.00

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Annexure 3: Estimate – Loose Boulder Structure (6m Length x 2m Height)

LOOSE BOULDER STRUCTURE 6m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	6	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Layout					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	6.6		6.05		39.93	9.74	Sq. Mt.	₹ 388.72
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	6	1.50	5.50	2.00	42.00	1640.17	Cu.Mt.	₹ 68,886.97
		Sub Total								**70478.69**
		Less Total of MR /Analysis								-70089.97
		Sub Total of SOR (A)								388.72
		Less-CP @ 9.09% of (A)						388.72	9.09%	-35.33
		Sub Total(B)								353.38
		Total of MR /Analysis								70089.97
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (1.5Km)					42.00	878.25	Cu.Mt.	₹ 36,886.54
		Sub Total(C)								**107329.90**
		Add due to increase in wagerate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ **1,07,329.90**
		Add contengency & consultancy @ 2%								₹ **2,146.60**
		Grand Total								₹ **1,09,476.50**
		Say								₹ **1,09,476.00**

Annexure 4: Estimate – Loose Boulder Structure (8m Length x 2m Height)

LOOSE BOULDER STRUCTURE 8m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	8	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	8.8		6.05		53.24	9.74	Sq. Mt.	₹ 518.29
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	8	1.50	5.50	2.00	56.00	1640.17	Cu.Mt.	₹ 91,849.30
		Sub Total								**93570.59**
		Less Total of MR /Analysis								-93052.30
		Sub Total of SOR (A)								518.29
		Less-CP @ 9.09% of (A)						518.29	9.09%	-47.11
		Sub Total(B)								471.18
		Total of MR /Analysis								93052.30
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					56.00	878.25	Cu.Mt.	₹ 49,182.06
		Sub Total(C)								**142705.53**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 1,42,705.53
		Add contengency & consultancy @ 2%								₹ 2,854.11
		Grand Total								₹ 1,45,559.64
		Say								₹ 1,45,560.00

Annexure 5: Estimate – Loose Boulder Structure (10m Length x 2m Height)

LOOSE BOULDER STRUCTURE 10m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	10	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height / Avr.] in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	11		6.05		66.55	9.74	Sq. Mt.	₹ 647.86
3	5.6.4 [W.R.D.]	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	10	1.50	5.50	2.00	70.00	1640.17	Cu.Mt.	₹ 1,14,811.62
		Sub Total								**116662.48**
		Less Total of MR /Analysis								-116014.62
		Sub Total of SOR (A)								647.86
		Less CP @ 9.09% of (A)						647.86	9.09%	-58.89
		Sub Total(B)								588.97
		Total of MR /Analysis								116014.62
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					70.00	878.25	Cu.Mt.	₹ 61,477.57
		Sub Total(C)								**178081.16**
		Add due to increase in wage rate from 401.00/-to ...../- @ .....%								
		Sub Total(D)								₹ 1,78,081.16
		Add contengency & consultancy @ 2%								₹ 3,561.62
		Grand Total								₹ 1,81,642.79
		Say								₹ 1,81,643.00

Annexure 6: Estimate – Loose Boulder Structure (12m Length x 2m Height)

LOOSE BOULDER STRUCTURE 12m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	12	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	13.2		6.05		79.86	9.74	Sq. Mt.	₹ 777.44
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	12	1.50	5.50	2.00	84.00	1640.17	Cu.Mt.	₹ 1,37,773.94
		Sub Total								**139754.38**
		Less Total of MR /Analysis								-138976.94
		Sub Total of SOR (A)								777.44
		Less-CP @ 9.09% of (A)						777.44	9.09%	-70.67
		Sub Total(B)								706.77
		Total of MR /Analysis								138976.94
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					84.00	878.25	Cu.Mt.	₹ 73,773.08
		Sub Total(C)								**213456.80**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ **2,13,456.80**
		Add contengency & consultancy @ 2%								₹ **4,269.14**
		Grand Total								₹ **2,17,725.93**
		Say								₹ **2,17,726.00**

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Annexure 7: Estimate – Gully Plugging (2m Length x 1m Height)

GULLY PLUGGING 2m L x 1m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	2	Mt.			Wage Rate			₹ 401.00
		Height of Structure	1	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottom Width of Structure	3.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Layout					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	2.2		3.85		8.47	9.74	Sq. Mt.	₹ 82.46
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel trenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	2	1.50	3.50	1.00	5.00	1640.17	Cu.Mt.	₹ 8,200.83
		Sub Total								**9486.29**
		Less Total of MR /Analysis								-9403.83
		Sub Total of SOR (A)								82.46
		Less CP @ 9.09% of (A)						82.46	9.09%	-7.50
		Sub Total(B)								74.96
		Total of MR /Analysis								9403.83
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					5.00	878.25	Cu.Mt.	₹ 4,391.26
		Sub Total(C)								**13870.05**
		Add due to increase in wage rate from 401/-to ...../-@ .....%								
		Sub Total(D)								₹ 13,870.05
		Add contengency & consultancy @ 2%								₹ 277.40
		Grand Total								₹ 14,147.45
		Say								₹ 14,147.00

Annexure 8: Estimate – Gully Plugging (3m Length x 1m Height)

GULLY PLUGGING 3m L x 1m H

BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS

	Length of Structure	3	Mt.		Wage Rate		₹	401.00
	Height of Structure	1	Mt.					
	Top Width of Structure	1.5	Mt.					
	Bottom Width of Structure	3.50	Mt.					
	Side Slope	1:01						

Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height / Avr.] in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	3.3		3.85		12.705	9.74	Sq. Mt.	₹ 123.68
3	5.6.4 [W.R.D.]	Supplying laying boulder in rock toe, heel trenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	3	1.50	3.50	1.00	7.50	1640.17	Cu.Mt.	₹ 12,301.25
		Sub Total								**13627.93**
		Less Total of MR /Analysis								-13504.25
		Sub Total of SOR (A)								123.68
		Less-CP @ 9.09% of (A)						123.68	9.09%	-11.24
		Sub Total (B)								112.44
		Total of MR /Analysis								13504.25
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					7.50	878.25	Cu.Mt.	₹ 6,586.88
		Sub Total(C)								**20203.57**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total (D)								₹ 20,203.57
		Add contengency & consultancy @ 2%								₹ 404.07
		Grand Total								₹ 20,607.64
		Say								₹ 20,608.00

Annexure 9: Estimate – Gully Plugging (4m Length x 1m Height)

GULLY PLUGGING 4m L x 1m H

BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS

		Length of Structure	4	Mt.			Wage Rate			₹	401.00
		Height of Structure	1	Mt.							
		Top Width of Structure	1.5	Mt.							
		Bottam Width of Structure	3.50	Mt.							
		Side Slope	1:01								

Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit		Amount
1		Survey & Lay out					3	401	M.D.	₹	1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	4.4		3.85		16.94	9.74	Sq. Mt.	₹	164.91
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	4	1.50	3.50	1.00	10.00	1640.17	Cu.Mt.	₹	16,401.66
		Sub Total									**17769.57**
		Less Total of MR /Analysis									-17604.66
		Sub Total of SOR (A)									164.91
		Less-CP @ 9.09% of (A)						164.91	9.09%		-14.99
		Sub Total(B)									149.92
		Total of MR /Analysis									17604.66
4		**Carriage of Materials with loading & unloading:-**									
		Boulder (15Km)					10.00	878.25	Cu.Mt.	₹	8,782.51
		Sub Total(C)									**26537.09**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%									
		Sub Total(D)								₹	26,537.09
		Add contergency & consultancy @ 2%								₹	530.74
		Grand Total								₹	27,067.83
		Say								₹	27,068.00

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Annexure 10: Estimate – Stop Dam (15m Length x 3m Height)

STOP DAM 15m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	15	Mt.	Wall Column Width (foundati			0.6	Mt.	
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth			1.5	Mt.	
		Length of Appron (Avr.)	7.5	Mt.	ApproнFoundationDepth			1.2	Mt.	
		Length of Toe wall	15	Mt.	FoundationLowerP.C.C.			0.15	Mt.	
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary			0.9	Mt.	
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.			0.3	Mt.	
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height			4.5	Mt.	Wage Rate
		Wing wall Length	2	Mt.	Free Board			1.5	Mt.	₹ 401.00
		Weir Slope	1:01		Top Width of Weir			0.45	Mt.	
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	30	15		450	Sq.Mt.	9.74	4380.75
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	15.00	0.60	1.50	13.50			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	15.00	0.60	1.20	10.80			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**112.50**	**Cum**	**240.86**	**27096.30**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	15.00	0.60	0.15	5.40			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Sidewall	4	7.50	0.60	0.15	2.70			
		Wingwall	2	2.00	0.60	0.15	0.36			
		Toewall	1	15.00	0.60	0.15	1.35			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**27.05**	**Cum**	**4120.82**	**111447.58**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	15.00	0.60	0.30	10.80			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Sidewall	4	7.50	0.60	0.30	5.40			
		Wingwall	2	2.00	0.60	0.30	0.72			
		Toewall	1	15.00	0.60	0.30	2.70			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**49.82**	**Cum**	**4120.82**	**205315.74**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per speification and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	15.00		0.30	36.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Sidewall	8	7.50		0.30	18.00			
		Wingwall	4	2.00		0.30	2.40			
		Toewall	2	15.00		0.30	9.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**264.36**	**Sqm**	**459.83**	**121561.45**

6	5.5.4 (B.C.D.)	Providing Tor steel rainforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	20.34	140.00	2847.60				
		Columns	KG	27.22	160.00	4354.56				
						7406.28				
		8mm dia TMT Fe 500					**2221.88**	**Kg.**	**91.65**	**203625.50**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1110.94**	**Kg.**	**90.31**	**100324.94**
	(iii)	12mm dia TMT Fe 502					**4073.45**	**Kg.**	**88.97**	**362402.89**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall / Anti seepage wall	1	15.00	1.50	3.00	67.50			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wal	1	15.00	0.45	0.45	3.04			
		Total					**127.78**	**Cum**	**3013.65**	**385076.41**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	15.00		3.00	90.00			
		Top face	1	15.00		0.60	18.00			
		Head wall Slope part	1	15.00		4.10	123.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	15.00		0.45	20.25			
		Top face	1	15.00		0.60	27.00			
		Total					**387.45**	**Sqm**	**303.53**	**117604.25**
		Sub Total								1642845.80
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1638835.80**
		Less-CP @ 9.09% of (A)								-148970.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1493875.62**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					88.61	cum	820.92	72742.42
		Stone Chip's					68.41	cum	1234.20	84435.83
		Cement					38.75	MT	807.26	31283.77
		Steel					7.41	MT	807.26	5978.77
		Boulder					127.78	cum	878.25	112220.72
		Sub Total(C)								**1800537.14**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							850921.02	0.00
		Sub Total(D)								**1800537.14**
		Add contengency & consultancy @ 2% of(C)								36010.74
		Total								**₹ 18,36,547.88**
		Say								**₹ 18,36,548.00**

Annexure 11: Estimate – Stop Dam (18m Length x 3m Height)

STOP DAM 18m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. Of Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	18	Mt.	Wall Column Width (foundation)		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	ApproFoundationDepth		1.2	Mt.		
		Length of Toe wall	18	Mt.	FoundationLowerP.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	Foundation Rubble Masonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.	Wage Rate	
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	36	15		540	Sq.Mt.	9.74	5256.9
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	18.00	0.60	1.50	16.20			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	18.00	0.60	1.20	12.96			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**117.36**	**Cum**	**240.86**	**28266.86**

4	5.3.6 (W.R.D) Refer RCD 11.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	18.00	0.60	0.15	6.48			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toewall	1	18.00	0.60	0.15	1.62			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**28.40**	**Cum**	**4120.82**	**117010.68**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	18.00	0.60	0.30	12.96			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toewall	1	18.00	0.60	0.30	3.24			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**52.52**	**Cum**	**4120.82**	**216441.95**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per spelfication and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	18.00		0.30	43.20			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toewall	2	18.00		0.30	10.80			
		For Columns, Pillars, Piers, Abutments, Posts and Struts								
		Columns	56	0.60		5.40	181.44			
		Total					**273.36**	**Sqm**	**459.83**	**125699.95**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	23.04	140.00	3225.60				
		Columns	KG	27.22	160.00	4354.56				
						7784.28				
		8mm dia TMT Fe 500					**2335.28**	**Kg.**	**91.65**	**214018.09**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1167.64**	**Kg.**	**90.31**	**105445.30**
	(iii)	12mm dia TMT Fe 502					**4281.35**	**Kg.**	**88.97**	**380899.12**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall / Anti seepage wall	1	18.00	1.50	3.00	81.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	18.00	0.45	0.45	3.65			
		Total					**141.89**	**Cum**	**3013.65**	**427591.45**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	18.00		3.00	108.00			
		Top face	1	18.00		0.60	21.60			
		Head wall Slope part	1	18.00		4.10	147.60			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	18.00		0.45	24.30			
		Top face	1	18.00		0.60	32.40			
		Total					**443.10**	**Sqm**	**303.53**	**134495.92**
		Sub Total								1759136.22
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1755126.22**
		Less-CP @ 9.09% of (A)								-159540.97
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1599595.25**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000 each	1676.99	0.00
		Coarse Sand					96.73	cum	820.92	79406.48
		Stone Chip's					72.02	cum	1234.20	88884.50
		Cement					41.72	MT	807.26	33680.00
		Steel					7.78	MT	807.26	6283.91
		Boulder					141.89	cum	878.25	124610.64
		Sub Total(C)								**1932460.79**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							929063.76	0.00
		Sub Total(D)								**1932460.79**
		Add contengency & consultancy @ 2% of(C)								38649.22
		Total								**₹ 19,71,110.01**
		Say								**₹ 19,71,110.00**

Annexure 12: Estimate – Stop Dam (20m Length x 3m Height)

STOP DAM 20m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	20	Mt.	Wall Column Width (foundati		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	ApproнFoundationDepth		1.2	Mt.		
		Length of Toe wall	20	Mt.	FoundationLowerP.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	40	15		600	Sq.Mt.	9.74	5841
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-8) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	10.00	0.60	1.50	18.00			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	10.00	0.60	1.20	14.40			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**120.60**	**Cum**	**240.86**	**29047.23**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C M-150 with nominal mix of(1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	20.00	0.60	0.15	7.20			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	20.00	0.60	0.15	1.80			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**29.30**	**Cum**	**4120.82**	**120719.42**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	20.00	0.60	0.30	14.40			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	20.00	0.60	0.30	3.60			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**54.32**	**Cum**	**4120.82**	**223859.43**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per spelfication and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	20.00		0.30	48.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	20.00		0.30	12.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**279.36**	**Sqm**	**459.83**	**128458.95**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	24.84	140.00	3477.60				
		Columns	KG	27.22	160.00	4354.56				
						8036.28				
		8mm dia TMT Fe 500					**2410.88**	**Kg.**	**91.65**	**220946.48**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT fe 501					**1205.44**	**Kg.**	**90.31**	**108858.88**
	(iii)	12mm dia TMT Fe 502					**4419.95**	**Kg.**	**88.97**	**393229.95**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seepage wall	1	20.00	1.50	3.00	90.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	20.00	0.45	0.45	4.05			
		Total					**151.29**	**Cum**	**3013.65**	**455934.81**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	20.00		3.00	120.00			
		Top face	1	20.00		0.60	24.00			
		Head wall Slope part	1	20.00		4.10	164.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	20.00		0.45	27.00			
		Top face	1	20.00		0.60	36.00			
		Total					**480.20**	**Sqm**	**303.53**	**145757.03**
		Sub Total								1836663.17
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1832553.17**
		Less CP @ 9.09% of (A)								-166588.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1670074.99**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					102.14	cum	820.92	83849.18
		Stone Chip's					74.42	cum	1234.20	91850.29
		Cement					43.70	MT	807.26	35277.49
		Steel					8.04	MT	807.26	6487.34
		Boulder					151.29	cum	878.25	132870.59
		Sub Total(C)								**2020409.89**
		Add due to increase in wage rate from 401.00/- to ...../- @.....%							981158.91	0.00
		Sub Total(D)								**2020409.89**
		Add contengency & consultancy @ 2% of(C)								40408.20
		Total								**₹ 20,60,818.09**
		Say								**₹ 20,60,818.00**

Annexure 13: Estimate – Stop Dam (25m Length x 3m Height)

STOP DAM 25m L x 3m H										
BASED ON S.O.R W.R.D., R.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	25	Mt.	Wall Column Width (foundat		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	AppronFoundationDepth		1.2	Mt.		
		Length of Toe wall	25	Mt.	FoundationLower P.C.C.		0.15	Mt.		
		Height of Toe wal	0.45	Mt.	FoundationRubbleMasonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1.01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	50	15		750	Sq.Mt.	9.74	7301.25
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	203.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	25.00	0.60	1.50	22.50			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	25.00	0.60	1.20	18.00			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**128.70**	**Cum**	**240.86**	**30998.17**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of(1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	25.00	0.60	0.15	9.00			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Sidewall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	25.00	0.60	0.15	2.25			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**31.55**	**Cum**	**4120.82**	**129991.27**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	25.00	0.60	0.30	18.00			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Sidewall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	25.00	0.60	0.30	4.50			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**58.82**	**Cum**	**4120.82**	**242403.12**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per speification and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	25.00		0.30	60.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Sidewall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	25.00		0.30	15.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**294.36**	**Sqm**	**459.83**	**135356.44**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	29.34	140.00	4107.60				
		Columns	KG	27.22	160.00	4354.56				
						8666.28				
		8mm dia TMT Fe 500					**2599.88**	**Kg.**	**91.65**	**238267.47**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1299.94**	**Kg.**	**90.31**	**117392.81**
	(iii)	12mm dia TMT Fe 502					**4766.45**	**Kg.**	**88.97**	**424057.00**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seepage wall	1	25.00	1.50	3.00	112.50			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	25.00	0.45	0.45	5.06			
		Total					**174.80**	**Cum**	**3013.65**	**526793.20**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	25.00		3.00	150.00			
		Top face	1	25.00		0.60	30.00			
		Head wall Slope part	1	25.00		4.10	205.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Sidewall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	25.00		0.45	33.75			
		Top face	1	25.00		0.60	45.00			
		Total					**572.95**	**Sqm**	**303.53**	**173909.81**
		Sub Total								2030480.54
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**2026470.54**
		Less-CP @ 9.09% of (A)								-184206.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1846274.36**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					112.96	cum	820.92	92734.59
		Stone Chip's					79.23	cum	1234.20	97781.85
		Cement					47.66	MT	807.26	38472.47
		Steel					8.67	MT	807.26	6995.92
		Boulder					174.80	cum	878.25	153520.47
		Sub Total(C)								**2235779.66**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							1111396.81	0.00
		Sub Total(D)								**2235779.66**
		Add contengency & consultancy @ 2% of(C)								44715.59
		Total								**₹ 22,80,495.25**
		Say								**₹ 22,80,495.00**

Annexure 14: Estimate – Stop Dam (30m Length x 3m Height)

STOP DAM 30m L x 3m H

BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022

		Nala Width / Head Wall Length	30	Mt.	Wall Column Width (foundation)			0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth			1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	Appron Foundation Depth			1.2	Mt.		
		Length of Toe wall	30	Mt.	Foundation Lower P.C.C.			0.15	Mt.		
		Height of Toe wall	0.45	Mt.	Foundation Rubble Masonary			0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.			0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height			4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.				1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir			0.45	Mt.		
		No. of Column	14	Pc.							

Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	60	15		900	Sq.Mt.	9.74	8761.5
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	203.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	30.00	0.60	1.50	27.00			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	30.00	0.60	1.20	21.60			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**136.80**	**Cum**	**240.86**	**32949.10**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embenkment structures with aparoved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E\I.								
		For PCC of Wall/ Tie Beam								
		Weir/Head wall	4	30.00	0.60	0.15	10.80			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	30.00	0.60	0.15	2.70			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**33.80**	**Cum**	**4120.82**	**139263.11**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir/Head wall	4	30.00	0.60	0.30	21.60			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	30.00	0.60	0.30	5.40			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**63.32**	**Cum**	**4120.82**	**260946.81**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per sperification and direction of E\I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir/Head wall	8	30.00		0.30	72.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	30.00		0.30	18.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**309.36**	**Sqm**	**459.83**	**142253.94**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.60	204.12				
		For Tie Band	KG	33.84	140.60	4737.60				
		Columns	KG	27.22	160.60	4354.56				
						9296.28				
		8mm dia TMT Fe 500					2788.88	Kg.	91.65	255588.45
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					1394.44	Kg.	98.31	125926.75
	(iii)	12mm dia TMT Fe 502					5112.95	Kg.	88.97	454884.06
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seeepage wall	1	30.00	1.50	3.00	135.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	30.00	0.45	0.45	6.08			
		Total					**198.32**	**Cum**	**3013.65**	**597651.60**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	30.00		3.00	180.00			
		Top face	1	30.00		0.60	36.00			
		Head wall Slope part	1	30.00		4.10	246.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	30.00		0.45	40.50			
		Top face	1	30.00		0.60	54.00			
		Total					**665.70**	**Sqm**	**303.53**	**202062.58**
		Sub Total								2224297.90
		Less Total of MR/Analysis								-4010.00
		Sub Total of SOR (A)								**2220287.90**
		Less-CP @ 9.09% of (A)								-201824.17
		Total of MR/Analysis								4010.00
		Sub Total(B)								**2022473.73**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000 each	1676.99	0.00
		Coarse Sand					129.20	cum	820.92	106062.69
		Stone Chip's					86.44	cum	1234.20	106679.20
		Cement					53.60	MT	807.26	43264.94
		Steel					9.30	MT	807.26	7504.49
		Boulder					198.32	cum	878.25	174170.35
		Sub Total(C)								**2460155.40**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							1241634.71	0.00
		Sub Total(D)								**2460155.40**
		Add contengency & consultancy @ 2% of(C)								49203.11
		Total								**₹ 25,09,358.51**
		Say								**₹ 25,09,359.00**

Annexure 15: Estimate – Earthen Check Dam (20m Length x 3m Height)

Earthen Checkdam 20m L x 3m H						
General Information		Technical Information				
P.F.		Length (Av.)	20.00	Mt.	Key trench size in Mt.	
Block		Height(Av.)	2.40	Mt.	Top width	5.0
Beat		Top	5.00	Mt.	Bottom width	2.0
Range		Base(Av.)	12.50	Mt.	Depth	1.5
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0
		Free board	1.00	Mt.	(max width+3=1mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00

Item code	Item of Work	Quantity	Unit	Rate /''	Amount in '	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.O.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,413.88	
3 5.1.11.2.1 (W.R.O.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
4. 7.1.30 (W.R.O)	Earthwork in filling foundation trenches and back filling of structures in layor not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.O.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.69	₹ 459.83	
6. 5.1.8(W.R.O.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	374.00	Cu.Mt.	223.94	₹ 83,642.39	
7. 7.1.25 (W.R.O.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I. (Mode of measurement sectional measurement shall be of compacted earth).	374.400	Cu.Mt.	140.72	₹ 52,686.65	
8. 7.1.34 (W.R.O.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	89.856	Cu.Mt.	14.69	₹ 1,319.83	
9. 7.1.38 (W.R.O.)	Watering and consolidation of earth laid in 150mm to 215mm layers by manual labour with C.I hammers to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	374.40	Cu.Mt.	43.78	₹ 16,391.23	
10. 6.6.6 (W.R.O.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	16.83	Cu.Mt.	968.17	₹ 25,978.73	
11. 7.1.42.1 (W.R.O)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	187.33	Sq.Mt.	35.00	₹ 6,556.75	
12. 7.1.42.2 (W.R.O)	Extra for each lead of 150M over initial lead of 150M.	187.33	Sq.Mt.	5.64	₹ 943.03	
	Add for transporting Grass in en motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	187.33	Sq.Mt.	100.25	₹ 16,774.96	
	Sub Total				**244422.52**	
	Less Total of MR /Analysis				-18378.96	
	Sub Total of SOR (A)				226043.57	
	Less CP @ 9.09% of (A)		226044	9.09%	-20547.36	
	Sub Total(B)				205496.21	
	Total of MR /Analysis				18378.96	
	Carriage of Materials with loading & unloading:-					
	Boulder (15 Km)	26.83	Cu.Mt.	798.41	₹ 21,423.59	
	Sub Total(C)				**245298.75**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				**₹ 2,45,298.75**	
	Add contengency & consultancy @ 2%				**₹ 4,905.98**	
	Add Cost of Waste weir				**₹ 65,905.80**	
	Grand Total				**₹ 3,16,109.73**	
	Say				**₹ 3,16,110.00**	

Annexure 16: Estimate – Earthen Check Dam (30m Length x 3m Height)

Earthen Checkdam 30m L x 3m H						
General Information		Technical Information				
P.F.		Length (Avg)	30.00	Mt.	Key trench size in Mt.	
Block		Height (Avg)	7.40	Mt.	Top width	5.0
Tehsil		Top	5.00	Mt.	Bottom width	2.0
Range		Base (Avg)	12.60	Mt.	Depth	1.5
District		Deposit (Avg)	5.97	Mt.	Length	6.0
		Free board	1.00	Mt.	(top width+bottom width)/2	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /-	Amount in ₹	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.38 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying 7.5 discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoil etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.57	₹ 4,411.88	
3 5.1.11.2.3 W.R.D)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) Excle type of soil Item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.31	₹ 5,490.89	
4 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	31.5	Cu.Mt.	14.80	₹ 466.20	
6 5.1.8(b) & D)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	561.60	Cu.Mt.	226.04	₹ 1,26,969.50	
7 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil Item A) obtained from borrow area or any other source free from logs, roots,or any other ingredients etc. with initial lead of 1KM and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I (Mode of measurement sectional measurement shall be of completed earth).	561.600	Cu.Mt.	140.72	₹ 79,030.04	
8 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)					
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	134.784	Cu.Mt.	14.80	₹ 1,967.44	
9 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with CI. hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	561.60	Cu.Mt.	48.78	₹ 24,586.85	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	40.25	Cu.Mt.	968.17	₹ 38,968.89	
11 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	251.00	Sq.Mt.	15.03	₹ 3,772.53	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M	251.00	Sq.Mt.	5.64	₹ 1,414.54	
	Add for transporting grass in an motorable road or head load & other rates from average 500mt. 0.25 M.D. per Sq.Mt.	251.00	Sq.Mt.	100.25	₹ 25,162.44	
	Sub Total				**544604.31**	
	Less Total of M/R /Analysis				-25768.44	
	Sub Total of SOR (A)				518777.70	
	Less CP @ 5.00% of (A)		518778	5.00%	-25805.89	
	Sub Total (B)				492883.70	
	Total of M/R /Analysis				25768.44	
	Carriage of Materials with loading & unloading:-					
	Boulder (15 Km)	40.25	Cu.Mt.	798.41	₹ 32,135.39	
	Sub Total(C)				**847684.53**	
	Add due to increase in wage rate from 401.00/- to ____/- @ ____%					
	Sub Total(D)				₹ 5,47,884.53	
	Add contingency & consultancy @ 2%				₹ 8,957.69	
	Add Cost of Waste wier				₹ 65,305.00	
	Grand Total				₹ 4,20,147.21	
	Say				₹ 4,20,147.00	

Annexure 17: Estimate – Earthen Check Dam (40m Length x 3m Height)

Earthen Checkdam 40m L x 3m H						
General Information		Technical Information				
P.S.		Length (Av.)	40.00	Mt.	Key trench size in Mt.	
Block		Height(Av.)	2.40	Mt.	Top width	5.0
East		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Av.)	12.60	Mt.	Depth	1.5
District		Slope2 1(H:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	[nalo width+1.4] net]	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate / `	Amount in `	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying FS discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.37	₹ 4,411.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in sot rock (where blasting is not required) (vide type of soil item C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile with in a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including inocorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	748.80	Cu.Mt.	223.94	₹ 1,67,684.77	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile(vide classification of soil item A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	748.800	Cu.Mt.	140.72	₹ 1,05,373.18	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	179.712	Cu.Mt.	14.60	₹ 2,623.16	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225 mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	748.80	Cu.Mt.	43.78	₹ 32,782.46	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder dulo packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	53.67	Cu.Mt.	968.17	₹ 51,957.45	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and surfing with 75mm thick grass sods, obtained within lead of 150mt, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	334.66	Sq.Mt.	15.08	₹ 5,029.51	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	334.66	Sq.Mt.	5.64	₹ 1,886.06	
	Add for transporting Grass in an motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	334.66	Sq.Mt.	100.25	₹ 33,549.92	
	Sub Total				**441865.93**	
	Less Total of NR (Analysis				-35153.92	
	Sub Total of SOR (A)				406712.01	
	Less-CP @ 9.09% of (A)		406712	9.09%	-37242.82	
	Sub Total(B)				371469.19	
	Total of NR /Analysis				35153.92	
	Carriage of Materials with loading & unloading-					
	Boulder (15 Km)	53.67	Cu.Mt.	788.41	₹ 42,317.18	
	Sub Total(C)				**4304 70.29**	
	Add due to increase in wage rate from 401.00/- to ...../- @ ..... %					
	Sub Total(D)				₹ **4,50,470.29**	
	Add contengency & consultancy @ 2%				₹ **9,009.41**	
	Add Cost of Waste weir				₹ **65,905.80**	
	Grand Total				₹ **5,25,384.69**	
	Say				₹ **5,25,385.00**	

Annexure 18: Estimate – Earthen Check Dam (50m Length x 3m Height)

Earthen Check Dam 50m L x 3m H							
General Information		Technical Information					
P.F.		Length (Av.)	50.00	Mt.	Key trench size in Mt.		
Block		Height(Av.)	2.40	Mt.	Top width	3.0	
Beat		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Av.)	12.50	Mt.	Depth	1.5	
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0	
		Free Board	3.00	Mt.	(+ve width+(-)ve)		
		Sand depth	0.90	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate ₹	Amount in ₹	Remarks	
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00		
2 7.1.18 (W.R.D.)	Earth work in soil clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88		
3 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soil rock (where blasting is not required) (side type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by taper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.52	₹ 5,496.89		
4 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	[illegible]	₹ 32,012.44		
S. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil (vide classification of soil Item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81		
6 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50 m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	935.00	Cu.Mt.	223.94	₹ 2,09,605.57		
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots, or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 215mm thick complete as per specification and direction of E/I (Mode of measurement sectional measurement shall be of compacted earth).	935.000	Cu.Mt.	140.72	₹ 1,31,738.73		
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil (vide classification of soil Item A and B)	224.640	Cu.Mt.	14.60	₹ 3,279.37		
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 215mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	935.00	Cu.Mt.	43.78	₹ 40,934.08		
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder dule packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	67.08	Cu.Mt.	968.17	₹ 64,946.82		
11 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	418.33	Sq.Mt.	15.03	₹ 6,286.89		
12 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	418.33	Sq.Mt.	5.64	₹ 2,357.57		
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 3.25 M.D. per Sq.Mt.	418.33	Sq.Mt.	100.25	₹ 41,937.40		
	Sub Total				**545087.84**		
	Less Total of MR /Analysis				43541.40		
	Sub Total of SOR (A)				501546.24		
	Less- CP @ 9.09% of (A)		[illegible]	9.09%	45590.55		
	Sub Total(B)				455955.69		
	Total of MR /Analysis				43541.40		
	Carriage of Materials with loading & unloading-						
	Boulder (15 Km)	67.08	Cu.Mt.	798.41	₹ 53,558.37		
	Sub Total(C)				**553056.05**		
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%						
	Sub Total(D)				₹ **553,056.05**		
	Add contengency & consultancy @ 2%				₹ **11,061.12**		
	Add Cost of Waste work				₹ **65,905.00**		
	Grand Total				₹ **630,022.18**		
	Say				₹ **6,30,022.00**		

Annexure 19: Estimate – Earthen Check Dam (60m Length x 3m Height)

Earthen Checkdam 60m L x 3m H						
General Information		Technical Information				
P.F.		Length (Ave.)	60.00	Mt.	Key trench size in Mt.	
Block		Height (Ave.)	2.40	Mt.	Top width	5.0
Beat		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Ave.)	12.60	Mt.	Depth	1.5
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	[side width+1+1mt.]	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /	Amount in ₹	Remarks
1	Survey & lay out	4	W.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 10m and lift of 1.5m as per specification and direction of E/I.	31.640	Cu.Mt.	135.17	₹ 4,413.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in sat rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per	11.5	Cu.Mt.	174.31	₹ 5,490.95	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per	11.5	Cu.Mt.	[illegible]	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	11.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8 (W.R.D.)	E/M in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and	1123.20	Cu.Mt.	123.94	₹ 2,51,527.16	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots, or any other ingredients etc. with initial lead of 1.5M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 215mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	1123.200	Cu.Mt.	140.71	₹ 1,58,060.87	
8 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	269.568	Cu.Mt.	14.60	₹ 3,934.88	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 215mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1123.20	Cu.Mt.	43.78	₹ 49,173.70	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	80.50	Cu.Mt.	968.17	₹ 77,936.18	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	501.99	Sq.Mt.	15.03	₹ 7,544.28	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	501.99	Sq.Mt.	5.64	₹ 2,829.89	
	Add for transporting Grass in un motorable road on head load & other means from average 500 mt. 0.25 M.D. per Sq.Mt.	501.99	Sq.Mt.	100.25	₹ 50,324.88	
	Sub Total				**645309.34**	
	Less Total of MR /Analysis				-51928.88	
	Sub Total of SOR (A)				593380.46	
	Less CP @ 9.09% of (A)		[illegible]	9.09%	-53938.28	
	Sub Total(B)				539442.18	
	Total of MR /Analysis				51928.88	
	Carriage of Materials with loading & unloading:-					
	Boulder (15 KM)	80.50	Cu.Mt.	798.41	₹ 64,270.77	
	Sub Total(C)				**655641.82**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				₹ **655,641.82**	
	Add contingency & consultancy @ 2%				₹ 13,113.04	
	Add Cost of Waste weir				₹ 65,885.00	
	Grand Total				₹ 7,34,659.86	
	Say				₹ **7,34,660.00**	

Annexure 20: Estimate – Earthen Check Dam (70m Length x 3m Height)

Earthen Checkdam 70m L x 3m H						
General Information		Technical Information				
P.F.		Length (Aw.)	70.00	Mt.	Key trench size in Mt.	
Block		Height(Aw.)	2.40	Mt.	Top width	5.0
Teh.		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Aw.)	12.60	Mt.	Depth	1.5
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	(sole width+1+1mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /-	Amount in ₹	Remarks
1	Survey & lay out	1	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.37	₹ 4,413.88	
3 5.2.13.2.1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not resulted) (vide type of soil Item-C) with disposal of spoil beyond 1/2m from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.59	
4 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in suitable profile within a lead of 300M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6 5.1.8(W.R.D.)	C/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50 m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	1310.40	Cu.Mt.	223.94	₹ 2,93,448.36	
7 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	1310.400	Cu.Mt.	140.72	₹ 1,84,403.42	
8 7.1.34	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	314.496	Cu.Mt.	14.60	₹ 4,590.70	
9 7.1.28 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 95% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1310.40	Cu.Mt.	43.78	₹ 57,369.31	
10. 6.6.8 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	93.91	Cu.Mt.	968.37	₹ 90,925.55	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	585.66	Sq.Mt.	15.03	₹ 8,801.64	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	585.66	Sq.Mt.	5.64	₹ 3,300.60	
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	385.00	Sq.Mt.	100.23	₹ 38,712.30	
	Sub Total				**745531.05**	
	Less Total of MR /Analysis				-60316.36	
	Sub Total of SOR (A)				685214.69	
	Less CP @ 9.09% of (A)		685215	9.09%	-62286.02	
	Sub Total(B)				622928.67	
	Total of MR /Analysis				60316.36	
	Carriage of Materials with loading & unloading:					
	Boulder (15 Km)	93.91	Cu.Mt.	798.41	₹ 74,982.56	
	Sub Total(C)				**758227.59**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				**₹ 7,58,227.59**	
	Add contingency & consultancy @ 2%				**₹ 15,164.55**	
	Add Cost of Waste weir				**₹ 65,905.00**	
	Grand Total				**₹ 8,39,297.14**	
	Say				**₹ 8,39,297.00**	

Annexure 21: Estimate – Earthen Check Dam (75m Length x 3m Height)

Earthen Checkdam 75m L x 3m H						
General Information		Technical Information				
P.F.		Length (Avr.)	75.00	Mt.	Key trench size in Mt.	
Block		Height(Avr.)	2.40	Mt.	Top width	5.0
Beat		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Avr.)	12.60	Mt.	Depth	1.5
District		Slope(1:1)(H:V)	3.37	Mt.	Length	6.0
		Free board	1.00	Mt.	(nala width +1+1 mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	**Item of Work**	**Quantity**	**Unit**	**Rate /'**	**Amount in'**	**Remarks**
1	Survey & lay out	1	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying f.s discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88	
3. 5.1.11.2. 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (wide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and backfilling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(edo classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8(W.R.D.)	E/M in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50 m away from the toe of dam in the country side) within initial lead of 1.5OM and initial lift of 1.5M all lifts as per specification and direction of E/I.	1404.00	Cu.Mt.	223.94	₹ 3,14,408.95	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	1404.000	Cu.Mt.	140.72	₹ 1,97,575.09	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil(edo classification of soil item A and B)	336.960	Cu.Mt.	14.60	₹ 4,918.61	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with CI hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1404.00	Cu.Mt.	43.78	₹ 61,467.12	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	100.62	Cu.Mt.	968.17	₹ 97,410.23	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 15mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	627.49	Sq.Mt.	15.05	₹ 9,430.55	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	627.49	Sq.Mt.	5.64	₹ 3,538.56	
	Add for transporting Grass in un motorable road on head load & other means from average 100mt. 0.25 M.D. per Sq.Mt.	627.49	Sq.Mt.	100.15	₹ 62,806.10	
	Sub Total				**705641.30**	
	Less Total of MR /Analysis				-64510.10	
	Sub Total of SOR (A)				731131.80	
	Less CP @ 9.09% of (A)			9.09%	-66459.88	
	Sub Total(B)				664671.92	
	Total of MR /Analysis				64510.10	
	Carriage of Materials with loading & unloading:-					
	Boulder (1.5 Km)	100.62	Cu.Mt.	798.41	₹ 80,338.40	
	Sub Total(C)				**809520.47**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				**₹ 8,09,520.47**	
	Add contengency & consultancy @ 2%				**₹ 16,190.41**	
	Add Cost of Waste weir				**₹ 65,905.00**	
	Grand Total				**₹ 8,91,615.88**	
	Say				**₹ 8,91,616.00**	

Annexure 22: Estimate – Earthen Check Dam (80m Length x 3m Height)

Earthen Checkdam 80m L x 3m H							
General Information		Technical Information					
P.F.		Length (Avr.)	80.00	Mt.	Key trench size in Mt.		
Block		Height(Avr.)	2.40	Mt.	Top width	5.0	
Amt		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Avr.)	12.60	Mt.	Depth	1.5	
District		Slope2.5(H:V)	5.22	Mt.	Length	6.0	
		Free Board	1.00	Mt.	[Valu width+1+1mt.]		
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.08	
Item code	Item of Work	Quantity	Unit	Rate /	Amount in ₹		Remarks
1	Survey & lay out	1	M.D.	881.00	₹ 1,304.00		
2 7.1.38 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88		
3. 7.1.11.2.3 W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in sat. rock (where blasting is not required) (side type of soil item C) with disposal of spoil beyond 10.0m from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	33.3	Cu.Mt.	174.30	₹ 3,496.99		
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	33.3	Cu.Mt.	1018.27	₹ 32,013.44		
5. 7.1.38 (W.R.D.)	Extra for earth work for each subsequent lift of 3M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	33.3	Cu.Mt.	14.60	₹ 458.82		
6. 5.1.8(W.R.D.)	E/M in excavation of foundation trenches as per designed section in all kinds of soil, including moorum/soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	1497.60	Cu.Mt.	223.94	₹ 3,35,368.55		
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm size placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I(Mode of measurement sectional measurement shall be of compacted earth).	1497.600	Cu.Mt.	180.72	₹ 2,70,746.76		
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 3M over the initial lift of 1.5M. (Approx 24 % of total volume.)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	399.424	Cu.Mt.	14.60	₹ 5,246.51		
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with GI hammer to achieve maximum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1497.60	Cu.Mt.	43.78	₹ 65,564.93		
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder dry packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	107.33	Cu.Mt.	968.17	₹ 1,03,914.91		
11. 7.1.82.1 (W.R.D)	Free dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	668.33	Sq.Mt.	35.04	₹ 23,418.03		
12. 7.1.82.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	668.33	Sq.Mt.	5.84	₹ 3,772.13		
	Add for transporting Grass in an motorable road on head load & other means from average 300mt. 0.25 M.D. per Sq.Mt.	669.33	Sq.Mt.	180.25	₹ 67,208.84		
	Sub Total				8467512.75		
	Less Total of MR /Analysis				-69703.84		
	Sub Total of SOR (A)				777048.91		
	Less-CP @ 9.08% of (A)		777049	9.095	-70631.75		
	Sub Total(B)				706415.17		
	Total of MR /Analysis				69703.84		
	Carriage of Materials with loading & unloading :						
	Boulder (15 Km)	107.33	Cu.Mt.	788.51	₹ 85,694.25		
	Sub Total(C)				860813.26		
	Add due to increase in wage rate from 401.08/- to ...../- @ ..... %						
	Sub Total(D)				₹ 8,68,813.26		
	Add contingency & consultancy @ 2%				₹ 17,216.27		
	Add Cost of Waste weir				₹ 65,905.00		
	Grand Total				₹ 9,49,934.53		
	Say				₹ 9,49,935.00		

Annexure 23: Estimate – Earthen Check Dam (85m Length x 3m Height)

Earthen Check Dam 85m L x 3m H							
General information		Technical information					
P.F.		Length (Avr.)	85.00	Mt.	Key trench dia in Mt.		
Block		Height (Avr.)	2.40	Mt.	Top width	5.0	
Beat		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Avr.)	17.60	Mt.	Depth	1.5	
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0	
		Free board	1.00	Mt.	(mids width+2x Lmt.)		
		Sand depth	0.60	Mt.	Wage Rate	₹	400.00
Item code	Item of Work	Quantity	Unit	Rate / `	Amount in `		Remarks
1	Survey & lay out	4	M.D.	481.00	₹	1,604.00	
2 7.1.18 (M.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S. discharge of 20 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoil etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.648	Cu.Mt.	135.17	₹	4,411.88	
3 5.1.13.2.1(M.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section (not rock (where blasting is not required) (wide type of soil item-C) with disposal of spoil beyond 1/2Rm from centre of trench (at) upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹	5,490.89	
4 7.1.30 (M.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.48	
5. 7.1.34 (M.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.3	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹	459.81	
6. 5.1.8(W.A. D.)	R/W in excavation of foundation trenches as per designed section in all kinds of soil (including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same beyond 50m away from the top of dam on the country side) within initial lead of 250M and initial lift of 1.5M all lifts as per specification and direction of E/I.	158120	Cu.Mt.	203.94	₹	3,96,380.15	
7. 7.1.25 (M.R.D.)	Earth work in filling in canal banks (canal discharge upto 20 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, rootsor any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I (Mode of measurement: sectional measurement shall be of compacted earth).	1591.200	Cu.Mt.	140.72	₹	2,23,918.44	
8. 7.1.34 (M.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx24 % of total volume.)						
7.1.34.3	For ordinary and hard soil(vide classification of soil item A and B)	381.888	Cu.Mt.	14.60	₹	5,574.42	
9 7.1.38 (M.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with CI hammer to achieve minimum 93% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1591.20	Cu.Mt.	43.78	₹	69,662.14	
10. 8.0.0 (M.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	114.04	Cu.Mt.	968.17	₹	1,10,409.93	
11. 7.1.42.1 (M.R.D)	Free dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 15MM, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	711.11	Sq.Mt.	15.03	₹	10,687.71	
12. 7.1.42.2 (M.R.D)	Extra for each lead of 15MM over initial lead of 150M.	711.11	Sq.Mt.	5.64	₹	4,007.87	
	Add for transporting Grass turf on motorable road or head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	711.11	Sq.Mt.	100.25	₹	71,293.58	
	Sub Total					**8,05,663.00**	
	less Total of MR /Analysis					-73897.58	
	Sub Total of SOR (A)					8,31,966.02	
	less CP @ 9.09% of (A)		812996	9.09%	₹	-74807.61	
	Sub Total(B)					7,57,158.41	
	Total of MR /Analysis					73897.58	
	Carriage of Materials with loading & unloading:-						
	Boulder (75 Km)	114.04	Cu.Mt.	758.41	₹	91,090.25	
	Sub Total(E)					**91,090.25**	
	Add due to increase in wage rate from 400.00/- to ...../-@ ..... %						
	Sub Total(D)					₹	**8,12,106.34**
	Add contingency & consultancy @ 2%					₹	**16,242.12**
	Add Cost of Waste weir					₹	**65,905.00**
	Grand Total					₹	**8,94,253.37**
	Say					₹	**8,94,253.00**

Annexure 24: Estimate – Earthen Check Dam (130m Length x 3m Height)

Earthen Check Dam 130m L x 3m H								
General Information		Technical Information						
P.F.		Length (Avr.)	130.00	Mt.	Key trench size in Mt.			
Block		Height(Avr.)	2.40	Mt.	Top width	5.0		
Nest		Top	3.00	Mt.	Bottom width	2.0		
Range		Base (Avr.)	12.80	Mt.	Depth	1.5		
District		Slope2 (H:V)	5.37	Mt.	Length	6.0		
		Free Board	1.00	Mt.	(Nala width+1+1mt.)			
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00		
Item code	Item of Work	Quantity	Unit	Rate / `	Amount in `		Remarks	
1	Survey & lay out	4	M.D.	401.00	₹	1,604.00		
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profilein spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹	4,411.88		
3. 5.1.11.2. 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.12	₹	5,484.93		
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44		
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M							
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	31.5	Cu.Mt.	14.60	₹	459.81		
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same beyond 50m away from the toe of dam in the country sideS within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	2433.60	Cu.Mt.	223.94	₹	5,44,975.51		
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	2433.600	Cu.Mt.	140.72	₹	3,42,463.49		
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)							
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	584.064	Cu.Mt.	14.60	₹	8,525.53		
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessry tools and plants with all leads and lifts all complete as per specification and direction of E/I.	2433.60	Cu.Mt.	43.78	₹	1,06,543.01		
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	174.41	Cu.Mt.	968.17	₹	1,68,861.73		
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1087.65	Sq.Mt.	15.03	₹	16,345.01		
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	1087.65	Sq.Mt.	5.64	₹	6,129.69		
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.05 M.D. per Sq.Mt.	1087.65	Sq.Mt.	100.25	₹	1,09,057.21		
	Sub Total					**1346861.27**		
	Less Total of MR /Analysis					110641.23		
	Sub Total of SOR (A)					1236220.04		
	Less-CP @ 9.09 % of (A)		1236220	9.09%		-112372.40		
	Sub Total(B)					1123847.63		
	Total of MR /Analysis					110641.23		
	Carriage of Materials with loading & unloading-							
	Boulder (15 Km)	174.41	Cu.Mt.	798.41	₹	139,253.31		
	Sub Total(C)					**1373742.19**		
	Add due to increase in wage rate from 401.00/- to ___/- @ ____%							
	Sub Total(D)					₹	13,73,742.19	
	Add contengency & consultancy @ 2%					₹	27,474.88	
	Add Cost of Waste weir					₹	65,905.00	
	Grand Total					₹	14,67,122.04	
	Say					₹	**14,67,122.00**	

Annexure 25: Estimate – Earthen Check Dam (140m Length x 3m Height)

Earthen Check Dam 140m L x 3m H							
General Information		Technical Information					
P.F.		Length (Avr.)	140.00	Mt.	Key trench size in Mt.		
Block		Height(Aver.)	3.40	Mt.	Top width	5.0	
Beat		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Aver.)	12.60	Mt.	Depth	3.5	
District		Impact (H+V)	5.37	Mt.	Length	6.0	
		Free Board	1.00	Mt.	(rule width+1+1mt.)		
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate / '	Amount in '	Remarks	
1	Survey & layout	4	M.D.	401.00	₹ 1,604.00		
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88		
3. 5.1.11.1. 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1.0km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.59		
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44		
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81		
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	2620.80	Cu.Mt.	223.94	₹ 5,86,896.71		
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	2610.800	Cu.Mt.	140.72	₹ 3,68,826.84		
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	628.992	Cu.Mt.	14.60	₹ 9,181.48		
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	2620.80	Cu.Mt.	43.78	₹ 1,14,738.62		
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	187.83	Cu.Mt.	968.17	₹ 1,81,851.09		
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1171.32	Sq.Mt.	15.03	₹ 17,603.28		
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	1171.32	Sq.Mt.	5.64	₹ 6,601.23		
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	1171.32	Sq.Mt.	100.25	₹ 1,17,424.71		
	Sub Total				**14470B2.97**		
	Less Total of MR /Analysis				-119028.71		
	Sub Total of SOR (A)				1328054.26		
	Less-CP @ 9.09% of (A)		1328054	9.09%	-120720.13		
	Sub Total(B)				1207334.13		
	Total of MR /Analysis				119028.71		
	Carriage of Materials with loading & unloading-						
	Boulder (15 Km)	187.83	Cu.Mt.	798.41	₹ 1,49,965.12		
	Sub Total(C)				**1476327.96**		
	Add due to increase in wage rate from 401.00/- to ___/- @ ___%						
	Sub Total(D)				₹ **14,76,327.96**		
	Add contengency & consultancy @ 2%				₹ **29,526.58**		
	Add Cost of Waste weir				₹ **65,905.00**		
	Grand Total				₹ **15,71,759.52**		
	Say				₹ **15,71,760.00**		

Annexure 26: Estimate – Earthen Check Dam (150m Length x 3m Height)

Earthen Check Dam 150m L x 3m H							
General Information		Technical Information					
P.F.		Length (Avr.)	150.00	Mt.	Key trench size in Mt.		
Block		Height(Avr.)	2.40	Mt.	Top width	5.0	
Beat		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Avr.)	12.60	Mt.	Depth	1.5	
District		Slope(2.5(H:V)	5.37	Mt.	Length	6.0	
		Free Board	1.00	Mt.	(side width+1+1 mt.)		
		Sand depth	0.65	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate / `	Amount in `		Remarks
1	Survey & lay out	4	M.D	401.00	₹	1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying f.s discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹	4,411.88	
3. 5.1.11.2. 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soil rock (where blasting is not required) (wide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹	5,490.58	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layr not exceeding 150mm thik well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹	459.81	
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	2808.00	Cu.Mt.	228.94	₹	6,28,817.90	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I(Mode of measurement sectional measurement shall be of compacted earth).	2808.000	Cu.Mt.	140.72	₹	3,95,150.18	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	673.920	Cu.Mt.	14.60	₹	9,837.21	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessry tools and plants with all leads and lifts all complete as per specification and direction of E/I.	2808.00	Cu.Mt.	43.78	₹	1,22,934.24	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	201.25	Cu.Mt.	968.17	₹	1,94,840.45	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1254.98	Sq.Mt.	15.03	₹	18,860.66	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	1254.98	Sq.Mt.	5.64	₹	7,073.72	
	Add for transporting Grass in un motorable road on head load & other means from average 500 mt. 0.25 M.D. per Sq.Mt.	1254.98	Sq.Mt.	100.25	₹	1,25,852.19	
	Sub Total					**1547104.68**	
	Less Total of MR /Analysis					127416.19	
	Sub Total of SOR (A)					1419688.48	
	Less CP @ 9.09% of (A)		1419688	9.09%		129067.86	
	Sub Total(B)					1290820.62	
	Total of MR /Analysis					127416.19	
	Carriage of Materials with loading & unloading:						
	Boulder (1.5 Km)	281.25	Cu.Mt.	798.41	₹	1,60,676.91	
	Sub Total(C)					**1578913.73**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%						
	Sub Total(D)				₹	**15,78,913.73**	
	Add contingency & consultancy @ 2%				₹	**31,578.27**	
	Add Cost of Waste weir				₹	**65,905.00**	
	Grand Total				₹	**16,76,397.00**	
	Say				₹	**16,76,397.00**	

Annexure 27: Estimate – Earthen Check Dam (190m Length x 3m Height)

Earthen Check Dam 190m L x 3m H							
General Information		Technical Information					
P.F.		Length (Avr.)	190.00	Mt.	Key trench size in Mt.		
Block		Height (Avr.)	2.40	Mt.	Top width	5.0	
Tehsil		Top	3.00	Mt.	Bottom width	2.0	
Range		Base (Avr.)	12.60	Mt.	Depth	1.5	
District		Slope (1:1) (H:V)	5.37	Mt.	Length	6.0	
		Free Board	1.00	Mt.	(Top width+(1+1)*H)		
		Sand depth	0.80	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate /-	Amount in ₹		Remarks
1	Survey & lay out	-A-	M.D.	401.00	₹	1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹	4,411.88	
3 5.1.11.2. 3(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (side type of soil item C) with disposal of spoil beyond 1/2rm from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of I/I.	31.5	Cu.Mt.	174.32	₹	5,490.09	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and backfilling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹	459.81	
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same(beyond 10m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	3556.83	Cu.Mt.	223.94	₹	7,96,502.08	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	9556.800	Cu.Mt.	140.72	₹	5,00,529.57	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	853.632	Cu.Mt.	14.60	₹	12,460.47	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I harrow to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	3556.83	Cu.Mt.	43.78	₹	1,55,716.70	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	254.91	Cu.Mt.	968.27	₹	2,46,797.91	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1589.65	Sq.Mt.	15.03	₹	23,890.17	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	1589.65	Sq.Mt.	5.64	₹	8,958.77	
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	1589.65	Sq.Mt.	100.25	₹	1,59,362.11	
	Sub Total					**19488191.49**	
	Less Total of MR /Analysis					-160966.11	
	Sub Total of SOR (A)					1787225.38	
	Less-CP @ 9.03% of (A)		1787225	9.09%		-162438.79	
	Sub Total (B)					1624786.60	
	Total of MR /Analysis					160966.11	
	Carriage of Materials with loading & unloading:-						
	Boulder (15 Km)	254.91	Cu.Mt.	798.41	₹	2,03,524.09	
	Sub Total(C)					**1988256.80**	
	Add due to increase in wage rate from 401.00/- to ____/- @ _____%						
	Sub Total(D)				₹	**19,88,256.80**	
	Add contengency & consultancy @ 2%				₹	**39,785.14**	
	Add Cost of Waste weir				₹	**65,805.00**	
	Grand Total				₹	**20,94,846.93**	
	Say				₹	**20,94,847.00**	

Annexure 28: Estimate – Earthen Check Dam (220m Length x 3m Height)

Earthen Check Dam 220m L x 3m H							
General Information		Technical Information					
P.F.		Length (Aver.)	220.00	Mt.	Key trench size in Mt.		
Block		Height(Aver.)	2.40	Mt.	Top width	5.0	
Beat		Top	1.00	Mt.	Bottom width	2.0	
Range		Nose (Aver.)	12.60	Mt.	Depth	1.5	
District		Slope (1H:1V)	5.37	Mt.	Length	6.0	
		Free Board	1.00	Mt.	(nala width+1+1 mt.)		
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate / '	Amount in '		Remarks
1	Survey & lay out	4	M.D.	401.00	₹	1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying / discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.648	Cu.Mt.	135.17	₹	4,411.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2bm from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹	5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹	459.81	
6. 5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	4118.40	Cu.Mt.	223.84	₹	9,22,266.26	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots, or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I. (Mode of measurement sectional measurement shall be of compacted earth).	4118.480	Cu.Mt.	140.72	₹	5,79,553.60	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	988.416	Cu.Mt.	14.60	₹	14,427.91	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	4118.40	Cu.Mt.	43.78	₹	1,80,303.55	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	295.16	Cu.Mt.	968.17	₹	2,85,766.00	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1840.64	Sq.Mt.	15.03	₹	27,662.30	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M	1840.64	Sq.Mt.	5.64	₹	10,373.32	
	Add for transporting Grass in un motorable road on headload & other means from average 500mt. 0.25 M.D. per Sq.Mt.	1840.64	Sq.Mt.	100.25	₹	1,84,524.55	
	Sub Total					**2248856.61**	
	Less Total of MR /Analysis					-186128.55	
	Sub Total of SOR (A)					2062728.06	
	Less-CP @ 9.09% of (A)		2062728	9.09%		-187501.98	
	Sub Total(B)					1875226.08	
	Total of MR /Analysis					186128.55	
	Carriage of Materials with loading & unloading:						
	Boulder (15 Km)	295.16	Cu.Mt.	798.41	₹	2,35,659.47	
	Sub Total(C)					**1297814.10**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%						
	Sub Total(D)				₹	**22,97,014.10**	
	Add contengency & consultancy @ 2%				₹	**45,940.18**	
	Add Cost of Waste weir				₹	**65,905.00**	
	Grand Total				₹	**24,08,859.18**	
	Say				₹	**24,08,859.00**	

Annexure 29: Estimate – Water Absorption Trench

Model Estimate for Construction of Water Absorption Trench (WAT) - AREA 5 ha										
Sl.	**Particulars**		**Description**							
1	Land Type/ Land Use		Upland/Wasteland/ Just bellow the steep slope/ Forest land							
2	Position of structure		Slope 10% & above, where upland meet with forest land or on transition point where							
3	Top width of trench		1.0 M							
4	Depth of trench		1.0 M							
5	Bottom width of trench		1.0 M							
6	Average length of one WAT		6.0 M							
7	Equalizer width		1.0 M							
8	Berm width		1.0 M							
9	Cross section of the trench		1.0 sqm							
10	Size of bund		B.W-2.0 m, T.W-0.5 m, Ht-							
11	Length of designed bund		292							
12	No. of trench in one Hect.		42	No.						
13	Estimated for 5 Hect.		210	No.					**Wage**	**401.00**
Sl. No	SOR	Particulars	Length (m)	Bottom width (m)	Top width (m)	Cross section area	Quantity	Unit	Rate (Rs.)	Amount
1	3. (Forest Dept.	Labour charge for making the contour line and alignment through A-frame					2	MD	401.00	802.00
2	3.13 (B) Chapter-III of Erosion, control and Drainage (RCD effective from 28	Excavation for structure (Earth work in excavation of foundation of structure as per drawing and technical specification, including setting out,... Dressing of side and bottom, backfilling the excavation of earth to the extent required and utilizing the remaining earth locally as per engineer I/C)								
		For 42 No. WAT (1 Hect.) = 42No.x 6m x 1m x 1m = 210.00	252	1	1	1	252	m^3	61.4	15,467.76
3		Compaction of bund by labour/Beneficiaries @1000					9	MD	401.00	3,609.00
4	N.S.	Display Board						L.S.		330.00
5		Two stage Photography with work completion certificate						L.S.		55.00
6	N.S.	Miscellaneous expenditure like strings, making power, A-frame, first aid box etc.						L.S.		165.00
		Sub Total (A)								**20,428.76**
		Less Total of MR /Analysis								-4,306.11
		Sub Total of SOR (A)								16,122.65
		Less-CP @ 9.09% of (A)					9.09%		16,122.65	-1,465.55
		Sub Total(B)								**14,657.10**
		Total of MR /Analysis								4,306.11
		Sub Total(C)								**18,963.21**
		Add for Contigency and Consultancy					2%		18,963.21	379.26
		Total								**19,342.48**
		Say								**₹ 19,342.48**
		For 5 Hect.					**5**	**Hect.**	**19,342.48**	**96,712.38**

POND DE-SILTATION PLAN

Prepared in compliance of the Condition bearing **Sl. No. xxiii** laid by MoEF&CC, Govt. of India while granting Stage-I approval under Section 2 of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 vide F. No. 8-37/2022-FC dated 18th September, 2024, **for diversion of 455.1108 ha of forest land in Dumka district with respect to Pachhwara South Coal Block Project** in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

Submitted by:
M/s Neyveli Uttar Pradesh Power Ltd.

Prepared by:
Rajiv Ranjan, IFS (Retd.)

EXECUTIVE SUMMARY

The instant Pond/Tank De-siltation Plan has been formulated in compliance of one of the conditions laid by the Ministry of Environment, Forest and Climate Change, Government of India (MoEF&CC) while according approval to diversion of forest land involved in Pachhwara South Coal Block located in Dumka district of Jharkhand.

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited – by the Ministry of Coal, Govt. of India for mining of coal. Coal from this project will be supplied to Ghatampur Thermal Power Plant, a Coal based Thermal Power Plant with a capacity of 1980 MW at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. This is a Greenfield Project.

The project area is spread over 715.00 ha in the approved Mine Plan of Pachhwara South Coal Mine Project of NUPPL. According to the land schedule authenticated by DFO, Dumka, a total of 455.1108 ha falls under forest land category and remaining 259.7445 ha under non-forest category. Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

Pachhwara South Coal block occupies the southernmost part of the Rajmahal Coalfield in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated in villages namely Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District.

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024, has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of M/s Neyveli Uttar Pradesh Power Ltd. in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The condition, in fulfilment of which the instant Plan is being formulated, states the following:

> "*xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required.*"

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the boundary of the Dumka and Pakur forest divisions/districts. Both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearance has been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of Soil & Moisture Conservation (SMC) plans independently within ten km of their respective lease boundaries. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the preparation of SMC plans with respect to Pachhwara (N) CB and Pachhwara Central CB, the Impact Area has been taken to be the area falling within 10 km and 10-20 km radius of the mine lease boundary respectively. However, the Impact Area considered for both the aforesaid projects has been restricted to Pakur Forest Division.

The de-siltation of all ponds falling within the respective impact areas considered for both Pachhwara (N) and Pachhwara Central projects constitute a part of the respective SMC plans. Thus, all the ponds falling within 20 km of the radius of both the said lease boundaries taken together, and restricted to Pakur Forest Division have already been taken up in the respective SMC plans.

Hence, in order to comply with the condition mentioned at sl. No. xxiii. of the Stage-I forest clearance order, it is incumbent upon the user agency with respect to Pachhwara South Coal Block to take up preparation of a plan for de-siltation of ponds located within 5 km radius of the lease boundary, leaving those ponds which happen to be located in Pakur Forest Division. This will rule out any chance of duplication in plan proposals.

For small ponds, sediment deposition is a serious problem as the rate of siltation is much higher compared to larger water bodies and this reduces the useful life of the pond. Apart from geomorphological processes, soil erosion is largely governed by anthropogenic modifications in the catchment such as concrete drainage networks, deforestation, agriculture intensification, road construction, and uncontrolled grazing. High rate of topsoil erosion in India threatens the ecological dynamics of the receiving water bodies including ponds.

Open-cast mining involves removing large amounts of soil and rock to access mineral deposits beneath the surface. This process can have a significant impact on the surrounding environment, including ponds in buffer areas near mining projects. Buffer areas are typically designated to protect sensitive ecosystems and water bodies from the effects of mining activities. However, these areas can still be negatively impacted by various factors related to mining operations.

De-siltation of village ponds is the process of removing accumulated sediments (silt, mud, sand, and organic matter) from the pond bed to restore its depth, improve water quality, and ensure its ecological health. Sediment accumulation in ponds is a natural process, but excessive siltation can lead to a reduction in water holding capacity, loss of biodiversity, and poor water quality. The primary aim of de-siltation is to restore the pond's functionality for local communities, agriculture, wildlife, and biodiversity.

There are various methods and processes to de-silt village ponds, ranging from traditional manual techniques to modern mechanical and biological methods. These methods vary in terms of cost, scale, and environmental impact.

Often, a combination different methods is used to achieve the most effective de-siltation results. For example, manual excavation followed by biological methods like planting vegetation to control ongoing siltation; dredging or excavation combined with sediment traps to prevent further sediment buildup; hydraulic dredging followed by natural filtration to restore ecological balance in the pond.

Thus, the choice of de-siltation method for village ponds depends on factors like pond size, sediment load, available resources, and ecological considerations. While mechanical methods like dredging and excavation can be more efficient for large ponds, manual and biological techniques are often more sustainable and community-friendly for smaller, rural ponds. Regular maintenance, combined with preventive measures such as sediment traps or vegetation restoration, can help maintain the health of village ponds and prevent excessive siltation in the future.

The gross budget estimation towards de-siltation under the Plan has been made with the presumption that the manual method is adopted for the purpose. The de-siltation process (depth: 1.20m) of all the 176 ponds lying within 5 km periphery of the lease area has been proposed to be spread over first five years of the Plan. Next five years shall involve de-siltation of ponds by a depth of 0.40m. In other words, ponds de-silted by 1.20m depth in Year-1 shall be subjected again

to de-siltation by a depth of 0.40m in Year-6 and so on, till the ponds de-silted by 1.20m in Year-5 are taken up again for de-siltation in Year-10, the final year of this Plan.

Year-wise Financial Forecast of the Plan for De-siltation of Ponds is as under:

Activity	Estimated Cost (Rs. in lakh)										Total (Rs. in Lakh)
	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	
De-siltation (1.20m)	80.93	89.70	89.03	90.22	68.92	-	-	-	-	-	418.80
De-siltation (0.40m)	-	-	-	-	-	34.88	38.50	36.68	36.52	30.09	176.67
Capacity Building	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Awareness Development	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Miscellaneous Expenses	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
Total	83.43	92.20	91.53	92.72	71.42	36.38	40.00	38.18	38.02	31.59	615.47
Cost Escalation @ 20%	16.69	18.44	18.31	18.54	14.28	7.28	8.00	7.64	7.60	6.32	123.10
Grand Total	**100.12**	**110.64**	**109.84**	**111.26**	**85.70**	**43.66**	**48.00**	**45.82**	**45.62**	**37.91**	**738.57**

Cost to the User Agency towards implementation of the Pond De-siltation Plan = Rs. 738.57 Lakh.

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ACKNOWLEDGEMENTS

This Pond De-siltation Plan could not have been prepared without the committed collaboration of Mr. Satwik, IFS, Divisional Forest Officer, Dumka Forest Division and the frontline forest staff of Dumka forest division. Also, the interaction with Mr. Umesh Sahani, Conservator of Forests, Dumka Circle and Mr. Satish Chandra Rai, Regional Chief Conservator of Forests, Dumka Region played a vital role in shaping this Plan particularly in terms of its effective implementation in future.

I am grateful to Mr. Kislay Kumar (M/s Ecos Offset Ltd.) and his team members who carried out an intensive survey of the Target Area in question. Without their active support and sincere efforts this Plan could not have seen light of the day.

I owe special thanks to the officials of M/s NUPPL and M/s MIPL GCL Infracontract Pvt. Ltd., the MDO of the project who took utmost care to ensure all logistic support while undertaking field surveys.

Rajiv Ranjan, IFS (Retd.)

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1. INTRODUCTION

1.1. ABOUT THE PROJECT

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited – by the Ministry of Coal, Govt. of India for mining of coal. Coal from this project will be supplied to Ghatampur Thermal Power Plant, a Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. This is a new upcoming project, hence a Greenfield Project.

The project area is spread over 715.00 Ha in the approved Mine Plan of Pachhwara South Coal Mine Project of NUPPL. The net geological reserve of the block is about 354.82 Million Tons and mineable reserve of the block is about 258.91 Million tons. With due mining losses, the extractable reserve comes to about 252.44 Million tons. The Ministry of Coal has approved the normative capacity for coal production at 9.00 MTPA with peak rated capacity at 13.50 MTPA. The land schedule authenticated by DFO, Dumka states that 455.1108 ha falls under forest land category and remaining 259.7445 ha falls under non-forest category. With the rated capacity of 9 MTPA (normative), life of the mine will be around 38 years including two years of pre-mining activity.

Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

1.2. LOCATION OF THE PROJECT

Pachhwara South Coal block occupies the southernmost part of the Rajmahal Coalfield in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated in villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District. The coal block area is covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates as follows:

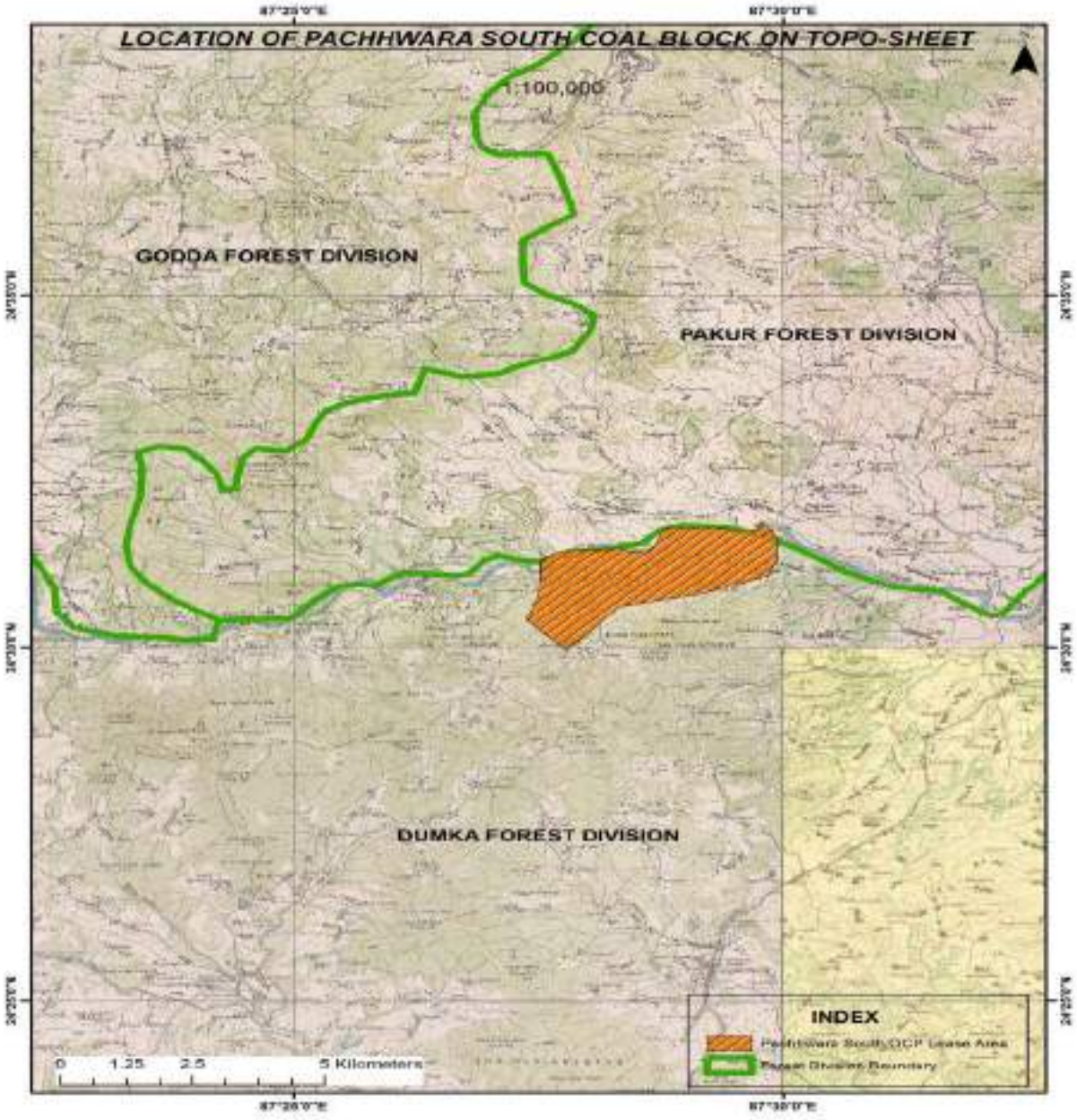
Latitude: 24° 29' 57.404" N – 24° 31' 46.956" N

Longitude: 87° 27' 22.010" E – 87° 29' 56.150" E

The Block is well connected with Dumka, the district headquarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area and well connected with both

Dumka and Pakur (district headquarters) through black-topped Dumka-Shahibganj Road and Amrapara-Maheshpur-Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The location of Pachhwara South Coal Block is being shown in the following map on topo-sheet.

Map 1: Location of Pachhwara South Coal Block



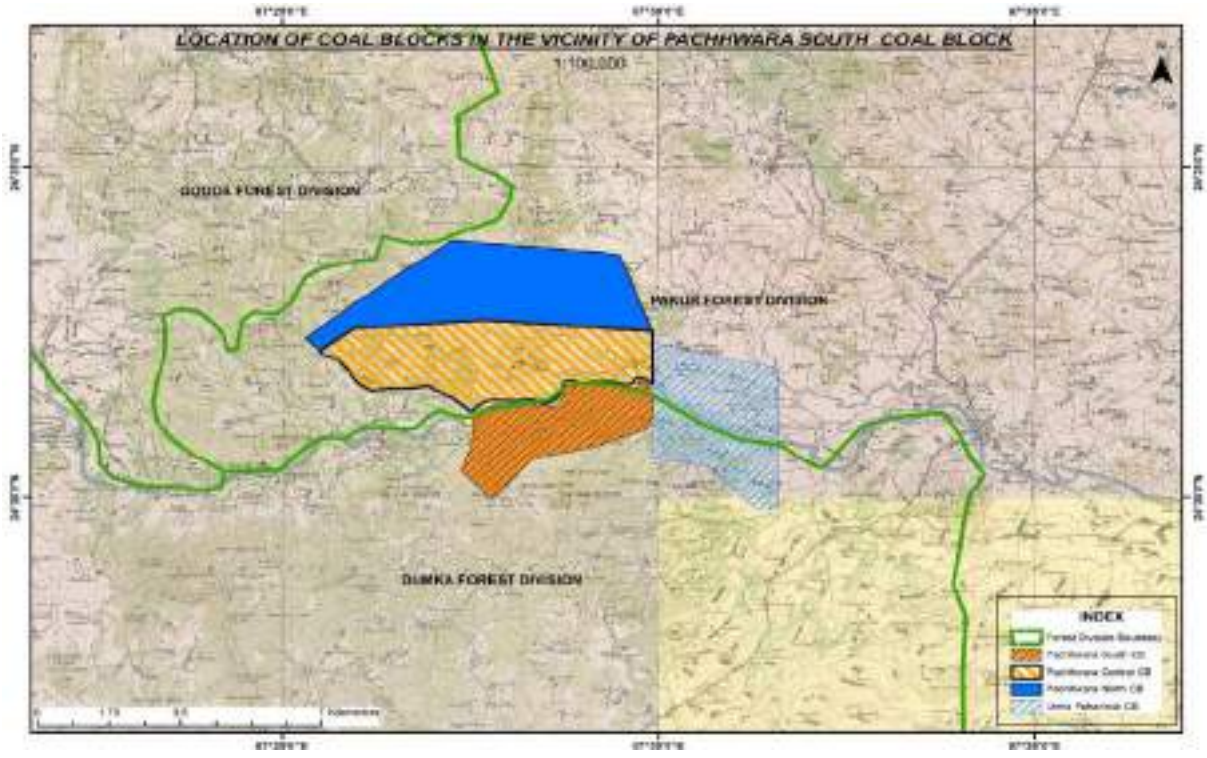
1.3. FORMULATION OF POND DESILTATION PLAN – BACKGROUND

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (**Annexure-1**), has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of M/s Neyveli Uttar Pradesh Power Ltd. in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The condition, in fulfilment of which the instant Plan is being formulated, states the following:

> "*xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required.*"

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. Apart from these three coal blocks, there is another coal block, namely Urma Pahartoli, which is located just adjacent and towards east of the three coal blocks. For better appreciation, the location of the said three mining lease areas are being shown in the following map.

Map 2: Location of Existing Coal Blocks in the Vicinity of Pachhwara South Coal Block



It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river

being the boundary of the Dumka and Pakur forest divisions/districts. Both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearance has been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of Soil & Moisture Conservation (SMC) plans independently within ten km of their respective lease boundaries. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the preparation of SMC plans with respect to Pachhwara (N) CB and Pachhwara Central CB, the Impact Area has been taken to be the area falling within 10 km and 10-20 km radius of the mine lease boundary respectively. However, the Impact Area considered for both the aforesaid projects has been restricted to Pakur Forest Division.

The de-siltation of all ponds falling within the respective impact areas considered for both Pachhwara (N) and Pachhwara Central projects constitute a part of the SMC plans. Thus, all the ponds falling within 20 km of the radius of both the said lease boundaries taken together, and restricted to Pakur Forest Division have already been taken up in the respective SMC plans.

Hence, in order to comply with the condition mentioned at sl. No. xxiii. of the Stage-I forest clearance order, it is incumbent upon the user agency with respect to Pachhwara South Coal Block to take up preparation of a plan for de-siltation of ponds located in 5 km radius of the lease boundary, leaving those ponds which happen to be located in Pakur Forest Division and are within 5 km radius of Pachhwara South Coal Block. This will rule out any chance of duplication in plan proposals.

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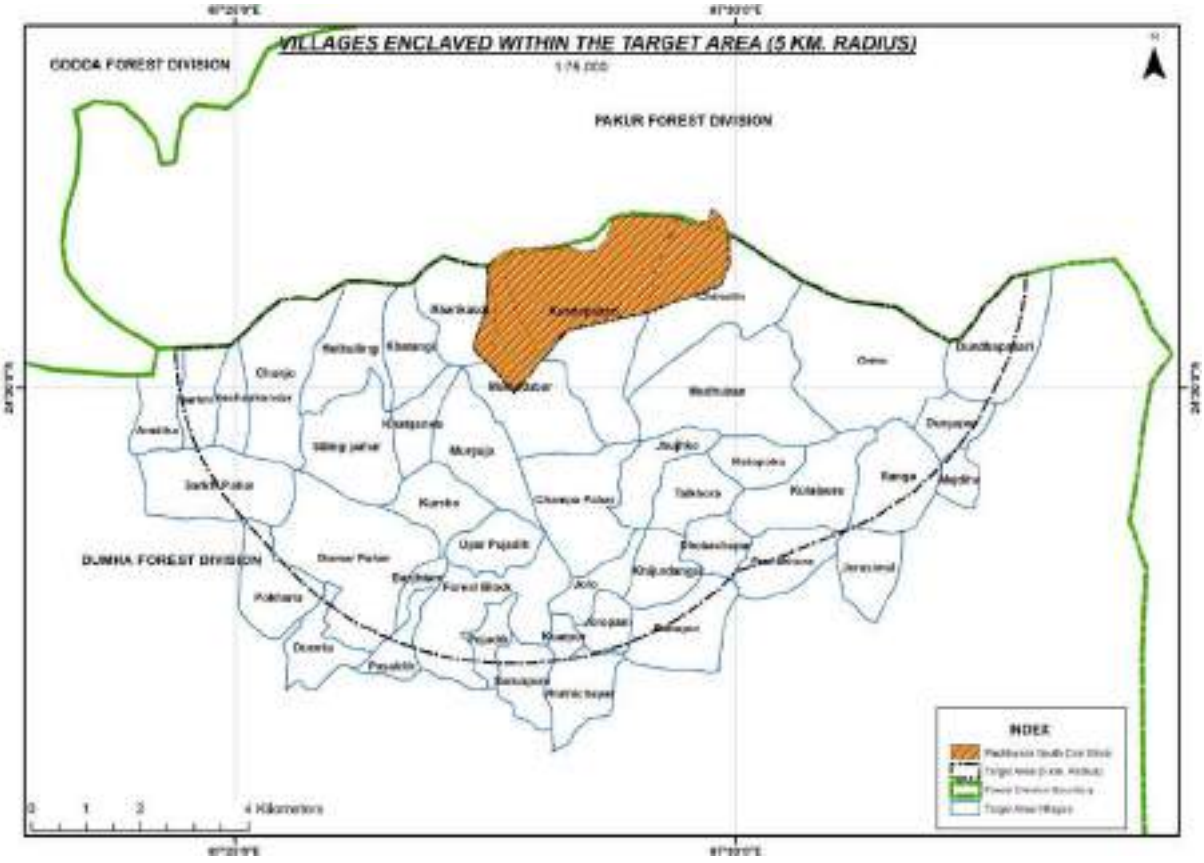
2. TARGET AREA FOR FORMULATION OF POND DESILTATION PLAN

As explained in the previous chapter, the Target Area for the instant Plan has been fixed to be the area encompassed within 5 km radius of the lease area and restricted to Dumka Forest Division..

2.1. VILLAGES ENCLAVED WITHIN THE TARGET AREA AND CORRESPONDING FOREST ADMINISTRATIVE UNITS

The Target Area along with the enclaved villages is being shown in the following map.

Map 3: Villages Enclaved within the Target Area (5 km radius)



The Target Area villages and the corresponding forest administrative units are being tabulated as under.

Table 1: Target Area Villages and Corresponding Forest Administrative Units

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/Thana No.
Kathikund	**Gopikandar**	**Gopikandar West**	1.	Babupur	Gopikandar-21
			2.	Champa Pahar	-
			3.	R.F.	
			4.	Jhutichapar	Gopikandar-4
			5.	Jolo	Gopikandar-1
			6.	Jaropani	Gopikandar-2
			7.	Kuarpur	Gopikandar-3

			8.	Pujadih	Gopikandar-06
			9.	Soruapani	Gopikandar-05
		Korcho	10.	Amdiha	Silangi-08
			11.	Kachuakandar	Silangi-10
			12.	Sarkhi	Silangi-09
	Chirudih	**Durgapur East**	13.	Dhobachapar	Kuskira-07
			14.	Jhanjhko	Kuskira-03
			15.	Khajurdangal	Kuskira-06
			16.	Majhdiha	Kuskira-23
			17.	Talkhora	Kuskira-05
		Durgapur West	18.	Dundhapahari	Kuskira-18
			19.	Durgapur	Kuskira-17
			20.	Jorasimal	Kuskira-15
			21.	Chetopoka	Kuskira-04
			22.	Kulaipura	Kuskira-08
			23.	Ormo	Kuskira-01
			24.	Puranakhora	Kuskira-09
			25.	Ranga	Kuskira-16
		Chirudih	26.	Chirudih	Silangi-20
			27.	Kundapahari	Silangi-19
			28.	Madhuban	Kuskira-02
		Silangi	29.	Chunjo	Silangi-12
			30.	Hethsilangi	Silangi-13
			31.	Kharikasol	Silingi-17
			32.	Khatangi	Silingi-16
			33.	Khatganwa	Silangi-15
			34.	Mahaldabar	Silangi-18
			35.	Sarkhi Pahar	Silangi-11
			36.	Silingi Pahar	Silangi-14
	Narganj	**Lakhanpur**	37.	Pokharia	Narganj-39
		Bora Pahari	38.	Banjhiam	Narganj-44
			39.	Dumra Pahar	Narganj-40
			40.	Dumaria	Narganj-51
			41.	Kurcho	Narganj-41
			42.	Murguja	Narganj-42
			43.	Pusaldih	Narganj-45
			44.	Upar Pujadih	Narganj-43

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3. POND ECOSYSTEM

3.1. General Account of Pond Ecosystem

Ponds are the biodiversity hotspots that collectively support far more species, including rare and threatened species than other freshwater habitats. These also provide food security to the developing nations. Despite the ecological and social benefits, the ponds were largely excluded from several international and national legislations and commitments targeting freshwater ecosystem protection and conservation. Restoration and management efforts are primarily directed towards the larger water bodies and the wetlands of national importance, or are part of a national protected area network. The increasing number of scientific studies on ponds in recent decades indicates the growing concern of the global community. A large number of studies have focused on the physicochemical characteristics, specific species-based biodiversity conservation and enhancing targeted ecosystem services of ponds. However, the narrow utilitarian use-based conservation (i.e., conservation of specific species and ecosystem resources to avoid possible shortages in the future with harmful economic and social consequences) fails to recognize the multiple anthropogenic pressures and provides narrow solutions which are inefficient to regenerate the degraded pond ecosystem.

Ponds are the centuries-old traditional water harvesting structures central to the settlement pattern of India. In 2017–2018, Space Application Centre mapped 2,31,195 water bodies and wetlands in the country covering 15.98 Million hectares of area which accounts for 4.86% of the total geographical area of India (i.e., 328.7 Million hectares). The distribution of ponds and tanks indicate two-third (i.e., 65.67%; 151,815 ponds/tanks) of the total water bodies and wetlands mapped in the country and contribute 11.4% of the total mapped area. Aquaculture ponds occupy 2.7% of the total mapped area. The wetlands of size < 2.25 ha were excluded from wetland classification and identified only as point features. It is relevant to mention here that the surface area of majority of small ponds in India is < 1 ha. According to the 5th census of minor irrigation scheme (2013–2014), the contribution of the ponds/tanks towards irrigation is 41%, which is the largest in the surface flow minor irrigation scheme of India.

A large number of ponds are located in the plateau and desert region of the country compared to the Himalayan and Indo-Gangetic plains, indicating their significance as the water-storage structure in the water-scarce regions of the country. Large number of ponds and tanks (including aqua-culture ponds) are located in southern-India. Majority of ponds and tanks are in Andhra Pradesh followed by Tamil Nadu, Maharashtra, Karnataka, and Telangana. Pond-like structures are also called tanks in the southern states of India.

Historically, ponds were the livelihood source and economic base for the communities. They were mainly managed by the local community which ensured the equitable share and distribution of water to the people. In the eighteenth century, many villages in India contributed ~ 5% of their gross produce to the maintenance of the ponds. With the advent of large-scale irrigation projects, the significance of community-managed ponds was neglected. The perverse incentives and government policies encouraged the over-extraction of groundwater and surface water resource disregarding water conservation and deserting the pond ecosystem.

3.2. POND REHABILITATION

3.2.1. Rationale

The rationale for pond restoration is valid not only from the equity and stability points of view but also from the economic angle. Thus, future food security is critically linked to protecting and strengthening these structures.

Pond restoration has another important benefit in terms of groundwater replenishment. Recharging of groundwater appears to be one of most pressing reasons for pond restoration given the fact that groundwater is the single largest source of irrigation in most parts of India. It is observed that in the absence of replenishing mechanisms like ponds or canals, water supply available from wells is much limited. In most regions open wells have dried up and water levels go down rapidly in the deep borewells in the absence of well managed tanks/ponds in the vicinity, especially during the low rainfall years. And whenever canals/tanks do not get adequate supply, the wells located in the vicinity get poor recharge and the independent wells get almost negligible recharge due to low rainfall. This not only emphasises the rationale for the revival of ponds but also points to the need for conjunctive use of surface and groundwater resources.

Therefore, restoring these systems will go a long way in addressing the issues of food security, regional imbalances, ecological balance, etc. While there is urgent need for policy intervention in this regard, the need for managing these resources in a sustainable manner is equally important. As these systems fall under Common Property Resources, collective action is a prerequisite for their management. Traditionally, local people through institutional arrangements managed these systems. These traditional systems of resource management have degenerated over time due to the state interventions and due to the social, political and economic dynamics at the village level. Loss of capacity of the ponds is not only the loss of pond irrigation but also loss of groundwater recharge in the pond dominant regions, which are relatively dry and drought-prone and dependent on wells as much.

3.2.2. Sedimentation And Soil Erosion – A Major Issue

For small ponds, sediment deposition is a serious problem as the rate of siltation is much higher compared to large water bodies and this reduces the useful life of the pond. Apart from geomorphological processes, soil erosion is largely governed by anthropogenic modifications in the catchment such as concrete drainage networks, deforestation, agriculture intensification, road construction, and uncontrolled grazing. High rate of topsoil erosion in India threatens the ecological dynamics of the receiving water bodies including ponds. In India, scientists have estimated the average rate of soil erosion as 16.35 ton/ha/year, of which 10% are deposits in the reservoirs and ponds leading to the reduction of storage capacity by 1 to 2% annually. Reduction in the water retention capacity of ponds affects the agricultural productivity and livestock in the developing region. It has been found that ponds are the major sediment sink compared to the large dams. Soil erosion and sediment transport not only are responsible for sediment load but also deliver sediment-associated nutrients, organic matter, heavy metals, and other emerging contaminants to the ponds. According to Ramsar Convention on Wetlands (2018), the erosion of nutrient-rich topsoil leads to increased nitrogen and phosphorus transport globally. It has also been reported that the partitioning of heavy metals in the pond sediment is in the order of Pb > Cr > Cd. In India, a large number of ponds are surrounded by habitation and residential area. The landlocked ponds in the country with narrow or no outlet are highly susceptible to sediment deposition and accumulation of contaminants.

3.2.3. Pond Acidification

Freshwater acidification is harmful to various aquatic organisms. Climate warming and changes in water chemistry profoundly affect the pond's pH. The rise in atmospheric carbon dioxide lowers the pH in ponds. Human-induced acidification can be due to atmospheric deposition of carbon dioxide and other inorganic acids or by natural processes and organic acids. The emission of gaseous pollutants such as nitrogen dioxide and Sulphur leads to acid precipitation and subsequent acidification of the ponds. The biodiversity of ponds decreases with an increase in acidification, as the species sensitive to low pH cannot survive in the acidifying ponds. Acidity in ponds alters the solubility of metals in water and increases their toxicity as the metals in dissolved state are more toxic in soft water. In a study of the heavy metal accumulation (mainly Zinc and Copper) with increased acidification in the ponds of East Kolkata wetlands, it has been found that a negative relation between pH and dissolved Zn and Cu in the ponds indicating that the acidification accelerates the dissolution of heavy metals in the ponds affecting the floating food chain such as planktons, and fishes through bioaccumulation.

3.2.4. Climate Change and Pond Rehabilitation

The major impacts of climate change are likely to occur through water. Climate change predictions of the Intergovernmental Panel on Climate Change (IPCC) for South Asia (Indian Region) indicated 0.5^0C-1.2^0 C increase in temperature by 2020 (IPCC, 2007). Rainfall pattern is also likely to change in terms of distribution and intensity. While agriculture as a whole is expected to be mostly negatively impacted rain-fed agriculture, where pond irrigation is concentrated, in particular is expected to be impacted differently under the climate change (IPCC, 2007). Rain-fed agriculture may have unexpected changes in its crop compositions and crop calendar as the pattern and structure of climatic variables may change. These unexpected changes could sometimes be beneficial when they are internalised. But mostly these impacts become cascading due to the various socio-economic changes taking place in these regions. Increasing commercialization, changes in gender and age composition of working farmers and lack of educated farmers in agriculture, increasing labour costs and declining labour productivity are some of the changes that complicate the situation on the ground. The cascading impact of all these changes accentuated by the climate variability seems to be driving the fortunes of the rain-fed farmers. More importantly the farming communities and institutions are unable to foresee these impacts and adequately prepare themselves to face the challenges.

3.3. EFFECT OF OPEN CAST MINING PROJECT ON PONDS LOCATED IN ITS BUFFER AREAS

Open-cast mining involves removing large amounts of soil and rock to access mineral deposits beneath the surface. This process can have a significant impact on the surrounding environment, including ponds in buffer areas near mining projects. Buffer areas are typically designated to protect sensitive ecosystems and water bodies from the effects of mining activities. However, these areas can still be negatively impacted by various factors related to mining operations. Some key ways in which ponds in buffer areas can be affected by open-cast mining projects are described in the following paras.

3.3.1. Water Quality Degradation

- Sediment Runoff: During mining, large quantities of soil and waste material (overburden) are removed, which can lead to increased sediment runoff. If this runoff reaches nearby ponds, it can lead to siltation, clouding the water, reducing light penetration, and harming aquatic life.
- Chemical Contaminants: Mining operations often involve the use of chemicals like cyanide or sulfuric acid, which can leach into water bodies. Heavy metals, such as mercury, arsenic,

and lead, may also be present in mine waste. These contaminants can accumulate in ponds, affecting water quality and harming aquatic organisms.

- Acid Mine Drainage: This occurs when sulphide minerals exposed during mining react with water and oxygen to form sulfuric acid. The resulting acidic water can drain into nearby water bodies, lowering the pH and making the water toxic to aquatic organisms.

3.3.2. Changes in Hydrology

- Altered Water Flow: Open-cast mining can significantly alter the local hydrology by changing natural water flow patterns. Excavating large areas can disrupt groundwater flow and surface runoff, which may reduce the inflow to ponds or lead to flooding in buffer areas. This can affect the availability of water for aquatic ecosystems.
- Water Table Lowering: Mining can lower the water table in the surrounding area, potentially reducing the water levels in nearby ponds. This can affect aquatic plants, fish, and other organisms that rely on stable water levels.

3.3.3. Habitat Destruction

- Loss of Vegetation: Mining activities often involve clearing vegetation even in the buffer zones, which can lead to the destruction of habitats for terrestrial and aquatic species. Vegetation loss also means less filtration of pollutants from runoff before they reach ponds, increasing the likelihood of contamination.
- Disruption of Ecosystem Services: Ponds in buffer zones may provide important ecosystem services, such as water filtration, habitat for wildlife, and a source of water for nearby communities. Mining activities can degrade these services, affecting biodiversity and local communities.

3.3.4. Dust and Air Pollution

- Airborne Dust: Open-cast mining operations generate significant amounts of dust, which can settle on water bodies, altering water chemistry and temperature. Dust can reduce the oxygen content in ponds, affecting fish and other aquatic life.
- Temperature Changes: Dust accumulation on ponds can also affect their thermal properties, possibly leading to changes in water temperature that may harm sensitive species of aquatic life.

3.3.5. Fragmentation of Ecosystems

- Isolation of Habitats: The development of mining projects often leads to fragmentation of habitats, which can isolate populations of species in buffer areas and ponds. Fragmentation can reduce genetic diversity and the ability of species to migrate, find food, or reproduce.
- Increased Human Activity: Increased human activity in mining areas, including transportation and infrastructure development, can lead to further disturbance in buffer areas, potentially causing long-term degradation of ecosystems.

3.3.6. Cumulative Impacts

- Compounding Effects Over Time: The long-term and cumulative impacts of open-cast mining can intensify over time. Repeated sedimentation, contamination, and habitat loss can lead to the gradual degradation of ponds in buffer zones, reducing their ability to support diverse ecosystems and perform key ecological functions.

Thus, ponds in buffer areas of open-cast mining projects are at risk of degradation due to factors such as water quality contamination, changes in hydrology, habitat destruction, and dust pollution. Effective mitigation measures, such as sediment control, water treatment, and habitat restoration, can help reduce these impacts and protect the ecological integrity of these critical water bodies.

3.4. LEGAL AND OTHER CHALLENGES

India is a signatory of the Ramsar Convention on Wetlands (1971). The Wetland (Conservation and Management) Rules, 2017 of India under the provision of the Environment Protection Act, 1986 prioritizes wetland conservation and strictly prohibits encroachment, solid waste dumping, disposal of untreated waste, industrial expansion, conversion, and poaching within the wetland area. However, wetland rules are mainly applicable to the natural water bodies having inundation area >5 ha, thus ignoring the small ponds under the wetland rule. In view of the degradation and disuse of existing water bodies causing loss of irrigation potential, the Government of India under Ministry of Jal Shakti launched a Repair, Renovation, and Restoration (RRR) scheme, 2005, later merged with Prime Minister Krishi Sinchayee Yojana, 2015. Despite the ambitious RRR scheme (restoring 3,341 water bodies), ponds were largely excluded from restoration as the scheme centers on water bodies of size >5 ha for rural water bodies and between 2 ha and 10 ha for urban water bodies (RRR-MoJS 2017). As per new 2022 guidelines, water bodies of size >2 ha (rural water body) and >1 ha (urban water body) are eligible for the RRR scheme (RRR-MoJS 2022). In general small ponds are of size <1ha, specifically in rural India. Since water is a state subject every state in India has its classification system for water bodies. The nonexistence of a unique water body

classification system throughout the country contributes to the deterioration of ponds/tanks. Although no specific policy and legislative frameworks for ponds/tanks exist in India, their conservation and management are indirectly influenced by several other policies for instance, National Water Policy-2012, National Environment Policy-2006, National Plan for Conservation of Aquatic Ecosystem-2013, National Action Plan on Climate Change-2008, Atal Mission for Rejuvenation and Urban Transformation, and The Mahatama Gandhi National Rural Employment Guarantee Act-2005. The number of policies and programs running under various ministries further complicates pond conservation restoration and management.

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4. DESILTATION METHODS/PROCESSES

De-siltation of village ponds is the process of removing accumulated sediments (silt, mud, sand, and organic matter) from the pond bed to restore its depth, improve water quality, and ensure its ecological health. Sediment accumulation in ponds is a natural process, but excessive siltation can lead to a reduction in water holding capacity, loss of biodiversity, and poor water quality. The primary aim of de-siltation is to restore the pond's functionality for local communities, agriculture, wildlife, and biodiversity.

There are various methods and processes to de-silt village ponds, ranging from traditional manual techniques to modern mechanical methods. These methods vary in terms of cost, scale, and environmental impact. Different de-siltation methods are being described in the following paras.

4.1. MANUAL DE-SILTATION METHODS

Manual de-siltation methods are simple, cost-effective, and environmentally friendly techniques used to remove sediment from village ponds. These methods are especially useful in small-scale or community-managed ponds where access to heavy machinery or mechanical equipment is limited. Manual de-siltation is often labour-intensive but can be an effective way to restore water capacity sustainably, improve water quality, and support biodiversity. It also involves local labourers or community members, which fosters a sense of ownership and responsibility for pond health. Some common manual de-siltation methods for village ponds are as follows.

4.1.1. Hand Excavation

This involves using basic tools like shovels, spades, and hoes to manually dig up silt and sediment from the bottom of the pond. Labourers typically stand in shallow water or use ropes to access deeper areas, scraping the silt into containers (like baskets or sacks) and hauling it out. The pond is typically drained or partially lowered to expose sediment. Manual labourers scoop out the silt from the pond bed and transfer it to the shore for disposal or reuse. The sediment can be used as compost for agriculture or disposed of in a nearby location.

The advantages of this method is its low cost and it does not require machinery or fuel, making it suitable for rural settings. It can be done in smaller ponds or ponds with irregular shapes where machinery cannot reach.

The disadvantages of this method are: Labor-intensive and time-consuming; limited to shallow or moderately deep ponds. Also, it may take longer to complete the de-siltation process for larger areas.

4.1.2. Use of Traditional Tools (Rakes, Nets and Scoops)

Villagers often use traditional hand tools like large rakes, scoops, or nets to collect silt and organic debris from the pond. These tools are often dragged through the water to loosen sediment, which is then scooped into baskets or containers for removal. Rakes or scoops are used to gather loose silt from the surface or from shallow areas of the pond. Sediment is collected in small quantities and placed in baskets or large sacks for removal. Sometimes, nets are used to collect floating debris and fine sediment.

The advantages of this method is that it involves simple tools that are easy to use and inexpensive. There is no need for machinery, making it accessible to rural communities. Also, there is less disruption to aquatic ecosystems compared to mechanical methods.

The disadvantages are the limited effectiveness for large-scale de-siltation. The process can be slow if the pond is deep or if the silt is compacted. Thus, this method works best for shallow ponds or surface sediments.

4.1.3. Silt Scooping Using Wooden or Metal Scoops

A scoop (often a large, flat, shallow container made of wood or metal) is used to scrape the sediment from the pond bed. This method is similar to using a shovel but is more efficient in some situations, especially for areas with a buildup of fine sediment. Workers use the scoop to scoop up sediment from the bottom of the pond, starting from the edges and moving inward. The sediment is then transferred to containers or directly to the shore. After the scoop has collected enough sediment, it is emptied, and the process is repeated.

This process is efficient for removing shallow layers of silt and mud. It works well in smaller ponds with limited water depths. However, it requires manual effort and may be ineffective for deeper ponds. And the process is limited to soft, loose sediment (compacted or hard sediments may be difficult to scoop).

4.1.4. Basin Digging (Excavating Small Sections at a Time)

In this method, the pond is divided into smaller sections or "basins", and sediment is removed incrementally, starting from one basin. This can help manage the workload, allowing labourers to tackle one section at a time. The pond is typically sectioned off into smaller areas, and one area is de-silted at a time. Labourers manually excavate the sediment from each basin, removing it and transporting it to the shore. This method allows for controlled de-siltation, especially when the pond is large.

The advantage of this method is that it allows for systematic and gradual sediment removal. Also, it reduces the risk of overwhelming the pond ecosystem with sudden disturbances. However, the process is time-consuming and labour-intensive and it may not be suitable for ponds with irregular shapes.

4.1.5. Manual Silt Removal Using Sludge Pumps (Small-Scale Manual Pumps)

Some manual pumps (like hand-powered sludge or diaphragm pumps) can be used to suck up silt and water from the bottom of the pond. These pumps can be operated by hand or with a small motor to pump out both water and silt. Typically, a manual pump is lowered into the pond, and the sediment-laden water is pumped out to the shore. The sediment is then separated from the water using sieves or settling tanks. The sediment is then removed for disposal or repurposing.

This process is more efficient than manual scooping or raking. It can work for deeper or more compacted sediment layers. However, this involves purchase of a manual pump. Further, it is labor-intensive to operate, especially in large ponds.

4.2. MECHANICAL DESILTATION METHODS

Mechanical de-siltation is a more efficient and faster method of removing accumulated silt, mud, and sediment from village ponds compared to manual techniques. It involves the use of machinery or specialized equipment to remove sediments, which can significantly improve the pond's water storage capacity, water quality, and biodiversity. This method is often employed for larger ponds or ponds with deep silt buildup that cannot be easily managed through manual labour alone. Some common mechanical de-siltation methods for village ponds are being described in the following paras.

4.2.1. Excavators and Backhoe Loaders

Excavators or backhoe loaders are heavy machines equipped with buckets or scoops to remove silt and sediment from the bottom of the pond. These machines scoop up sediment, which is then transferred to dump trucks or piles at the pond's edge for disposal or reuse. The pond is either partially drained or the water level is lowered to allow access to the sediment. The excavator's bucket or backhoe scoops up the silt from the pond bed, and it is either deposited on-site or hauled away. Excavators can also be used to reshape or deepen the pond if necessary.

This method is efficient for large-scale de-siltation of larger or deeper ponds. It can remove large volumes of sediment quickly and is suitable for ponds with significant silt buildup or where sediments are compacted. However, it is expensive to hire or purchase machinery and operators.

Also, it may cause environmental damage (e.g., erosion, disturbance of aquatic habitats) if not done carefully. Further, it is not ideal for very shallow ponds or those with irregular shapes that machinery can't easily reach.

4.2.2. Dredging (Hydraulic or Mechanical)

Dredging involves using specialized equipment to scoop or pump up silt and sediment from the pond bottom. There are two primary types of dredging: hydraulic and mechanical.

- Hydraulic Dredging: Uses suction or a high-pressure water jet to loosen the sediment, which is then sucked up through a pipe and transported to a disposal area.
- Mechanical Dredging: Uses mechanical scoops, buckets, or grabs to physically remove sediment, which is then deposited into barges, trucks, or on the shore for disposal.

A dredger is lowered into the pond to remove sediment using either hydraulic pumps or mechanical grabs. The sediment is sucked up or scooped into containers for removal. The pond's shape can be maintained or modified if needed during the process.

The advantages of this method is that it is very effective for deep ponds or ponds with thick layers of sediment. It can handle larger volumes of silt and sediment more efficiently than manual methods and is suitable for large-scale de-siltation projects. Nevertheless, it requires specialized equipment, which can be costly to rent or operate. It may disturb the pond's ecosystem if not managed properly. The disposal of the dredged material also requires additional planning to ensure environmental safety.

4.2.3. Hydraulic Suction Pumps

This process involves use of hydraulic suction pumps or vacuum pumps which are used to remove silt from the bottom of the pond. These pumps use suction to lift sediment and water and discharge the slurry to an appropriate disposal site. A suction pipe is lowered into the pond, and sediment-laden water is sucked up by the pump. The slurry (water and silt mixture) is discharged through pipes to a designated location for dewatering or further disposal. Depending on the system, the silt may be separated from the water using filtration or sedimentation tanks.

This method is less invasive than dredging and causes minimal disruption to the water surface. It is effective for removing fine silt and organic matter and it is typically suited for deep ponds and ponds with hard-to-reach areas. The disadvantages are that it requires the purchase or rental of suction pumps, which can be expensive. Further, it is suitable only for removing silt and fine

sediments; large debris may clog the system. Disposal of the slurry properly can be challenging, especially in environmentally sensitive areas.

4.2.4. Mechanical Dredgers with Buckets/Clamshells

Mechanical dredgers use large buckets or clamshell-type scoops attached to a crane or dredging rig. The scoop is lowered to the pond bottom, where it picks up sediment and lifts it to the surface for disposal. The mechanical dredger is positioned over the pond, and the bucket or clamshell scoop is lowered to scoop up the sediment. The sediment is lifted and deposited into a nearby truck or pile for removal. This method is particularly useful for areas with thicker, more compacted sediment.

This method is ideal for ponds with heavy sediment buildup. It is efficient and quick in removing large amounts of sediment. It can work in relatively deep ponds. However, equipment is costly to purchase or rent. The process may disturb the pond ecosystem, including aquatic plants and animals. It may not work well for very shallow ponds or irregularly shaped ponds.

4.2.5. Dragline Dredging

This involves a large crane with a dragline bucket attached, which is used to drag across the pond bed and remove sediment. The dragline bucket scoops up sediment, which is then lifted and transferred to a nearby disposal site. The dragline is positioned at the pond's edge, and the bucket is dragged across the bottom of the pond to scoop up silt. The sediment is lifted to the surface and deposited for further transport or use.

The process is effective for removing large amounts of sediment from deeper ponds as it can handle dense, heavy sediments. Hence, it is suitable for deep ponds where other methods may be ineffective. The obvious disadvantages of the method are that dragline dredgers are expensive to hire and operate, requiring specialized operators. Environmental impact (disturbance to aquatic life) needs to be managed.

4.2.6. Water Jetting (High-Pressure Water Jets)

High-pressure water jets or hoses are used to dislodge compacted silt and sediment from the bottom of the pond. The jets break up the sediment, which is then collected and removed using other mechanical equipment. High-pressure water is directed at the sediment on the pond bed to break it up. The loosened sediment is then removed using scoops, vacuum pumps, or dredgers.

The advantages are that this process is effective for breaking up compacted or hard layers of silt. It can be used in combination with other methods for improved results. However, it requires water

sources with sufficient pressure, which may not always be available. Also, it can cause a temporary increase in water turbidity, affecting water quality. Potentially this method is more expensive than other methods.

Thus, mechanical de-siltation methods are best suited for larger village ponds, ponds with significant sediment accumulation, or ponds where manual methods would be inefficient or impossible. While these methods offer speed and efficiency, they come with higher costs and potential environmental impacts. In many cases, a combination of mechanical and manual techniques may be used to optimize de-siltation and minimize disruption to the pond's ecosystem. Proper planning and careful management are crucial to ensure the ecological health of the pond during and after the de-siltation process.

4.3. BIOLOGICAL OR NATURAL DE-SILTATION METHODS

These methods focus on promoting natural processes to reduce sedimentation or prevent further buildup of silt in ponds. While they are not direct methods of de-siltation, they can help manage and control silt accumulation over time. Some of the biological or natural de-siltation techniques that can be used in village ponds are being described in the following paras.

4.3.1. Aquatic Plants and Vegetation

Aquatic plants are known to play a crucial role in controlling siltation by stabilizing the pond bed, absorbing excess nutrients, and improving water quality.

- Floating Plants: Plants like Water Hyacinth (Eichhornia crassipes) or Duckweed (Lemna spp.) can help reduce the amount of sunlight reaching the pond bed, thus reducing the growth of algae that might contribute to siltation.
- Submerged Plants: Plants like Vallisneria, Elodea, or Hornwort (Ceratophyllum demersum) help in stabilizing the sediment and preventing erosion of the pond bed.
- Emergent Plants: Plants such as Cattails (Typha spp.) and Bulrushes (Schoenoplectus spp.) absorb nutrients from the water and improve water quality while helping bind soil particles together.

4.3.2. Bioremediation Using Microorganisms

Certain microorganisms can be introduced to a pond to break down organic matter and reduce silt accumulation. These microbes digest organic sediments, converting them into non-toxic substances that can be easily absorbed by plants or dissolved in the water.

- Bacteria: Special strains of bacteria, such as Pseudomonas or Bacillus, can break down organic matter and promote the flocculation of fine particles, making them easier for plants to absorb.
- Fungi: Mycoremediation, or the use of fungi to decompose organic material, can also help in the breakdown of accumulated organic matter in the pond.

4.3.3. Fish and Aquatic Fauna

- Fish Species: Certain species of fish like Grass Carp (Ctenopharyngodon idella) can help control aquatic weeds and prevent the excessive buildup of organic material in the pond. Some fish species like Tilapia (Oreochromis spp.) and Catfish (Clarias spp.) feed on detritus, algae, and organic material, helping to break down sediments naturally.
- Snails and Crustaceans: Species like Apple Snails (Pomacea spp.), freshwater mollusks, or Shrimp can help control the accumulation of algae and organic matter by consuming detritus and contributing to the breakdown of sediment.

4.3.4. Mudskipper and Earthworm Activity

In ponds with shallow waters, mudskippers or earthworms (if present) can help aerate the soil and organic materials. Their burrowing and feeding behaviour help to decompose organic matter and mix silt with the surrounding environment.

4.3.5. Bio-flocculation

This is a process where naturally occurring microbes and algae bind to fine silt particles, making them larger and heavier. The flocculated particles sink to the bottom of the pond, reducing the suspended sediment and helping to clear the water. Adding certain biocontrol agents or biofertilizers can enhance this process by stimulating the growth of microorganisms that cause bio-flocculation.

4.3.6. Composting of Organic Waste

Pond areas can be managed by composting organic waste such as fallen leaves, algae, and weeds around the pond's perimeter. The compost can help improve soil quality and provide nutrients to plants that can stabilize the pond's edges and reduce the deposition of excess organic matter.

4.3.7. Integrated Aquaculture

Integrating fish farming (aquaculture) with the pond ecosystem can contribute to the natural de-siltation process. The fish can help feed on the detritus, algae, and aquatic plants, reducing the

organic load in the pond. Additionally, proper management of aquaculture waste can help maintain the ecological balance.

4.3.8. Silt Traps and Filtration Systems

Though not strictly biological, designing ponds with natural filtration systems (such as wetland areas) or silt traps along the inflow and outflow can significantly reduce silt accumulation. These areas can be planted with vegetation that filters water as it flows, reducing the amount of sediment entering the pond.

4.3.9. Improved Catchment Management

Managing the watershed or catchment area that drains into the pond can help reduce the amount of sediment entering the pond. Natural vegetation cover in the catchment area can reduce soil erosion, while agroforestry and sustainable farming practices can reduce silt runoff into the pond.

4.3.10. Sediment Management with a Holistic Approach

A combination of the above methods, along with regular monitoring, is often the most effective. For example, periodic harvesting of aquatic plants, careful management of fish populations, and supporting natural processes like microbial degradation of organic matter can ensure long-term sustainability.

The benefits of aforementioned Biological/ Natural De-siltation Methods are that these are cost-effective and sustainable, maintaining and improving the ecological balance of the pond. They improve water quality by preventing excessive nutrient buildup and reducing algal blooms. Encouraging biodiversity by creating a habitat for various aquatic organisms is another plus point. Further, the local communities can play a role in maintaining the pond, enhancing their involvement in sustainable water management.

However, the challenges are also there when these methods are adopted. Biological methods take longer to show results compared to mechanical de-siltation. Invasive species like Water Hyacinth can become problematic if not managed carefully. The whole process requires knowledge of ecosystem management, including the right balance of plant species, fish populations, and microorganisms.

Thus, biological and natural de-siltation methods can be highly effective and sustainable ways to manage sedimentation in village ponds. By employing a mix of aquatic plants, microorganisms, fauna, and careful pond management, it is possible to maintain the ecological health and water quality of village ponds over the long term.

4.4. GRAVITATIONAL OR DRAINAGE TECHNIQUES

Gravitational or drainage techniques for de-siltation of village ponds involve using the natural forces of gravity and water flow to remove accumulated silt and debris. These methods are often more sustainable and cost-effective than mechanical dredging, as they make use of natural processes to enhance the pond's self-cleaning abilities. Various gravitational and drainage techniques that can be applied to village ponds for de-siltation are as follows.

4.4.1. Controlled Drainage and Sediment Removal

One of the simplest gravitational methods is to control the drainage of the pond in a way that helps remove silt and sediments naturally. This can be done by:

- Seasonal Drainage: In areas where water levels fluctuate, draining the pond during the dry season can help remove accumulated silt. The pond is allowed to fill up with water again in the wet season. The accumulated sediment can be allowed to settle or can be manually scooped out after draining.
- Draining with Silt Extraction: A controlled release of pond water can help flush out lighter sediments, leaving behind denser silt particles that settle at the pond bed. This can be combined with strategic inlet and outlet management, allowing for silt-laden water to be drained from the pond through lower outlets.

4.4.2. Sediment Traps and Silt Sumps

Creating sediment traps or silt sumps at the inflow and outflow points of the pond is a highly effective gravitational technique. These traps work by directing the incoming water through a shallow, low-lying area where silt can settle out before the water enters the main body of the pond. Key components include the following:

- Catchment Area Modification: Channels or ditches leading to the pond can be designed to slow down the water flow, allowing suspended sediments to settle before reaching the pond.
- Inflow Modifications: A silt trap is constructed at the inflow, allowing water to enter the pond at a controlled speed, causing particles to settle. These traps can be periodically cleaned out to prevent them from becoming clogged.
- Silt Sumps: These are deeper, localized areas near the inlet or outlet where heavier silt accumulates. When the water level of the pond is lowered, the silt from these sumps can be manually or mechanically removed.

4.4.3. Use of Perforated Pipes for Sediment Transport

A more advanced method involves using perforated pipes installed at the bottom of the pond or at its sediment-heavy areas. These pipes allow water to flow out through small holes or perforations, dragging along lighter silt particles with it. The process is essentially a form of subsurface drainage.

Perforated pipes are laid across the pond bed, usually in the deeper areas where sediment accumulation is most significant. The water flowing through the pipes is drained away from the pond, carrying suspended sediments along with it. The system can be controlled to ensure that only sediment-laden water is removed without losing too much water from the pond.

4.4.4. Pond Outlet Design (Weir and Settling Basin)

A weir or settling basin at the pond outlet can be a highly effective gravitational technique for silt management. The design of the outlet determines the rate of flow and helps manage the sediment load:

A weir can be placed at the outlet to regulate water flow, ensuring that excess water (and silt) is allowed to drain slowly and in a controlled manner. It helps maintain water levels while preventing sudden flushes that could disturb the sediments. Before water is released from the pond, it can be routed through a settling basin. The basin is designed to slow down the water, allowing suspended particles to settle out before water is drained or used for irrigation.

4.4.5. Gravitational De-siltation Through Pond Deepening

In cases where silt accumulation is severe, gravitational de-siltation can be achieved by deepening the pond. This technique involves:

- Excavation of the Pond Bed: The pond bed is lowered strategically to remove sediment layers that have accumulated over time. This allows the pond to regain its original depth and water holding capacity.
- Gravity-Assisted Silt Movement: After deepening, the pond is left to fill with water during the rainy season, allowing natural flow dynamics to help redistribute and settle fine silt particles. Over time, water flow through the pond may help wash away lighter sediments toward the outlet, where they can be drained off.

4.4.6. Check Dams and Catchment Drainage

Building small check dams or pond embankments in the catchment area can help slow the flow of water into the pond, allowing silt to settle before reaching the pond. This can be done in combination with improved drainage channels that direct water toward silt traps or natural filters:

- Check Dams: These small dams or embankments help slow down the water flow, creating a controlled environment where sediment can settle naturally.
- Catchment Area Water Management: In addition to check dams, the entire watershed area can be managed to slow down surface runoff and reduce soil erosion. Vegetative cover, terraces, and retention ponds can prevent silt from entering the village pond in the first place.

4.4.7. Natural Filtration and Erosion Control

Natural drainage techniques can be enhanced by preventing soil erosion in the pond's catchment area. This involves the creation of natural filtration systems such as:

- Vegetated Buffers: Planting grasses, shrubs, and trees around the pond's edges and within the catchment area helps reduce erosion and filter out sediment before it reaches the pond.
- Terracing and Erosion Barriers: Terracing of hillsides and the use of erosion control measures (e.g., stone walls, live fences) can slow down water flow and reduce silt transport into the pond.

4.4.8. Utilizing Water Flow for Silt Removal

For ponds with inflow channels or streams, controlled flow management can be used to create a "scouring" effect that removes accumulated silt:

- Inflow Control: During periods of high water flow, the direction of inflow can be altered to create turbulent currents that help dislodge silt from the pond bed. These particles can then be carried out through designated outlet channels.
- Outlet Control: Similarly, the outflow of water can be adjusted to flush out sediments from the deeper parts of the pond. This requires managing the outlet in such a way that sediment-rich water is removed while maintaining the pond's water level.

The advantages of Gravitational or Drainage Techniques are:

- Low Cost: These methods are relatively inexpensive compared to mechanical de-siltation (e.g., dredging).

- Sustainability: These techniques make use of natural processes and minimize environmental disruption.
- Minimal Maintenance: Once implemented, gravitational and drainage techniques require less active management and maintenance.
- Eco-friendly: These methods work in harmony with the local ecosystem and reduce the need for chemical interventions or machinery.

The challenges involved are:

- Time-Consuming: Natural de-siltation methods take longer to show results compared to mechanical dredging.
- Sediment Redistribution: There is a risk of sediment being redistributed elsewhere in the pond or surrounding areas, which may cause new accumulation problems.
- Seasonal Limitations: Some techniques (like seasonal drainage) are dependent on local weather patterns and might not be applicable in areas with irregular rainfall.

Thus, gravitational and drainage techniques for de-siltation can be highly effective for maintaining the health of village ponds. These methods rely on natural water flow dynamics, sediment management, and landscape design to reduce silt accumulation in an environmentally sustainable manner. Combining these techniques with other management practices can ensure long-term sustainability for the pond ecosystem.

4.5. COMBINATION OF DIFFERENT METHODS

Often, a combination of the methods listed above is used to achieve the most effective de-siltation results. For example, manual excavation followed by biological methods like planting vegetation to control ongoing siltation; dredging or excavation combined with sediment traps to prevent further sediment buildup; hydraulic dredging followed by natural filtration to restore ecological balance in the pond.

Thus, we may conclude that the choice of de-siltation method for village ponds depends on factors like pond size, sediment load, available resources, and ecological considerations. While mechanical methods like dredging and excavation can be more efficient for large ponds, manual and biological techniques are often more sustainable and community-friendly for smaller, rural ponds. Regular maintenance, combined with preventive measures such as sediment traps or vegetation restoration, can help maintain the health of village ponds and prevent excessive siltation in the future.

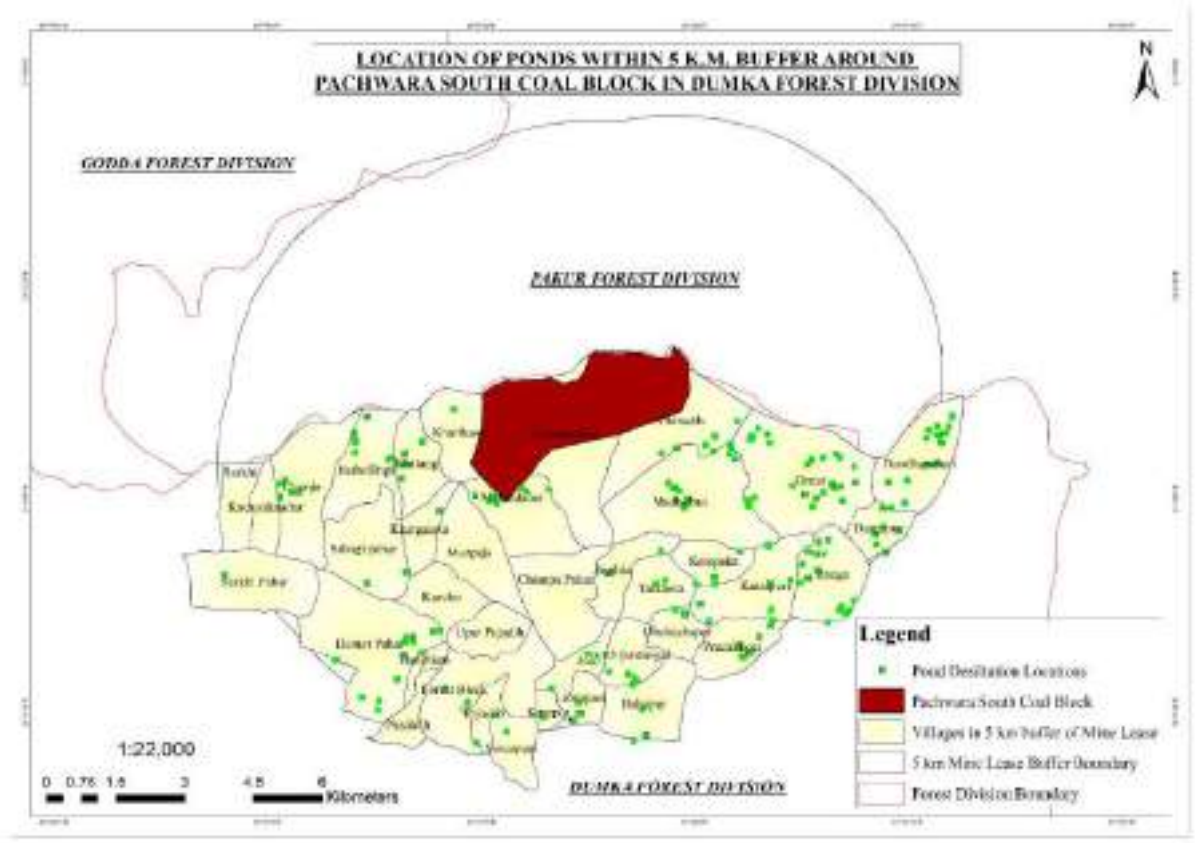
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5. LOCATION AND DESCRIPTION OF THE PONDS WITHIN THE TARGET AREA

5.1. LOCATION AND DESCRIPTION OF PONDS

The location map of ponds within the Target Area is as follows.

Map 4: Location Map of Ponds within the Target Area



The dimensions and actual locations (latitude & longitude) of ponds in 5 km buffer of Pachhwara South Coal Block in **Dumka Forest Division** are being tabulated hereunder.

Table 2: Location and Approximate Dimension of Ponds in the Target Area

Range	CD Block	Village	Sl. No.	Dimension (Approx.)	Latitude	Longitude
Kathikund	Gopikandar	**Babupur**	1.	30m x 30m	24.45890	87.48990
			2.	30m x 30m	24.46371	87.48801
			3.	30m x 30m	24.46380	87.48777
			4.	30m x 30m	24.46390	87.48775
			5.	25m x 30m	24.45380	87.49057
	Gopikandar	**Chirudih**	6.	30m x 40m	24.50934	87.50365
			7.	15m x 15m	24.51054	87.50216
			8.	30m x 50m	24.51232	87.50395

			9.	30m x 40m	24.51520	87.50838
			10.	30m x 30m	24.50898	87.49349
	Gopikandar	**Chunjo**	11.	20m x 25m	24.50035	87.41907
			12.	30m x 30m	24.50040	87.41908
			13.	30m x 30m	24.50112	87.42269
			14.	30m x 30m	24.50305	87.41905
			15.	20m x 30m	24.50375	87.42010
			16.	30m x 30m	24.50128	87.42149
	Gopikandar	**Dhobachapar**	17.	25m x 35m	24.47841	87.49635
			18.	30m x 40m	24.47763	87.49813
	Kathikund	**Dumra Pahar**	19.	30m x 30m	24.45883	87.43815
			20.	40m x 40m	24.46060	87.43840
			21.	30m x 30m	24.46123	87.43508
			22.	20m x 20m	24.46484	87.44188
			23.	40m x 50m	24.46844	87.43016
			24.	30m x 30m	24.46940	87.44330
			25.	30m x 30m	24.46950	87.44300
			26.	20m x 30m	24.46971	87.44309
			27.	20m x 20m	24.47012	87.44683
			28.	25m x 25m	24.47217	87.44512
			29.	25m x 25m	24.47225	87.44340
			30.	30m x 30m	24.47283	87.44366
			31.	20m x 35m	24.47296	87.44509
			32.	30m x 30m	24.47392	87.44876
			33.	30m x 30m	24.47420	87.45029
	Gopikandar	**Dundhapahari**	34.	15m x 20m	24.49820	87.53854
			35.	20m x 20m	24.49934	87.54102
			36.	30m x 30m	24.50370	87.54148
			37.	30m x 30m	24.50668	87.54543
			38.	15m x 20m	24.50692	87.54716
			39.	40m x 60m	24.51095	87.54810
			40.	20m x 40m	24.51189	87.54530
			41.	30m x 40m	24.51231	87.54777
			42.	10m x 15m	24.51255	87.54741
			43.	30m x 30m	24.51280	87.54897
			44.	20m x 30m	24.51332	87.54571
			45.	30m x 30m	24.51420	87.54735
			46.	30m x 30m	24.51420	87.54960
			47.	30m x 30m	24.51600	87.55021
			48.	30m x 35m	24.51626	87.55033
			49.	30m x 30m	24.50324	87.53790
	Gopikandar	**Durgapur**	50.	10m x 10m	24.49308	87.53521
			51.	15m x 20m	24.49382	87.54000
			52.	15m x 30m	24.49447	87.53676
			53.	20m x 20m	24.49823	87.53682
			54.	30m x 30m	24.49128	87.53545
	Gopikandar	**R. F.**	55.	30m x 30m	24.46020	87.45556
			56.	30m x 30m	24.46027	87.45561
			57.	25m x 30m	24.46292	87.45122

	Gopikandar	**Hethsilangi**	58	30m x 40m	24.50757	87.44031
			59.	30m x 40m	24.50787	87.44078
			60.	30m x 30m	24.50902	87.43380
			61.	30m x 30m	24.51125	87.43382
			62.	30m x 40m	24.51261	87.43365
			63.	30m x 30m	24.51610	87.43608
	Gopikandar	**Jhanjhko**	64.	30m x 30m	24.48550	87.48313
			65.	25m x25m	24.48555	87.48336
			66.	30m x 30m	24.48986	87.49335
	Gopikandar	**Jolo**	67.	35m x 40m	24.46944	87.48088
			68.	20m x 20m	24.46984	87.47917
			69.	25m x 25m	24.46297	87.47206
	Gopikandar	**Jaropani**	70.	25m x 30m	24.45683	87.47628
			71.	30m x 30m	24.45809	87.47762
			72.	15m x 20m	24.46015	87.47746
	Gopikandar	**Chetopoka**	73.	20m x 30m	24.48486	87.50387
			74.	20m x 30m	24.48982	87.50888
	Gopikandar	**Kharikasol**	75.	20m x 35m	24.51752	87.45305
	Gopikandar	**Khatangi**	76.	20m x 30m	24.50402	87.44275
			77.	30m x 40m	24.50670	87.44332
			78.	30m x 40m	24.50887	87.44335
			79.	40m x 60m	24.51125	87.44687
	Gopikandar	**Khatganwa**	80.	30m x 30m	24.49768	87.45030
	Gopikandar	**Khajurdangal**	81.	30m x 30m	24.46450	87.48862
			82.	30m x 30m	24.46581	87.48698
			83.	30m x 30m	24.46630	87.48335
			84.	30m x 30m	24.46514	87.48839
	Gopikandar	**Kuarpur**	85.	40m x 40m	24.45739	87.47041
	Gopikandar	**Kulaipura**	86.	30m x 30m	24.47840	87.51492
			87.	30m x 30m	24.48330	87.50391
			88.	20m x 30m	24.48360	87.51484
			89.	25m x 30m	24.48411	87.51873
			90.	30m x 30m	24.47615	87.50289
			91.	30m x 30m	24.47942	87.50108
			92.	30m x 30m	24.49086	87.51457
	Gopikandar	**Kumarbandh**	93.	60m x 60m	24.45297	87.48815
	Gopikandar	**Kundapahari**	94.	30m x 30m	24.50180	87.47170
	Gopikandar	**Madhuban**	95.	30m x 30m	24.49109	87.51437
			96.	20m x 35m	24.49830	87.49775
			97.	40m x 40m	24.49840	87.49810
			98.	30m x 30m	24.49860	87.51056
			99.	30m x 30m	24.49997	87.49856
			100.	20m x 35m	24.50153	87.49702
			101.	30m x 30m	24.50199	87.49580
			102.	30m x 30m	24.50220	87.49609
			103.	30m x 30m	24.50312	87.49497
			104.	30m x 35m	24.50862	87.50688
			105.	30m x 40m	24.50996	87.49664
			106.	30m x 30m	24.50790	87.50792

	Gopikandar	**Mahaldabar**	107.	30m x 30m	24.49897	87.46140
			108.	60m x 70m	24.49956	87.46002
			109.	40m x 40m	24.50060	87.46105
			110.	20m x 30m	24.50067	87.45719
			111.	30m x 30m	24.50140	87.46710
			112.	20m x 20m	24.50208	87.46619
	Kathikund	**Majhdiha**	113.	40m x 40m	24.48940	87.53725
			114.	40m x 40m	24.48980	87.53711
	Gopikandar	**Ormo**	115.	40m x 40m	24.49845	87.52299
			116.	20m x 30m	24.49958	87.52888
			117.	30m x 30m	24.49966	87.51048
			118.	30m x 30m	24.49970	87.51006
			119.	30m x 45m	24.50005	87.52371
			120.	30m x 35m	24.50019	87.51170
			121.	35m x 40m	24.50078	87.52155
			122.	20m x 20m	24.50133	87.52521
			123.	30m x 40m	24.50140	87.52507
			124.	30m x 35m	24.50253	87.52837
			125.	30m x 30m	24.50212	87.52742
			126.	30m x 30m	24.50264	87.51906
			127.	30m x 30m	24.50308	87.52692
			128.	30m x 30m	24.50327	87.53134
			129.	35m x 35m	24.50624	87.53113
			130.	20m x 25m	24.50659	87.52204
			131.	20m x 30m	24.50764	87.52280
			132.	80m x 80m	24.50792	87.52509
			133.	25m x 25m	24.50793	87.52832
			134.	30m x 35m	24.50883	87.52766
			135.	30m x 35m	24.51006	87.50720
			136.	60m x 70m	24.51065	87.50698
			137.	30m x 30m	24.51093	87.51469
			138.	20m x 30m	24.51162	87.51075
			139.	25m x 25m	24.51191	87.51134
			140.	25m x 35m	24.51230	87.51107
			141.	30m x 30m	24.51250	87.51428
			142.	25m x 30m	24.51356	87.51242
	Kathikund	**Pokharia**	143.	30m x 30m	24.46833	87.42976
	Gopikandar	**Puranakhora**	144.	35m x 35m	24.46907	87.50937
			145.	20m x 30m	24.46981	87.51059
			146.	30m x 30m	24.46990	87.51084
			147.	30m x 45m	24.47147	87.50877
			148.	30m x 30m	24.47307	87.51262
			149.	30m x 40m	24.47517	87.51487
			150.	20m x 40m	24.47638	87.51530
	Gopikandar	**Pujadih**	151.	30m x 40m	24.45240	87.45738
			152.	30m x 35m	24.45774	87.46108
	Gopikandar	**Ranga**	153.	30m x 30m	24.47585	87.52604
			154.	20m x 30m	24.47782	87.52934
			155.	25m x 40m	24.47826	87.53022

			156.	20m x 25m	24.47837	87.52819
			157.	25m x 45m	24.47907	87.52870
			158.	20m x 30m	24.48014	87.53102
			159.	10m x 20m	24.48361	87.52050
			160.	20m x 20m	24.48458	87.52209
			161.	20m x 20m	24.48603	87.52397
			162.	20m x 35m	24.48722	87.52109
			163.	20m x 35m	24.48921	87.52529
			164.	30m x 40m	24.48928	87.52370
			165.	20m x 40m	24.48982	87.52225
			166.	20m x 20m	24.49157	87.52420
			167.	25m x 40m	24.49187	87.52618
	Gopikandar	**Sarkhi Pahar**	168.	20m x 20m	24.48521	87.40828
	Gopikandar	**Silingi Pahar**	169.	20m x 20m	24.48353	87.43603
			170.	20m x 20m	24.48578	87.44402
			171.	10m x 20m	24.48579	87.44359
	Gopikandar	**Saruapani**	172.	45m x 60m	24.45450	87.46335
	Gopikandar	**Talkhora**	173.	30m x 30m	24.48320	87.50044
			174.	20m x 20m	24.48344	87.49246
			175.	10m x 20m	24.48345	87.50018
			176.	30m x 30m	24.48410	87.49430

5.2. FIELD SURVEY EXERCISE

The field survey of the target area has been carried out by teams consisting of the following members:

Table 3: Qualifications & Experience of the Survey Team Members

Sl. No.	Name	Qualification	Experience
1.	Kislay Kumar	M. Sc. Ecology	10 years
2.	Anzar Anis	M. Tech. Geoinformatics	4 years
3.	Vicky Mahto	M. Sc. Botany	3 years
4.	Lamboder Mahto	B. Sc. Zoology (Hons.)	2 years
5.	Vikas Kumar Sen	B. A.	2 years
6.	Biswa Darshi Behera	M. Sc. Geoinformatics	Fresher
7.	Sugandha Ganguli	M. Sc. Geoinformatics	Fresher
8.	Sujata Nath	M. Sc. Geoinformatics	Fresher

The participation of villagers during survey has been ensured by the respective teams in the areas allotted to them.

5.3. SNAPSHOTS OF REPRESENTATIVE PONDS








Latitude: 24.51239
Longitude: 87.548971
Altitude: -4.34±15 m
Accuracy: 8.6 m
Time: 05-10-2024 13:02
Note: Dursla pahari pond desiltation 30*30m


Latitude: 24.514193
Longitude: 87.547352
Altitude: -7.09±3 m
Accuracy: 11.4 m
Time: 05-10-2024 13:16


Latitude: 24.469364
Longitude: 87.443284
Elevation: 231.31±4 m
Accuracy: 5.4 m
Time: 21-10-2024 11:27


Latitude: 24.514177
Longitude: 87.549603
Altitude: 31.29±19 m
Accuracy: 6.3 m
Time: 03-10-2024 12:58
Note: Durvila pahan pond desiltation 30*30m


Latitude: 24.515297
Longitude: 87.488154
Elevation: 210.44±7 m
Accuracy: 6.9 m
Time: 02-10-2024 13:42
Note: kumar bandh pond desiltation 60*60 rayel


Latitude: 24.501964
Longitude: 87.525074
Elevation: 89.89±20 m
Accuracy: 3.0 m
Time: 04-10-2024 13:28
Note: arma pond desiltation 40*30


Latitude: 24.511253
Longitude: 87.548354
Elevation: 60.29±13 m
Accuracy: 5.0 m
Time: 05-10-2024 13:06


Latitude: 24°27.081'
Longitude: 87°29.001'
Elevation: 208.62±3.12 m
Accuracy: 4.91 m
GPSTime: 19-10-2024 13:22:48


Latitude: 24°28.134'
Longitude: 87°29.259'
Elevation: 242.02±3.06 m
Accuracy: 5.60 m
GPSTime: 19-10-2024 12:45:02


Latitude: 24°27.634'
Longitude: 87°29.394'
Elevation: 239.97±3.16 m
Accuracy: 4.87 m
GPSTime: 19-10-2024 13:56:24
Note: Pond desilting 30*30(Bebupur)


Latitude: 24.489403
Longitude: 87.537246
Elevation: 101.91±16 m
Accuracy: 11.7 m
Time: 16-10-2024 11:46


Latitude: 24.48547
Longitude: 87.48313
Elevation: 148.86±3 m
Accuracy: 12.7 m
Time: 18-10-2024 12:05
Note: jhunjko Pond desiltation 30 *30m

6. INDICATIVE BUDGET ESTIMATION TOWARDS DESILTATION OF PONDS LOCATED IN THE TARGET AREA

The gross budget estimation towards de-siltation has been made with a presumption that the manual method is adopted for the purpose. The de-siltation process (depth: 1.20m) of all the 176 ponds lying within 5 km periphery of the lease area shall be spread over first five years. Next five years shall involve de-siltation by a depth of 0.40m. In other words, ponds de-silted by 1.20m in Year-1 shall be subjected again to de-siltation by a depth of 0.40m in Year-6 and so on, till the ponds de-silted by 1.20m in Year-5 are taken up again for de-siltation in Year-10, the final year of this Plan.

6.1. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-1 UNDER THE PLAN

Forest Range: Kathikund
CD Block: Gopikandar/Kathikund

Table 4: Site-Specific Budget Estimation for Year-1 (De-siltation Depth-1.20m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 1.20 m(Rs.)
Babupur	1.	30m x 30m	24.45890	87.48990	224200
	2.	30m x 30m	24.46371	87.48801	224200
	3.	30m x 30m	24.46380	87.48777	224200
	4.	30m x 30m	24.46390	87.48775	224200
	5.	30m x 25m	24.45380	87.49057	192000
Chirudih	6.	40m x 30m	24.50934	87.50365	290600
	7.	15m x 15m	24.51054	87.50216	76400
	8.	50m x 30m	24.51232	87.50395	357000
	9.	40m x 30m	24.51520	87.50838	290600
	10.	30m x 30m	24.50898	87.49349	224200
Chunjo	11.	25m x 20m	24.50035	87.41907	137400
	12.	30m x 30m	24.50040	87.41908	224200
	13.	30m x 30m	24.50112	87.42269	224200
	14.	30m x 30m	24.50305	87.41905	224200
	15.	30m x 20m	24.50375	87.42010	159900
	16.	30m x 30m	24.50128	87.42149	224200
Dhobachapar	17.	35m x 25m	24.47841	87.49635	219900
	18.	40m x 30m	24.47763	87.49813	290600
Dumra Pahar	19.	30m x 30m	24.45883	87.43815	224200
	20.	40m x 40m	24.46060	87.43840	376400
	21.	30m x 30m	24.46123	87.43508	224200
	22.	20m x 20m	24.46484	87.44188	114900
	23.	50m x 40m	24.46844	87.43016	464300
	24.	30m x 30m	24.46940	87.44330	224200
	25.	30m x 30m	24.46950	87.44300	224200
	26.	30m x 20m	24.46971	87.44309	159900
	27.	20m x 20m	24.47012	87.44683	114900
	28.	25m x 25m	24.47217	87.44512	164200
	29.	25m x 25m	24.47225	87.44340	164200

	30.	30m x 30m	24.47283	87.44366	224200
	31.	35m x 20m	24.47296	87.44509	182300
	32.	30m x 30m	24.47392	87.44876	224200
	33.	30m x 30m	24.47420	87.45029	224200
Dundhapahari	34.	20m x 15m	24.49820	87.53854	93500
	35.	20m x 20m	24.49934	87.54102	114900
	36.	30m x 30m	24.50370	87.54148	224200
	37.	30m x 30m	24.50668	87.54543	224200
	38.	20m x 15m	24.50692	87.54716	93500
Estimated Cost (Year-1)					**80,93,000.00**

6.2. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-2 UNDER THE PLAN

Table 5: Site-Specific Budget Estimation for Year-2 (De-siltation Depth-1.20m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 1.20 m(Rs.)
Dundhapahari	39.	60m x 40m	24.51095	87.54810	552200
	40.	40m x 20m	24.51189	87.54530	204800
	41.	40m x 30m	24.51231	87.54777	290600
	42.	15m x 10m	24.51255	87.54741	60300
	43.	30m x 30m	24.51280	87.54897	224200
	44.	30m x 20m	24.51332	87.54571	159900
	45.	30m x 30m	24.51420	87.54735	224200
	46.	30m x 30m	24.51420	87.54960	224200
	47.	30m x 30m	24.51600	87.55021	224200
	48.	35m x 30m	24.51626	87.55033	257400
	49.	30m x 30m	24.50324	87.53790	224200
Durgapur	50.	10m x 10m	24.49308	87.53521	48500
	51.	20m x 15m	24.49382	87.54000	93500
	52.	30m x 15m	24.49447	87.53676	127700
	53.	20m x 20m	24.49823	87.53682	114900
	54.	30m x 30m	24.49128	87.53545	224200
R. F.	55.	30m x 30m	24.46020	87.45556	224200
	56.	30m x 30m	24.46027	87.45561	224200
	57.	30m x 25m	24.46292	87.45122	192200
Hethsilangi	58	40m x 30m	24.50757	87.44031	290600
	59.	40m x 30m	24.50787	87.44078	290600
	60.	30m x 30m	24.50902	87.43380	224200
	61.	30m x 30m	24.51125	87.43382	224200
	62.	40m x 30m	24.51261	87.43365	290600
	63.	30m x 30m	24.51610	87.43608	224200
Jhanjhko	64.	30m x 30m	24.48550	87.48313	224200
	65.	25m x25m	24.48555	87.48336	164200
	66.	30m x 30m	24.48986	87.49335	224200
Jolo	67.	40m x 35m	24.46944	87.48088	333500
	68.	20m x 20m	24.46984	87.47917	114900
	69.	25m x 25m	24.46297	87.47206	164200
Jaropani	70.	30m x 25m	24.45683	87.47628	192000
	71.	30m x 30m	24.45809	87.47762	224200
	72.	20m x 15m	24.46015	87.47746	93500
Chetopoka	73.	30m x 20m	24.48486	87.50387	159900
	74.	30m x 20m	24.48982	87.50888	159900
Kharikasol	75.	35m x 20m	24.51752	87.45305	182300
Khatangi	76.	30m x 20m	24.50402	87.44275	159900
	77.	40m x 30m	24.50670	87.44332	290600
	78.	40m x 30m	24.50887	87.44335	290600
	79.	60m x 40m	24.51125	87.44687	552200
Estimated Cost (Year-2)					**89,70,300.00**

6.3. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-3 UNDER THE PLAN

Table 6: Site-Specific Budget Estimation for Year-3 (De-siltation Depth-1.20m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 1.20 m(Rs.)
Khatganwa	80.	30m x 30m	24.49768	87.45030	224200
Khajurdangal	81.	30m x 30m	24.46450	87.48862	224200
	82.	30m x 30m	24.46581	87.48698	224200
	83.	30m x 30m	24.46630	87.48335	224200
	84.	30m x 30m	24.46514	87.48839	224200
Kuarpur	85.	40m x 40m	24.45739	87.47041	376400
Kulaipura	86.	30m x 30m	24.47840	87.51492	224200
	87.	30m x 30m	24.48330	87.50391	224200
	88.	30m x 20m	24.48360	87.51484	159900
	89.	30m x 25m	24.48411	87.51873	192000
	90.	30m x 30m	24.47615	87.50289	224200
	91.	30m x 30m	24.47942	87.50108	224200
	92.	30m x 30m	24.49086	87.51457	224200
Kumarbandh	93.	60m x 60m	24.45297	87.48815	809600
Kundapahari	94.	30m x 30m	24.50180	87.47170	224200
Madhuban	95.	30m x 30m	24.49109	87.51437	224200
	96.	35m x 20m	24.49830	87.49775	182300
	97.	40m x 40m	24.49840	87.49810	376400
	98.	30m x 30m	24.49860	87.51056	224200
	99.	30m x 30m	24.49997	87.49856	224200
	100.	35m x 20m	24.50153	87.49702	182300
	101.	30m x 30m	24.50199	87.49580	224200
	102.	30m x 30m	24.50220	87.49609	224200
	103.	30m x 30m	24.50312	87.49497	224200
	104.	35m x 30m	24.50862	87.50688	257400
	105.	40m x 30m	24.50996	87.49664	290600
	106.	30m x 30m	24.50790	87.50792	224200
Mahaldabar	107.	30m x 30m	24.49897	87.46140	224200
	108.	70m x 60m	24.49956	87.46002	940400
	109.	40m x 40m	24.50060	87.46105	376400
	110.	30m x 20m	24.50067	87.45719	159900
	111.	30m x 30m	24.50140	87.46710	224200
	112.	20m x 20m	24.50208	87.46619	114900
Estimated Cost (Year-3)					**89,02,500.00**

6.4. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-4 UNDER THE PLAN

Table 7: Site-Specific Budget Estimation for Year-4 (De-siltation Depth-1.20m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 1.20 m(Rs.)
Majhdiha	113.	40m x 40m	24.48940	87.53725	376400
	114.	40m x 40m	24.48980	87.53711	376400
Ormo	115.	40m x 40m	24.49845	87.52299	376400
	116.	30m x 20m	24.49958	87.52888	159900
	117.	30m x 30m	24.49966	87.51048	224200
	118.	30m x 30m	24.49970	87.51006	224200
	119.	45m x 30m	24.50005	87.52371	323800
	120.	35m x 30m	24.50019	87.51170	257400
	121.	40m x 35m	24.50078	87.52155	333500
	122.	20m x 20m	24.50133	87.52521	114900
	123.	40m x 30m	24.50140	87.52507	290600
	124.	35m x 30m	24.50253	87.52837	257400
	125.	30m x 30m	24.50212	87.52742	224200
	126.	30m x 30m	24.50264	87.51906	224200
	127.	30m x 30m	24.50308	87.52692	224200
	128.	30m x 30m	24.50327	87.53134	224200
	129.	35m x 35m	24.50624	87.53113	295000
	130.	25m x 20m	24.50659	87.52204	137400
	131.	30m x 20m	24.50764	87.52280	159900
	132.	80m x 80m	24.50792	87.52509	1414400
	133.	25m x 25m	24.50793	87.52832	164200
	134.	35m x 30m	24.50883	87.52766	257400
	135.	35m x 30m	24.51006	87.50720	257400
	136.	70m x 60m	24.51065	87.50698	940400
	137.	30m x 30m	24.51093	87.51469	224200
	138.	30m x 20m	24.51162	87.51075	159900
	139.	25m x 25m	24.51191	87.51134	164200
	140.	35m x 25m	24.51230	87.51107	219900
	141.	30m x 30m	24.51250	87.51428	224200
	142.	30m x 25m	24.51356	87.51242	192000
Estimated Cost (Year-4)					**90,22,400.00**

6.5. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-5 UNDER THE PLAN

Table 8: Site-Specific Budget Estimation for Year-5 (De-siltation Depth-1.20m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 1.20 m(Rs.)
Pokharia	143.	30m x 30m	24.46833	87.42976	224200
Puranakhora	144.	35m x 35m	24.46907	87.50937	295000
	145.	30m x 20m	24.46981	87.51059	159900
	146.	30m x 30m	24.46990	87.51084	224200
	147.	45m x 30m	24.47147	87.50877	323800
	148.	30m x 30m	24.47307	87.51262	224200
	149.	40m x 30m	24.47517	87.51487	290600
	150.	40m x 20m	24.47638	87.51530	204800
Pujadih	151.	40m x 30m	24.45240	87.45738	290600
	152.	35m x 30m	24.45774	87.46108	257400
Ranga	153.	30m x 30m	24.47585	87.52604	224200
	154.	30m x 20m	24.47782	87.52934	159900
	155.	40m x 25m	24.47826	87.53022	247700
	156.	25m x 20m	24.47837	87.52819	137400
	157.	45m x 25m	24.47907	87.52870	275500
	158.	30m x 20m	24.48014	87.53102	159900
	159.	20m x 10m	24.48361	87.52050	72000
	160.	20m x 20m	24.48458	87.52209	114900
	161.	20m x 20m	24.48603	87.52397	114900
	162.	35m x 20m	24.48722	87.52109	182300
	163.	35m x 20m	24.48921	87.52529	182300
	164.	40m x 30m	24.48928	87.52370	290600
	165.	40m x 20m	24.48982	87.52225	204800
	166.	20m x 20m	24.49157	87.52420	114900
	167.	40m x 25m	24.49187	87.52618	247700
Sarkhi Pahar	168.	20m x 20m	24.48521	87.40828	114900
Silingi Pahar	169.	20m x 20m	24.48353	87.43603	114900
	170.	20m x 20m	24.48578	87.44402	114900
	171.	20m x 10m	24.48579	87.44359	72000
Saruapani	172.	60m x 45m	24.45450	87.46335	616500
Talkhora	173.	30m x 30m	24.48320	87.50044	224200
	174.	20m x 20m	24.48344	87.49246	114900
	175.	20m x 10m	24.48345	87.50018	72000
	176.	30m x 30m	24.48410	87.49430	224200
Estimated Cost (Year-5)					**68,92,200.00**

6.6. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-6 UNDER THE PLAN

Table 9: Site-Specific Budget Estimation for Year-6 (De-siltation Depth-0.40m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 0.40 m(Rs.)
Babupur	1.	30m x 30m	24.45890	87.48990	95500
	2.	30m x 30m	24.46371	87.48801	95500
	3.	30m x 30m	24.46380	87.48777	95500
	4.	30m x 30m	24.46390	87.48775	95500
	5.	30m x 25m	24.45380	87.49057	84800
Chirudih	6.	40m x 30m	24.50934	87.50365	119000
	7.	15m x 15m	24.51054	87.50216	44200
	8.	50m x 30m	24.51232	87.50395	142500
	9.	40m x 30m	24.51520	87.50838	119000
	10.	30m x 30m	24.50898	87.49349	95500
Chunjo	11.	25m x 20m	24.50035	87.41907	65900
	12.	30m x 30m	24.50040	87.41908	95500
	13.	30m x 30m	24.50112	87.42269	95500
	14.	30m x 30m	24.50305	87.41905	95500
	15.	30m x 20m	24.50375	87.42010	74000
	16.	30m x 30m	24.50128	87.42149	95500
Dhobachapar	17.	35m x 25m	24.47841	87.49635	94700
	18.	40m x 30m	24.47763	87.49813	119000
Dumra Pahar	19.	30m x 30m	24.45883	87.43815	95500
	20.	40m x 40m	24.46060	87.43840	147600
	21.	30m x 30m	24.46123	87.43508	95500
	22.	20m x 20m	24.46484	87.44188	57700
	23.	50m x 40m	24.46844	87.43016	178200
	24.	30m x 30m	24.46940	87.44330	95500
	25.	30m x 30m	24.46950	87.44300	95500
	26.	30m x 20m	24.46971	87.44309	74000
	27.	20m x 20m	24.47012	87.44683	57700
	28.	25m x 25m	24.47217	87.44512	74800
	29.	25m x 25m	24.47225	87.44340	74800
	30.	30m x 30m	24.47283	87.44366	95500
	31.	35m x 20m	24.47296	87.44509	82200
	32.	30m x 30m	24.47392	87.44876	95500
	33.	30m x 30m	24.47420	87.45029	95500
Dundhapahari	34.	20m x 15m	24.49820	87.53854	50500
	35.	20m x 20m	24.49934	87.54102	57700
	36.	30m x 30m	24.50370	87.54148	95500
	37.	30m x 30m	24.50668	87.54543	95500
	38.	20m x 15m	24.50692	87.54716	50500
Estimated Cost (Year-6)					**34,87,800.00**

6.7. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-7 UNDER THE PLAN

Table 10: Site-Specific Budget Estimation for Year-7 (De-siltation Depth-0.40m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 0.40 m(Rs.)
Dundhapahari	39.	60m x 40m	24.51095	87.54810	208900
	40.	40m x 20m	24.51189	87.54530	90400
	41.	40m x 30m	24.51231	87.54777	119000
	42.	15m x 10m	24.51255	87.54741	38800
	43.	30m x 30m	24.51280	87.54897	95500
	44.	30m x 20m	24.51332	87.54571	74000
	45.	30m x 30m	24.51420	87.54735	95500
	46.	30m x 30m	24.51420	87.54960	95500
	47.	30m x 30m	24.51600	87.55021	95500
	48.	35m x 30m	24.51626	87.55033	107200
	49.	30m x 30m	24.50324	87.53790	95500
Durgapur	50.	10m x 10m	24.49308	87.53521	34200
	51.	20m x 15m	24.49382	87.54000	50500
	52.	30m x 15m	24.49447	87.53676	63300
	53.	20m x 20m	24.49823	87.53682	57700
	54.	30m x 30m	24.49128	87.53545	95500
R. F.	55.	30m x 30m	24.46020	87.45556	95500
	56.	30m x 30m	24.46027	87.45561	95500
	57.	30m x 25m	24.46292	87.45122	84800
Hethsilangi	58	40m x 30m	24.50757	87.44031	119000
	59.	40m x 30m	24.50787	87.44078	119000
	60.	30m x 30m	24.50902	87.43380	95500
	61.	30m x 30m	24.51125	87.43382	95500
	62.	40m x 30m	24.51261	87.43365	119000
	63.	30m x 30m	24.51610	87.43608	95500
Jhanjhko	64.	30m x 30m	24.48550	87.48313	95500
	65.	25m x25m	24.48555	87.48336	74800
	66.	30m x 30m	24.48986	87.49335	95500
Jolo	67.	40m x 35m	24.46944	87.48088	133300
	68.	20m x 20m	24.46984	87.47917	57700
	69.	25m x 25m	24.46297	87.47206	74800
Jaropani	70.	30m x 25m	24.45683	87.47628	84800
	71.	30m x 30m	24.45809	87.47762	95500
	72.	20m x 15m	24.46015	87.47746	50500
Chetopoka	73.	30m x 20m	24.48486	87.50387	74000
	74.	30m x 20m	24.48982	87.50888	74000
Kharikasol	75.	35m x 20m	24.51752	87.45305	82200
Khatangi	76.	30m x 20m	24.50402	87.44275	74000
	77.	40m x 30m	24.50670	87.44332	119000
	78.	40m x 30m	24.50887	87.44335	119000
	79.	60m x 40m	24.51125	87.44687	208900
Estimated Cost (Year-7)					**38,49,800.00**

6.8. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-8 UNDER THE PLAN

Table 11: Site-Specific Budget Estimation for Year-8 (De-siltation Depth-0.40m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 0.40 m(Rs.)
Khatganwa	80.	30m x 30m	24.49768	87.45030	95500
Khajurdangal	81.	30m x 30m	24.46450	87.48862	95500
	82.	30m x 30m	24.46581	87.48698	95500
	83.	30m x 30m	24.46630	87.48335	95500
	84.	30m x 30m	24.46514	87.48839	95500
Kuarpur	85.	40m x 40m	24.45739	87.47041	147600
Kulaipura	86.	30m x 30m	24.47840	87.51492	95500
	87.	30m x 30m	24.48330	87.50391	95500
	88.	30m x 20m	24.48360	87.51484	74000
	89.	30m x 25m	24.48411	87.51873	84800
	90.	30m x 30m	24.47615	87.50289	95500
	91.	30m x 30m	24.47942	87.50108	95500
	92.	30m x 30m	24.49086	87.51457	95500
Kumarbandh	93.	60m x 60m	24.45297	87.48815	294700
Kundapahari	94.	30m x 30m	24.50180	87.47170	95500
Madhuban	95.	30m x 30m	24.49109	87.51437	95500
	96.	35m x 20m	24.49830	87.49775	82200
	97.	40m x 40m	24.49840	87.49810	147600
	98.	30m x 30m	24.49860	87.51056	95500
	99.	30m x 30m	24.49997	87.49856	95500
	100.	35m x 20m	24.50153	87.49702	82200
	101.	30m x 30m	24.50199	87.49580	95500
	102.	30m x 30m	24.50220	87.49609	95500
	103.	30m x 30m	24.50312	87.49497	95500
	104.	35m x 30m	24.50862	87.50688	107200
	105.	40m x 30m	24.50996	87.49664	119000
	106.	30m x 30m	24.50790	87.50792	95500
Mahaldabar	107.	30m x 30m	24.49897	87.46140	95500
	108.	70m x 60m	24.49956	87.46002	339600
	109.	40m x 40m	24.50060	87.46105	147600
	110.	30m x 20m	24.50067	87.45719	74000
	111.	30m x 30m	24.50140	87.46710	95500
	112.	20m x 20m	24.50208	87.46619	57700
Estimated Cost (Year-8)					**36,68,200.00**

6.9. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-9 UNDER THE PLAN

Table 12: Site-Specific Budget Estimation for Year-9 (De-siltation Depth-0.40m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 0.40 m(Rs.)
Majhdiha	113.	40m x 40m	24.48940	87.53725	147600
	114.	40m x 40m	24.48980	87.53711	147600
Ormo	115.	40m x 40m	24.49845	87.52299	147600
	116.	30m x 20m	24.49958	87.52888	74000
	117.	30m x 30m	24.49966	87.51048	95500
	118.	30m x 30m	24.49970	87.51006	95500
	119.	45m x 30m	24.50005	87.52371	130700
	120.	35m x 30m	24.50019	87.51170	107200
	121.	40m x 35m	24.50078	87.52155	133300
	122.	20m x 20m	24.50133	87.52521	57700
	123.	40m x 30m	24.50140	87.52507	119000
	124.	35m x 30m	24.50253	87.52837	107200
	125.	30m x 30m	24.50212	87.52742	95500
	126.	30m x 30m	24.50264	87.51906	95500
	127.	30m x 30m	24.50308	87.52692	95500
	128.	30m x 30m	24.50327	87.53134	95500
	129.	35m x 35m	24.50624	87.53113	119800
	130.	25m x 20m	24.50659	87.52204	65900
	131.	30m x 20m	24.50764	87.52280	74000
	132.	80m x 80m	24.50792	87.52509	499000
	133.	25m x 25m	24.50793	87.52832	74800
	134.	35m x 30m	24.50883	87.52766	107200
	135.	35m x 30m	24.51006	87.50720	107200
	136.	70m x 60m	24.51065	87.50698	339600
	137.	30m x 30m	24.51093	87.51469	95500
	138.	30m x 20m	24.51162	87.51075	74000
	139.	25m x 25m	24.51191	87.51134	74800
	140.	35m x 25m	24.51230	87.51107	94700
	141.	30m x 30m	24.51250	87.51428	95500
	142.	30m x 25m	24.51356	87.51242	84800
Estimated Cost (Year-9)					**36,51,700.00**

6.10. PHYSICAL AND FINANCIAL PROPOSALS FOR YEAR-10 UNDER THE PLAN

Table 13: Site-Specific Budget Estimation for Year-10 (De-siltation Depth-0.40m)

Village	Pond Sl. No.	Dimension	Latitude	Longitude	Estimated Cost of de-siltation by 0.40 m(Rs.)
Pokharia	143.	30m x 30m	24.46833	87.42976	95500
Puranakhora	144.	35m x 35m	24.46907	87.50937	119800
	145.	30m x 20m	24.46981	87.51059	74000
	146.	30m x 30m	24.46990	87.51084	95500
	147.	45m x 30m	24.47147	87.50877	130700
	148.	30m x 30m	24.47307	87.51262	95500
	149.	40m x 30m	24.47517	87.51487	119000
	150.	40m x 20m	24.47638	87.51530	90400
Pujadih	151.	40m x 30m	24.45240	87.45738	119000
	152.	35m x 30m	24.45774	87.46108	107200
Ranga	153.	30m x 30m	24.47585	87.52604	95500
	154.	30m x 20m	24.47782	87.52934	74000
	155.	40m x 25m	24.47826	87.53022	104700
	156.	25m x 20m	24.47837	87.52819	65900
	157.	45m x 25m	24.47907	87.52870	114600
	158.	30m x 20m	24.48014	87.53102	74000
	159.	20m x 10m	24.48361	87.52050	43400
	160.	20m x 20m	24.48458	87.52209	57700
	161.	20m x 20m	24.48603	87.52397	57700
	162.	35m x 20m	24.48722	87.52109	82200
	163.	35m x 20m	24.48921	87.52529	82200
	164.	40m x 30m	24.48928	87.52370	119000
	165.	40m x 20m	24.48982	87.52225	90400
	166.	20m x 20m	24.49157	87.52420	57700
	167.	40m x 25m	24.49187	87.52618	104700
Sarkhi Pahar	168.	20m x 20m	24.48521	87.40828	57700
Silingi Pahar	169.	20m x 20m	24.48353	87.43603	57700
	170.	20m x 20m	24.48578	87.44402	57700
	171.	20m x 10m	24.48579	87.44359	43400
Saruapani	172.	60m x 45m	24.45450	87.46335	230300
Talkhora	173.	30m x 30m	24.48320	87.50044	95500
	174.	20m x 20m	24.48344	87.49246	57700
	175.	20m x 10m	24.48345	87.50018	43400
	176.	30m x 30m	24.48410	87.49430	95500
Estimated Cost (Year-10)					**30,09,200.00**

6.11. ABSTRACT OF EXPENDITURES UNDER THE PLAN

Table 14: Year-wise Financial Forecast of the Plan for De-siltation of Ponds

Activity	Estimated Cost (Rs. in lakh)										Total (Rs. in Lakh)
	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	
De-siltation (1.20m)	80.93	89.70	89.03	90.22	68.92	-	-	-	-	-	418.80
De-siltation (0.40m)	-	-	-	-	-	34.88	38.50	36.68	36.52	30.09	176.67
Capacity Building	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Awareness Development	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	7.50
Miscellaneous Expenses	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
Total	83.43	92.20	91.53	92.72	71.42	36.38	40.00	38.18	38.02	31.59	615.47
Cost Escalation @ 20%	16.69	18.44	18.31	18.54	14.28	7.28	8.00	7.64	7.60	6.32	123.10
Grand Total	**100.12**	**110.64**	**109.84**	**111.26**	**85.70**	**43.66**	**48.00**	**45.82**	**45.62**	**37.91**	**738.57**

Cost to the User Agency towards implementation of the Pond De-siltation Plan = Rs. 738.57 Lakh.

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6.12. NOTABLE POINTS REGARDING IMPLEMENTATION OF THE PLAN

Following points are worth noting while implementing the Plan:

- As per the condition laid under the Stage-I order, **the User Agency is required *to regularly undertake de-silting of village tanks and other water bodies located within five km from the mine lease boundary*.**
- If the Forest Department decides to execute the works departmentally, the Plan may be revised every three years depending upon the feedback of DFO, Dumka and taking into consideration the properly assessed gap between the expected outcome and the actual results. Though it is somewhat difficult to assess the gaps in an objective manner, the experience of the field staff and villagers' views may come in handy at times. As for the cost of revision of the Plan, the User Agency shall submit an undertaking to the Divisional Forest Officer, Dumka to the effect that the cost of revision of the Plan shall be borne by them.
- Though provision of a flat rate of 20% has been made towards cost escalation in the Plan on account of increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, Dumka to the effect that they will deposit extra cost of the Plan beyond the cost escalation provision, owing to increase in wage rate etc. as and when such demand is raised by the DFO as well as consequent upon revision in the plan, if any.
- The Plan has been formulated by taking into consideration the available Schedule of Rates at current wage rate (Rs. 401.00). Since the Plan is expected to begin its journey not any time before the next financial year i.e., 2026-27 when it is expected to be included in the State APO (CAMPA), cost escalation of 20% has been provided for, right from Year 1.
- **While estimating the cost of various activities under the Plan, approved schedule of rates has been followed. However, these are based on some broad assumptions. The implementing agency is expected to prepare pond-specific estimates considering the rates approved by the State Government against specific items required for a specific activity.**
- For successful implementation of the Plan, it would be desirable that a comprehensive APO is prepared after the funds are received. It is a common practice that the amount estimated in the Plan for a specific year is not received by the implementing agency in full. Therefore, prioritisation of works would be an exercise which may call for due care and diligence in the interest of meeting the objectives under the Plan.

ANNEXURES

Annexure 1: MoEF & CC Letter granting Forest Clearance (Stage-I)

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-3464 V.P. dated 29.11.2022 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government & on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand subject to fulfilment of the following conditions:

i. Legal status of the diverted forest land shall remain unchanged;

ii. **Compensatory Afforestation**:

a. *Details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion including the area for safety zone/green belt shall be submitted by the State Government along with the compliance report of the Stage-I approval.*
b. *The non-forest land to be identified shall be transferred and mutated in favour*

of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval.

c. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

iii. **Net Present Value:**

a. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

b. At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

iv. *Trees should be felled in a phased manner and when become absolutely necessary and under strict supervision of State Forest Department and wherever feasible suitable species should be transplanted.*

v. *The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.*

vi. *As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*

vii. *Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost.*

viii. *A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*

ix. *User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be*

repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

x. *As recommended by the State, the Water security plan prepared by the group of experts shall be adhered to.*

xi. The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;

xii. All the funds received from the user agency under the project shall be transferred/depsoted in CAMPA account only through **e-portal** (https://parivesh.nic.in/); Amount depsoted through other mode will not be accepted as compliance of the Stage-I clearance;

xiii. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent Reclamation Plan as per the approved Mining Plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

xiv. The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

xv. The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

xvi. Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:

a. User agency shall ensure demarcation of safety zone (7.5 meter strip all

along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the State Forest Department;

b. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
c. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department; and
d. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

xvii. Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department:

a. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;
b. Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved Plan/scheme;
c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;
d. Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and
e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

xviii. The validity of approval granted under the Adhiniyam shall be for a period co-terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;

xx. The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

xxi. The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;

xxii. Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

xxiv. The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and

xxv. Under no circumstances, approval granted for the use of forest land for underground mining, shall subsequently be converted to opencast mining operations.

xxvi. The R&R Plan shall be implemented as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones;

xxvii. The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled;

xxviii. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

xxix. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

xxx. No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

xxxi. The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;\The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;

xxxii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

xxxiii. No damage to the flora and fauna of the adjoining area shall be caused;

xxxiv. The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;

xxxv. The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

xxxvi. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency; and

xxxvii. Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 as issued by this Ministry's letter dated 29.12.2023;

xxxviii. The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Signed by
Dheeraj Mittal
Date: 18-09-2024 14:10:45

Yours sincerely,

(Dr. Dheeraj Mittal)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi for uploading on PARIVESH portal.

Annexure 2: Model Estimate for De-siltation of Pond (30m x 30m; Depth: 1.20m)

Model Estimate - De-siltation of Pond (30m x 30m) - De-siltation Depth 1.2m

DETAILED ESTIMATE

S. No.	S.O.R. Item No.	Item of Works	Detail of Qty. (FT/M)				Quantity	Unit	Rate in Rs.	Amount
			No.	Length	width	Height/Depth				
1	D.S.R/2.31	Clearing jungle including uprooting of rank vegetation, grass, brush wood,trees and saplings of girth up to 30 cm measured at a height of 1 mabove ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.								
			4	30.00	2.00		240.00	M²	14.36	3446.4
2	W.R.D /P-83	Provision of dewatering with 10 H.P diesel pump set including P.O.L. part-B WRD PAGE 83 SL.NO 10								
			1			70.00	70.000	hours	330.00	23100.00
3	W.R.D/7.1.43.2	Earth work in excavation in canal by the hydraulic excavator as per design section in all kinds of soil ,soil mixed with kankar ,pebbles and boulders up to 300 mm size and disposal of spoil up to 500m with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/L (7.1.43.2) part-B, WRD page no.-138.								
			1	30.000	30.000	1.20	1080.000	M³	105.09	113497.20
4	W.R.D/5.1.37	Supply and laying 300 mm thick humous layer on slope of dam with manual compaction and turfing the surface with approved dub grass do. do. E/I								
			2	30.000	3.000		180.000	Sft		
							16.729	M²	130.50	2183.09
5		Carrage of material								
		(85% of qty vide item no 3)					378.000	M³		
		Soil (3P+1K) for 4km					378.000	M³	171.23	64724.94
									Total Rs.	206951.63
		less 9.09% C.P Rs								-18811.90
		Sub - Total Rs.								188139.73
		Add GST @18% of Sub Total Rs.								33865.15
		Total Rs.								222004.88
		Add for Labour cess @ 1% of Total Rs.								2220.05
		Total Rs.								224224.93
		Say RS.								224200.00

SOIL AND MOISTURE CONSERVATION PLAN

Prepared in compliance of Condition bearing **Sl. No. ix., xix & xxiv** laid by MoEF&CC, Govt. of India while granting Stage-I approval under Section 2 of Forest (Conservation) Act vide F. No. 8-37/2022-FC dated 18th September, 2024 **for diversion of 455.1108 ha of forest land in Dumka district for Pachhwara South Coal Block Project** in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

Submitted by:
M/s Neyveli Uttar Pradesh Power Ltd.

Prepared by:
Rajiv Ranjan, IFS (Retd.)

EXECUTIVE SUMMARY

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited (formerly Neyveli Lignite Corporation India Limited, a Navratna Government of India Enterprise) and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited (UPRVUNL), a Government of Uttar Pradesh Enterprise – by the Ministry of Coal, Govt. of India for mining of coal. The project area is spread over 715.00 Ha in the approved Mining Plan of Pachhwara South Coal Mine Project of NUPPL. Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

The coal block occupies the southernmost part of the Rajmahal Coal field in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District.

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (**Annexure-1**), has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of NUPPL in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The conditions, in fulfilment of which the instant Soil & Moisture Conservation Plan (SMC Plan) is being formulated, are as follows:

> "*ix. ……..On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chutua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost…….*"
>
> ……..
>
> ……..
>
> *xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40, if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval.*
>
> ……..

……

*xxiv. The User Agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approva*l."

In the backdrop of the aforesaid conditions, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the bifurcating boundary between Dumka and Pakur forest divisions/districts. Apart from the aforesaid coal blocks adjacent to Pachhwara South coal block, there is one more upcoming coal block namely Urma Paharitola.

While defining the Impact Area of the instant Project it is important to note that both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of SMC plans and Site-specific Wildlife Conservation plans independently. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the said plans have been formulated restricting the respective project impact areas to the territorial jurisdiction of Pakur forest division; within 10 km periphery of the Lease in case of Pachhwara North and within 10-20 km distance from the lease in case of Pachhwara Central. Therefore, in the best interest of the conservation needs of the area, the instant SMC plan has been formulated considering the Project Impact Area to be restricted to the territorial boundaries of Dumka and Godda forest divisions and within 10 km radius of the boundary of the coal block.

The delineated Impact Area consists of altogether 169 number of villages, 133 in Dumka Forest Division and 36 in Godda Forest Division. It would be relevant to mention here that the areas of villages which fall partly outside the 10 km boundary have also been considered for prescribing management interventions under the plan. The geographical extent of the Impact Area is about 257.73 sq.km.

The Project Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla. These rivers are fed by various streams and streamlets/drains. Out of these, the most important river is

Bansloi which originates from Bans Hill in Sahebganj district of Jharkhand and flows through Pakur district of Jharkhand and Birbhum and Murshidabad districts of West Bengal before draining into the Ganges north of Jangipur. It flows from west to east with a few ephemeral streamlets like Darno river, Baroscorna nala, Okri jor nala & Makar kandi nala) descending from the catchment area of the Bansloi River forming the drainage system of the area.

SMC involves activities that maintain or enhance the productive capacity of land in areas affected by or prone to soil erosion. Soil erosion implies the movement of soil from one part of the land to another through the action of wind or water. Thus, soil erosion by water is caused by raindrop impact surface sealing, and crust formation leading to high runoff rate and amount, high runoff velocity on long and undulating slopes, and low soil strength of structurally weak soils with high moisture content due to frequent rains. Soil erosion by wind is caused by lack of vegetation cover, dry pulverized soils, strong wind speeds, and poor land management practices such as continuous tillage and over-grazing.

The methodology adopted in formulation of the SMC plan involves mapping in great detail the drainage network (rivers, streams and streamlets) including respective stream orders, village boundaries, forest division boundaries etc. Further, the extensive field survey carried out for preparation of the Plan has been corroborated with the **LiDAR Survey results** (**Para 3.5.2**). The LiDAR survey has been conducted by M/s. Ecos Offset Ltd. The Report and the analysis has been shared by the company with us. The execution of the LiDAR drone survey has been carried out using DGPS (Differential GPS) to ensure high positional accuracy. The survey included a 70-80% front overlap and a 60-70% side overlap between flight lines, optimizing coverage and minimizing data gaps. The drone was flown at an altitude of 100-120 m above the surface, providing the necessary resolution for accurate terrain mapping while maintaining safety and efficiency in data collection. The analysis of the data received from the survey has thoroughly been worked out and maps with Digital Elevation Model (DEM), Contour, Drainage, Digital Surface Model (DSM), Digital Terrain Model (DTM) etc. have been prepared.

Based on the location of rivers and their feeder streams and drains, the whole Impact Area has been divided into different stream corridors. However, since the area cuts across two forest divisions, the stream corridors have been delineated so as to restrict these along forest division boundaries in order to help facilitate smoother implementation of the interventions prescribed here. For convenience in carrying out field surveys etc., stream corridors have been constituted in such a manner that it consists of a set of villages having. In other words, a corridor has been delineated in accordance with village boundaries and in most of the cases more than one village

constitute any particular stream corridor. However, the villages located partly on the fringe of 10 km boundary within the Impact Area, have been included in whole as a part of the respective stream corridor.

It may be noted here that the delineation in the above explained manner is similar to that of micro-watershed framework. The extensive field survey has been undertaken in all villages where streams have been found as well as in those villages which are bereft of any stream as such. The primary concern was to fix the locations of structural/engineering measures as well as other biological interventions with the objective of soil and moisture conservation in the area. Since the survey has been done in all villages irrespective of whether any stream is located in a particular village or not, it is just academic whether we call it stream corridor or micro-watershed.

Based on the above scheme, altogether nine stream corridors have been identified and numbers have been assigned to each stream corridor with prefix as the initial letter of the forest division name. Thus, Dumka Forest Division part of the Impact Area contains seven stream corridors which have been designated with nomenclature as D/SMC/I, D/SMC/II, D/SMC/III, D/SMC/IV, D/SMC/V, D/SMC/VI and D/SMC/VII whereas Godda Forest Division part houses two corridors namely G/SMC/I and G/SMC/II.

The instant Plan primarily focusses on Soil & Moisture Conservation over the identified Impact Area. Following are the broad objectives of these measures:

- To protect the soil surface from the erosion of falling rainwater;
- To increase the soil infiltration capacity, and prevent the occurrence of surface erosion;
- To guarantee land functions to support community life;
- To optimize the productivity of land to realize economic, social and environmental benefits in a balanced and sustainable manner;
- To increase the carrying capacity of the watershed;
- To increase the capacity to develop and empower community participation; and
- To guarantee the utilization of soil and water conservation fairly and evenly for the benefit of the community.

Apart from preparation of Soil & Moisture Conservation Plan, one of the conditions (Sl. No. xix) specifically mandates the user agency, either itself, or through the State Forest Department, to undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if

any, located within the periphery of 100 m from outer perimeter of the mining lease (condition no. xix). The instant plan proposal includes such activities which are appropriate to comply with this specific condition. This has been dealt with separately under **Chapter-4** of the Plan.

After detailed survey of each and every village falling within the Impact Area, particularly from the viewpoint of the aforesaid objectives, various interventions have been categorized into following broad heads:

(A) Natural Resource Management/Soil and Moisture Conservation Measures.

(B) Capacity Building of Frontline Forest staff.

(C) Awareness Development Programmes.

(D) Development of Alternative Livelihoods

(E) Promotion of Renewable/Alternative Energy Consumption

(F) Development and Implementation of appropriate Monitoring and Evaluation Framework.

(G) Infrastructural strengthening aimed towards implementation as well as monitoring and evaluation of the Plan.

The total cost to the User Agency towards implementation of the proposed SMC Plan is Rs. **4009.59 Lakh** spread over 10 years (2026-27 to 2035-36). The fund allocation has been made as per norms for preparation of such plans and in consultation with the concerned forest officials.

The proposed financial projection under the Plan may be summarized in the following table.

Sl. No.	Activity Head	Dumka Forest Division (Rs. in Lakh)	Godda Forest Division (Rs. in Lakh)	Total (Rs. in Lakh)
A.	Natural Resource Management/ Soil and Moisture Conservation Measures	**2272.60**	**721.22**	**2993.82**
B.	Capacity Building of Frontline Forest Staff	**20.00**	**10.00**	**30.00**
C.	Awareness Development Programmes	**10.00**	**5.00**	**15.00**
D.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	**50.00**	**25.00**	**75.00**
E.	Monitoring and Evaluation	**10.00**	**5.00**	**15.00**
F.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	**100.00**	**50.00**	**150.00**
G.	Administrative Cost	**50.00**	**12.50**	**62.50**
H.	Total	**2512.60**	**828.72**	**3341.32**
I.	Cost Escalation Provision @ 20%	**502.52**	**165.75**	**668.27**
Grand Total		**3015.12**	**994.47**	**4009.59**

Cost to the User Agency towards implementation of the SMC Plan = Rs. 4009.59 Lakh

----------xxx----------

ACKNOWLEDGEMENT

This Soil and Moisture Conservation Plan could not have been prepared without the committed collaboration of Mr. Satwik, IFS, Divisional Forest Officer, Dumka Forest Division, Mr. Wagh Pavan Shaligram, IFS, Divisional Forest Officer, Godda Forest Division, Mr. Maun Prakash, IFS, the then Divisional Forest Officer, Godda Forest Division and the frontline forest staff of Dumka and Godda forest divisions. Also, the interaction with Mr. Umesh Sahni, Conservator of Forests, Dumka Circle and Mr. Satish Chandra Rai, Regional Chief Conservator of Forests, Dumka Region played a vital role in shaping this Plan particularly in terms of its effective implementation in future.

I am grateful to Mr. Kislay Kumar (Ecos Offset Ltd.) and his team members who carried out an intensive survey of the Impact Area in question. Also, the LiDAR Study Report of the Project Impact Area prepared by M/s. Ecos Offset Ltd. played an instrumental role in fixing the location of SMC structures required for appropriate treatment of the Area. Without their active support and sincere efforts this Plan could not have seen light of the day.

I owe special thanks to the officials of M/s NUPPL and M/s MIPL GCL Infracontract Pvt. Ltd., the MDO of the project who took utmost care to ensure all logistic support while undertaking field surveys.

Rajiv Ranjan IFS (Retd.)

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1. INTRODUCTION

1.1. ABOUT THE PROJECT

Pachhwara South Coal Block was allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL) – a joint venture of NLC India Limited and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited – by the Ministry of Coal, Govt. of India for mining of coal. Coal from this project will be supplied to Ghatampur Thermal Power Plant, a Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. This is a new upcoming project, hence a Greenfield Project.

The project area is spread over 715.00 Ha in the approved Mine Plan of Pachhwara South Coal Mine Project of NUPPL. The net geological reserve of the block is about 354.82 Million Tons and mineable reserve of the block is about 258.91 Million tons. With due mining losses, the extractable reserve comes to about 252.44 Million tons. The Ministry of Coal has approved the normative capacity for coal production at 9.00 MTPA with peak rated capacity at 13.50 MTPA. The land schedule authenticated by DFO, Dumka states that 455.1108 ha falls under forest category and remaining 259.7445 ha falls under non forest category. With the rated capacity of 9 MTPA (normative), life of the mine will be around 38 years including two years of pre-mining activity.

Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling & blasting with Shovel Dumper combination while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

1.2. LOCATION OF THE PROJECT

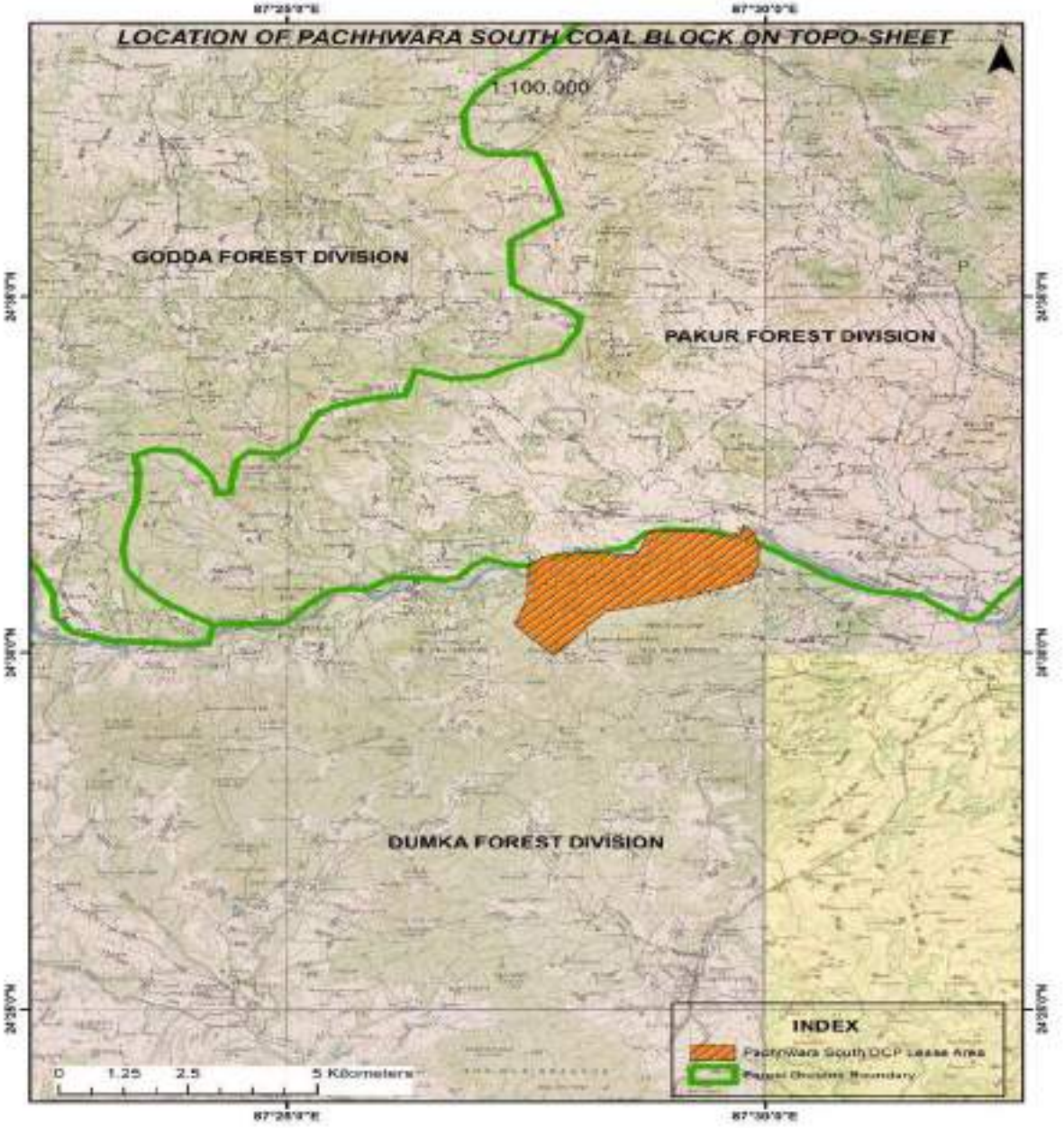
Pachhwara South Coal block occupies the southernmost part of the Rajmahal Coalfield in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District. The coal block area is covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates as follows:

Latitude: 24° 29' 57.404" N – 24° 31' 46.956" N

Longitude: 87° 27' 22.010" E – 87° 29' 56.150" E

The Block is well connected with Dumka, the district headquarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area and well connected with both Dumka and Pakur (district headquarters) through black-topped Dumka-Shahibganj Road and Amrapara-Maheshpur-Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The location of Pachhwara South Coal Block is being shown in the following map on topo-sheet.

Map 1: Location of Pachhwara South Coal Block



1.3. FORMULATION OF SOIL AND MOISTURE CONSERVATION PLAN – BACKGROUND

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (**Annexure-1**), has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of M/s Neyveli Uttar Pradesh Power Ltd. in Dumka District of Jharkhand subject to fulfilment of a number of conditions. The conditions, in fulfilment of which the instant Plan is being formulated, are as follows:

> "*ix. ……..On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chutua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost…….."*
>
> …….
>
> …….
>
> *xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40, if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval.*
>
> …….
>
> ……
>
> *xxiv. The User Agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approva*l."

In the backdrop of the aforesaid conditions, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the bifurcating boundary of the Dumka and Pakur forest divisions/districts. Both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearances have been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of SMC plans and Site-specific Wildlife Conservation plans independently. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been

approved by the competent authority. Notably, the said plans have been formulated restricting the respective project impact areas within Pakur forest division.

Hence, it is incumbent upon the user agency with respect to Pachhwara South Coal Block to take up only those areas for SMC Plan as project impact area which do not fall within Pakur forest division so that there is no chance of any duplication in plan proposals. Further, the location of Pachhwara South Coal Block is such that if we exclude the territory of Pakur division, the area surrounding the coal block lease area would involve two divisions – Dumka and Godda.

Apart from preparation of Soil & Moisture Conservation Plan, one of the conditions (Sl. No. xix) specifically mandates the user agency, either itself, or through the State Forest Department, to undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease (condition no. xix). The instant plan proposal (Chapter 5) includes such activities which are appropriate to comply with this specific condition.

1.4. General Principles Regarding Formulation of Soil and Moisture Conservation Plan

At the outset it is being clarified that the expressions viz. 'Soil Moisture Conservation Plan' and 'Soil & Moisture Conservation Plan' are somewhat confusing and may *prima facie* attribute to different import in meanings and objectives of the conservation plan as such. The main objective of soil moisture conservation is to minimize the amount of water lost from the soil through evaporation (water loss directly from the soil) and transpiration (water loss occurring through the plants) – or combined i.e., the evapotranspiration. Preserving soil moisture is important means to maintain the necessary water for agricultural production, and also helps minimize irrigation needs of the crops. This is especially important in areas where rainwater and/or groundwater resources for irrigation are scarce or decreasing due to climate change or other causes. Thus, Soil moisture conservation plan has somewhat more emphasis on agricultural production by way of techniques such as spreading manure or compost over the soil, mulching, crop rotation, deep tillage, mixed cropping and inter-planting, contour ploughing, strip cropping etc. However, when we use the term 'Soil & Moisture conservation' it primarily lays more emphasis on drainage line treatment and ancillary structural and engineering measures as well as augmentation in vegetation cover and quality thereof etc. to improve soil and water regime of any particular selected area of study.

Soil and Moisture Conservation (SMC) involve activities that maintain or enhance the productive capacity of land in areas affected by or prone to soil erosion. Soil erosion implies the movement of soil from one part of the land to another through the action of wind or water. Thus, soil erosion by water is caused by raindrop impact surface sealing, and crust formation leading to high runoff rate and amount, high runoff velocity on long and undulating slopes, and low soil strength of structurally weak soils with high moisture content due to frequent rains. Soil erosion by wind is caused by lack of vegetation cover, dry pulverized soils, strong wind speeds, and poor land management practices such as continuous tillage and over-grazing.

The available literature indicates that any Soil and Moisture Conservation Plan with respect to a particular study area should generally aim the following:

- To protect the soil surface from the erosion of falling rainwater;
- To increase the soil infiltration capacity, and prevent the occurrence of surface erosion;
- To guarantee land functions to support community life;
- To optimize the productivity of land to realize economic, social and environmental benefits in a balanced and sustainable manner;
- To increase the carrying capacity of the watershed;
- To increase the capacity to develop and empower community participation; and
- To guarantee the utilization of soil and water conservation fairly and evenly for the benefit of the community.

1.5. SOIL AND MOISTURE CONSERVATION PLAN VIS-A-VIS CATCHMENT AREA TREATMENT PLAN

Chapter 9 of the "*Consolidated Guidelines and Clarifications issued under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023*" dated 29th December, 2023 (MoEF&CC) lays down that the measures proposed under the Catchment Area Treatment Plan (CAT Plan), among other provisions, should focus on arresting soil erosion, improving effective drainage in the area, and rejuvenation of the degraded eco system in the catchment. The said guidelines prescribe following general principles which ought to be kept in focus while formulating CAT plans:

(i) In the dense forest areas major concentration should be on soil & water conservation including water harvesting for which various water harvesting structures like check dams, gully plugging, gabion dams, contour trenches and vegetative structures should be made.

(ii) *In the open forest areas besides taking up soil & water conservation measures, plantation of local indigenous tree and shrub species, including rare/medicinal plants, should be done. In higher altitudes plantation of Chir pine should be avoided.*

(iii) *The CAT plan should include a component of fodder development on the civil soyam forest or on revenue/private lands in order to meet the requirement of fodder/small timber/fire wood for the local population with a view to reduce pressure on the forests.*

(iv) *The CAT Plan should have a socio-economic component including supply of CNG connections to the project affected families to be implemented through Joint Forest Management Committees (the nomenclature may vary among the States/UTs).*

(v) *The infrastructure component like construction of buildings, vehicles, salaries of staff etc. may be provided based on a careful analysis of the need for the same with detailed justification and should constitute a very small percentage (say up to 5%) of the total cost of the CAT plan.*

(vi) *CAT plan shall be approved by the Principal CCF & HoFF or any other officer authorized by him for the purpose.*

(vii) *Regular monitoring is essential for effective implementation of the CAT Plan. The Chief Project Officer of the User Agency must be associated in implementation as well as monitoring of the progress of CAT plan. For this, a committee with following composition may be constituted at State level for quarterly review of progress of implementation of various CAT plans and take immediate steps to ensure the same:*

1. *PCCF & HoFF - Chairman*
2. *Secretary (Agriculture) or his representative - Member*
3. *Secretary (Animal Husbandry) or his representative - Member*
4. *Project Officer-User Agency - Member*
5. *Concerned Conservator of Forests - Member*
6. *Nodal Officer (FC) o/o PCCF -Member Secretary*

The aforesaid guidelines indicate that activities aimed towards Soil & Moisture Conservation are an integral part of Catchment Area Treatment. Thus, a CAT Plan is an important and essential plan for enhancing and maintaining the ecological health of the catchment area through site-specific biological and engineering measures for conservation of soil & moisture and management of water regime. Among other provisions, the measures should focus on arresting soil erosion, improving effective drainage in the area, and rejuvenation of the degraded eco system in the catchment.

Notably, neither the said guidelines nor any other communication issued by MoEF&CC on record does contain any specific guideline towards formulation/preparation of SMC plans with reference

to compliance of condition laid herein under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Therefore, the instant SMC Plan is being formulated taking cue from the guidelines stated under the guidelines with reference to formulation of Catchment Area Treatment Plans. Also, the general principles of Area-Specific Soil and Water Conservation have been adhered to, keeping in mind the ground situation of the Impact Zone of the project after thorough survey of the area concerned. Needless to say, the prime objective of the instant Plan is to compensate the negative impacts of the open cast mining activities over the immediate surroundings of the mining lease area.

1.6. DISCUSSION ON REQUIREMENT OF FORMULATION OF CAT PLAN AS WELL AS SMC PLAN UNDER STAGE-I CLEARANCE CONDITIONS FOR THE PROJECT

Apart from formulation of SMC Plan, the Stage-I order of the Project includes specific conditions pertaining to formulation and implementation of CAT Plan and find mention in Stage-I order of the Project in following words:

> "*vi. As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*
> *ix. ……On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chutua nala and other nearby nalas……*"

The scope of the conditions laid under Stage-I order issued in favour of the project particularly in regard to formulation of CAT and SMC plans was thoroughly discussed with the field forest officials including RCCF, Dumka. **In order to do justice with the said conditions in letter and spirit it was decided to formulate SMC plan within 10 km radius and CAT plan within 10-15 km radius around the lease area restricting the treatment area to the territory of Dumka Forest Division. The activities prescribed within 10 km area under SMC plan shall be common in both the plans and therefore, these activities shall be excluded from the CAT plan.** Further, the condition under Sl. No. xx of the Stage-I order specifically mandates the user agency to undertake desilting of village tanks and other water bodies within 5 km from the mine lease boundary. Hence, the desilting activities within 5 km of the lease boundary shall be excluded from the SMC/CAT plan.

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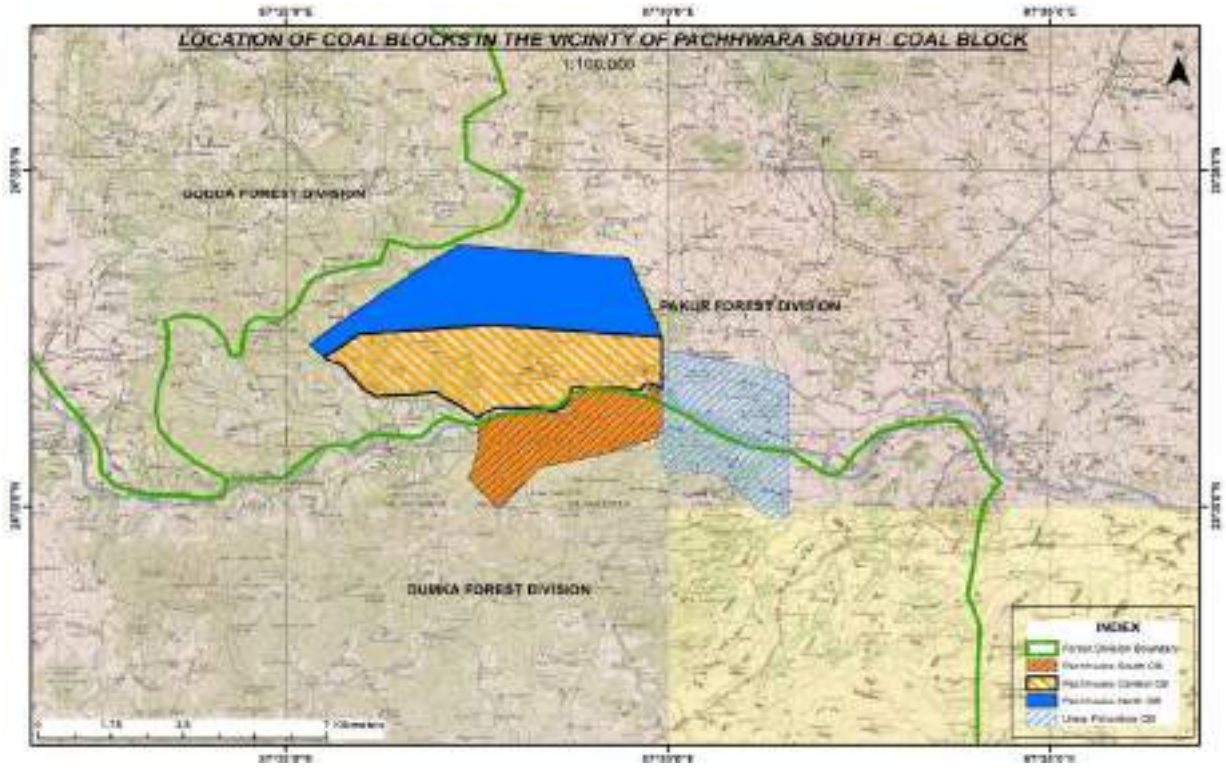
2. PROJECT IMPACT AREA

2.1. DEFINING THE IMPACT AREA/ZONE OF INFLUENCE OF THE PROJECT

The Impact Area or Zone of Influence (ZoI) around development footprints, in the instant case open cast mining, is the area indirectly affected by human activities, and is more difficult to define. The distance a ZoI may extend around a feature, and its effect on soil and water ecosystem, varies depending on the nature of the development feature and the level of activity associated with the feature. Conventionally 10 km buffer around any development feature is taken as the standard practice for planning interventions towards conservation needs oriented towards any particular objective or a set of objectives.

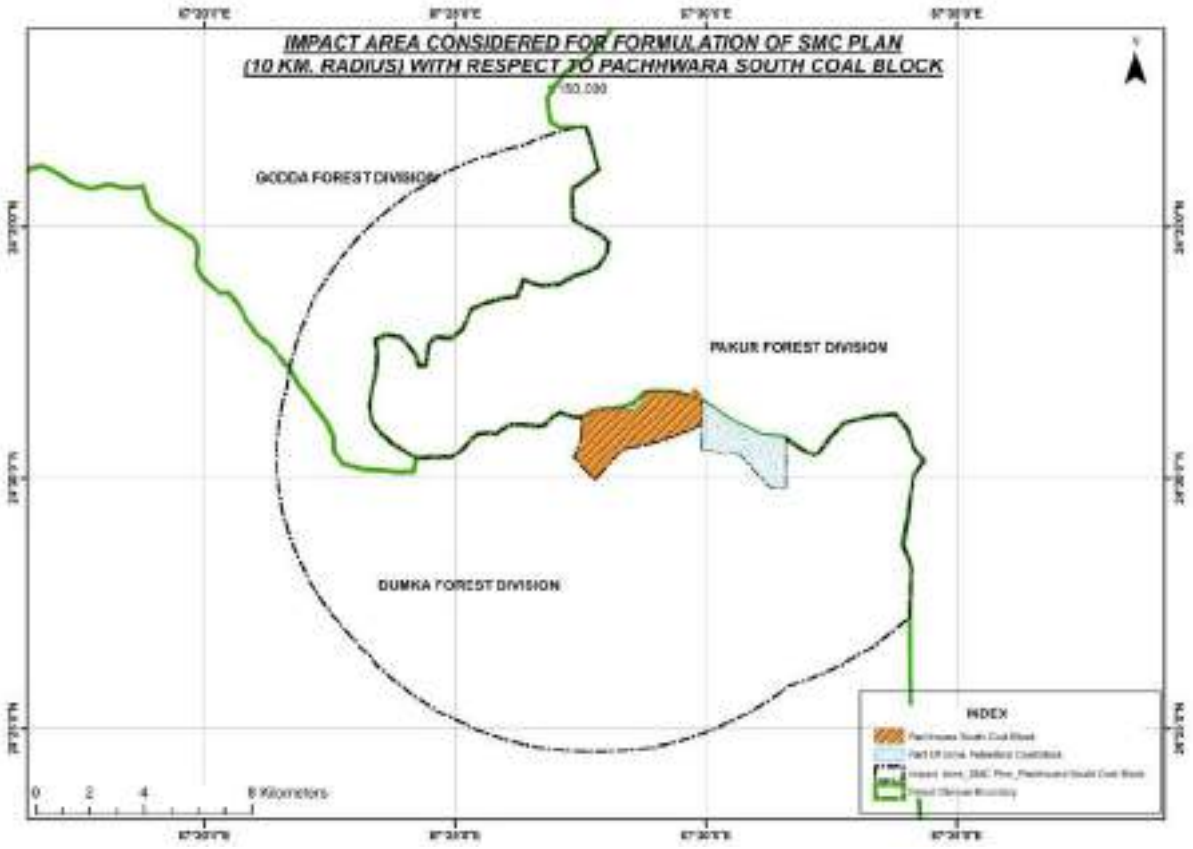
While defining the Impact Area of the instant Project it is important to note that two other coal blocks are located in close vicinity of Pachhwara South Coal Block (CB), namely Pachhwara Central and Pachhwara North CBs. Pachhwara South Block is situated within Dumka Forest Division/District whereas Pachhwara Central and Pachhwara North blocks fall within the administrative boundary of Pakur Forest Division/District, the Bansloi river being the bifurcating boundary of the two districts. Apart from the aforesaid coal blocks adjacent to Pachhwara South coal block, there is one more upcoming coal block namely Urma Paharitola Coal Block. All the four coal blocks are being depicted in the following map on topo-sheet.

Map 2: Location of Existing Coal Blocks in the Vicinity of Pachhwara South Coal Block



It is to be noted that in compliance of conditions laid by MoEF&CC towards forest clearance with respect to Pachhwara Central CB and Pachhwara North CB, SMC plans and Wildlife Conservation plans have been formulated and approved by respective competent authorities. And the impact area delineated under the said plans has been restricted to the territory of Pakur forest division. Therefore, in the best interest of the conservation needs of the area, the instant SMC plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions and within 10 km radius of the boundary of the coal block. The impact area so delineated is being shown in the following map.

Map 3: Impact Area Considered for Formulation of Soil & Moisture Conservation Plan



2.1.1. Villages Enclaved within the Impact Area and Corresponding Administrative Units of Forest Department

The Impact Area consists of altogether 169 number of villages, 133 in Dumka Forest Division and 36 in Godda Forest Division. It would be relevant to mention here that the areas of villages which fall partly outside the 10 km boundary have also been considered for prescribing management interventions under the plan.

The geographical extent of the Impact Area is about 257.73 sq.km. The names of the villages are being tabulated hereunder in accordance with the sub-units of forest administration, namely Forest Range, Beat and Sub-Beat.

Table 1: Impact Area Villages and Corresponding Forest Administrative Units – Dumka Forest Division

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/Thana No.	Forest Land (ha)
Kathikund	**Gopikandar**	**Gopikandar East**	1.	Amjhari	Gopikandar-37	-
			2.	Balia	Gopikandar-24	10.99
			3.	Dharampur	Gopikandar-32	-
			4.	Dumaria	Gopikandar-55	29.28
			5.	Dumartola	Gopikandar-30	66.16
			6.	Jamchua	Gopikandar-38	-
			7.	Janamdih	Gopikandar-34	0.21
			8.	Jitpur	Gopikandar-33	-
			9.	Karmo	Gopikandar-40	-
			10.	Kochapani	Gopikandar-42	69.91
			11.	Musna	Gopikandar-36	-
			12.	Rambani	Gopikandar-35	-
			13.	Ramgarh	Gopikandar-39	-
			14.	Sugapahari	Gopikandar-41	-
			15.	Talberia	Gopikandar-31	24.90
		Gopikandar West	16.	Babupur	Gopikandar-21	-
			17.	Bankijor	Gopikandar-08	20.71
			18.	Baratalli	Gopikandar-10	8.70
			19.	Bhagabandh	Gopikandar-13	10.52
			20.	Bhuskidangal	Gopikandar-14	14.70
			21.	Burhichapar	Kuskira-11	-
			22.	Champa Pahar	-	-
			23.	Chandramali	Gopikandar-18	46.84
			24.	Chhatarchua	Gopikandar-22	-
			25.	Dubrajpur	Gopikandar-12	35.41
			26.	R.F.		
			27.	Gamharia	Kuskira-12	-
			28.	Gariapani	Gopikandar-15	12.63
			29.	Gopikandar	Gopikandar-16	-
			30.	Jhariapani	Gopikandar-09	39.30
			31.	Jhutichapar	Gopikandar-4	0.66
			32.	Jolo	Gopikandar-1	-
			33.	Jaropani	Gopikandar-2	-
			34.	Kairasol	Gopikandar-07	-
			35.	Katuidangal	Gopikandar-11	27.32
			36.	Kheribari	Gopikandar-17	1.22
			37.	Koyada	Gopikandar-19	1.21
			38.	Kuarpur	Gopikandar-3	-
			39.	Kumarbandh	Gopikandar-20	-
			40.	Kurumba	Gopikandar-23	-
			41.	Pujadih	Gopikandar-06	-

			42.	Soruapani	Gopikandar-05	-
		Korcho	43.	Amdiha	Silangi-08	-
			44.	Bara Pahari	Silangi-04	15.20
			45.	Kachuakandar	Silangi-10	17.19
			46.	Koilo	Silangi-06	22.17
			47.	Kolha	Silangi-07	-
			48.	Sahara	Silangi-3	59.85
			49.	Sarkhi	Silangi-09	0.05
			50.	Tesaphuli	Silangi-5	47.31
Kathikund	**Kathikund**	**Kathikund East**	51.	Lakraphela Pahar	Kathikund-25	-
Kathikund	**Chirudih**	**Durgapur East**	52.	Amarpur	Kuskira-32	-
			53.	Babuikhura	Kuskira-25	2.03
			54.	Bhadradighi	Kuskira-31	-
			55.	Bhangahir	Kuskira-24	7.26
			56.	Dhobachapar	Kuskira-07	-
			57.	Dhobarna	Kuskira-21	15.01
			58.	Digha Parbat	Kuskira-30	-
			59.	Gumapahari	Kuskira-20	61.33
			60.	Jhanjhko	Kuskira-03	-
			61.	Kajikend	Kuskira-14	-
			62.	Khajurdangal	Kuskira-06	-
			63.	Lakhibad	Kuskira-29	-
			64.	Majhdiha	Kuskira-23	1.86
			65.	Paharpur	Kuskira-28	0.27
			66.	Pindargara	Kuskira-27	12.93
			67.	Pipra	Kuskira-26	17.18
			68.	Rampur	Kuskira-13	-
			69.	Talkhora	Kuskira-05	-
		Durgapur West	70.	Dundhapahari	Kuskira-18	33.18
			71.	Durgapur	Kuskira-17	9.00
			72.	Jorasimal	Kuskira-15	8.09
			73.	Chetopoka	Kuskira-04	-
			74.	Kulaipura	Kuskira-08	80.67
			75.	Kuskira	Kuskira-19	13.17
			76.	Majurabari	Kuskira-22	35.20
			77.	Ormo	Kuskira-01	56.87
			78.	Palasbani	Kuskiraa-10	-
			79.	Puranakhora	Kuskira-09	-
			80.	Ranga	Kuskira-16	24.40
		Chirudih	81.	Chirudih	Silangi-20	85.01
			82.	Kundapahari	Silangi-19	65.55
			83.	Madhuban	Kuskira-02	59.79
		Silangi	84.	Chunjo	Silangi-12	87.45
			85.	Hethsilangi	Silangi-13	-
			86.	Kharikasol	Silingi-17	67.40
			87.	Khatangi	Silingi-16	13.91
			88.	Khatganwa	Silangi-15	-
			89.	Mahaldabar	Silangi-18	124.38
			90.	Sarkhi Pahar	Silangi-11	-
			91.	Silingi Pahar	Silangi-14	-
Kathikund	**Narganj**	**Baskia**	92.	Balidih	Narganj-36	175.57

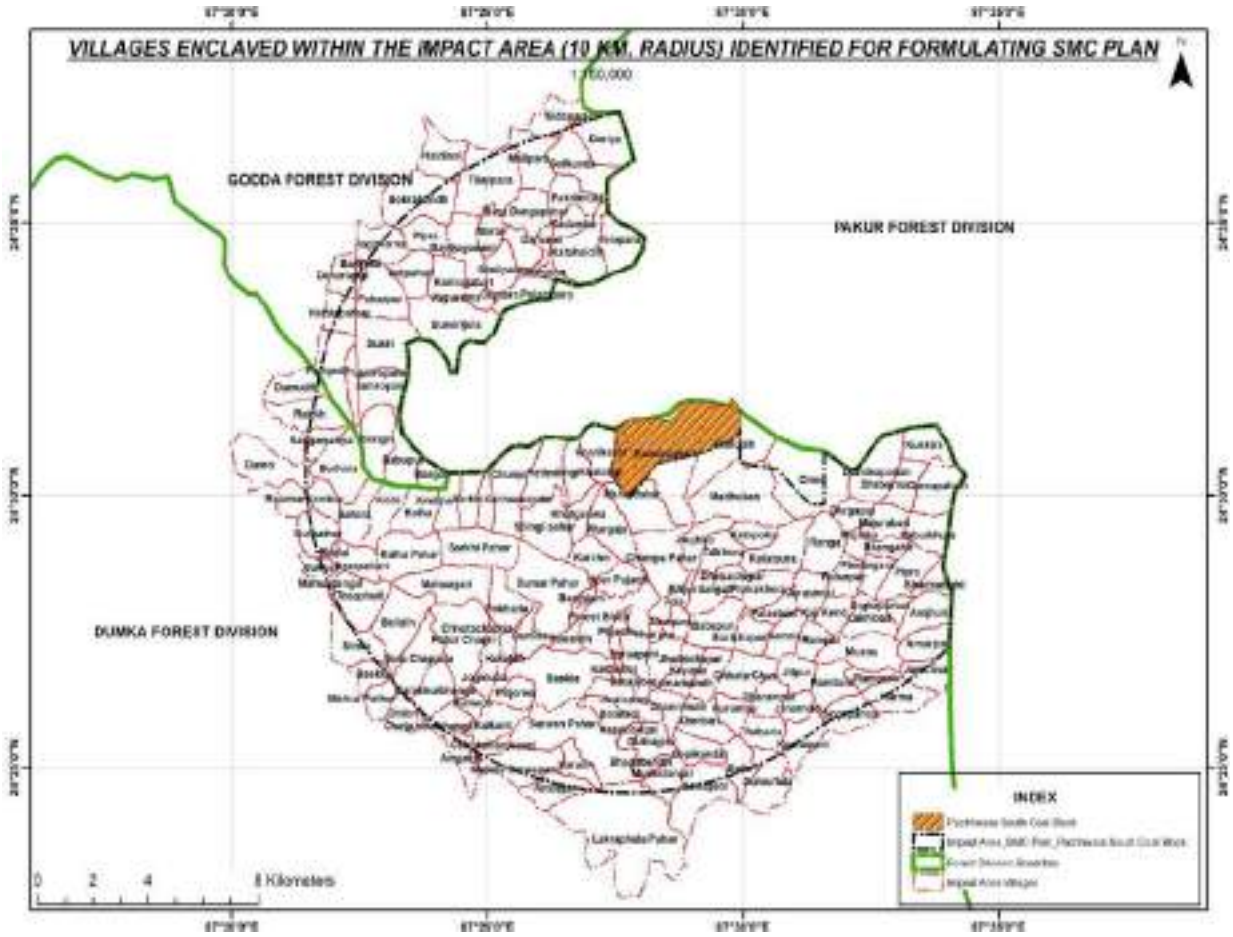
			93.	Baskia	Narganj-03	35.47
			94.	Dhibri	Narganj-05	2.99
			95.	Mahuapathar	Narganj-04	13.48
			96.	Simra	Narganj-01	71.71
		Narganj	97.	Ambajora	Narganj-57	15.75
			98.	Amgachhi	Narganj-32	22.00
			99.	Bara Chaparia	Narganj-35	112.37
			100.	Bara Bhuibhanga	Narganj-34	62.49
			101.	Chhota Chaparia	Narganj-49	27.24
			102.	Chhota Maruapani	Narganj-54	1.52
			103.	Chhota Bhuibhanga	Narganj-33	19.15
			104.	Jogiduba	Narganj-50	17.45
			105.	Kotaldih	Narganj-48	36.38
			106.	Kulkant	Narganj-53	24.36
			107.	Majhila Sarwapani	Narganj-55	78.85
			108.	Pahar Chapri	-	-
			109.	Pirjorwa	Narganj-52	46.57
			110.	Sarwan	Narganj-56	6.92
			111.	Sarwan Pahari	-	-
		Lakhanpur	112.	Pokharia	Narganj-39	-
		Bora Pahari	113.	Banjhiam	Narganj-44	-
			114.	Baskia	Narganj-03	35.47
			115.	Dumra Pahar	Narganj-40	-
			116.	Dumaria	Narganj-51	-
			117.	Kolha Pahar	Narganj-37	-
			118.	Kurcho	Narganj-41	32.63
			119.	Mahuagari	Narganj-38	-
			120.	Murguja	Narganj-42	-
			121.	Pusaldih	Narganj-45	-
			122.	Upar Pujadih	Narganj-43	-
Hizla West	**Nonihat**	**Amdiha**	123.	Bakua	-	-
			124.	Bhelai	-	-
			125.	Burhnia	Dodho-11	41.52
			126.	Damudih	-	-
			127.	Danro	-	-
			128.	Kendua	Dodho-12	9.77
			129.	Kulapathar	Bara-10	10.85
			130.	Mahuadangal	Kathikund-7	18.00
			131.	Raidih	-	-
			132.	Rajamar	-	-
			133.	Rangamatia	Lakhanpur-41	1.81

Table 2: Impact Area Villages and Corresponding Forest Administrative Units – Godda Forest Division

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/Thana No.	Forest Land (ha)
Godda	**Poreyahat**	**Pindrahat**	1.	Daharlangi	Poreyahat-208	34.28
			2.	Hathiapathar	Poreyahat-209	13.05
			3.	Jamropani	Poreyahat-213	-
			4.	Pairgadih	Poreyahat-211	-
Sundarpahari	**Damru**	**Damruhat**	5.	Bara Dangapara	Sundarpahari-06	49.40
			6.	Damakol	Sundarpahari-07	8.49
			7.	Doriya	Sundarpahari-10	-
			8.	Golkunda	Sundarpahari-11	-
			9.	Malipara	Sundarpahari-04	42.74
			10.	Pakrikhunta	Sundarpahari	-
			11.	Sidapara	Sundarpahari-5	-
		Susni	12.	Babupur	Sundarpahari-25	149.58
			13.	Bankatti	Sundarpahari-20	5.23
			14.	Bargo	Sundarpahari-26	82.60
			15.	Belpahari	Sundarpahari-18	54.08
			16.	Baigni	Sundarpahari-24	49.24
			17.	Chhota Dangapara	Sundarpahari-09	21.30
			18.	Jamropani	Sundarpahari-23	76.71
			19.	Jogimarna	Sundarpahari-19	88.54
			20.	Karamba	Sundarpahari-08	14.40
			21.	Kathaldih	Sundarpahari-13	-
			22.	Kamupahari	Sundarpahari-15	70.73
			23.	Mulgipur	Sundarpahari-10	-
			24.	Paharpur	Sundarpahari-21	68.14
			25.	Sundrijola	Mahagama-17	374.33
			26.	Susni	Mahagama-22	179.95
			27.	Telopara	Sundarpahari-14	51.72
		Bokrabandh	28.	Bajrajogusami	Sundarpahari-13	100.75
			29.	Bokrabandh	Sundarpahari-02	112.21
			30.	Barai	Sundarpahari-05	44.70
			31.	Dumra Palampara	Sundarpahari-11	18.52
			32.	Hardisol	Sundarpahari-03	46.93
			33.	Jagusama	Sundarpahari-16	-
			34.	Pipra	Sundarpahari-14	52.68
			35.	Simlipara	Sundarpahari-12	-
			36.	Tilaypara	Sundarpahari-06	28.90

The villages located within the Impact Area are being shown in the following map:

Map 4: Villages Enclaved within the Impact Area



2.1.2. Description of Notified Forest Land within the Impact Area and Corresponding Prescriptions under the Working Plan

Table 3: Working Plan Prescriptions with respect to Villages having notified Forest land – Dumka Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	CWSWC*	RCSWC*	PCPWC*	PWC*	TWC*
Kathikund/ Gopikandar/ Gopikandar East	Amjhari	Gopikandar-37	-	-	-	-	-	-
	Balia	Gopikandar-24	10.99	-	10.99	-	-	-
	Dharampur	Gopikandar-32	-	-	-	-	-	-
	Dumaria	Gopikandar-55	29.28	11.31	14.37	-	3.60	-
	Dumartola	Gopikandar-30	66.16	21.53	24.64	-	19.99	-
	Jamchua	Gopikandar-38	-	-	-	-	-	-
	Janamdih	Gopikandar-34	0.21	-	0.21	-	-	-
	Jitpur	Gopikandar-33	-	-	-	-	-	
	Karmo	Gopikandar-40	-	-	-	-	-	-
	Kochapani	Gopikandar-42	69.91	21.43	16.54	-	31.94	-
	Musna	Gopikandar-36	-	-	-	-	-	-
	Rambani	Gopikandar-35	-	-	-	-	-	-
	Ramgarh	Gopikandar-39	-	-	-	-	-	-
	Sugapahari	Gopikandar-41	-	-	-	-	-	-

	Talberia	Gopikandar-31	24.90	13.15	11.75	-	-	-
Kathikund/ Gopikandar/ Gopikandar West	Babupur	Gopikandar-21	-	-	-	-	-	-
	Bankijor	Gopikandar-08	20.71	6.98	13.73	-	-	-
	Baratalli	Gopikandar-10	8.70	-	8.70	-	-	-
	Bhagabandh	Gopikandar-13	10.52	-	10.52	-	-	-
	Bhuskidangal	Gopikandar-14	14.70	-	14.70	-	-	-
	Burhichapar	Kuskira-11	-	-	-	-	-	-
	Champa Pahar	-	-	-	-	-	-	-
	Chandramali	Gopikandar-18	46.84	8.91	17.32	20.61	-	-
	Chhatarchua	Gopikandar-22	-	-	-	-	-	-
	Dubrajpur	Gopikandar-12	35.41	8.67	8.74	-	18.00	-
	R.F.	-	-	-	-	-	-	-
	Gamharia	Kuskira-12	-	-	-	-	-	-
	Gariapani	Gopikandar-15	12.63	-	12.63	-	-	-
	Gopikandar	Gopikandar-16	-	-	-	-	-	-
	Jhariapani	Gopikandar-09	39.30	20.66	18.64	-	-	-
	Jhutichapar	Gopikandar-04	0.66	-	0.66	-	-	-
	Jolo	Gopikandar-01	-	-	-	-	-	-
	Jaropani	Gopikandar-02	-	-	-	-	-	-
	Kairasol	Gopikandar-07	-	-	-	-	-	-
	Katuidangal	Gopikandar-11	27.32	13.70	13.62	-	-	-
	Kheribari	Gopikandar-17	1.22	-	1.22	-	-	-
	Koyada	Gopikandar-19	1.21	-	1.21	-	-	-
	Kuarpur	Gopikandar-03	-	-	-	-	-	-
	Kumarbandh	Gopikandar-20	-	-	-	-	-	-
	Kurumba	Gopikandar-23	-	-	-	-	-	-
	Pujadih	Gopikandar-06	-	-	-	-	-	-
	Soruapani	Gopikandar-05	-	-	-	-	-	-
Kathikund/ Gopikandar/ Korcho	Amdiha	Silangi-08	-	-	-	-	-	-
	Bara Pahari	Silangi-04	15.20	-	15.20	-	-	-
	Kachuakandar	Silangi-10	17.19	8.32	8.87	-	-	-
	Koilo	Silangi-06	22.17	-	13.21	-	8.96	-
	Kolha	Silangi-07	-	-	-	-	-	-
	Sahara	Silangi-3	59.85	18.42	27.42	-	14.01	-
	Sarkhi	Silangi-09	0.05	-	0.05	-	-	-
	Tesaphuli	Silangi-5	47.31	7.43	31.56	-	8.32	-
Kathikund/ Kathikund/ Kathikund E.	Lakraphela Pahar	Kathikund-25	-	-	-	-	-	-
Kathikund/ Chirudih/ Durgapur E.	Amarpur	Kuskira-32	-	-	-	-	-	-
	Babuikhura	Kuskira-25	2.03	-	2.03	-	-	-
	Bhadradighi	Kuskira-31	-	-	-	-	-	-
	Bhangahir	Kuskira-24	7.26	-	7.26	-	-	-
	Dhobachapar	Kuskira-07	-	-	-	-	-	-
	Dhobarna	Kuskira-21	15.01	-	15.01	-	-	-
	Digha Parbat	Kuskira-30	-	-	-	-	-	-
	Gumapahari	Kuskira-20	61.33	-	-	61.33	-	-
	Jhanjhko	Kuskira-03	-	-	-	-	-	-
	Kajikend	Kuskira-14	-	-	-	-	-	-
	Khajurdangal	Kuskira-06	-	-	-	-	-	-
	Lakhibad	Kuskira-29	-	-	-	-	-	-
	Majhdiha	Kuskira-23	1.86	-	1.86	-	-	-
	Paharpur	Kuskira-28	0.27	-	0.27	-	-	-
	Pinargaria	Kuskira-27	12.93	-	12.93	-	-	-
	Pipra	Kuskira-26	17.18	-	17.18	-	-	-
	Rampur	Kuskira-13	-	-	-	-	-	-
	Talkhora	Kuskira-05	-	-	-	-	-	-
Kathikund/	Dundhapahari	Kuskira-18	33.18	10.21	7.65	-	15.32	-

Chirudih/ Durgapur W.	Durgapur	Kuskira-17	9.00	-	9.00	-	-	-
	Jorasimal	Kuskira-15	8.09	-	8.09	-	-	-
	Chetopoka	Kuskira-04	-	-	-	-	-	-
	Kulaipura	Kuskira-08	80.67	-	-	80.67	-	-
	Kuskira	Kuskira-19	13.17	-	13.17	-	-	-
	Majurabari	Kuskira-22	35.20	10.41	12.48	-	12.31	-
	Ormo	Kuskira-01	56.87	-	-	56.87	-	-
	Palasbani	Kuskira-10	-	-	-	-	-	-
	Puranakhora	Kuskira-09	-	-	-	-	-	-
	Ranga	Kuskira-16	24.40	9.14	6.95	-	8.31	-
Kathikund/ Chirudih/ Chirudih	Chirudih	Silangi-20	85.01	14.32	57.36	3.02	21.31	-
	Kundapahari	Silangi-19	65.55	26.32	8.47	-	30.76	-
	Madhuban	Kuskira-02	59.79	-	-	59.79	-	-
Kathikund/ Chirudih/ Silangi	Chunjo	Silangi-12	87.45	12.40	39.53	14.21	21.31	-
	Hethsilangi	Silangi-13	-	-	-	-	-	-
	Kharikasol	Silingi-17	67.40	19.32	34.65	-	13.43	-
	Khatangi	Silingi-16	13.91	-	13.91	-	-	-
	Khatganwa	Silangi-15	-	-	-	-	-	-
	Mahaldabar	Silangi-18	124.38	8.71	32.12	21.43	62.12	-
	Sarkhi Pahar	Silangi-11	-	-	-	-	-	-
	Silingi Pahar	Silangi-14	-	-	-	-	-	-
Kathikund/ Narganj/ Baskia	Balidih	Narganj-36	175.57	43.21	0.05	50.00	82.31	-
	Baskia	Narganj-03	35.47	-	-	35.47	-	-
	Dhibri	Narganj-05	2.99	-	2.99	-	-	-
	Mahuapathar	Narganj-04	13.48	-	-	13.48	-	-
	Simra	Narganj-01	71.71	-	-	71.71	-	-
Kathikund/ Narganj/ Narganj	Ambajora	Narganj-57	15.75	-	-	-	15.75	-
	Amgachhi	Narganj-32	22.00	8.37	13.63	-	-	-
	Bara Chaparia	Narganj-35	112.37	-	-	112.37	-	-
	Bara Bhuibhanga	Narganj-34	62.49	-	-	54.42	8.07	-
	Chhota Chaparia	Narganj-49	27.24	-	-	27.24	-	-
	Chhota Maruapani	Narganj-54	1.52	-	1.52	-	-	-
	Chhota Bhuibhanga	Narganj-33	19.15	-	-	19.15	-	-
	Jogiduba	Narganj-50	17.45	-	17.45	-	-	-
	Kotaldih	Narganj-48	36.38	-	-	36.38	-	-
	Kulkant	Narganj-53	24.36	-	-	24.36	-	-
	Majhila Sarwapani	Narganj-55	78.85	20.34	21.52	-	36.99	-
	Pahar Chapri	-	-	-	-	-	-	-
	Pirjorwa	Narganj-52	46.57	-	-	46.57	-	-
	Sarwan	Narganj-56	6.92	-	6.92	-	-	-
	Sarwan Pahari	-	-	-	-	-	-	-
Kathikund/ Narganj/ Lakhanpur	Pokharia	Narganj-39	-	-	-	-	-	-
Kathikund/ Narganj/ Bora Pahari	Banjhiam	Narganj-44	-	-	-	-	-	-
	Baskia	Narganj-03	35.47	-	-	35.47	-	-
	Dumra Pahar	Narganj-40	-	-	-	-	-	-
	Dumaria	Narganj-51	-	-	-	-	-	-
	Kolha Pahar	Narganj-37	-	-	-	-	-	-
	Kurcho	Narganj-41	32.63	11.03	-	-	21.60	-
	Mahuagari	Narganj-38	-	-	-	-	-	-
	Murguja	Narganj-42	-	-	-	-	-	-
	Pusaldih	Narganj-45	-	-	-	-	-	-

	Upar Pujadih	Narganj-43	-	-	-	-	-	-
Hizla West/ Nonihat/ Amdiha	Bakua	-	-	-	-	-	-	-
	Bhelai	-	-	-	-	-	-	-
	Burhnia	Dodho-11	41.52	-	23.41	18.11	-	-
	Damudih	-	-	-	-	-	-	-
	Danro	-	-	-	-	-	-	-
	Kendua	Dodho-12	9.77	-	9.77	-	-	-
	Kulapathar	Bara-10	10.85	-	-	10.85	-	-
	Mahuadangal	Kathikund-7	18.00	-	-	18.00	-	-
	Raidih	-	-	-	-	-	-	-
	Rajamar	-	-	-	-	-	-	-
	Rangamatia	Lakhanpur-41	1.81	-	1.81	-	-	-

*CWSWC – Coppice with Standard Working Circle
*RCSWC – Rehabilitation -cum- Soil & Moisture Conservation Working Circle
*PCPWC – Plantation and Pastureland Working Circle
*PWC – Protection Working Circle
*TWC – Tasar Working Circle

Table 4: Working Plan Prescriptions with respect to Villages having notified Forest land – Godda Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	IWC*	RCSWC*	PLWC*	PRWC*	TWC*
Godda/ Poreyahat/ Pindrahat	Daharlangi	Poreyahat-208	34.28	-	-	-	34.28	-
	Hathiapathar	Poreyahat-209	13.05	-	-	-	13.05	-
	Jamropani	Poreyahat-213	-	-	-	-	-	-
	Pairgadih	Poreyahat-211	-	-	-	-	-	-
Sundarpahari/ Damru/ Damruhat	Bara Dangapara	Sundarpahari-06	49.40	-	-	-	49.40	-
	Damakol	Sundarpahari-07	8.49	3.50	3.19	1.80	-	-
	Doriya	Sundarpahari-10	-	-	-	-	-	-
	Golkunda	Sundarpahari-11	-	-	-	-	-	-
	Malipara	Sundarpahari-04	42.74	17.64	11.76	13.34	-	-
	Pakrikhunta	Sundarpahari	-	-	-	-	-	-
	Sidapara	Sundarpahari-5	-	-	-	-	-	-
Sundarpahari/ Damru/Susni	Babupur	Sundarpahari-25	149.58	-	119.68	29.90	-	-
	Bankatti	Sundarpahari-20	5.23	-	5.23	-	-	-
	Bargo	Sundarpahari-26	82.60	-	-	-	82.60	-
	Belpahari	Sundarpahari-18	54.08	-	-	-	54.08	-
	Baigni	Sundarpahari-24	49.24	34.54	-	14.70	-	-
	Chhota Dangapara	Sundarpahari-09	21.30	-	-	-	21.30	-
	Jamropani	Sundarpahari-23	76.71	53.90	22.80	-	-	-
	Jogimarna	Sundarpahari-19	88.54	61.97	26.57	-	-	-
	Karamba	Sundarpahari-08	14.40	5.80	-	8.60	-	-
	Kathaldih	Sundarpahari-13	-	-	-	-	-	-
	Kamupahari	Sundarpahari-15	70.73	42.10	18.03	-	10.60	-
	Mulgipur	Sundarpahari-10	-	-	-	-	-	-
	Paharpur	Sundarpahari-21	68.14	-	20.44	6.80	40.90	-
	Sundrijola	Mahagama-17	374.33	-	169.00	149.70	55.63	-
	Susni	Mahagama-22	179.95	67.10	49.20	18.95	44.70	-
	Telopara	Sundarpahari-14	51.72	-	-	-	-	51.72
Sundarpahari/ Damru/ Bokrabandh	Bajrajogusami	Sundarpahari-13	100.75	-	-	-	100.75	-
	Bokrabandh	Sundarpahari-02	112.21	47.80	20.60	1.00	-	42.81
	Barai	Sundarpahari-05	44.70	44.70	-	-	-	-
	Dumra Palampara	Sundarpahari-11	18.52	-	-	-	18.52	-
	Hardisol	Sundarpahari-03	46.93	17.98	7.70	11.01	10.24	-

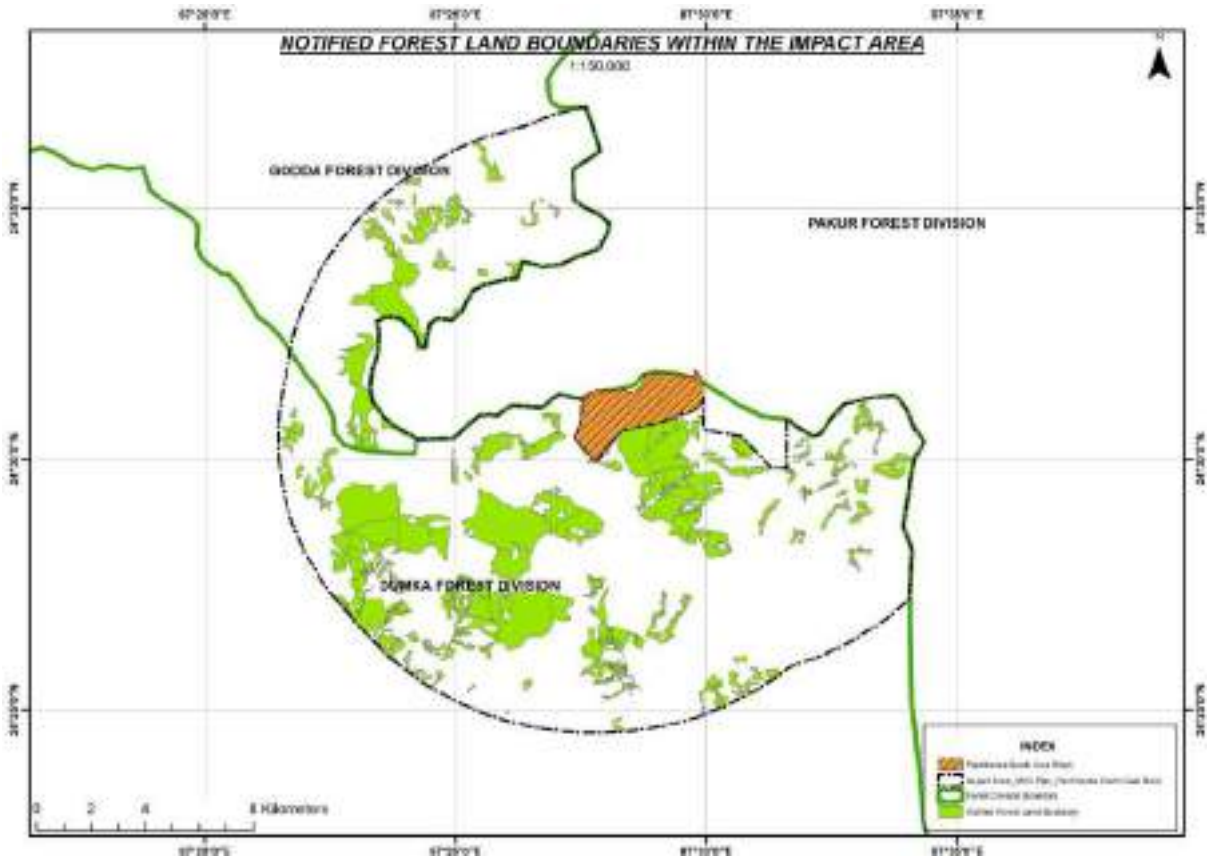
	Jagusama	Sundarpahari-16	-	-	-	-	-	-
	Pipra	Sundarpahari-14	52.68	-	-	-	52.68	-
	Simlipara	Sundarpahari-12	-	-	-	-	-	-
	Tilaypara	Sundarpahari-06	28.90	-	-	-	-	28.90

*IWC – Improvement Working Circle
*RCSWC – Rehabilitation – cum- Soil Conservation Working Circle
*PLWC – Plantation Working Circle
*PRWC – Protection Working Circle
*TWC – Tasar Working Circle

2.1.3. Forest Boundaries and Forest Cover within the Impact Area

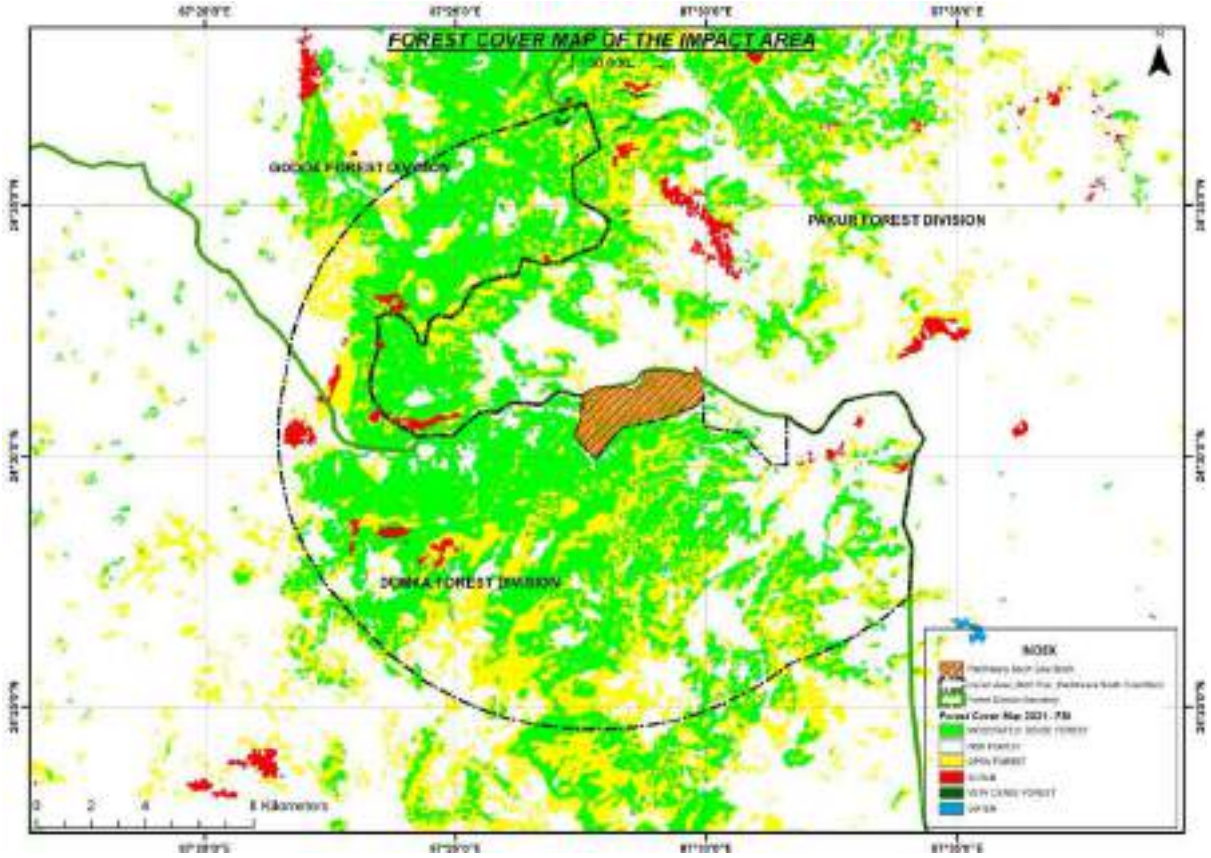
The Notified Forest land boundaries are being shown in the following map.

Map 5: Notified Forest Land Boundaries within the Impact Area



The Forest Cover Map (FSI, 2021) of the Impact Area is as follows.

Map 6: Forest Cover Map of the Impact Area (FSI, 2021)



According to the forest cover map of the Impact Area, the area under different tree canopy density classes are as under.

Table 5: Impact Area under Different Tree Canopy Density Classes

Sl. No.	Forest Density Class	Tree Canopy Density	Area (ha)
1.	Very Dense Forest	≥ 70%	24.263
2.	Moderately Dense Forest	≥ 40%; < 70%	11415.300
3.	Open Forest	< 40%; ≥ 10%	6281.990
4.	Scrub Forest	< 10%	323.758
5.	Non-Forest	-	7453.590

2.2. Ecosystem and Biodiversity Status of the Impact Area

Biodiversity constitutes the most important working component of a natural ecosystem. It helps maintain ecological processes, creates soils, recycles nutrients, has a moderating effect on the climate, degrades waste, controls diseases and above all, provides an index of health of an ecosystem. Providing food, medicines and a wide range of useful products, it is the natural wealth

that exists on land, in freshwater etc. Plant diversity alone offers more than just food security and healthcare for the one-quarter of humanity who live their lives at or near subsistence levels; it provides them with a roof over their heads and fuel to cook, and, on an average, meets 90 per cent of their material needs.

2.2.1. Forest Flora

The forests of Dumka and Godda forest divisions broadly conform to Northern Tropical Dry Deciduous Forest and may be classified as 5-B as per Champion and Seth (1968) classification. According to the classification of forest types of India, the forests of Dumka and Godda Divisions fall into the following sub-types:

- Northern Dry Peninsular Sal Forest–5B/C-1 type
- Northern Tropical Dry Mixed Deciduous Forest– 5B/C-2 type
- Tropical Dry Deciduous Scrub Forest–5B/DS-1 type

Most of the forests are situated along the northern aspects where slope is moderate to steep. The primary associate species found in the Sal forests are Terminalia chebula, Semicarpus anacardium, along with occasional bamboo brakes. Miscellaneous forests are situated both on plains as well as hills where soil is shallow and degraded, on the warmer aspects and in comparatively drier localities (such as hill slopes and hill tops having poor soil and moisture content). Here, the primary species are Dhaura, Asan, Kend, Galgal, Piar, Amla and so on. Scattered Semal trees are found in moister localities. Sal occurs near the foot-hill and in well drained moist localities. The areas coming under Tropical Dry Deciduous Scrub category are home to thorny species such as Flacouria indica, Carissa spinerum, Randia species, Euphorbia species, Acacia species, zyzyphus species, Zinosa species, Boswellia, Anogeissus, Aegle marmelos, Butea monosperma, Daiospyros, Madhuca, Nyctanthes etc. The tree species are mostly malformed and have stunted growth. The bamboos occur scattered around the fringes of the forests and mainly along the hill slopes. However, bamboos are of generally poor quality.

2.2.2. Forest Fauna

No Sensitive Ecological Habitat like National Park, Wild Life Sanctuary, Tiger Reserve or Elephant Reserve is located within the Impact Area.

2.2.2.1. Herpetofauna

Two species of amphibians viz. Common Toad (Duttaphrynus melanostictus) and Indian Bullfrog (Hoplobatrachus tigerinus) etc. are found in the study area. All the species are listed as species of

Least Concern as per IUCN Classification (IUCN Version 2017-3). Six species of reptiles have been reported from the study area. The list includes Indian Cobra (Naja naja), Common Krait (Bungarus caeruleus), Indian Rat Snake (Ptyas mucosus), Russel's Viper (Daboia russellii), Checkered Keelback (Xenochrophis piscator) and Oriental Garden Lizard (Calotes versicolor). The list includes four Schedule II species as per the Wildlife Protection Act, 1972 viz. Indian Cobra, Indian Rat Snake, Russel's Viper and Checkered Keelback.

2.2.2.2. Avifauna

A total of 39 species have been recorded from the study area. The species list includes terrestrial and aquatic birds.

Terrestrial birds include Asian Pied Starling, House Crow (Corvus splendens), Shikra (Accipiter badius), Common Myna (Acridotheres tristis), Paddyfield Pipit (Anthus rufulus), House Swift (Apus nipalensis), Common Pigeon (Columba livia), Asian Palm Swift (Cypsiurus balasiensis), Ashy Prinia, Black Drongo (Dicrurus macrocercus), Asian Koel (Eudynamys scolopaceus), Coppersmith Barbet (Psilopogon haemacephalus), Little Green bee-eater (Merops orientalis), Black Kite (Milvus migrans), Black Winged Kite (Elanus caeruleus), House sparrow (Passer domesticus), Baya weaver (Ploceus philippinus), Indian Silverbill, Plain Prinia (Prinia inornata), Rose-ringed Parakeet (Psittacula krameri), Red-vented Bulbul (Pycnonotus cafer), Indian Robin (Copsychus fulicatus), Spotted Dove, Eurasian Collared Dove (Streptopelia decaocto), Jungle babbler (Turdoides striata),etc.

Aquatic birds include White-breasted Waterhen (Amaurornis phoenicurus), Grey Heron (Ardea cinerea), Indian Pond Heron (Ardeola grayii), Purple Heron (Ardea purpurea), Cattle Egret (Bubulcus ibis), Intermediate Egret (Ardea intermedia), Pied Kingfisher (Ceryle rudis), Little Egret (Egretta garzetta), White- throated Kingfisher (Halcyon smyrnensis), Little Cormorant (Microcarbo niger), Purple Swamphen (Porphyrio porphyrio), Red-wattled Lapwing (Vanellus indicus) etc. Shikra (Accipiter badius), Black Kite (Milvus migrans) and Black Winged Kite (Elanus caereleus) are listed as Schedule I as per Wildlife Protection Act, 1972.

All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.2.2.3. Mammals

A total of 6 species of mammals are reported from the study area. The mammals reported are: Five-striped Palm Squirrel (Funambulus pennantii), Golden Jackal (Canis aureus), Common Grey Mongoose (Herpestes edwardsii), Rhesus macaque (Macaca mulatta), Indian Flying Fox (Pteropus giganteus), Lesser Bandicoot Rat (Bandicota bengalensis) etc. Large mammals were reported to be absent in the study area. The list includes three Schedule II species namely Golden Jackal, Common Grey Mongoose and Rhesus macaque. All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.3. DEMOGRAPHIC PROFILE OF VILLAGES FALLING WITHIN THE IMPACT AREA

The demographic profile of the villages involved in the Impact Area is being presented in the following table.

Table 6: Demographic Profile of Villages falling within the Impact Area

Forest Division	CD Block	Village	Area (ha)	Total Population	Sex Ratio*	Total no. of households	Total Literacy (%)
DUMKA	**Gopikandar**	Amarpur	163.53	270	1061	61	51.69
		Amdiha	98.00	72	1000	16	51.67
		Amjhari	189.22	348	881	81	38.97
		Babuikhura	153	447	987	104	52.74
		Babupur	255.45	214	1140	53	45.76
		Balia	174.71	260	985	57	61.58
		Bankijor	77.19	89	1023	24	23.75
		Barapahari	138.34	223	1124	51	71.12
		Baratalli	126.00	138	1029	30	20.17
		Bhadradighi	86.00	242	967	54	51.27
		Bhagabandh	61.70	154	901	34	50.41
		Bhuskidangal	135.89	288	1268	62	29.51
		Bhangahir	84.00	165	941	35	53.38
		Burhnia	94.01	248	879	49	60.38
		Burhichapar	147.00	341	874	74	51.69
		Champa Pahar	-	-	-	-	-
		Chandramali	109.54	59	903	13	34.04
		Chhatarchua	258.74	422	927	93	61.21
		Chirudih	444.91	554	1075	115	56.29
		Chunjo	245.66	287	1095	68	45.81
		Dhobarna	151.90	257	1024	57	39.39
		Dharampur	131.07	379	1016	80	62.65
		Dhobachapar	121.00	171	1085	39	52.70
		Dighaparbat	60.76	144	846	34	48.28
		Dubrajpur	136.85	145	883	32	51.18
		Dumariya	174.64	283	952	57	35.42

		Dumartola	253.42	279	860	64	22.87
		Dundhapahari	250.30	591	1081	125	52.43
		Durgapur	117.00	552	978	109	59.86
		Gamharia	142.25	262	1319	59	47.85
		Gariapani	335.43	509	1078	161	46.12
		Gopikandar	137.52	1293	977	283	64.77
		Gumapahari	212.00	540	1030	109	53.33
		Hethsilangi	189.87	200	1198	48	61.88
		Jamchua	163.00	430	1000	89	50.57
		Janamdih	98.85	157	1122	36	39.13
		Jhariapani	165.06	223	798	53	34.38
		Jhanjhko	137.97	90	957	22	25.00
		Jhutichapar	150.57	146	973	31	36.28
		Jitpur	135.14	262	885	51	28.64
		Jolo	97.40	278	1000	55	38.92
		Jorasimal	147.00	268	1078	57	55.40
		Jaropani	79.00	256	1065	53	64.73
		Kachuakandar	80.19	34	1429	6	65.52
		Kairasol	23.00	8	1000	2	66.67
		Kajikend	119.00	182	896	37	49.04
		Karmo	201.63	424	981	91	45.22
		Katuidangal	45.07	41	864	8	61.11
		Chetopoka	125.91	131	1047	24	31.96
		Kharikasol	135.82	93	898	21	55.70
		Khatangi	141.00	99	1302	23	55.68
		Khatganwa	110.00	121	921	26	32.23
		Kheribari	196.00	626	990	150	16.61
		Khajurdangal	132.86	131	845	29	24.43
		Koilo	120.17	59	967	16	20.34
		Kolha	173.04	267	1102	59	26.22
		Koyada	155.00	134	1680	30	15.67
		Kuarpur	35.00	55	719	10	21.82
		Kochapani	191.60	211	867	44	37.91
		Kulaipura	258.96	378	909	87	44.44
		Kumarbandh	159.00	313	1252	64	28.75
		Kundapahari	566.63	555	914	124	36.76
		Kurumba	126.00	204	1103	54	47.55
		Kuskira	186.81	1254	1013	276	62.92
		Lakhibad	191.00	291	877	62	36.43
		Madhuban	517.00	742	1005	160	38.95
		Mahaldabar	341.00	388	1000	76	47.16
		Majurabari	156.00	417	895	94	62.11
		Musna	272.46	545	1004	112	31.74
		Ormo	496.00	979	865	205	24.31
		Paharpur	124.00	380	854	84	34.21
		Palasbani	106.64	238	1088	43	44.12
		Pinargaria	110.00	203	1030	44	32.02
		Pipra	209.54	334	898	78	24.85
		Puranakhora	159.55	281	1081	59	43.42
		Pujadih	68.00	147	1227	34	49.66
		Rambani	186.71	276	1075	60	32.97
		Ramgarh	86.89	241	883	63	42.74
		Rampur	119.00	267	963	57	36.70

		Ranga	230.21	665	1118	143	50.83
		Sahara	150.61	75	744	14	61.33
		Sarkhi	92.00	117	773	25	39.32
		Sarkhi Pahar	325.00	53	1120	9	62.26
		Silingi Pahar	295.55	138	1060	27	36.23
		Sugapahari	175.00	226	1093	48	31.86
		Saruapani	119.19	115	917	26	33.04
		Talberia	153.79	252	909	58	41.27
		Talkhora	161.82	118	967	27	30.51
		Tesaphuli	260.23	256	1048	57	25.39
	Kathikund	Ambajora	188.00	403	1005	89	53.10
		Amgachhi	301.00	1119	1031	221	24.75
		Balidih	310.89	314	950	68	48.41
		Banjhiam	41.00	79	975	18	18.99
		Bara Chaparia	244.24	400	961	91	56.50
		Bara Bhuibhanga	179.42	131	955	28	25.95
		Baskia	102.86	105	944	24	31.43
		Baskia	-	-	-	-	-
		Chhota Chaparia	67.02	60	1143	12	41.67
		Chhota Maruapani	-	-	-	-	-
		Chhota Bhuibhanga	132.08	231	1081	49	57.58
		Dhibri	100.55	178	1171	39	29.21
		Dumrapahar	491.78	241	975	51	21.99
		Dumaria	109.21	204	1040	42	36.76
		Jogiduba	72.77	120	1308	30	23.33
		Kolha Pahar	279.00	-	-	-	-
		Kotaldih	86.00	163	831	34	39.88
		Kulkant	207.00	316	904	72	47.15
		Kurcho	159.29	109	1370	19	48.62
		Lakraphela Pahar	-	-	-	-	-
		Mahuapathar	105.33	282	1043	57	29.79
		Mahuagari	340.62	242	847	50	39.67
		Majhila Sarwapani	254.00	396	868	81	49.24
		Majhdiha	183.68	416	1039	89	52.88
		Murguja	246.93	168	909	30	12.50
		Paharchapri	-	-	-	-	-
		Pirjorwa	-	-	-	-	-
		Pokharia	248.13	834	949	167	41.13
		Pusaldih	85.86	169	1167	36	57.40
		Sarwan	-	-	-	-	-
		Sarwan Pahari	-	-	-	-	-
		Simra	198.41	196	922	43	33.16
		Upar Pujadih	136.57	162	1025	37	19.14
	Ramgarh	Bakua	87.03	177	863	40	50.85
		Bhelai	20.00	-	-	-	-
		Damudih	147.00	507	943	110	55.03
		Danro	322.00	2181	908	451	56.26
		Kendua	115.00	523	951	110	66.54
		Kulapathar	179.00	339	960	71	47.49
		Mahuadangal	28.00	-	-	-	-
		Raidih	182.00	402	887	85	56.97
		Rajamar	105.00	151	1068	34	34.44

		Rangamatiya	92.00	266	1094	58	43.61
GODDA	**Sundarpahari**	Babupur	213.00	14	1000	4	28.57
		Bajrajogusami	220.00	126	2818	26	43.65
		Bankatti	58.00	68	838	14	44.12
		Bara Dangapara	192.00	385	1225	89	26.49
		Barai	124.00	172	1024	29	23.26
		Bargo	179.00	111	1018	28	23.42
		Belpahari	173.00	263	1039	62	33.46
		Baigni	272.00	535	1106	118	25.79
		Bokrabandh	379.00	555	850	112	35.68
		Chhota Dangapara	121.00	70	795	17	10.00
		Damakol	55.67	61	968	12	13.11
		Doria	-	-	-	-	-
		Dumra Palampura	146.00	262	1015	58	31.30
		Golkunda	274.37	161	1147	37	29.19
		Hardisol	185.00	298	774	63	34.56
		Jagusama	77.00	9	800	2	44.44
		Jamropani	233.00	265	1087	56	43.02
		Jogimarna	215.00	187	1011	41	33.69
		Karamba	98.44	133	822	25	12.03
		Kathaldih	288.76	347	949	75	14.99
		Kamupahari	168.00	164	976	34	26.22
		Malipara	240.14	152	1054	36	13.82
		Mulgipur	44.00	-	-	-	-
		Paharpur	315.00	566	952	124	37.10
		Pakrikhunta	171.00	241	975	59	35.27
		Pipra	159.00	208	1019	43	50.00
		Sidapara	183.00	173	840	40	34.10
		Simlipara	149.00	106	710	29	29.25
		Sundrijola	458.00	231	974	73	32.90
		Susni	403.00	785	892	141	50.70
		Telopara	191.00	297	954	62	12.12
		Tilaypara	193.00	302	1068	64	38.08
	Poreyahat	Daharlangi	129.00	217	1009	41	36.41
		Hathiapathar	152.00	339	1146	75	36.28
		Jamropani	13.00	-	-	-	-
		Pairgadih	224.00	1235	921	267	51.90

*Sex Ratio means no. of females per 1000 males (Census, 2011)

The demographic profiles of Dumka and Godda districts are being presented in the following table.

Table 7: Demographic Profile of Dumka and Godda Districts

District	Total Population (No.)	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy
Dumka	13,21,442	6,68,514	6,52,928	6.02	21.87	93.18	6.82	61.02
Godda	13,13,551	6,77,927	6,35,624	8.80	10.71	94.90	5.10	56.40

The demographic profiles of the CD blocks involved in the Impact Area are being presented in the following table.

Table 8: Demographic Profile of CD Blocks involved in the Impact Area

District	CD Block	Total Population	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy (%)
Dumka	**Gopikandar**	42,063	20,999	21,064	1.58	42.40	100.00	-	50.12
	Kathikund	71,458	35,598	35,860	2.45	32.36	100.00	-	54.08
	Ramgarh	1,59,911	79,944	79,967	4.77	24.33	100.00	-	55.45
Godda	**Sundarpahari**	65,463	32,895	32,568	2.14	38.44	100.00	-	43.62
	Poreyahat	1,87,489	95,814	91,675	6.59	16.08	100.00	-	56.33

2.4. LIVELIHOOD STATUS OF THE POPULATION RESIDING IN THE IMPACT AREA

The Impact Area is predominantly agricultural in character. The main occupation of the people is cultivation. Kharif and Rabi are the main agricultural crops. The demographic profile of both Dumka and Godda districts is predominantly rural in character, with high level of poverty and low percentage of working population. The major crops grown are Paddy, Maize, Pulses, Oilseeds and Wheat. Paddy is grown intensively whereas other crops are grown by lesser number of farmers.

Rainfed farming system is the traditional practice followed by the farmers of the area. The Major crops grown in the district are rice, pulses such as moong, black-gram, pigeon pea and horse gram. Wheat is grown during rabi season and mustard and linseed, and pulses e.g. gram are also grown on stored or residual soil moisture. In some places, potato is also grown under irrigated condition. During the last five years there has been a marked increase in area under vegetables at some places in the district.

The important cropping patterns followed in different parts of Dumka and Godda are as follows: (a) Mono-cropping : Rice/Maize/Pigeon Pea / Groundnut / Horse gram. In some areas, farmers follow inter-cropping of Maize with Pigeon pea / Cow pea. (b) Double cropping : Rice wheat, Rice-Mustard, Maize-Wheat, Maize-Mustard, Rice-Potato, Rice-Vegetable, Maize-Vegetables. At few places, where irrigation water is available in summer also, farmers take rice and / vegetables at very scanty level.

Most of the cultivated lands suffer from soil erosion which results in poor soil fertility. In spite of having high rainfall (1000-1100 mm/year), farmers of these areas lack awareness about High Yield Varieties (HYVs). A study has revealed that poverty can be significantly reduced in sustainable manner by introduction of HYVs of paddy – a prominent crop of the region. Further, motivation of farmers towards crop diversification like wheat, chickpea and groundnut cultivation may a go a long way towards food security and improved socio-economic condition of the villagers.

In a project report entitled "Up-scaling Livelihood of Forest Communities through Enhanced Farm Productivity and Efficient Support Systems in Godda District of Jharkhand" prepared by Agricultural Finance Corporation (ICAR) in 2014, it has been observed that people would harvest bamboo culms either to sell them in the market or to use in house making and basket making. A need to diversify products from traditional to contemporary Bamboo crafts has been highlighted. The study has further noted that forest area of Sunderpahari and Godda forest ranges had abundant Sal (Shorea robusta) trees. Traditionally, local people collect Sal leaves, make the plates manually and sell to the local traders @ Rs.20 per 100 plates. Local traders would mechanize them and further sell in the market at higher price ranging from Rs. 60 to Rs. 90 per 100 plates. Hence, mechanization of leaf plates may contribute significantly towards livelihood augmentation. Forests of Godda and Sundarpahari ranges have ample trees and plants that provide different kinds of NTFPs. Some of them are edible fruits viz., Jackfruit (Artocarpus heterophyllus), Mango (Mangifera indica), Amra (Spondia pinnata), Aonla (Embelica officianlis), etc. Traditionally local people would collect these fruits either for self-consumption or selling in the local market at throwaway prices. In order to generate higher market returns these fruits may be processed, preserved, packed, labelled and sold in the market in form of pickle etc. Multilayer Vegetable Cropping System (MVCS) also needs to be introduced. Under MVCS better results were recorded compared to traditional as well as hybrid varieties under sole crop. Nutritional security for the people living in disadvantaged area may be effectively addressed through providing a small kit of vegetables seeds to grow them in the backyard. In addition, improved varieties of crops may be provided to the farmers. Vermi-composting may also be introduced. Use of vermi-compost could help in enhancing land fertility and provide a better alternative to the traditional use of dung. Nurseries may also be developed / established on the farmers land which is not used for cultivation purpose and lying vacant. The seedlings of plants such as Mango, Aonla, Bamboo, etc. could be raised in the nursery. In addition, seedlings of Coriander, Chilli, Cauliflower, etc. may also be grown in the poly house built within the nursery premises.

2.4.1. Occupational Profile of Residents in the Impact Area

The occupational profiles of the CD Blocks constituting the Impact area are being profiled in the following table:

Table 9: Occupational Profile of the CD Blocks Constituting the Impact Area

District	CD Block	Total Population	Total No. of Workers	No. of Main Workers	Main Workers (%)	No. of Marginal Workers	Marginal Workers (%)	Non-working Persons
Dumka	**Gopikandar**	42,063	23,406	8,044	34.37	15,362	65.63	18,657
	Kathikund	71,458	34,846	13,251	38.03	21,595	61.97	36,612
	Ramgarh	1,59,911	82,265	21,738	26.42	60,527	73.58	77,646

Godda	**Sundarpahari**	65,463	35,347	11,515	32.58	23,832	67.42	30,116
	Poreyahat	1,87,489	81,334	42,008	51.65	39,326	48.35	1,06,155

(Census, 2011)

A main worker is defined as a person who is engaged in any economically productive work for at least 183 days in a year. The main workers include 10 categories of workers as defined by the Census Department, consisting of cultivators, agricultural labourers, those engaged in live-stock, forestry, fishing, mining and quarrying; manufacturing, processing and repairs in household industry; and other than household industry, construction, trade and commerce, transport and communication and other services.

The marginal workers are those workers engaged in some work for a period of less than six months during the reference year prior to the census survey. A marginal worker is defined as one who engaged in only economically productive work for less than 183 days in a year.

The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc.; institutional inmates or all other nonworkers who do not fall under the above categories.

The data in the above table shows that percentage of the number of marginal workers to the number of total workers in all the CD blocks except Poreyahat, is quite high as these blocks are predominantly rural in character. Poreyahat CD block has some industrial installations which explains for significantly lesser percentage of marginal workers. Overall, it may be concluded that the Impact Area is affected by acute lack of employment opportunities. This is also being reflected through the fact that migration of residents to other urban destinations is quite common in the area.

2.4.2. Dependence on Forests in terms of Energy (Especially Fuelwood) and Fodder Needs

The dependency of the villagers on forest for various products is quite significant. The maximum dependency of the households on forest is for fuel wood, followed by fodder, NTFPs, tendu/kendu leaves, timber and bamboo.

Most of the households use timber, fodder and bamboo for their personal use. Only a small percentage of the households do marketing of these produces. Tendu/kendu leaves are collected by the households for marketing. Fuel wood and NTFPs are collected by the households both for personal use as well as for marketing. It is notable that those households whose income from main activity is relatively less, are engaged in selling forest produce and supplementing their income.

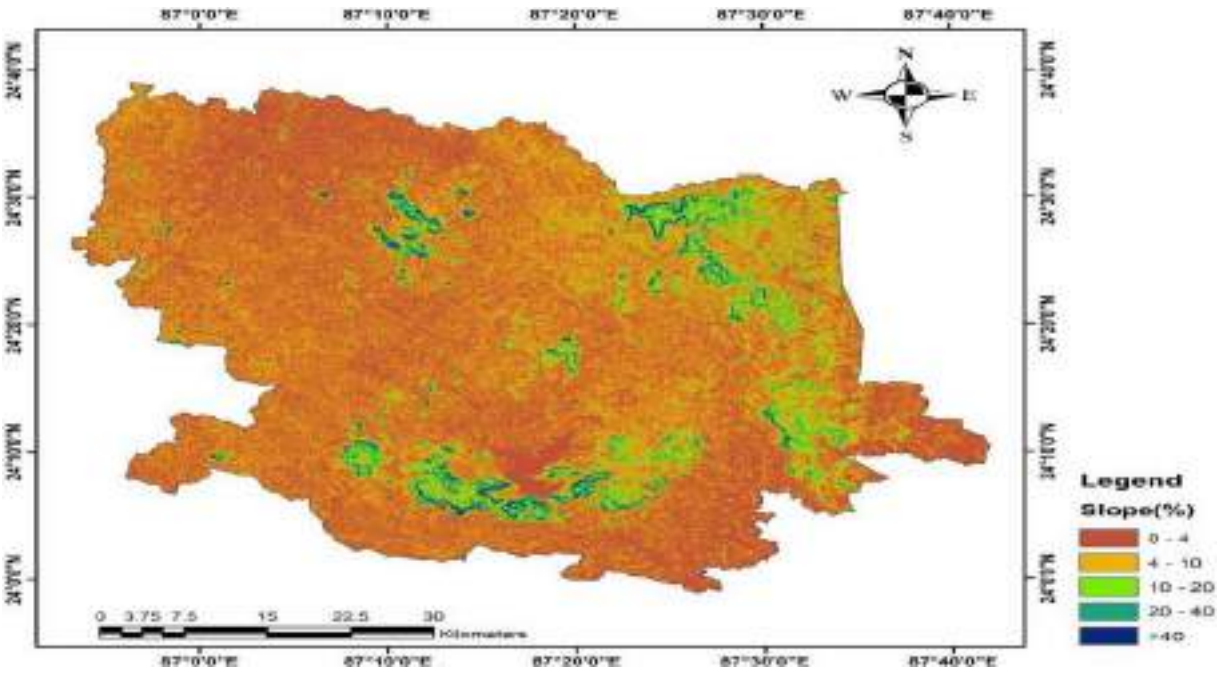
2.5. PHYSIOGRAPHY, GEOMORPHOLOGY, GEOLOGY AND CLIMATE OF THE IMPACT AREA

The Impact Area is predominantly located in Dumka District, CD blocks involved therein being Gopikandar, Kathikund and Ramgarh. Only a small portion of Godda district is a part of the Impact Area. Therefore, the details/data pertaining to physiography, geomorphology and climate of Dumka district have been taken into consideration for formulating the instant Plan. Moreover the said characteristics of both the districts are similar and the part of the impact area located in Godda district is adjacent to Dumka district.

2.5.1. Physiography, Type of Terrain and Topography

Topographically Dumka district is an upland tract with a hilly backbone running from north to south. The general elevation of the area is between 150 m to 640 m above msl. The prominent hills are Rajmahal hills, Ramgarh hills, Karakata and Sapchala hills. Among the loftiest peaks are: Mahuagachi (528 m), Korcho hills (640 m), Karakata (210 m). The general slope of the district is from North West to South East. The hills in many parts are covered with dense forests, while in the valleys small villages surrounded by cultivated clearing are found. The slope of the district is being shown in the following map.

Map 7: Slope Map of Dumka District



2.5.2. Geomorphology

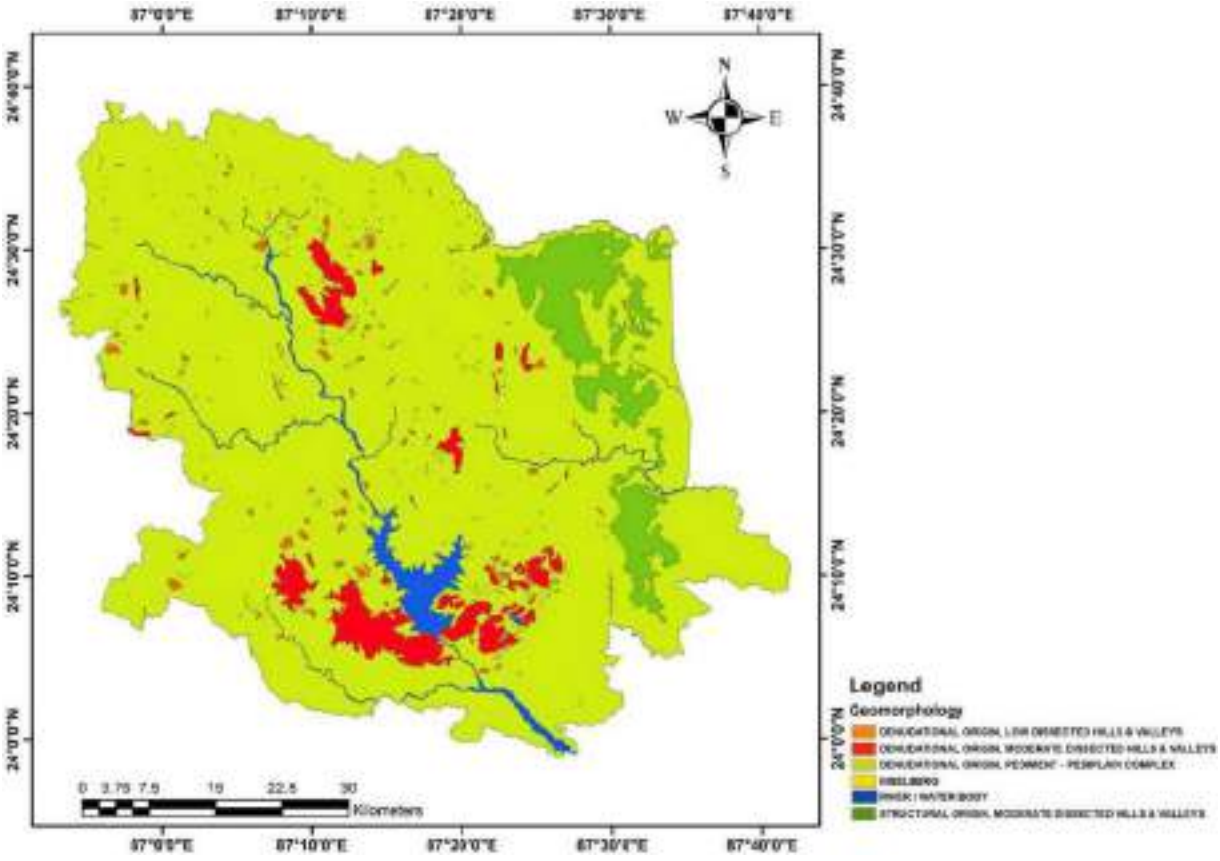
The landscape of Dumka district to a large extent comprises of long undulated ridges forming rugged and coarse dissected topography between which runs the drainage channels. The trough in

between the undulations is full of rich alluvial soil. Geomorphologically, the district can be broadly be divided into three well defined, physically identifiable and genetically significant units:

(a) the hilly area;
(b) the rolling country or valleys; and
(c) the pediplained flat country.

The indicative geomorphology is being depicted as follows.

Map 8: Geomorphological map of Dumka District



2.5.3. Geology

Geologically, Dumka district is represented by Chhotanagpur Granite-Gneiss of Archaean age to Proterozoic and Eastern Ghat super Group of Archean age, which are overlain by Gondwana Super Group, Rajmahal basaltic lava flows (Upper Jurrassic to lower cretaceous age) with intertrappean beds and at places Laterites.

The Chhotanagpur Gneissic complex is largely represented as lithological unit in the area and covers the major part of the district uninterruptedly. They form more or less gently undulating plains and high grounds pediments and buried pediments, seldom giving rise to small hillocks

mounds. They are mostly biotite gneisses and granite gneisses and in general coarse grained with porphroblastic texture and traversed by pegmatitite and quartz vein of various dimensions. It contains enclave of amphibolites and mica schists. These rocks are highly folded and have very steep foliation dip. These gneissic rocks have been intruded by numerous dykes. Eastern Ghat Super Group is represented by Patches of acid to basic charnockite and Khondalite/Garnet Sillimanite-Biotite Gneiss.

The pre-cambrian formations are overlain by Gondwana formations. Gondwanas are represented by Barakar, Talchir and Dubrajpur formations in the form of a strip running roughly in the NW-SE direction. However isolated patches of this formation are also found to occur in the central part of the district. Talchir formations consist of sandstone and shales. Barakar formation consists of white to fawn colored coarse grained sandstone, grits with occasional conglomerates and carbonaceous shales, thin lenticles and streaks of coal are found in this formation.

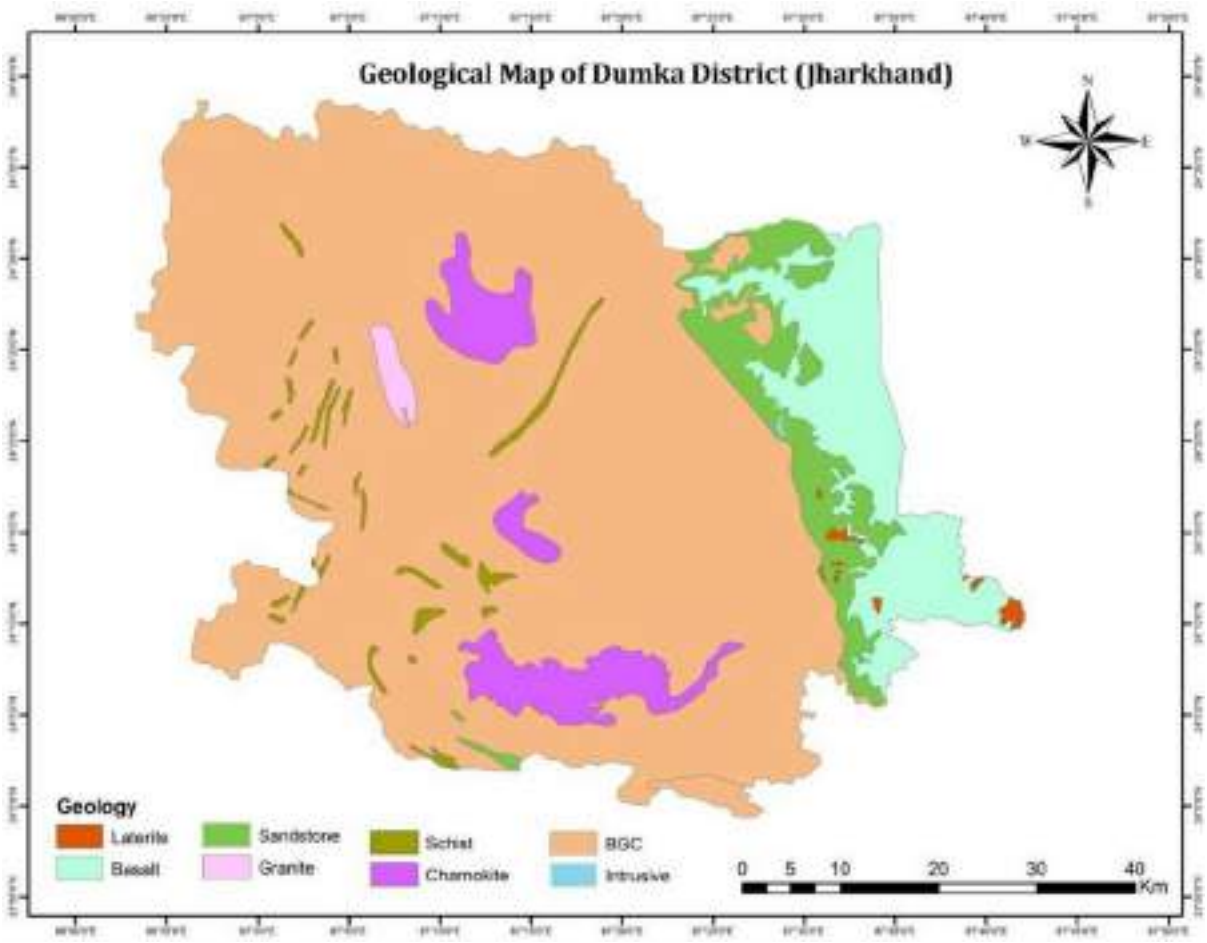
The pre-cambrian formations/Gondwana formations are further overlapped by Rajmahal Traps consisting of basaltic lava flows with sedimentary intertrappeans. The basaltic rocks are hard and fine to medium grained. Some of the lava flows are vesicular and cavities being filled by calcite and chalcedony. The non vesicular lava flows are hard, tough, compact and fine to medium grained in nature. The vesicular types are comparatively soft and break easily. In general the Rajmahal traps show vertical to horizontal joints trending E-W and N-S. Typical columnar joints are also common. These rocks are weathered with characteristic spherical exfoliation which give rise to large rounded boulders as the outcrops.

The Laterites are found in patches over Rajmahal traps. The alluvium patches are generally seen along major streams. Narrow, discontinuous patches of alluvium particularly in granitic country are identified. They comprise of medium to coarse grained sand associated with silt and clay. Occasionally calcareous nodules are also found to occur. They are light grey to brownish in colour. The thickness of the alluvium varies from place to place and is largely controlled by topography of the basement crystalliones.

In the district, the rocks are highly deformed and metamorphosed. The exposure of granite and other associated rocks show intricate folding. Based on morphotectonic analysis, the area has undergone several phases of tectonic deformations which led to various sets of fractures, fissures, faults etc which leads to lineaments. Based on lineament study of the area, various sets of fractures have been identified.

The indicative Geological map of the district is being shown as below.

Map 9: Geological Map of Dumka District



2.5.4. Hydrogeology

Ground water in the district is replenished mainly by the atmospheric precipitation. The depth to water and water level fluctuation depends mainly on the amount and distribution of rainfall, geomorphological set up, lithology etc. The occurrence and movement of Ground Water in the area is broadly governed by geological frameworks, i.e. nature of rock formations including their porosity and permeability. A fracture system roughly corresponds to a hydraulic system in the rock. A rock which has been exposed to a two-phase brittle deformation can also constitute one hydraulic system if there is a good connection between the two fracture systems. Based on morpho-genetic, geological diversities and relative ground water potentialities of the aquifers, the district can be broadly divided into following three Hydrogeological units:

- Consolidated or Fissured formations – Pre-cambrians and Rajmahal Trap
- Semi-Consolidated formations -Gondwanas
- Unconsolidated or Porous formations - Laterites and Alluvium

In major part of this district, Fissured formations, i.e. hard rock form the principal aquifers, which include mainly Chhotanagpur Granite gneissic complex and Rajmahal Traps. However, in isolated areas Gondwana formations, laterites, as well as valley fill materials along the vicinity of the rivers also form potential aquifers.

Hydrogeological map of Dumka district is being presented as below.

Map 10: Hydrogeological Map of Dumka District



Age Group	Lithology	Symbol	Hydrogeological Condition	Ground Water Potential
Middle Jurassic to lower cretaceous	Rajmahal Trap with intertrappeans		Groundwater restricted to weathered residium/ Fractures, Joints. Groundwater occurs under unconfind and semi confined to confined state of disposition.	Limited yield prospect upto 20 m^3/hr.
Upper Carboneferecus to Lower Jurrassic (Gondwana)	Sandstone and Shale		Groundwater restricted to fractures, fissures and joints ground water occurs ground water table and semi confined to confined condition	Limited yield prospect Upto 10 m^3/ hr.
Archean To Proterozoic	Granite-Gneiss with enclaves of Metamorphics		Groundwater restricted to weathered zone and inter connected fractures zones having secondary porosity. Groundwater occurs under water table and semi confined to confined state of disposition.	Moderate to good yield Upto 50 m^3/ hr.
Archean	Charnokites, Khondalites		Groundwater restricted to weathered zone and fractured zone. Groundwater occurs under water table and semi-confined condition mostly occurs as dykes.	Very Limited yield prospect below 10m^3/ h

2.5.5. Climate and Rainfall

The climate of Dumka district has been divided into three different seasons. The winter commences from middle November and extends up to middle of March, December and January

being the coldest months. The winter is characterized by heavy dew, thick fog and associated cold wave. The winter is followed by summer which lasts up to middle June. The heat is sometimes oppressive but generally nights are pleasant due to cool breeze. The monsoon sets in by the middle of June and continues up to end of September. The beginning of monsoon is marked by the strong dust storms from north-west with thunder and lightning. Normal atmospheric temperature recorded in the district is of the order of 42^0C to 46^0C in summer. In winter the minimum temperature goes down to about 4^0C. The relative humidity varies from 50 – 60%.

The district receives its share of rainfall mainly by south–west monsoon during rainy period and from the retreating monsoon during the inter-monsoon period which originates in the Bay of Bengal. The district receives 80% of the annual rainfall during monsoon period. Rainy season sets in the middle of June and continues till middle of October. The rainfall generally decreases from South – East to North – West. The Decadal average monsoon rainfall (2008 to 2018) of the district is 1043.67 mm and block wise it varies from 776.12 to 1351.07 mm. The rainfall data for the period of 2008–19 has been worked out and analysed. Decadal annual monsoon rainfall, standard deviation and coefficient of variation are given in the following table.

Table 10: Analytical Data of Monsoon Rainfall (2008-2018) of Dumka District

Sl. No.	CD Block	Decadal Average Monsoon Rainfall (mm)	Standard Deviation	Coefficient of Variation (%)
1.	Dumka	1351.07	515.03	38.12
2.	Jama	776.12	256.02	32.99
3.	Jarmundi	1196.22	191.68	16.02
4.	Saraiyahat	1270.81	391.93	30.84
5.	**Ramgarh***	999.86	314.48	31.45
6.	**Gopikandar***	934.88	242.19	25.91
7.	**Kathikund***	855.02	404.63	47.32
8.	Sikaripara	869.34	190.66	21.93
9.	Raneshwar	1125.38	260.82	23.18
10.	Masalia	1058.00	203.69	19.25

*Part of Blocks shown in bold and marked with asterisk constitute the Impact Area

2.6. SOIL TYPES

Soils in Dumka district has formed as a result of in-situ weathering of the crystalline basement. Climate, topography and vegetation have all contributed in the formation of soils. The following different types of soil occur in the entire district.

- **Alluvial Soil**: All the river channels in this district are covered with alluvial soil of recent origin, deposited over crystalline bed rocks. Alluvial fills are also found in patches away

from the river channels. Thickness of these fills depends upon the topographical control. The alluvial material consists mainly of silt and sand mixed with clay, silty material dominating over clayey material. These are yellowish – grey in colour.

- **Grey eroded scarp Soil**: This covers almost the entire area as a thin capping over granitic/ gneissic rocks.
- **Lateritic Soil**: Pallety, nodular, ferruginous, brownish laterites of Pleistocene age are found to occur as patches. The lateritic soil has been formed by the process of laterization of the weathering material aided by favourable climate and the local topography. They are highly permeable with poor holding capacity. However laterite formed due to the weathering of Rajmahal trap are generally brown to reddish in colour, porous, pitted and show vermicular cavities, and are good repository of ground water.
- **Forest soil**: Forest soil is confined to the forested area and has a surface layer of organic matter.

The pH value of all the soils varies from 5 – 6.5 indicating that these soils are acidic in nature. Undulating terrain and porous character of the soil have resulted in soil erosion all over the area.

2.7. GROUND WATER STATUS

Based on the morpho-genetic and geological diversities, and relative Ground Water potentialities of the aquifer belonging to different geological formations, the district of Dumka can be broadly sub – divided into two hydrogeological units.

- Fissured Formation
- Porous Formation

A total of 16 National Hydrograph Stations (NHS) have been established by Central Ground Water Board (CGWB) for the study of behaviour of the water level and their fluctuation.

- **Pre-monsoon depth to water level**: On the basis of the depth to water level of the year 2012, the pre-monsoon depth to water level varies between 4.45 to 12.3 mbgl (metre below ground level). Majority of the wells (85%) fall in the water level range of 5– 10 mbgl. About 10% wells fall in the water level range from 2 – 5 mbgl.
- **Post-monsoon depth to water level**: The post-monsoon depth to water level ranges between 3.10 to 8.4 mbgl. About 69% of the wells fall in the water level ranges between 2 – 5 mbgl and 31% of the wells fall in the depth to water level ranges between 5 -10 mbgl.

- **Seasonal Fluctuation**: From the pre-monsoon and post-monsoon depth to water level data collected during May 2012 and November 2012 respectively, water level fluctuation were computed for all NHS of the district. The water level fluctuation between pre monsoon and post monsoon period of the district varies from 1.64 to 6.75 m. About 33% wells are showing water level fluctuation between 0 – 4 m and while 67% wells show fluctuation > 4.0 m.

2.7.1. Salient Observations/Recommendations made by CGWB to enhance Groundwater potential in Dumka District

- Ground Water quality is generally potable, except few patches. Nitrate value has been found beyond permissible limit in 11 dug well samples and 12 samples of hand pump. Also, Fluoride value has been observed beyond permissible limit in 3 samples of dug well and 2 samples of bore well (hand pump). Purification/filtration of Nitrate and Fluoride may be adopted.
- Based on Ground water Resources estimation 2017, the stage of ground water development in Dumka district is 24.26% and the entire district comes under safe category. Therefore, there is sufficient scope for further ground water development.
- Three major ground water related issues in Dumka district are low ground water development, low ground water potential and nitrate/ fluoride contamination in the area.
- Ground Water Management strategy suggested are construction of 71681 dug wells and 11947 shallow bore wells in the feasible areas in the district to enhance the overall ground water development to 70%. This would bring an additional area of 28672 ha under assured irrigation.
- To suggest a sustainable ground water management plan there are two options – Supply Side Management Options (local water harvesting techniques) & Demand Side Management Options (real water-savings).
- The supply side interventions envisage construction of 2276 no. of Check Dams/Nala bunds, 363 no. of Percolation Tanks and 6267 no. of building Rooftop Rainwater Harvesting (RTRWH) in the areas feasible for construction of recharge structures based on the long term water level scenario and recharge potential of the aquifer. The implementation of water conservation through artificial recharge measures will have a positive impact on drinking water sources of the area. It will ensure that the wells do not go dry during summer/lean/stress period in the areas of implementation and sufficient ground water availability is there in the wells even during the summer season. Thus, not

only the drinking and domestic water sources will be strengthened but additional irrigation potential can be created through artificial recharge structures.

- The demand side intervention envisages the real water savings. The main demand side interventions may be:
    (i) Promoting improved irrigation technologies (drip or sprinkler irrigation, etc.);
    (ii) Crop choice management and diversification (promote less intensive crops like pulses and horticulture),
    (iii) Promoting treated municipal waste water for irrigation and construction use,
    (iv) Managing energy and irrigation nexus (providing quality power supply when needed through separate feeders, high voltage distribution lines, solar pumps, etc.). The government should encourage and provide incentive for the use of drip irrigation and sprinkler system.

2.8. LAND USE AND LAND COVER (LULC)

The two main characteristics on the basis of which land is classified are land use (LU) and land cover (LC). Land Cover can be defined as observed physical features on the Earth's Surface, which transforms to Land Use when a socio-economic function is added to it. Given the fact that increasing anthropogenic activities around the biosphere are causing large-scale alterations of the Earth's land surface, land-use and land-cover (LULC) change is an important indicator for monitoring environmental changes and a vital input for informed decision making in the context of land management.

In India, land-use and land-cover (LULC) statistics are maintained by National Remote Sensing Centre (NRSC), Department of Space (DOS) through a component on National Land Use/ Land Cover (LULC) mapping of the Natural Resources Census (NRC) Project of National Natural Resources Repository (NRR) Program. LULC datasets are made available on a periodic basis by NRSC on a 1:50,000 scale, where the LULC data is grouped as per the classes described in the following table.

Table 11: Grouping of Land Use and Land Cover (LULC) Classes

Sl. No.	Level-I	Level-II
I.	Built-up	Urban
		Rural
		Mining
II.	Agriculture	Crop Land
		Plantation
		Fallow

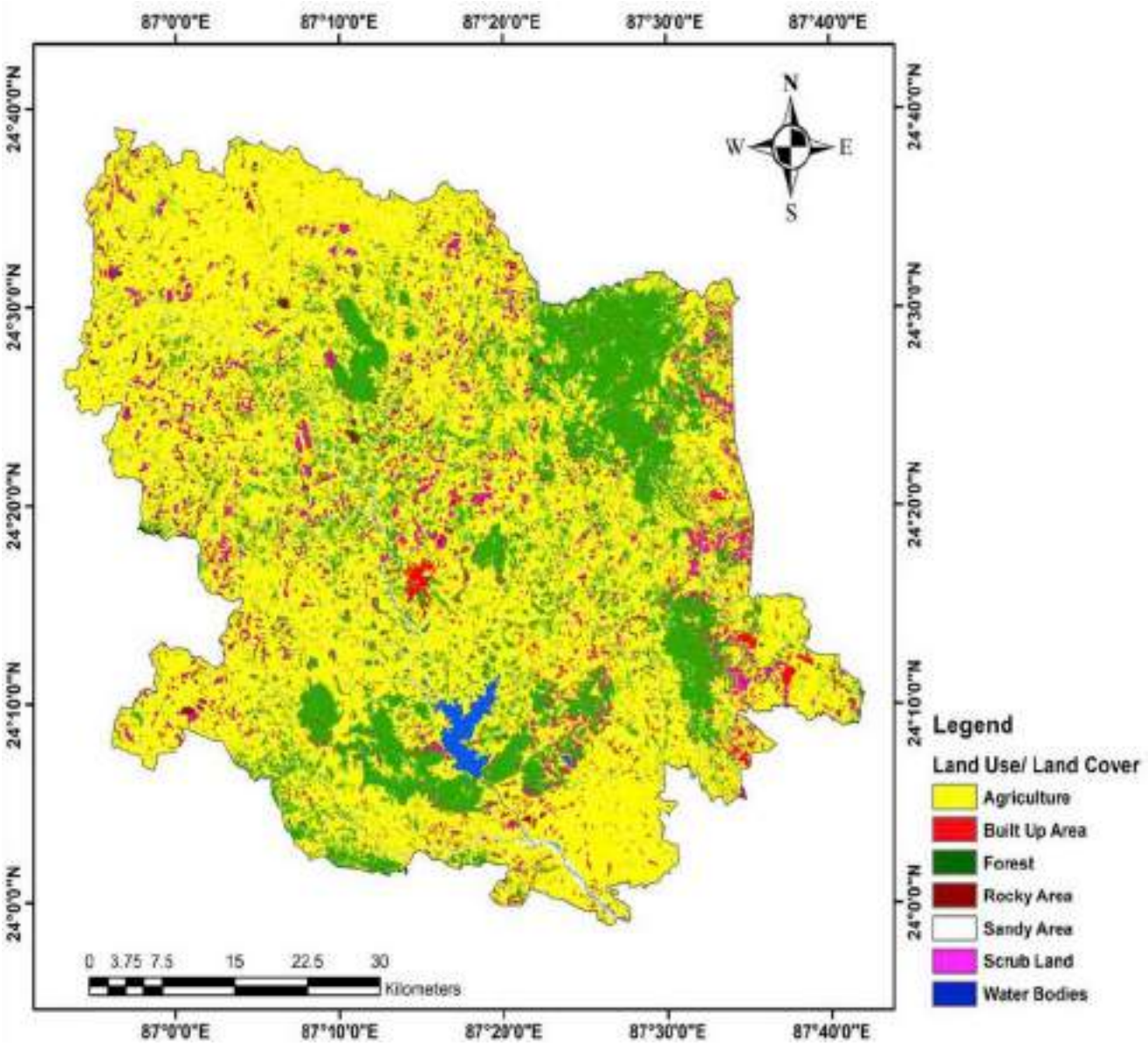
		Current Shifting Cultivation
III.	Forest	Evergreen/Semi-Evergreen
		Deciduous
		Forest Plantation
		Scrub Forest
		Swamp/Mangroves
IV.	Grass/Grazing	Grass/Grazing
V.	Barren/Unculturable/Wasteland	Salt Affected Land
		Gullied/Ravinous Land
		Scrub Land
		Sandy Area
		Barren Rocky
		Rann
VI.	Wetlands/Water Bodies	Inland Wetland
		Coastal Wetland
		River/Stream/Canals
		Water Bodies
VII.	Snow and Glacier	Snow

2.8.1. Land Use and Land Cover of Dumka District

There is dominance of cultivation over other uses of land in plains whereas the significance of forest in high land attains almost the same significance as that of agricultural land use. The forests are store house of manifold resources like fuel, timber, herbs and are source of raw materials from farm to factories. Moreover, forests are linked with the culture and socio-economic conditions of the aborigines. Their survival depends on the existence of forests as they are rain bringer, soil binder and pasture preserver.

Out of total geographical area of the district i.e., 3716 Sq km, nearly 15 % area comes under net sown area,13% under forests and the rest area falls under barren, cultivable waste, pasture and other agricultural use. An indicative map of the Land Use in Dumka district is being shown below.

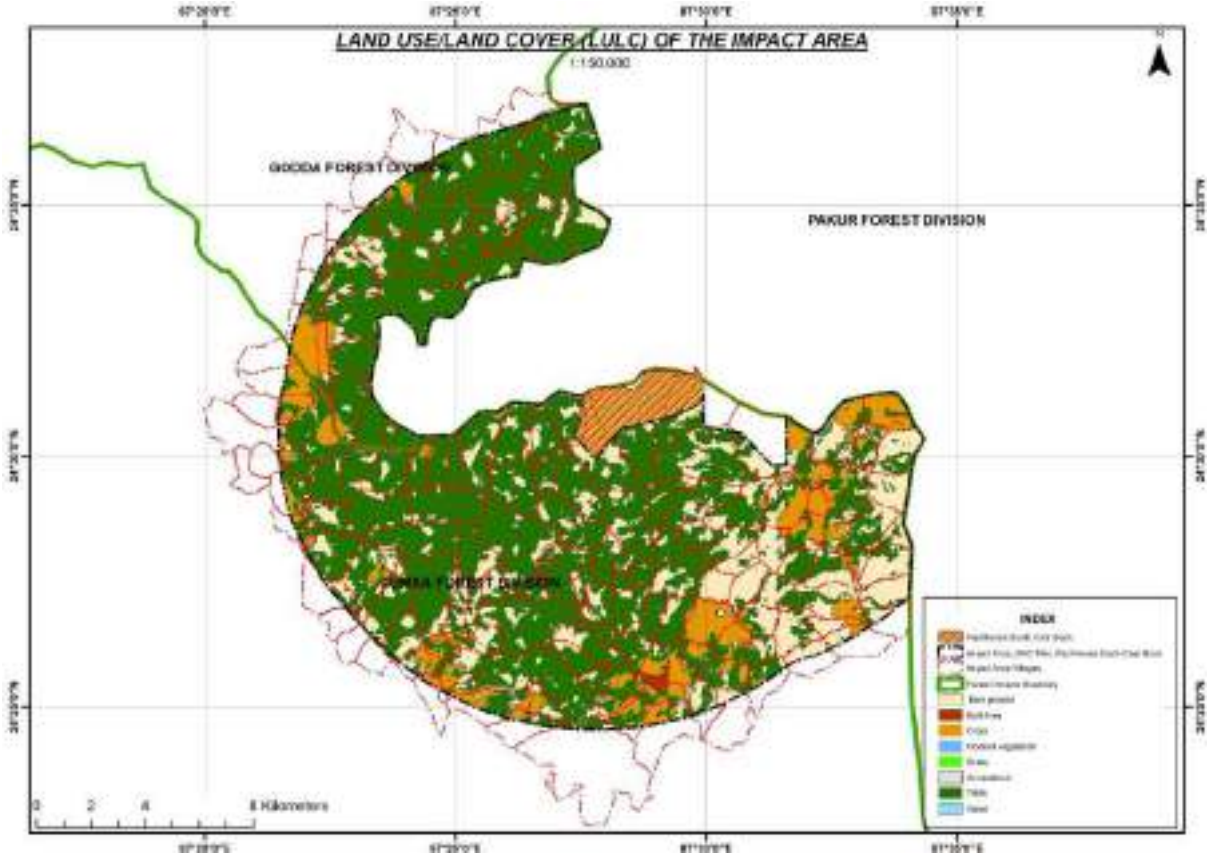
Map 11: Land Use Map of Dumka District



2.8.2. Land Use and Land Cover of the Impact Area

The Land Use and Land Cover map of the Impact Area may be depicted through the following map.

Map 12: Land Use/Land Cover of the Impact Area



The corresponding areas against different kinds of land use/land cover in the Impact Area are being tabulated as follows.

Table 12: Land Use and Land Cover of the Impact Area

Sl. No.	Land Use Class	Area (ha)	Percentage (%)
1.	Bare Ground	6459.97	24.88
2.	Built Area	182.21	0.71
3.	Crops	2593.31	10.14
4.	Flooded Vegetation	139.28	0.54
5.	Grass	151.61	0.59
6.	Shrub/Scrub	107.04	0.42
7.	Trees	16114.70	62.63
8.	Water	24.16	0.09
Total Area		**25772.88**	**100.00**

The LULC data of the Impact Area shows that the Impact Area is predominantly covered by trees.

2.9. LAND DEGRADATION

Several definitions of land degradation have been suggested by different authorities to express the degree of deterioration of land or land potential. In general, it implies temporary or permanent recession from a higher to a lower status of productivity through deterioration of physical, chemical and biological aspects of land. The physical processes which contribute to land degradation are mainly water and wind erosion, compaction, crusting and water logging. The chemical processes include Salinization, alkalization, acidification, pollution and nutrient depletion. The biological processes, on the other hand are related to the reduction of organic matter content in the soil, degradation of vegetation and impairment of activities of micro-flora and fauna. Generally, land degradation is defined as a human-induced or natural process that negatively affects the land to function effectively. It is the temporary or permanent lowering of the productive capacity of land.

Thus, land degradation is the loss of biodiversity and productivity that arises from the physical, chemical and biological degradation of the land. It affects the entire natural environment, resulting in losses of ecosystem services that have far reaching effects on human welfare and the global economy. It also has a close connection with other major global issues, particularly climate change and biodiversity.

Degraded land is a threat multiplier for communities, as it reduces people's ability to use their land and limits their access to resources. The main anthropogenic factors contributing to land degradation include deforestation and land clearing for economic use and to cope with increasing urbanization. In some instances, the economic demand for agricultural land has led not only to land clearing but also over-cultivation, over-grazing, insufficient crop rotations and the overuse of agrochemicals. These practices are focused on short-term production and profitability in order to meet the demand of growing populations. There is an urgent need to stop and reverse the process of land.

To sum up, major causes of land degradation are:

- Overgrazing
- Over cultivation of crop land
- Water logging and salinization of irrigated land
- Deforestation
- Pollution and industrial cause

2.9.1. Impact of Land Degradation

Land degradation has numerous environmental, economic, social and ecological consequences. Every ecosystem on the Earth is affected by some or other form of land degradation. When land is degraded, the ecology is damaged. There can be rather serious effects in terms of soil erosion, loss of soil fertility and thus reduced plant growth or crop productivity, clogging up of rivers and drainage systems, extensive floods and water shortages.

Carbon sequestration is an important function of soil, as it can retain three times as much carbon as the atmosphere if soil quality can be managed. Practices that degrade land, however, contribute one-third of anthropogenic greenhouse gases, and conversely, reversing land degradation can help to slow the rate of climate change.

2.9.2. Category-wise Estimation of Land Degradation in Dumka District

The nationwide land degradation mapping has been taken up by ISRO along with partner institutions from State remote sensing centres (Jharkhand Space Application Centre, JSAC for the State of Jharkhand), ISRO/ DOS centres and academia. The project has been taken up under Natural Resources Census (NRC) program of ISRO for generating information on land degradation at 1:50,000 scale using multi-temporal Resourcesat-1/2 LISS-III data.

The first cycle of mapping was carried out using Resourcesat-1 multi-temporal LISS-III data of 2005-06 and the second cycle of land degradation mapping on 1:50,000 scale was carried out using Resourcesat-2 multi-temporal LISS-III data for 2015-16. The overall approach to map land degradation on 1:50,000 scale is based on visual interpretation using the multitemporal LISS-III data. A detailed classification scheme has been evolved by NRSC to objectively analyse the satellite data.

Following the detailed mapping of the whole country National Remote Sensing Centre, ISRO has published "Status of Land Degradation in India 2015-16" in the year 2019. According to this report, the status of decadal change in land degradation in terms of the identified land categories is being tabulated in the following table to understand the ground situation in Dumka district.

Table 13: Status of Decadal Change in Land Degradation in Dumka District

Land Degradation Class	Degraded Land Categories	Area Estimated (2005-06) ha	Area Estimated (2015-16) ha	Increase (+)/ Decrease (-) ha
A1	Water Erosion – Sheet – Slight	1647	1605	(-) 42
A2	Water Erosion – Sheet – Moderate	23992	23774	(-) 218
A3	Water Erosion – Sheet – Severe	2663	2645	(-) 18
A5	Water Erosion – Gullies	1000	1000	0
G2	Mining & Dump Areas	787	1155	(+) 368
G3	Brick Kiln Areas	8	16	(+) 8
H2	Barren Rocky/Stony Waste	901	901	0
H3	Miscellaneous – Riverine Sands	149	149	0
Total		31147	31245	(+) 98

It is to be noted that the above estimation has been made via visual interpretation of satellite imageries. The table indicates that there has been significant deterioration in land status due to mining and ancillary activities. Though there has been slight improvement in land category with reference to water erosion, yet increasing anthropogenic factors require ample caution on this front.

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3. METHODOLOGY ADOPTED IN FORMULATION OF SOIL AND MOISTURE CONSERVATION PLAN

3.1. INTRODUCTION

Soil and Moisture conservation (SMC) is a strategy in the context of a sustainable natural resource management. It generally implies those activities at the local level which maintain or enhance the productive capacity of the land including soil, water and vegetation in areas prone to degradation through the following measures:

- prevention or reduction of soil erosion, compaction etc.;
- conservation of water; and
- maintenance or improvement of soil fertility.

Soil and moisture loss has been regarded as one of the most pressing global environmental problems, affecting the ecosystem and the safety of lives and property. The prevention of soil erosion and improvement of the eco-environment are required for sustainable development. Water and soil are the most precious resources for human beings. Soil erosion is a concentrated reflection of land degradation and loss of ecosystem function and is directly related to national ecological security. The functional definition of soil and water conservation ecological services refers to the comprehensive effect of the use of various measures adopted during the soil and water conservation process on maintaining, improving and protecting natural environmental conditions.

Land and water are natural resources that are essential for the existence of life. Land provides food, fodder, fuel, and shelter in addition to supporting secondary and other economic life supporting system. However, there has been a continuous depletion of land resources and the quality of land is deteriorating due to various factors like soil erosion caused mainly due to various factors including heavy downpour of rainfall, large scale deforestation, reckless mining activities, overgrazing, general mismanagement, etc. Such soil erosion leads to degradation of soils' physical property and loss of plant nutrients. It takes nature nearly 600-1000 years to build 2.5 cm of topsoil but it gets displaced within a year only due to misuse. It has been reported that 6000 million tons of productive soil is lost every year from the total of 80 million hectare of cultivated land alone in India. It has also been proved that soil lost from unprotected land is about 120 tonnes /ha/year and may even reach up to 300 tonnes /ha/year. Thus, apart from depletion of fertile soil, erosion results in the loss of runoff water, plant nutrients and micro flora, siltation of reservoirs and riverbeds thereby adversely affecting irrigation and power potential, causing floods in plains and

valleys which damage crops, animals, habitation, communication, etc. But most of these adversely affect agricultural production, forest productivity and availability of water both for irrigation and drinking besides bringing about a disturbance in the soil and water balance.

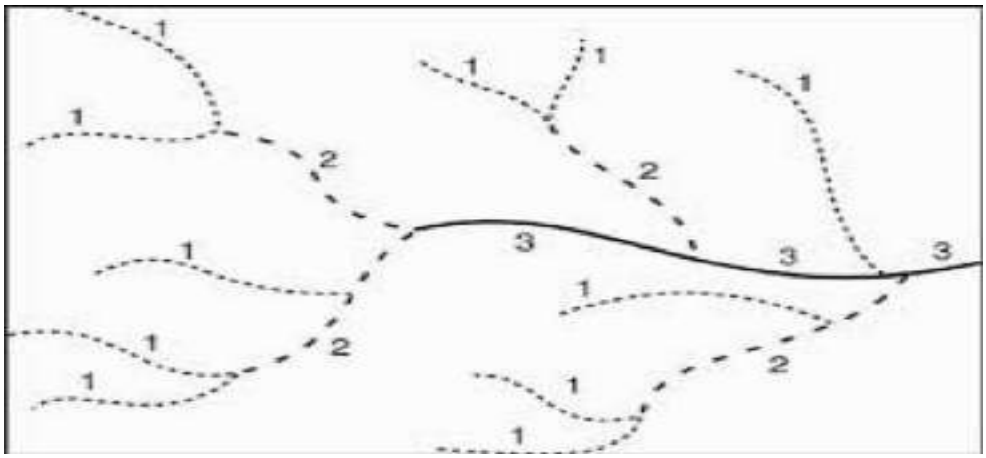
Various soil and moisture conservation measures are earthen bunds, stone pitched contour bunds, vegetative hedges, contour/staggered trenches, moisture conservation pits, etc to intercept rainfall where it falls and to obviate the chances of the runoff water from acquiring erosive velocities.

3.2. STREAM ORDER

The basic principle of SMC is to use and treat the land accordingly to economically sustain available water resources and drainage line treatment is the most important activity to be carried out particularly in hilly areas. To decide the type of interventions while planning the drainage line treatment of a plethora of streams all across the treatment area under consideration it is most important to assess the complexity of stream networks in the area. One way of assessing the complexity of a stream network is by ordering the streams in a catchment into a hierarchy. The most common method used to define stream order is the Strahler method. Starting at the uppermost points in the catchment, all headwater, or unbranched tributary streams are given a stream order of 1, and called first-order streams. When two first-order streams join, the stream order increases to 2 (second-order). When two second-order streams join, the stream order increases to 3, and so on. Notably, the stream order does not increase if two streams of different orders join. The highest stream order becomes the catchment order.

Generally, the depth of 1st order stream is quite shallow. Action should be taken from the 1st order stream first for harvesting of available rain water by erection of earthen bund, Loose Boulder Structures etc.

A schematic diagram of stream order is being shown in the following figure.



3.3. SOIL AND MOISTURE CONSERVATION PLAN

The soil erosion in catchment areas and the subsequent deposition in rivers, lakes and reservoirs are of great concern for two reasons. Firstly, rich fertile soil is eroded from the catchment areas. Secondly, there is a reduction in reservoir capacity as well as degradation of downstream water quality. Soil being one of the potential resources of a catchment, demands proper conservation and management.

The Soil and Moisture Conservation Plan broadly means a management plan for treatment of erosion prone area of the catchment through agronomic, biological and mechanical measures. The objective of a well-designed SMC plan should not only be to control the sedimentation of the reservoir but also to provide a life support system to the local population through their active involvement in soil conservation and livelihood works. The development of SMC plan for a watershed or catchment essentially comprises the prioritization of erosion prone sub-watersheds or areas, selection of suitable conservation measures, implementation and impact assessment.

3.4. DRAINAGE NETWORK

In geomorphology, a drainage system is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. Geomorphologists and hydrologists often view streams as being part of drainage basins. A drainage basin is the topographic region from which a stream receives runoff, through flow, and groundwater flow. Drainage basins are divided from each other by topographic barriers called a watershed. A watershed represents all of the stream tributaries that flow to some location along the stream channel. The number, size, and shape of the drainage basins found in an area varies and the larger the topographic map.

Since the Impact Area of the Project involves two districts, namely Dumka and Godda, the drainage systems in both the districts are briefly being discussed here.

3.4.1. Drainage Network of Dumka District

Dumka district is highly dissected with rivers of varying magnitude. The Brahmani, Bansloi, Mayurakshi, and their numerous tributaries form the main drainage of the district. These streams are ephemeral in nature. Most of these stream courses are structurally controlled. Mor river with its tributaries carry the drainage to the western part of the district which finally meet the Bhagirathi river below Murshidabad, West Bengal. The Brahmani raises in the west of the Dudhua hills in the

north of the Dumka district. Dendritic drainage pattern, a typical of hard rock terrain has developed over the district. However, radial drainage is also developed locally in some areas. All these drainage are having rapid surface runoff. Surface flow of most of the rivers dries up during summer; however there is sub-surface flow for a considerable part of the year, which indicates the effluent nature of the rivers. The drainage map of Dumka district is shown below.

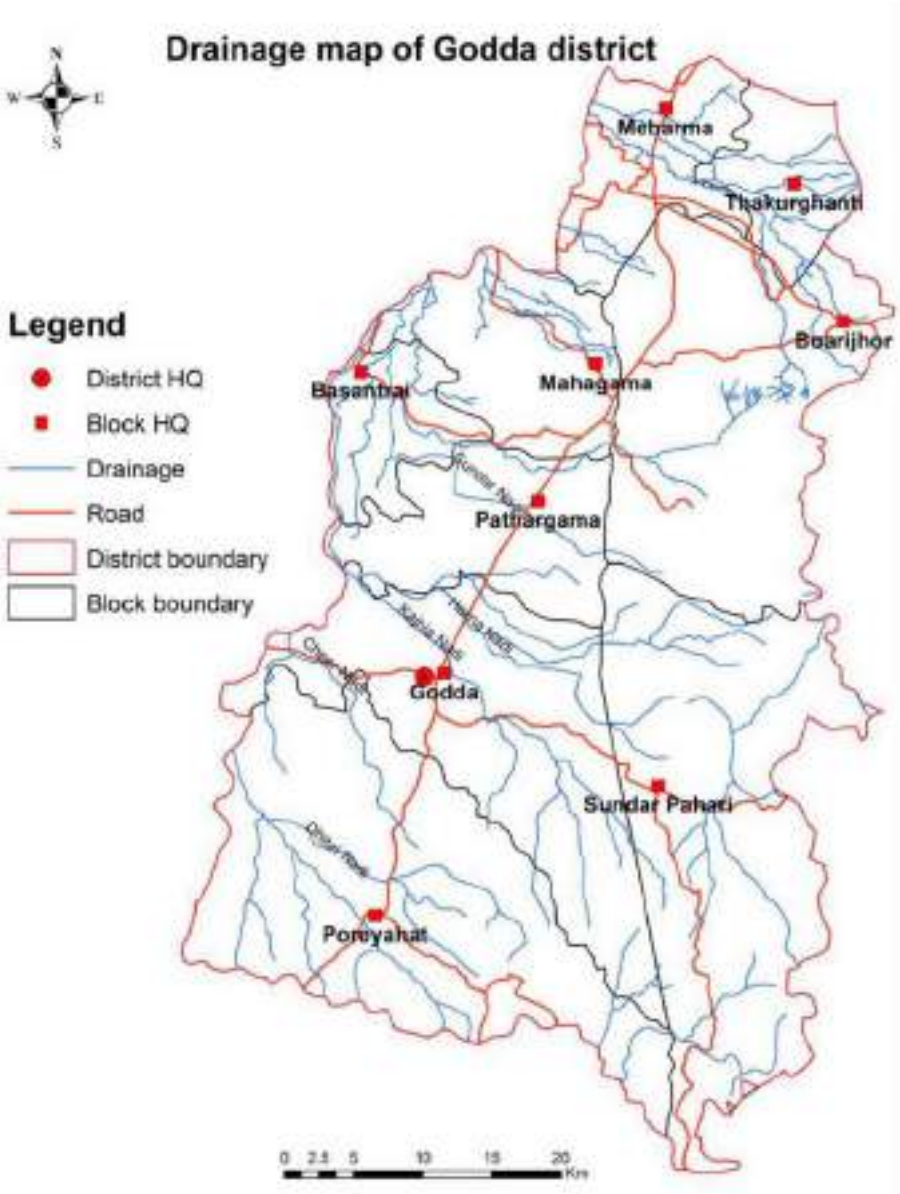
Map 13: Drainage Network of Dumka District



3.4.2. Drainage Network of Godda District

The principal rivers of the district are Kajhia, Burigeria , Harna, Sunder, Sapin, Kao, Cheer, Gerua, Gumani, Bansloi and their tributaries. Most of these are ephemeral in character. The general trend of the drainage is SE-NW. The structural features particularly the foliation and joints exert profound impact upon the drainage and control the drainage pattern of the district. The drainage map of Godda district is shown below.

Map 14: Drainage Network of Godda District

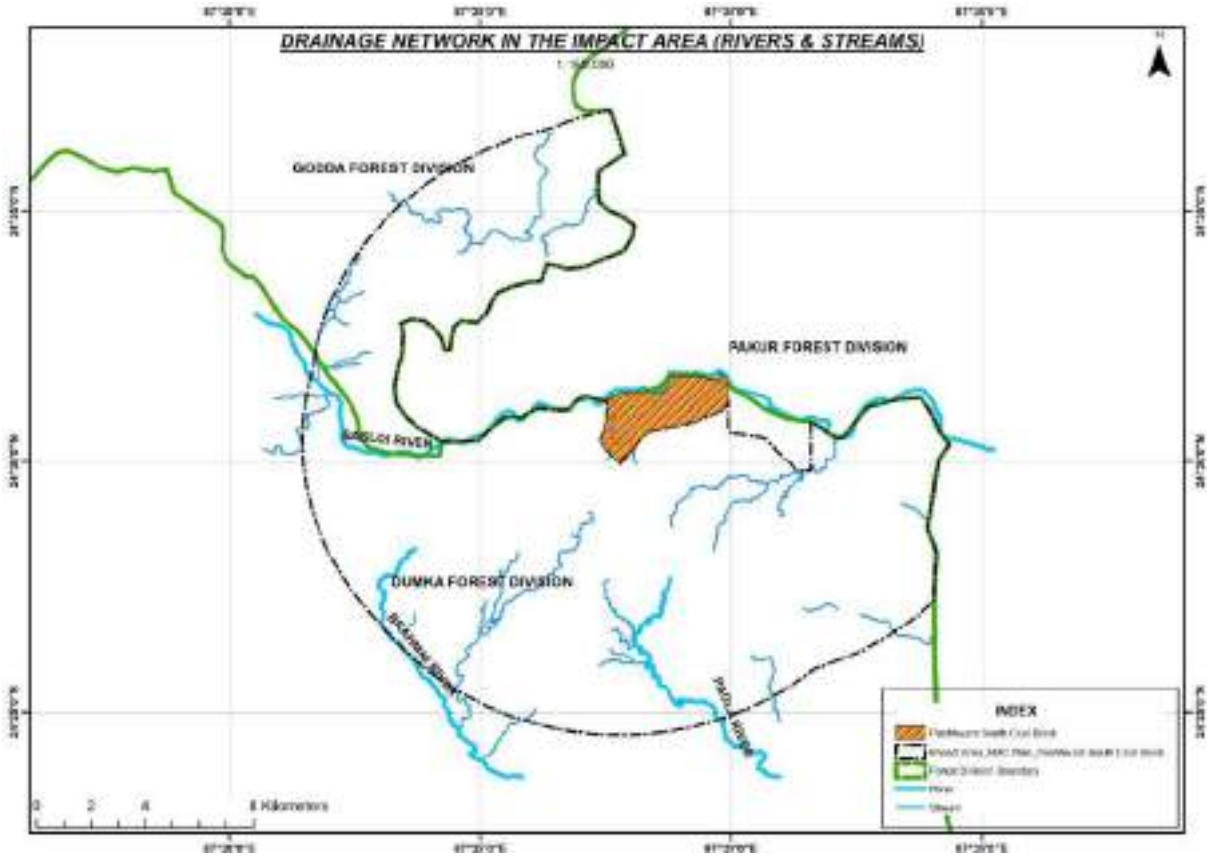


3.4.3. Drainage Network of the Project Impact Area

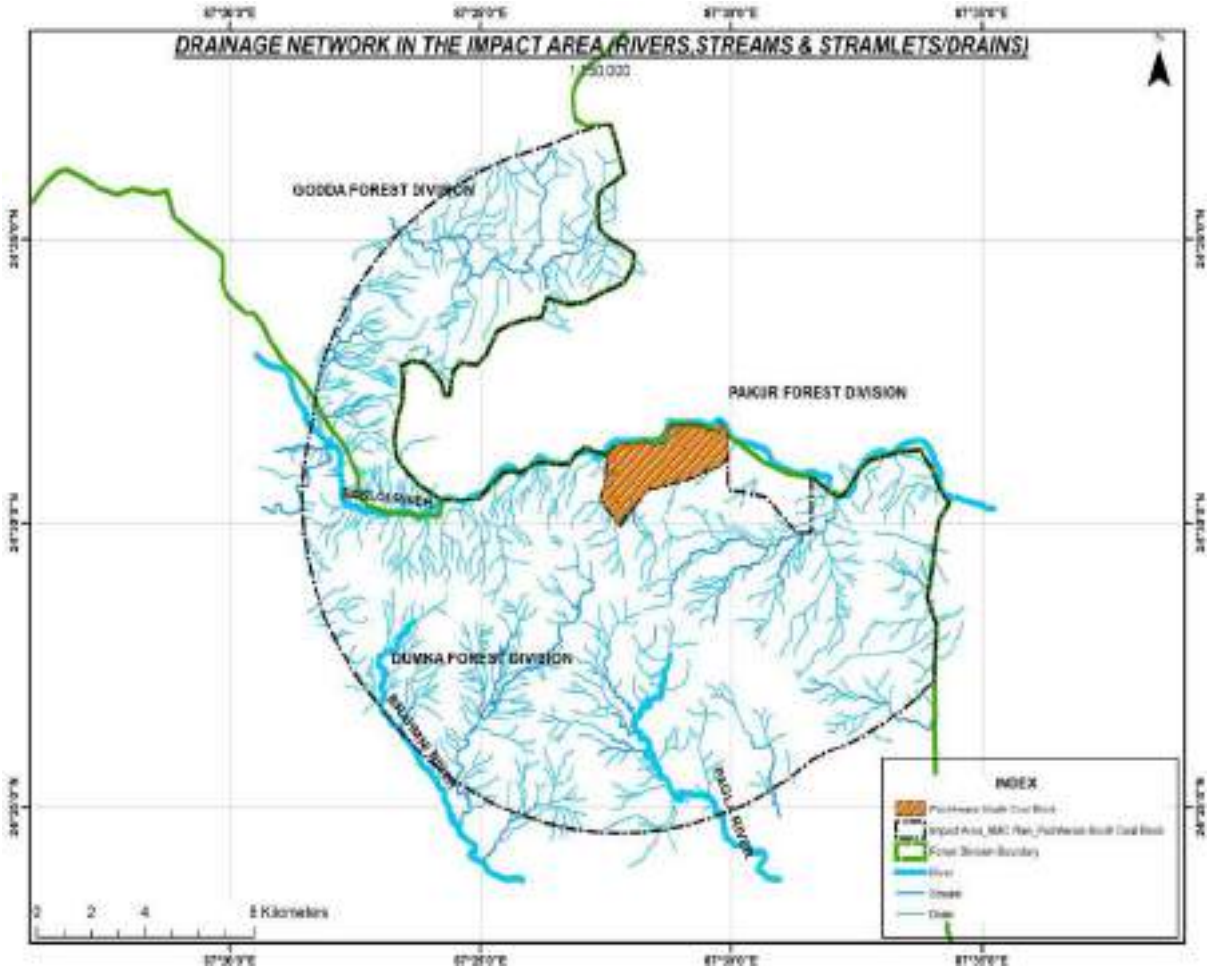
The Project Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla. These rivers are fed by various streams and streamlets/drains. Out of these, the most important river is Bansloi which originates from Bans Hill in Sahebganj district of Jharkhand and flows through Pakur district of Jharkhand and Birbhum and Murshidabad districts of West Bengal before draining into the Ganges north of Jangipur. It flows from west to east with a few ephemeral streamlets like Darno river, Baroscorna nala, Okri jor nala & Makar kandi nala) descending from the catchment area of the Bansloi River forming the drainage system of the area.

The drainage network in the Impact Area is being shown in the following maps:

Map 15: Drainage Network of the Project Impact Area (Rivers & Streams)



Map 16: Drainage Network of the Project Impact Area (Rivers, Streams & Drains)



The drainage network showing stream orders are being shown in the following map.

3.5. METHODOLOGY ADOPTED IN FORMULATION OF SOIL AND MOISTURE CONSERVATION PLAN

At the outset, the village boundaries and the stream/river locations within the Impact Area were studied on GIS domain. To have an overall picture of the drainage pattern within the Impact Area, GIS maps have been prepared including the layers of;

- The drainage network – rivers/streams;
- The drainage network – rivers/streams/streamlets (drains);
- Stream orders of all the streams/streamlets in the Impact Area;
- The village boundaries and the rivers/streams network; and
- Forest Division boundaries.

- LiDAR Survey of the Impact Area and preparation of Digital Elevation Model (DEM), Digital Surface Model (DSM), Digital Terrain Model (DTM), contour map and drainage map of the Impact Area
- Final decision regarding the location of SMC structures based on extensive ground survey and the LiDAR Survey Report of the whole Impact Area.

3.5.1. Delineation of Stream Corridors in The Impact Area

Based on the location of rivers and their feeder streams and drains, the whole Impact Area has been divided into different stream corridors consisting of groups of villages having streams. However, since the area cuts across two forest divisions, the stream corridors have been delineated so as to restrict these along forest division boundaries in order to help facilitate smoother implementation of the interventions prescribed here.

For convenience in carrying out field surveys etc., stream corridors have been constituted in such a manner that it consists of a set of villages. In other words, a corridor has been delineated in accordance with village boundaries and in most of the cases more than one village constitute any particular stream corridor. However, the villages located partly on the fringe of 10 km boundary within the Impact Area, have been included in whole as a part of the respective stream corridor.

It may be noted here that the delineation in the above explained manner is similar to that of micro-watershed framework. The extensive field survey has been undertaken in all villages where streams have been found as well as in those villages which are bereft of any stream as such. The primary concern was to fix the locations of structural/engineering measures as well as other biological interventions with the objective of soil and moisture conservation in the area. Since the survey has been done in all villages irrespective of whether any stream is located in a particular village or not, it is just academic whether we call it stream corridor or watershed.

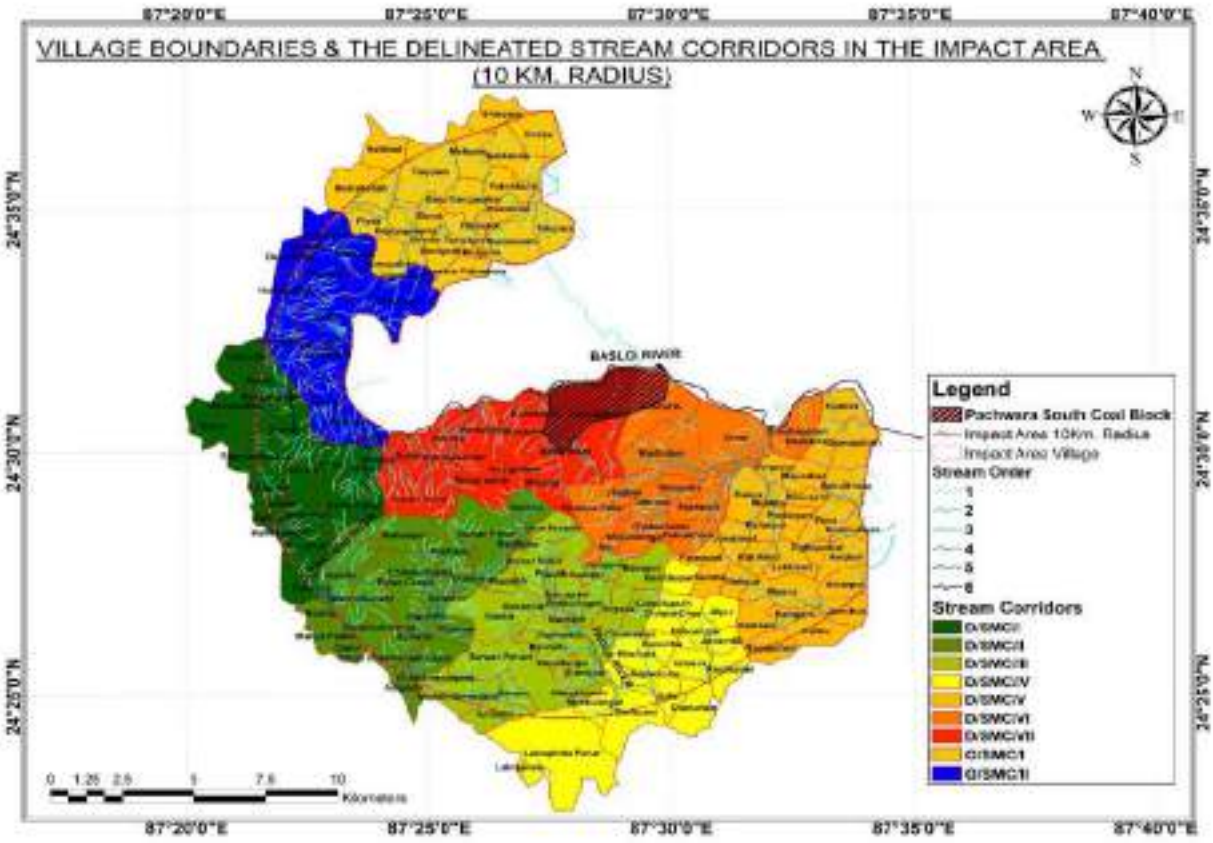
Based on the above scheme, altogether nine stream corridors have been identified and numbers have been assigned to each stream corridor with prefix as the initial letter of the forest division name. Thus, Dumka Forest Division part of the Impact Area contains seven stream corridors which have been designated with nomenclature as D/SMC/I, D/SMC/II, D/SMC/III, D/SMC/IV, D/SMC/V, D/SMC/VI and D/SMC/VII whereas Godda Forest Division part houses two corridors namely G/SMC/I and G/SMC/II.

The delineation of stream corridors is being depicted in the following map.

Map 17: Delineation of Stream Corridors within the Impact Area



Map 18: Delineated Stream Corridors and the Stream Orders in the Impact Area



3.5.2. LiDAR Survey

3.5.2.1. Introduction

LiDAR is an acronym for ***Light Detection and Ranging***. In LiDAR, laser light is sent from a source (transmitter) and reflected from objects in the scene. Essentially, LiDAR is a ranging device, which measures the distance to a target. The distance is measured by sending a short laser pulse and recording the time lapse between outgoing light pulse and the detection of the reflected (back-scattered) light pulse. The reflected light is detected by the system receiver and the time of flight (TOF) is used to develop a distance map of the objects in the scene.

LiDAR employs the method of sending laser light on to the target and measuring the reflected light back to recognize the variation in wave-length and arrival time of the reflected light. The measurement is done by calculating the laser return times and their wavelengths. It generates precise, high quality, and sometimes even a three-dimensional map of the environment that it scans. The generated map of the area in focus, helps in its characterization and examination. A typical LiDAR system consists of a scanner, laser, and sometimes specialized GPS receiver as well. Other elements that are essential for data collection and analysis are optics and photodetectors. The LiDAR data scanned is generally stored in a file with an extension of ".las". This format is supported by the American Society of Photogrammetry and Remote Sensing (ASPRS). A new format with an extension ".laz" has been developed recently by LasTools. ".laz" is a highly compressed version of ".las". The output data derived from the scanned data are stored in a file with an extension of ".tif". This system is typically used by scientists and mapping professionals to examine the environment they are interested in. These LiDAR measurements are mostly used for airborne, mobile, and terrestrial applications.

LiDAR has been advantageous in many sectors including the agricultural sector, where LiDAR robots plant seeds, detected weeds along with automated spraying and fertilizer distribution which makes it easier to grow crops, fruits, and vegetables effectively. In Archaeology, LiDAR can be used to determine the features of the ground, examine the forest canopy, and to create a high-resolution model of an archaeological site to uncover the topography, which was not possible to detect earlier. In autonomous vehicles, LiDAR is used to detect and avoid obstacles so that it can easily navigate through the path using laser beams. LiDAR can be used to obtain rain clouds profile, measure winds, study aerosols and quantify various atmospheric components, which may prove to be useful information for determining surface pressure, greenhouse gas emissions, photosynthesis, fires, and humidity.

Lidar data is initially collected as a "point cloud" of individual points reflected from everything on the surface, including structures and vegetation. To produce a "bare earth" Digital Elevation Model (DEM), structures and vegetation are stripped away.

3.5.2.2. LiDAR Drone Survey

LiDAR technology integrated with Drone platform has been utilised to study the Impact Area. The survey has been conducted by M/s. Ecos Offset Pvt. Ltd. While preparing the instant Plan, the Survey Report and data submitted by the consultant has been taken into account. The basic principles followed in conducting the survey are being briefly discussed as follows.

- ***Survey Planning and Preparation***: Survey planning and preparation require a clear definition of the survey's purpose, which, in this case, is terrain mapping. To ensure accurate data, a DGPS survey has been conducted in advance to obtain the exact GPS coordinates of the study area. Compliance with all relevant regulations has been ensured, which includes obtaining the necessary permissions from the Forest Department, Aviation authorities, and other competent bodies. This step is crucial for meeting legal requirements and minimizing potential risks associated with the project.
- ***Selection of Technology and Equipment***: For the selection of technology and equipment, a drone equipped with a Lidar (Zenmuse L2) sensor has been chosen for its high accuracy and capability in terrain mapping. Additionally, GNSS base stations and IMUs (Inertial Measurement Units) are included to ensure precise georeferencing of the data and to correct for any deviation in the drone's trajectory during the survey, enhancing the overall quality and reliability of the collected data.
- ***Execution of the Survey***: The execution of the LiDAR drone survey has been carried out using DGPS (Differential GPS) to ensure high positional accuracy. The survey included a 70-80% front overlap and a 60-70% side overlap between flight lines, optimizing coverage and minimizing data gaps. The drone was flown at an altitude of 100-120 m above the surface, providing the necessary resolution for accurate terrain mapping while maintaining safety and efficiency in data collection.
- ***Data collection and storage***: High-density point clouds were gathered to capture detailed topographical and structural information. Overlapping data was collected to ensure complete coverage of the survey area and facilitate cross-verification of the information. Additionally, drone operations were continuously monitored throughout the survey to promptly address any issues or malfunctions, ensuring smooth execution and reliable data acquisition.

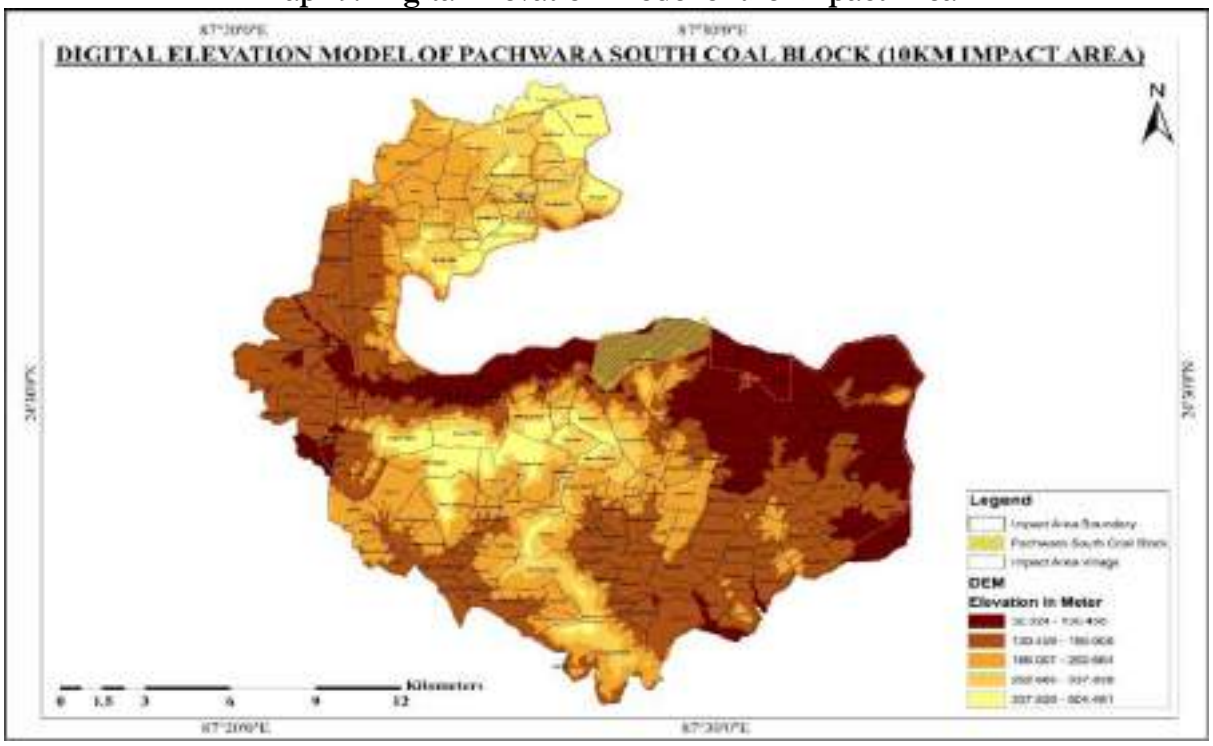
- ***Post-Processing and Analysis***: During post-processing and analysis, noise and irrelevant points, such as birds or non-terrain features, were removed from the point cloud data to enhance its quality and accuracy. GPS and IMU data were applied to precisely align the point cloud with real-world coordinates, ensuring accurate mapping. The data was then classified into distinct layers, such as ground, vegetation, and water bodies, to facilitate detailed analysis. Finally, the LiDAR survey results were carefully analysed to extract valuable insights for terrain mapping and project planning.
- ***Reporting and Documentation***: Topographical maps, elevation models, and drainage density maps were generated based on project requirements, serving as essential tools for decision-making and reporting. Additionally, comprehensive reports were prepared, documenting the methodologies, results, and recommendations for further actions based on the survey findings.

3.5.2.3. Digital Elevation Model (DEM)

The Impact Area has hilly terrain, with the highest altitude reaching approximately 504.48 meters above mean sea level (AMSL). The topography of the area is characterized by an uneven landscape consisting of moderate ridges, valleys, and small mounds. The highest elevation villages within the Dumka-side impact zone include villages namely, Kolha Pahar, Sarkhi Pahar, Silingi Pahar, Khatganwa, Dumar Pahar, Mahuagari, Pahar Chapri, and Chapa Pahar, primarily located in the central and southern parts of the Impact Area. In the Godda-side impact zone, situated in the northeastern section of the lease area, the high-altitude villages include villages namely, Doriya, Sidapara, Golkunda, Pakrikhuta, Dumara, and Palampara.

The Impact Area exhibits significant elevation variations, with approximately 105.80 sq. km. falling within the 130m-186m elevation range, making it the most extensive elevation category. Additionally, 86.5 sq. km. lies between 32.32m and 130.46m, followed by 65.8 sq. km. in the 186.00m-252.66m range. The 252.66m-337.84m elevation range covers around 36.30 sq. km., while the highest elevations, ranging from 337.839m to 504.481m, account for 15.20 sq. km. of the area. These elevation variations are critical for understanding the region's topography, water flow patterns, and environmental planning.

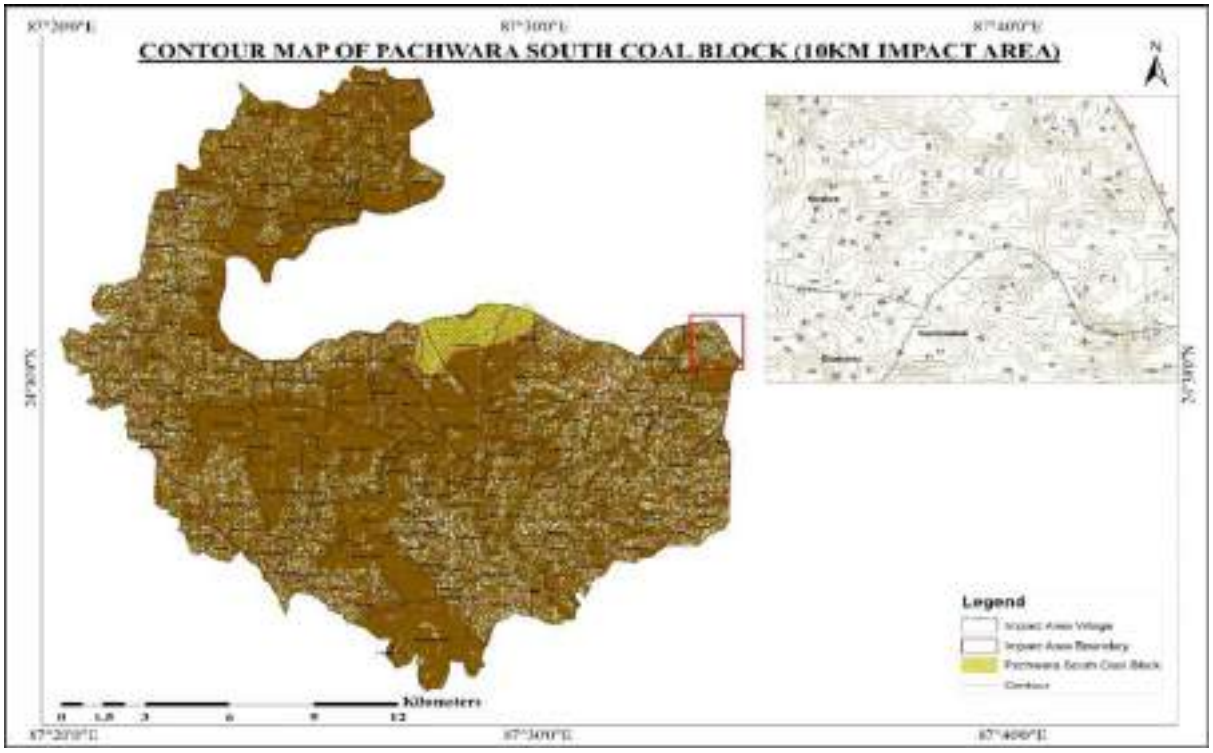
Map 19: Digital Elevation Model of the Impact Area



3.5.2.4. Contour

It includes contour lines that depict variations in elevation, which are crucial for understanding terrain characteristics. The Contour Map of the Impact Area is derived from 0.5m Lidar generated DEM. The contours are of 1m interval and are highly precise.

Map 20: Contour Map of the Impact Area



The inset section in the top right corner, which provides a magnified view of a specific area within the impact area, focuses on a region with dense contour lines, suggesting hilly or undulating terrain. Villages such as Kushkira, Gumapahari, and Dhabarna are situated in this landscape, where the changes in elevation can influence drainage patterns, soil stability, and risks of erosion or flooding. The Pachwara South Coal Block, is located in a moderately sloped area. Contour lines often form V-shaped patterns pointing upstream along river valleys, which helps identify natural drainage pathways and potential water accumulation zones. These patterns indicate the direction of water flow, with the point of the "V" facing higher elevations and the open end pointing downstream. In low-lying areas, contour patterns suggest potential flood-prone zones, particularly where the elevation changes gradually. Such areas are more susceptible to waterlogging and stagnant water accumulation. The map serves as a critical tool for assessing environmental impact, planning soil and moisture conservation strategies, and formulating mitigation measures to address any adverse effects of mining on local communities and ecosystems.

3.5.2.5. Drainage

Drainage refers to the process by which rivers and streams collect, transport, and distribute surface water across a landscape. It is a crucial component of the hydrological cycle, where water flows from higher elevations (such as hills and mountains) to lower areas (such as plains and oceans).

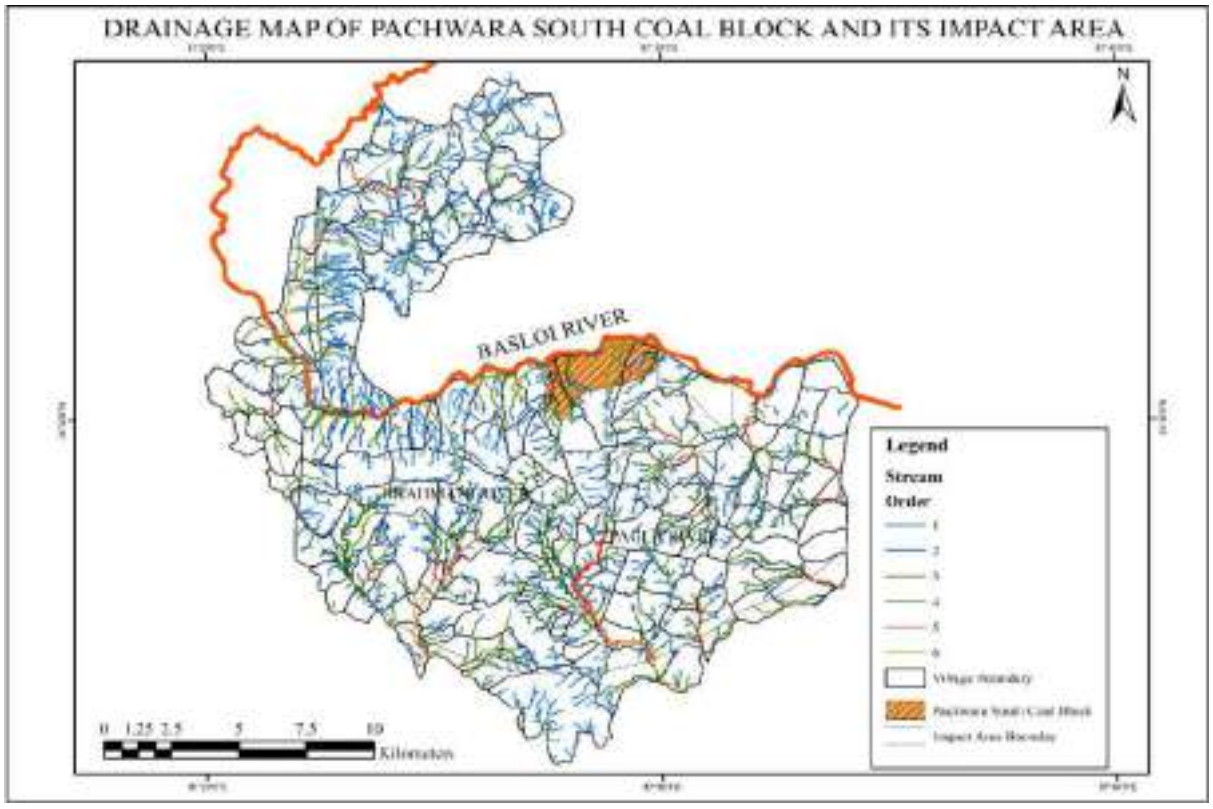
In the LiDAR survey, Digital Elevation Model (DEM) data was specifically used to create stream networks within a 10-kilometer radius of the Pachhwara South Coal Block Project for Soil Moisture Conservation Plan analysis. The accurate elevation data from the DEM enabled precise identification of water flow patterns, which is essential for understanding the hydrological behaviour of the area.

Rivers and streams are classified into a hierarchical network based on their size and connectivity, following the Strahler Stream Order System. First-order streams are the smallest, originating from rainfall or springs and having no tributaries. Second- to sixth-order streams result from the merging of smaller streams, gradually forming larger channels. Higher-order streams are major rivers that ultimately flow into seas or oceans.

In the Impact Area, the Basloi, Pagla, and Brahmani Rivers are classified as higher-order streams, with smaller tributaries feeding into them. The drainage map highlights the Basloi River in the northern part of the study area, while the Brahmani and Pagla Rivers are located in the southern part.

The drainage network follows the Strahler stream ordering method, classifying streams from 1st to 6th order. First-order streams originate from rainfall runoff, especially in hilly or forested terrain. As these streams merge, they form higher-order streams, with fifth- and sixth-order streams representing major rivers that significantly influence the region's hydrology. Among them, the Bansloi, Brahmani, and Pagla Rivers are the largest and most influential water bodies, playing a crucial role in water resource management and hydrological stability in the area. The Drainage Map created with the help of LiDAR survey is as follows.

Map 21: Drainage Map of the Impact Area



3.5.2.6. Digital Surface Model (DSM)

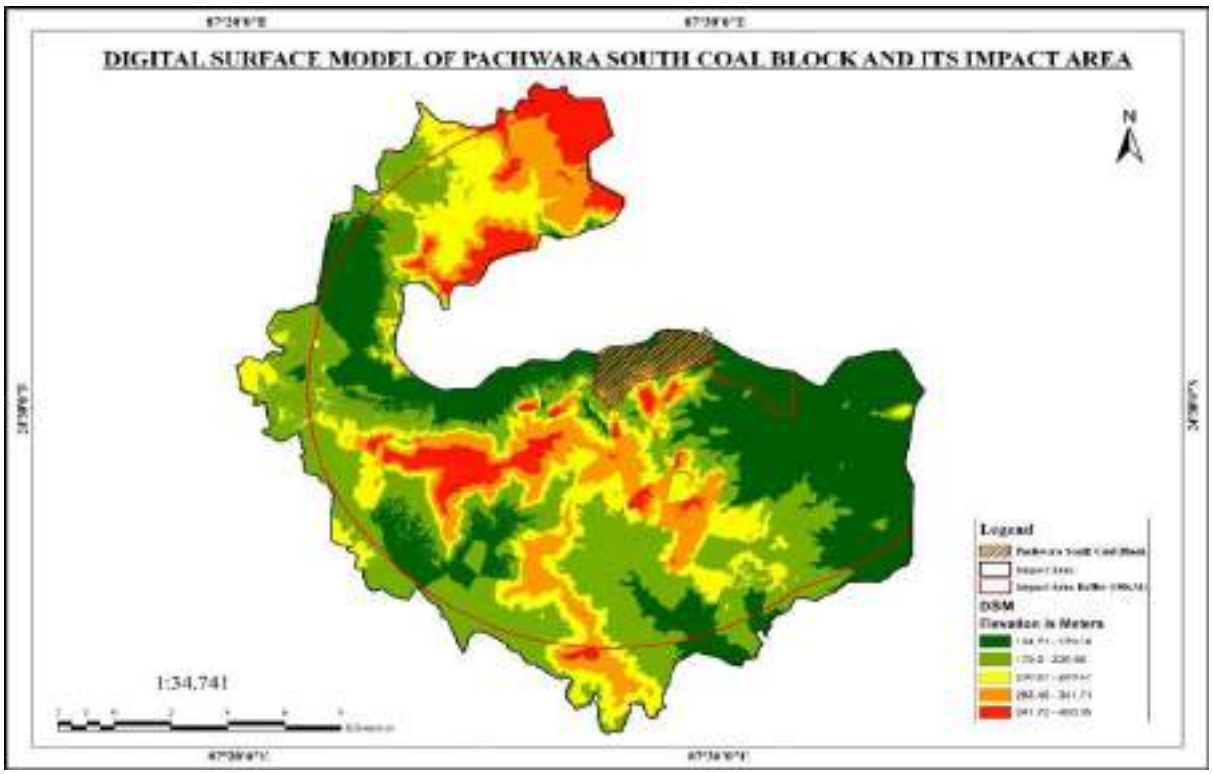
A Digital Surface Model (DSM) is a 3D representation of the Earth's surface that includes both natural and man-made features such as vegetation, buildings, and infrastructure. Unlike a Digital Elevation Model (DEM), which represents only the bare-earth terrain, a DSM captures the highest elevation points, making it valuable for applications like topographic mapping, urban planning, and environmental analysis.

In this project DSM is created with help of LiDAR survey. The Digital Surface Model (DSM) of the Pachwara South Coal Block and its impact area provides an elevation-based representation of the terrain, capturing variations in surface height, including vegetation, buildings, and natural

landforms. The colour gradient in the DSM represents different elevation ranges, with green indicating lower elevations and red depicting higher elevations. The low-elevation areas (104.706 - 173.775 meters) are primarily found in the southern and eastern parts of the impact area, representing flatlands, valleys, and lower lying terrain, which are likely to have denser vegetation cover and potential water accumulation zones. The moderate-elevation areas (173.776 - 311.915 meters), found across central and western parts, consist of gentle hills, undulating terrain, and forested

areas, influencing drainage patterns and watershed behaviour. The high-elevation areas (311.916 - 450.054 meters), mainly in the northern and southwestern parts, represent hilly and rugged terrains, with the red zones indicating the highest elevations, which act as potential sources for streams and drainage systems.

Map 22: Digital Surface Model of the Impact Area



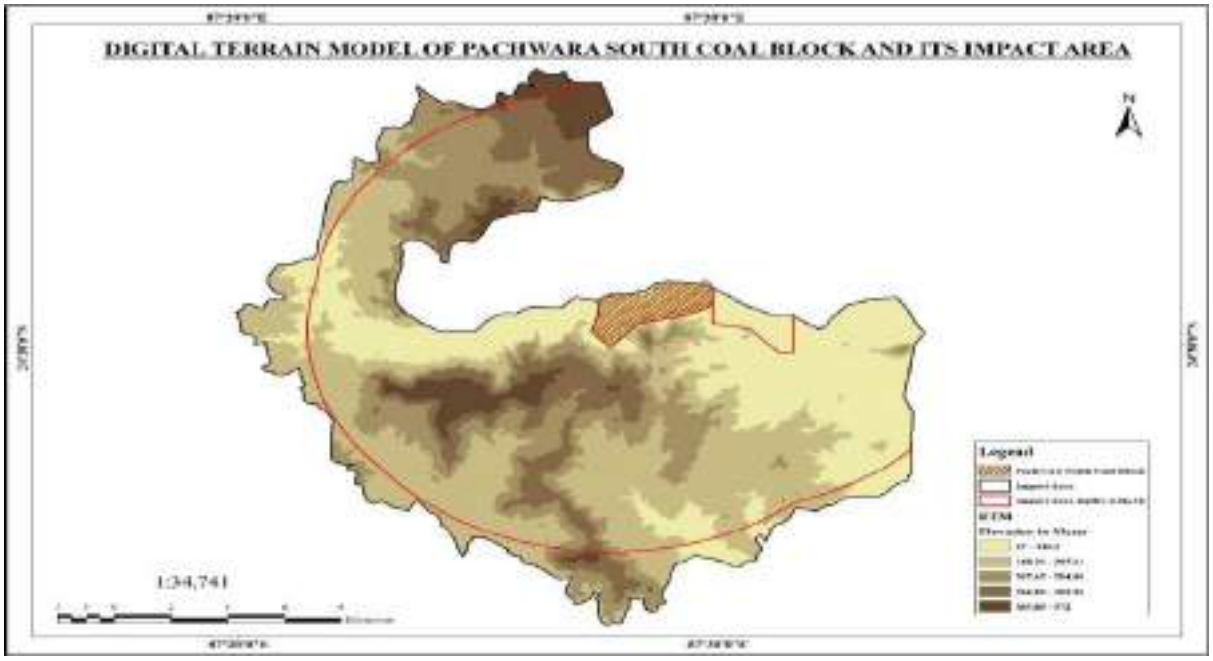
3.5.2.7. Digital Terrain Model (DTM)

A Digital Terrain Model (DTM) is a 3D representation of the Earth's bare ground surface, excluding vegetation, buildings, and other man-made or natural features. It provides a highly accurate depiction of the topography by capturing only the elevation of the land itself. DTMs are typically derived from LiDAR (Light Detection and Ranging), photogrammetry, or satellite radar data, and they serve as a fundamental tool in topographic mapping, hydrological modelling, and

land-use planning. Unlike a Digital Surface Model (DSM), which includes surface features, a DTM represents only the ground elevation, making it essential for applications requiring precise terrain analysis, such as flood risk assessment, soil erosion studies, and infrastructure development. In regions like the Pachwara South Coal Block, DTMs help in understanding drainage patterns, slope stability, and landform characteristics, which are critical for environmental management, mining operations, and watershed planning. By eliminating surface obstructions, DTMs provide a clearer understanding of elevation changes, allowing for more accurate predictions of water flow, terrain modification, and ecological impacts in forestry, agriculture, and urban development projects.

The Digital Terrain Model (DTM) map of the Pachhwara South Coal Block and its Impact Area provides a detailed representation of the land's bare-earth elevation, excluding vegetation and man-made structures. The elevation is classified into five categories, ranging from 67 meters to 572 meters. The low-lying areas (67–148 meters) are predominantly in the eastern and southeastern parts, while higher elevations (385–572 meters) are found mainly in the northern and central regions. The Pachhwara South Coal Block region is located in an area of moderate elevation, suggesting a mix of undulating terrain and relatively flat surfaces. This map is crucial for topographic analysis, providing insights into drainage patterns, slope stability and terrain suitability. The variation in elevation directly influences water flow, erosion potential, and site accessibility, making the DTM an essential tool for environmental impact assessments and resource management in the region.

Map 23: Digital Terrain Model of the Impact Area



3.5.3. Stream Corridor-wise List of Villages

The list of stream corridors and the names of villages included therein is as follows:

Table 14: Stream Corridor-wise List of Villages

Forest Division	Stream Corridor	Sl. No.	Village	Thana/Thana No.	Forest Range/Beat
DUMKA	**D/SMC/I**	1.	Bakua	-	Hizla West/Nonihat
		2.	Bara Pahari	Silangi-04	Kathikund/Gopikandar
		3.	Bhelai	-	Hizla West/Nonihat
		4.	Burhnia	Dodho-11	-do-
		5.	Damudih	-	-do-
		6.	Danro	-	-do-
		7.	Kendua	Dodho-12	-do-
		8.	Koilo	Silangi-06	Kathikund/Gopikandar
		9.	Kolha	Silangi-07	-do-
		10.	Kolha Pahar	Narganj-37	Kathikund/Narganj
		11.	Kulapathar	Bara-10	Hizla West/Nonihat
		12.	Mahuapathar	-	-do-
		13.	Mahuadangal	Kathikund-07	-do-
		14.	Pardaniduma	-	-do-
		15.	Rajamar	-	-do-
		16.	Raidih	-	-do-
		17.	Rangamatia	Lakhanpur-41	-do-
		18.	Sahara	Silangi-03	Kathikund/Gopikandar
		19.	Simra	Narganj-01	Kathikund/Narganj
		20.	Tesaphuli	Silangi-05	Kathikund/Gopikandar
	D/SMC/II	1.	Amgachhi	Narganj-32	Kathikund/Narganj
		2.	Balidih	Narganj-36	-do-
		3.	Banjhiam	Narganj-44	-do-
		4.	Bara Bhuibhanga	Narganj-34	-do-
		5.	Bara Chaparia	Narganj-35	-do-
		6.	Baskia	Narganj-03	-do-
		7.	Chhota Bhibhanga	Narganj-33	-do-
		8.	Chhota Chaparia	Narganj-49	-do-
		9.	Dhibri	Narganj-05	-do-
		10.	Dumra Pahar	Narganj-40	-do-
		11.	Dumaria	Gopikandar-55	Kathikund/Gopikandar
		12.	Dumria	Narganj-51	Kathikund/Narganj
		13.	Jogiduba	Narganj-50	-do-
		14.	Kotaldih	Narganj-48	-do-
		15.	Kulkant	Narganj-48	-do-
		16.	Kurcho	Narganj-41	-do-
		17.	Mahuagari	Narganj-38	-do-
		18.	Mahuapathar	Narganj-04	-do-
		19.	Pahar Chapri	-	-do-
		20.	Pirjorwa	Narganj-52	-do-
		21.	Pokharia	Narganj-39	-do-
	D/SMC/III	1.	Ambajora	Narganj-57	-do-
		2.	Baskia	Narganj-03	-do-
		3.	Babupur	Gopikandar-21	Kathikund/Gopikandar
		4.	Bankijor	Gopikandar-08	-do-

		5.	Baratalli	Gopikandar-10	-do-
		6.	Bhagabandh	Gopikandar-13	-do-
		7.	Chandramali	Gopikandar-18	-do-
		8.	Chhota Maruapani	Narganj-54	Kathikund/Narganj
		9.	Dubrajpur	Gopikandar-12	Kathikund/Gopikandar
		10.	Jhariapani	Gopikandar-09	-do-
		11.	Jhutichapar	Gopikandar-04	-do-
		12.	Jaropani	Gopikandar-02	-do-
		13.	Kairashol	Gopikandar-07	-do-
		14.	Katuidangal	Gopikandar-11	-do-
		15.	Koyada	Gopikandar-19	-do-
		16.	Kuarpur	Gopikandar-03	-do-
		17.	Kumarbandh	Gopikandar-20	-do-
		18.	Majhila Sarwapani	Narganj-55	Kathikund/Narganj
		19.	Pujadih	Gopikandar-06	Kathikund/Gopikandar
		20.	Pusaldih	Narganj-45	Kathikund/Narganj
		21.	R. F.	-	-do-
		22.	Sarwan	Narganj-56	-do-
		23.	Sarwan Pahari	-	-do-
		24.	Soruapani	Gopikandar-05	Kathikund/Gopikandar
		25.	Upar Pujadih	Narganj-43	Kathikund/Narganj
	D/SMC/IV	1.	Balia	Gopikandar-24	Kathikund/Gopikandar
		2.	Burhichapar	Kuskira-11	-do-
		3.	Chhatar Chua	Gopikandar-22	-do-
		4.	Dharampur	Gopikandar-32	-do-
		5.	Dumartola	Gopikandar-30	-do-
		6.	Gariapani	Gopikandar-15	-do-
		7.	Gopikandar	Gopikandar-16	-do-
		8.	Janamdih	Gopikandar-34	-do-
		9.	Jitpur	Gopikandar-33	-do-
		10.	Kheribari	Gopikandar-17	-do-
		11.	Kochapani	Gopikandar-42	-do-
		12.	Kurumba	Gopikandar-23	-do-
		13.	Lakraphela	Kathikund-25	-do-
		14.	Lakraphela Pahar	Kathikund-25	-do-
		15.	Bhuskidangal	Gopikandar-14	-do-
		16.	Talberia	Gopikandar-31	-do-
	D/SMC/V	1.	Amarpur	Kuskira-32	Kathikund/Chirudih
		2.	Amjhari	Gopikandar-37	Kathikund/Gopikandar
		3.	Babuikhura	Kuskira-25	Kathikund/Chirudih
		4.	Bhadradighi	Kuskira-31	-do-
		5.	Bhangahir	Kuskira-24	-do-
		6.	Dhobarna	Kuskira-21	-do-
		7.	Digha Parbat	Kuskira-30	-do-
		8.	Durgapur	Kuskira-17	-do-
		9.	Gamria	Kuskira-12	Kathikund/Gopikandar
		10.	Gumapahari	Kuskira-20	Kathikund/Chirudih
		11.	Jamchua	Gopikandar-38	Kathikund/Gopikandar
		12.	Jorasimal	Kuskira-15	Kathikund/Chirudih
		13.	Kajikend	Kuskira-14	-do-
		14.	Karmo	Gopikandar-40	Kathikund/Gopikandar
		15.	Kuskira	Kuskira-19	Kathikund/Chirudih
		16.	Lakhibad	Kuskira-29	-do-
		17.	Majhdiha	Kuskira-23	-do-

		18.	Majurabari	Kuskira-22	-do-
		19.	Musna	Gopikandar-40	Kathikund/Gopikandar
		20.	Paharpur	Gopikandar-57	-do-
		21.	Palasbani	Kuskira-10	Kathikund/Kathikund
		22.	Pindargara	Gopikandar-49	Kathikund/Gopikandar
		23.	Pipra	Kuskira-26	Kathikund/Chirudih
		24.	Rambani	Gopikandar-35	Kathikund/Gopikandar
		25.	Ramgarh	Gopikandar-39	-do-
		26.	Rampur	Kuskira-13	Kathikund/Chirudih
		27.	Ranga	Kuskira-16	-do-
		28.	Sogapahari	Gopikandar-41	Kathikund/Gopikandar
	D/SMC/VI	1.	Champa Pahar	-	-do-
		2.	Chirudih	Silangi-20	Kathikund/Chirudih
		3.	Dhobachapar	Kuskira-07	-do-
		4.	Dundhapahari	Kuskira-18	-do-
		5.	Jhanjhko	Kuskira-03	-do-
		6.	Jolo	Gopikandar-01	Kathikund/Gopikandar
		7.	Chetopoka	Kuskira-04	Kathikund/Chirudih
		8.	Khajurdangal	Kuskira-06	-do-
		9.	Kulaipura	Kuskira-08	-do-
		10.	Madhuban	Kuskira-02	-do-
		11.	Ormo	Kuskira-01	-do-
		12.	Puranakhora	Kuskira-09	-do-
		13.	Talkhora	Kuskira-05	-do-
	D/SMC/VII	1.	Amdiha	Silangi-08	Kathikund/Gopikandar
		2.	Chunjo	Silangi-12	Kathikund/Chirudih
		3.	Hethsilangi	Silangi-13	-do-
		4.	Kachuakandar	Silangi-10	Kathikund/Gopikandar
		5.	Kharikasol	Silangi-17	Kathikund/Chirudih
		6.	Khatangi	Silangi-16	-do-
		7.	Khatganwa	Silangi-15	-do-
		8.	Kunda Pahari	Silangi-19	-do-
		9.	Mahaldabar	Silangi-18	-do-
		10.	Murguja	Narganj-42	Kathikund/Narganj
		11.	Sarkhi	-	Kathikund/Gopikandar
		12.	Sarkhi Pahar	Silangi-11	Kathikund/Chirudih
		13.	Silangi Pahar	Silangi-14	Kathikund/Chirudih
GODDA	**G/SMC/I**	1.	Bajrijogosami	Sundarpahari-13	Sundarpahari/Damru
		2.	Bara Dangapara	Sundarpahari-06	-do-
		3.	Bokrabandh	Sundarpahari-02	-do-
		4.	Barai	Sundarpahari-05	-do-
		5.	Chhota Dangapara	Sundarpahari-09	-do-
		6.	Damakol	Sundarpahari-07	-do-
		7.	Doriya	Sundarpahari-07	-do-
		8.	Dumara Palampura	-	-do-
		9.	Golkunda	Sundarpahari-11	-do-
		10.	Hardisol	Sundarpahari-03	-do-
		11.	Karamba	Sundarpahari-08	-do-
		12.	Kathaldih	Sundarpahari-13	-do-
		13.	Kamupahari	Sundarpahari-15	-do-
		14.	Malipara	Sundarpahari-04	-do-
		15.	Mulgipur	Sundarpahari-10	-do-
		16.	Pakrikhuta	-	-do-
		17.	Pipra	Sundarpahari-14	-do-

		18.	Sidapara	Sundarpahari-05	-do-
		19.	Simlipara	Sundarpahari-12	-do-
		20.	Telopara	Sundarpahari-14	-do-
		21.	Tilaypara	Sundarpahari-06	-do-
	G/SMC/II	1.	Babupur	Sundarpahari-25	-do-
		2.	Bankatti	Sundarpahari-20	-do-
		3.	Bargo	Sundarpahari-26	-do-
		4.	Belpahari	Sundarpahari-18	-do-
		5.	Baigni	Sundarpahari-24	-do-
		6.	Daharlangi	Poreyahat-208	Godda/Poreyahat
		7.	Hathiyapathar	Poreyahat-209	-do-
		8.	Jagusama	Sundarpahari-16	Sundarpahari/Damru
		9.	Jamropani	Sundarpahari-23	-do-
		10.	Jamropani	Poreyahat-213	Godda/Poreyahat
		11.	Jogimarna	Sundarpahari-19	Sundarpahari/Damru
		12.	Paharpur	Sundarpahari-21	-do-
		13.	Pairgadih	Poreyahat-211	Godda/Poreyahat
		14.	Sundrijola	Mahgama-17	Sundarpahari/Damru
		15.	Susni	Mahgama-22	-do-

3.5.4. Field Survey Exercise

The physical field survey of the whole area has been carried out by teams consisting of the following members:

Table 15: Qualifications & Experience of the Survey Team Members

Sl. No.	Name	Qualification	Experience
1.	Kislay Kumar	M. Sc. Ecology	10 years
2.	Anzar Anis	M. Tech. Geoinformatics	4 years
3.	Vicky Mahto	M. Sc. Botany	3 years
4.	Lamboder Mahto	B. Sc. Zoology (Hons.)	2 years
5.	Vikas Kumar Sen	B. A.	2 years
6.	Biswa Darshi Behera	M. Sc. Geoinformatics	Fresher
7.	Sugandha Ganguli	M. Sc. Geoinformatics	Fresher
8.	Sujata Nath	M. Sc. Geoinformatics	Fresher

3.6. SNAPSHOTS OF FIELD SURVEY EXERCISE








1.01 m


Latitude: 24.513056
Longitude: 87.353498
Accuracy: 8.9 m
Time: 18-11-2024 11:17
Note: Mahuapathar Lbs 5mt*2mb


Latitude: 24.551092
Longitude: 87.410931
Accuracy: 3.0 m
Note: gully plugging 3*1m (Jagusama)


Latitude: 24.598678
Longitude: 87.4466
Elevation: 389.04±7 m
Accuracy: 6.5 m
Time: 03-12-2024 12:36


Latitude: 24.561584
Longitude: 87.409458
Elevation: 259.28±14 m
Accuracy: 3.0 m
Time: 03-12-2024 13:56


Latitude: 24.584433
Longitude: 87.392948
Elevation: 215.2±16 m
Accuracy: 8.6 m
Time: 04-12-2024 11:57

4. REJUVENATION OF DEGRADED OPEN FORESTS WITHIN PERIPHERY OF 100M FROM THE LEASE BOUNDARY

4.1. BACKGROUND

One of the conditions laid by MoEF&CC towards grant of forest clearance to the project reads thus:

> "*The User Agency either himself or through the Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;*" (Condition No. xix)

Further, in this context it would also be relevant to cite the following specific condition laid by MoEF&CC while granting the Environmental Clearance to the Project:

> "*PP shall restrict the mining activity at least 100m away from the HFL of the Bansloi River in order to protect the natural flow of river. Accordingly, embankment with stone pitching on both side (towards and outwards of river) shall be developed. Dense plantation shall be developed with Sal trees on this embankment.*" (Specific Condition No. iii)

The aforesaid condition towards grant of environmental clearance specifically aims to keep the flow and health of Bansloi river in its present condition even after mining operations become fully functional.

4.2. METHODOLOGY ADOPTED IN ARRIVING AT PROPOSALS FOR REJUVENATING THE PERIPHERAL AREA OF THE LEASE

The steps taken towards deciding the appropriate interventions in order to comply with the abovesaid condition laid under Forest Clearance are as follows:

(a) Preparation of a map of the target area i.e., the area within periphery of 100m from the lease boundary, with village boundaries and notified forest land boundaries; and
(b) Procuring satellite imagery of the target area (Sentinel-2 satellite imagery dated 1st January, 2025);
(c) Data processing through QGIS software;

(d) Assessment of vegetation through Normalized Difference Vegetation Index (NDVI) analysis;
(e) Identification of degraded open forest with crown density less than 0.4; and
(f) Choosing best possible method of rejuvenating the identified area.

4.3. NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI)

The use of satellite remote sensing to assess vegetation characteristics has gained significant attention in recent years, particularly in monitoring forest health, canopy structure, and vegetation dynamics. The Normalized Difference Vegetation Index (NDVI) is a robust and widely used remote sensing tool to evaluate vegetation cover, density, and health. Remote sensing provides tools to gather data from a distance, using satellites, drones, or aircraft equipped with sensors that capture information about the Earth's surface. This data is often used for vegetation and land-cover analysis. In particular, forest management and land use change require accurate measurements of vegetation characteristics, such as crown density, to monitor ecosystem health and forest cover.

Crown density refers to the amount of ground covered by the crowns (or canopies) of trees, usually expressed as a percentage of the total area. Understanding crown density is crucial for assessing forest health, structure, and biodiversity.

NDVI is a widely used vegetation index in remote sensing, based on the difference between the near-infrared (NIR) and red light reflectance. It provides a simple yet effective way to distinguish between different types of land cover, with specific utility in determining vegetation health and density.

4.3.1. Theoretical Principles of NDVI vis-à-vis Crown Density

As a matter of fact healthy vegetation absorbs a significant amount of red light due to the chlorophyll in leaves, which is essential for photosynthesis. When plants are healthy, the absorption is high, and reflectance in the red band is low. In contrast, healthy vegetation reflects a large portion of NIR light. This is because the leaf structure, including internal cell layers and air pockets, reflects NIR light rather than absorbing it. The more robust the leaf structure and chlorophyll content, the more NIR light is reflected. The NDVI formula compares the difference between NIR reflectance (which is high in healthy plants) and red reflectance (which is low in healthy plants). Therefore, healthy vegetation will have a high NDVI value (close to +1), whereas

stressed or dead vegetation, which reflects more red light and less NIR, will have a low NDVI value (closer to 0 or even negative).

By analysing the difference between near-infrared and red-light reflectance, NDVI helps identify stressed or unhealthy trees, allowing for early detection of issues such as water stress, nutrient deficiencies, or pest infestations.

NDVI is calculated using the formula: NDVI = (NIR – RED)/(NIR + RED)

Where NIR refers to the Near-Infrared band, which is sensitive to vegetation reflectance and RED refers to the Red band, where chlorophyll in plants absorbs most of the light

The value ranges from -1 to 1, where high values (>0.6) correspond to healthy, dense vegetation, and low values (approaching 0) reflect sparse or no vegetation. Values close to -1 are usually found in non-vegetated surfaces, such as water bodies, snow, or barren land.

NDVI can be directly related to vegetation density, as it highlights the amount of green, photosynthetically active vegetation. In forest ecosystems, higher NDVI values often correlate with greater crown cover, canopy height, and forest biomass. However, it is important to consider that NDVI can be influenced by environmental factors such as soil background, topography, and seasonal variations.

Crown density is a key parameter in understanding forest structure and dynamics. NDVI is not directly a measurement of crown density, but it can be used as a proxy. Areas with higher NDVI values often correspond to regions with denser canopy cover, which is an indicator of high crown density. By analysing NDVI patterns, one can make inferences about canopy structure and estimate crown density.

4.3.2. Methodology: NDVI Analysis for Crown Density Assessment

Remote sensing platforms such as Landsat, Sentinel, and MODIS provide regularly updated imagery at varying resolutions. Landsat 8, for example, provides both red and NIR bands that are commonly used for NDVI calculations. Also, Drones equipped with high-resolution multispectral sensors can capture NDVI data with more localized precision, which is beneficial for assessing crown density in smaller forested areas.

NDVI is calculated pixel by pixel from satellite or aerial imagery. The first step in the process is to select images that capture the area of interest and ensure that they cover both the red and NIR

bands. Once the NDVI is computed, the values are mapped across the landscape, with each pixel representing a vegetation density level.

NDVI values can be used to define vegetation types and estimate crown density using thresholding techniques. By setting an NDVI threshold, areas above this value can be classified as "vegetated" or "forested", while those below can be classified as "non-vegetated". Higher NDVI values are indicative of dense forest cover with higher crown density. A typical threshold value might be 0.4, where areas with NDVI greater than 0.4 are considered as covered by healthy vegetation.

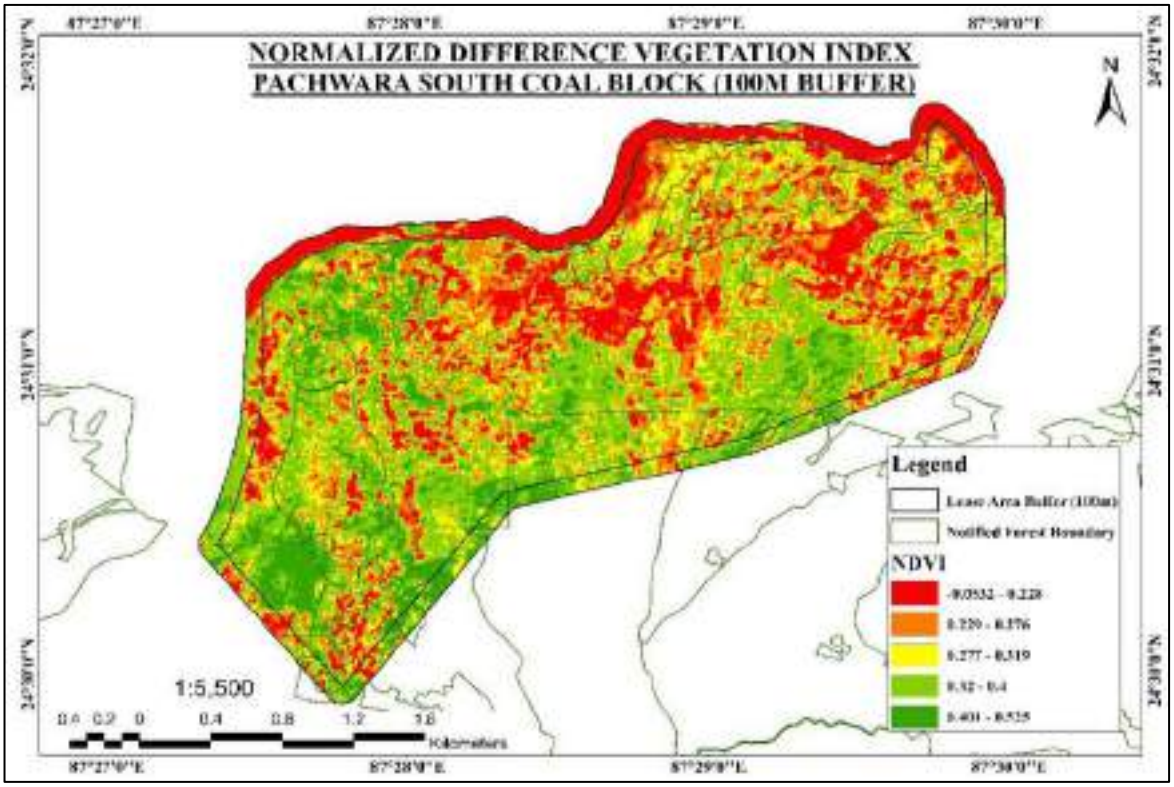
Statistical analyses such as regression models or machine learning techniques can be used to correlate NDVI values with actual field measurements of crown density (e.g., measured using LiDAR or field surveys). These models can be trained to predict crown density in different regions based on NDVI data. Finally, ground truthing of the data obtained after NDVI analysis is generally used for validation.

4.4. NDVI Analysis of the Target Area

Satellite imagery data of the target area, when processed through QGIS software for NDVI analysis, also validated through ground truthing, yields a clear picture of the target area, i.e. the buffer area within 100m periphery around the mining lease area. NDVI ranging from – 0.393 to +0.525 represents the scattered and open forest present in the region.

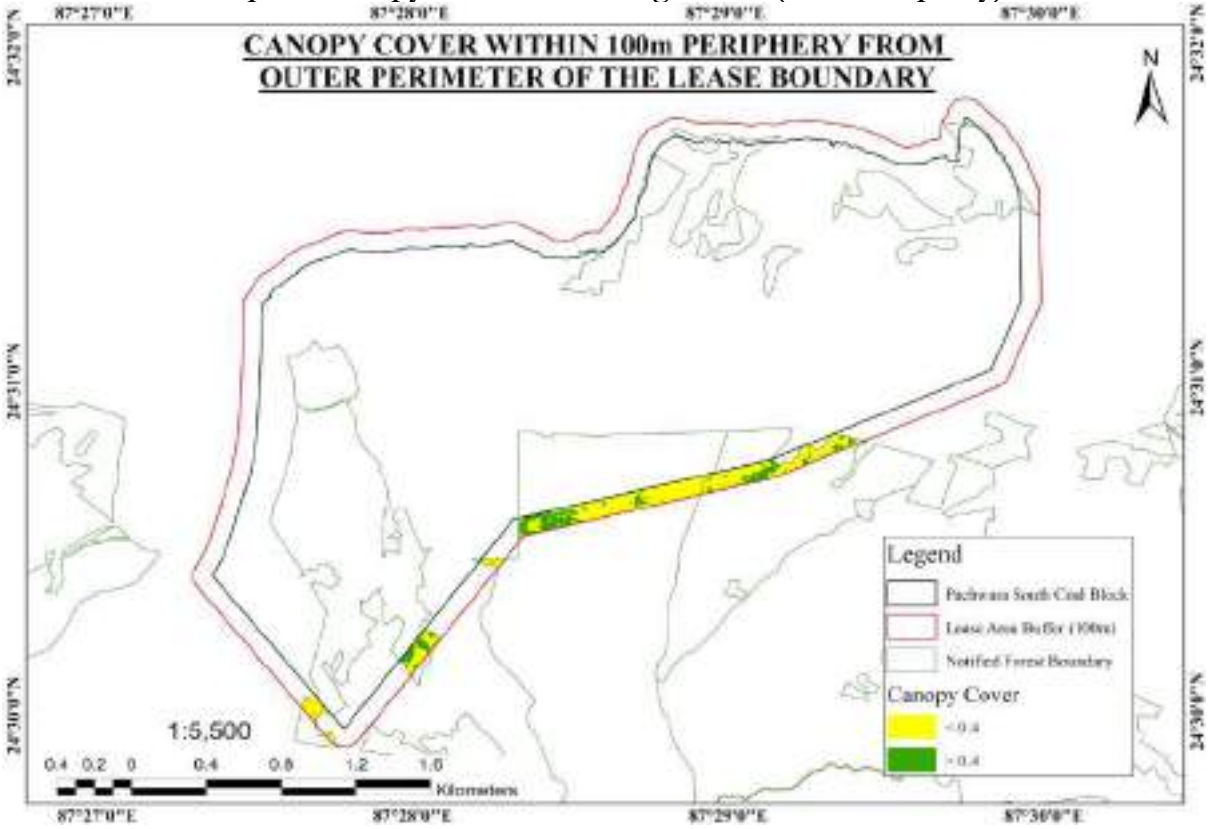
A map showing classification in 5 classes to separate the ground feature other than vegetation, the class with green shades representing the vegetation part, rest shades being the representation of crop land, settlement and water bodies present in the area, is being depicted as under.

Map 24: NDVI Assessment Within 100m Buffer of the Lease Area



The map of the target area showing the segregated canopy cover >0.4 and <0.4 is as follows.

Map 25: Canopy Cover in the Target Area (100m Periphery)



4.5. VILLAGE-WISE CANOPY COVER WITHIN THE NOTIFIED FOREST LAND IN 100M PERIPHERY OF THE LEASE AREA

Table 16: Village-wise Forest Land Area and Canopy Cover

Range	Beat	Sub-Beat	Village Name	Thana/ Thana No.	Forest Land (ha)	Canopy Cover <0.4 (ha)	Canopy Cover >0.4 (ha)
Kathikund	Chirudih	Chirudih	**Chirudih**	Silangi-20	85.01	2.878	0.875
			Kundapahari	Silangi-19	65.55	10.175	3.426
		Silangi	**Mahaldabar**	Silangi-18	124.38	2.503	0.984
Total forest land under Canopy Cover Density <0.4						**15.556**	

From the above table, it is clear that only 15.56 ha of net area in three villages, namely Chirudih, Kundapahari and Mahaldabar, is under canopy cover density of less than 0.4. It would be relevant to mention here that major part of forest land within the said three villages are part of the lease area and therefore, a subject matter of diversion.

4.6. PROPOSALS PRESCRIBED FOR REJUVENATION OF DEGRADED OPEN FORESTS WITHIN 100M PERIPHERY OF LEASE AREA

4.6.1. Silvicultural Operations with Gap Planting

The treatment area, after survey and demarcation, shall be subjected to cut-back, coppicing, climber cutting, stump dressing etc. Thereafter, as per protocol prescribed by the Forest Department, the area shall be planted with suitable species. About 200 plants per hectare shall be planted.

4.6.2. Soil & Moisture Conservation within the Target Area

The instant Plan has been formulated with the object of prescribing soil and moisture conservation interventions within 10 km radius of the Lease area. Hence, the target area is obviously a part of the Impact Area delineated for formulation of this Plan. Thus, the target area within 100m periphery of the Lease area has been considered in totality under the Plan and there is no need to deal with it here in this chapter separately.

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5. OBJECTIVES AND BRIEF OUTLINE OF THE PROPOSALS UNDER THE SOIL AND MOISTURE CONSERVATION PLAN

5.1. OBJECTIVES OF THE PROPOSALS

The instant Plan primarily focusses on Soil and Water Conservation measures over the Impact Area. Following are the broad objectives of these measures:

- To control runoff and thus prevent soil erosion as also to reduce soil compaction through biological and engineering measures.
- To maintain or to improve soil fertility;
- To conserve water;
- To harvest excess water wherever feasible;
- To rehabilitate degraded forest areas through afforestation wherever technically feasible and facilitating natural regeneration of plants;
- Ecosystem conservation resulting from increased vegetal cover and water retaining properties of soil;
- To meet the fuel and fodder requirements of local people;
- Promotion of non-conventional energy devices to reduce pressure on forest; and
- Employment generation through community participation and conservation.

5.2. ACTIVITIES PRESCRIBED UNDER THE PLAN

After detailed survey of each and every village falling within the Impact Area, particularly from the viewpoint of the aforesaid objectives, various interventions may be categorized into following broad heads:

(A) Soil and Water Conservation Measures.
(B) Capacity Building of Frontline Forest staff.
(C) Awareness Development Programmes.
(D) Development of Alternative Livelihoods
(E) Promotion of Renewable/Alternative Energy Consumption
(F) Development and Implementation of appropriate Monitoring and Evaluation Framework.
(G) Infrastructural strengthening aimed towards implementation as well as monitoring and evaluation of the Plan.

5.2.1. Soil and Moisture Conservation Measures

The treatment of any area with the objective of soil and moisture conservation broadly may be categorized into following two sub-heads:

(a) Vegetative measures
    (i) Grass sowing/pitching;
    (ii) Pastureland development;
    (iii) Assisted Natural Regeneration (ANR); Silvicultural operations; Rehabilitation of degraded forests;
    (iv) Plantation on barren forest lands;
    (v) Gabion plantation along streams/rivers, around ponds and check dams.

(b) Structural/Engineering measures
    (i) Trenches;
    (ii) Stream Bank Stabilization;
    (iii) Earthen Dams;
    (iv) Silt detention dams;
    (v) Ponds/Ahars – creation and de-siltation/renovation of existing ponds;
    (vi) Check dams – Temporary/Brushwood/Boulder/Loose Boulder/Masonry.

5.2.1.1. Vegetative Measures

Some of the vegetative measures are being enlisted as follows:

(a) **Grass Sowing/pitching**: Suitable grass species preferably fodder grass is planted in rows across the slope. It can also be planted on the berm of bunds. The fibrous root system of grass offers better protection of the top soil and filters the run off to trap the sediments. Well established grass species reduce erosion by moderating the impact of raindrops and also increase the infiltration opportunity time. The grass thus planted could be used as fodder for livestock, which could also be an alternate source of income to the farming community.

(b) **Plantation on Barren Forest land**: Plantation activities along with soil and moisture conservation measures may be taken up in forest areas which are almost bereft of any root stock. Such barren lands could be regenerated only with artificial plantation methods.

(c) **Gabion plantation along streams/rivers, around ponds and check dams**: Plantation in gabions along streams/rivers in the area which are generally subject to heavy erosion along their banks could be one of the methods to stabilize the stream banks. Further, such

plantation around the newly created/renovated (desilted) ponds/percolation tanks/check dams can serve the purpose of arresting the erosion around the water structures. Such plantation would also serve the aesthetic/cultural/religious purpose.

5.2.1.2. Structural/Engineering Measures

Some of the structural/engineering measures are being enlisted as follows:

(a) **Trenches/Water Absorption Trenches**: Trenches are constructed along the contour by excavating the soil. Contour trenches are effective measure for soil and moisture conservation in varying rainfall, soil types and depths, and sloping conditions. The trenches break the slope, reduce the velocity of surface run-off and store the excess runoff. These are of two types:

- Continuous contour trench
- Staggered trench

Water absorption Trenches do help recharge the ground water and may be constructed on 10% and beyond slope areas.

(b) **Stream Bank Stabilization**: Due to undulating topography, substantial quantities of rainwater flow through the drains during heavy rainfall. The existing drains are silted and flow of water through the drains is restricted resulting in severe bank erosion, overflow and spreading of water through adjacent land causing damage. Stream bank stabilization is done by constructing retaining walls of different configurations and design. By stabilizing the stream banks, the flow can be regulated, scouring of banks can be avoided and drainage congestion can be averted. It is being proposed to go for stream bank stabilization at more vulnerable places.

(c) **Construction of Ponds**: Ponds are mainly meant for the purpose of storing the surface runoff. The ponds and water harvesting structures constructed in the low-lying areas contribute to the conservation of excess rain water and the replenishment of ground water. These water harvesting structures are constructed as masonry/earthen structures. The impounded water also provides irrigation to the lands in the adjacent areas. It increases the soil moisture regime around the structure for increased crop production and recharge the ground water. Grass/fruit bearing/fodder trees could be planted on the berm of such ponds which provide additional income by way of fodder /fruit apart from providing better reinforcement.

(d) **De-siltation/renovation of Existing Ponds**: Majority of the ponds in the Impact Area require de-siltation and renovation etc. to strengthen the banks etc. Increasing the depth

of ponds shall augment the water storage in these structures. Further, bamboo gabion plantation on the berm of such ponds and plantation of fruit/fodder species should be taken up around ponds.

(e) **Check Dams**: The function of the check dams is to flatten the steep gradient of the gully by constructing a series of checks. The check dams convert the longitudinal gradient into a series of steps with low risers and long flat treads. These structures could be divided into two categories:

(i) **Temporary Check Dams**: These are constructed in small and medium gullies and intended to function until the vegetation cover in the gully gets established and provides permanent protection. The temporary dams trap water and soil and thus facilitate vegetation growth. These are usually made of brush, wire, poles or loose rock. To obtain satisfactory results from structural measures, a series of check dams should be constructed for each portion of the gully bed. Because they are less likely to fall, low check dams are more desirable than high ones. After the low dams silt up and rot away, vegetation can control the low overfalls much more easily than on high dams.

Boulder Check dams: Boulder check dams placed across the gully are used mainly to control channel erosion and to stabilize gully heads. In a gully system or multiple-gully system all the main gully channels of continuous gullies can be stabilized by boulder check dams. The maximum total height of the dam is two m. Foundation depth must be at least half of effective height.

Loose Stone Check Dam: Loose stone check dams made of relatively small rocks are placed across the gully. The main objectives for these dams are to control channel erosion along the gully bed, and to stop waterfall erosion by stabilizing gully heads. Loose stone check dams are used to stabilize the incipient and small gullies and the branch gullies of a continuous gully or gully network.

(ii) **Permanent Check Dams**: Masonry Check Dams: Masonry check dams constructed with cement mortar and non-disintegrating stones are generally used in torrent control. The main objective of the dam is to hold fine and coarse material carried by flowing water in the gully or torrent.

5.2.2. Capacity Building of Frontline Forest Staff

Implementation of all Soil and Moisture Conservation initiatives under this Plan has to be carried out by the frontline forest staff under the overall supervision of the forest officials of Dumka/Godda Forest Division. Though the frontline forest staff is trained for implementation

of similar programmes, yet the need of further specialised training is being felt. Needless to mention here that capacity building is also important for maintenance of structures and other common goods created during the implementation of the Plan.

The Impact Area constitutes a part of Kathikund & Hizla West ranges of Dumka Forest Division and Godda and Sundarpahari Ranges of Godda Forest Division. However, to ensure efficient and effective implementation of soil and water conservation programmes in other areas of the forest division in future, it would be more appropriate to involve all the frontline forest staff of the two divisions in capacity building initiatives under this Plan.

With the aforesaid objectives in mind, training and workshops with hands-on field exercises are being proposed to be taken up under this Plan. The workshops shall be organised at division level as well as at the range level. The divisional forest administration shall have the liberty of selection of individual trainers and institutions to be roped in capacity building programmes. The structure of the programmes may be decided in active participation of all the stakeholders.

The activities proposed for capacity building of the forest frontline staff may include the following:

- Workshops at division and range levels;
- Structured training on various activities proposed under the Plan;
- Demonstration of various technological aspects such as Remote Sensing and GIS tools to the staff. The remote sensing products such as land use/land cover maps, NDVI maps for baseline, mid-term and end of the project period shall help in understanding the impact of the project;
- Exposure Visit of the staff to the areas successfully treated;
- Publication and use of mass media to build awareness over larger community and wider areas.

The various topics of training programmes are being identified as follows:

(a) Developing strategy for soil conservation and water resource development;
    - Types of Soil Erosion
    - Preliminary Survey
    - Mapping and Site Investigation
    - Upstream-downstream concept
(b) Practical Application of GPS for survey;
(c) Importance, Planning and Designing of various Soil and Moisture Conservation Measures;

(d) Selection of activities and structures in different field situations keeping in focus the requirement of soil moisture regime as well as the need of community;

- Ridge to Valley Approach
- Decentralised planning
- Continuous Contour Trench (CCT)
- Contour Staggered trenches (CST)
- Contour Bunding with Field Outlet
- Graded Bunds/ Field Bunds
- Land Levelling
- Grassland development
- Terracing
- Farm Pond
- Ground water recharge

(e) Vegetative measures for soil and water conservation

(f) Drainage line treatment

- Vegetative measures
- Gully Plug
- Gabion Structure
- Check Dam
- Earthen Nala Bunding / Earthen Dam etc.

(g) Participatory monitoring and impact evaluation of Soil and Water Conservation Projects.

5.2.3. Awareness Development Programmes

Awareness amongst villagers and other stakeholders towards the importance of soil and water conservation issues is one of the most important aspects of the success of any plan intended to arrest degradation of soil and water resources of any area. However, the traditional knowledge of the villagers towards these issues cannot be ignored. The senior citizens of the villages generally have tremendous understanding of the importance of conservation of soil and water. But the younger generation more specifically needs to be sensitized towards the perils of not paying adequate attention to conservation needs.

It is an established fact that the degradation of land, water and soil resources adversely affects agriculture. For example, land degradation leads to the deterioration of soil quality. A reduction in land and soil productivity endangers the sustainability of agriculture, environmental stability and

quality, and also has an adverse impact on economic and social development. Without taking up appropriate soil, water and land management measures, the cost of arresting land degradation will get higher and yields will persistently decline thereby increasing recurrence of food insecurity even at the village level.

Some of the activities identified to meet the abovesaid objectives are:

- Organising regular educational and sensitisation meetings to enhance community awareness on water catchment conservation, forests and wetlands;
- Strengthening the capacities of communities, corporates and other stakeholders in the conservation and management of water catchment areas;
- Involving JFMCs in awareness campaigns.
- Organising marches with the help of community leadership etc.

5.2.4. Development of Alternative Livelihoods

Both Dumka and Godda districts are largely characterised as rural districts as most of the population resides in villages. Agriculture is the predominant activity in the districts and is the means for livelihood for about 80% of the population. The pattern of agriculture practices in the district is mono crop because of rain fed farming. The dependency on rainfall for agriculture purposes is evident from the fact that almost all area is dependent on rain for agriculture purpose.

Alternative livelihoods can be defined as livelihood activities that supplement people's basic income. These activities usually depend on people's spare time, their skills, resources and art. A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Issues such as capacity building, transfer of appropriate management practices, and strengthening community-based organizations come to mind. In our case JFMCs are the most crucial entities which could play a pivotal role in development of sustainable alternative livelihood options.

During field survey exercise conducted during the formulation of the instant Plan, some of the livelihood options identified are being enlisted as under:

- Sal Plate making;
- Bee keeping;
- Mushroom cultivation;
- Orchard creation;

- Distribution of vegetable seeds kits;
- Establishment of Village Nurseries;
- Vermicomposting;
- Poultry farming;
- Development of fisheries;
- Distribution of Sewing machines and training;
- Training in Computers etc.
- Training in vehicle driving etc.

These activities have been identified in active consultation and participation of the local villagers. The infrastructure as well as training etc. required to build on such infrastructure shall be provided by the Forest Department so as to make the system sustainable. However, it may be noted here that the activities may not be limited to the aforesaid categories. It could be further diversified to include other activities as well in consultation with the stakeholders.

5.2.5. Promotion of Renewable/Alternative Energy Consumption

Provision of solar powered street lights in villages and distribution of solar lanterns shall be taken up to enhance the living standards of villagers.

Wood, agricultural residues and cattle-dung cakes are the primary energy sources for cooking in rural areas. Traditional chulhas, commonly in use in rural areas, however, are inefficient and environmentally undesirable. In contrast, improved chulhas are scientifically designed for optimal regulation of heat flow and better fuel utilization. Improved chulhas have heat transfer efficiency of 20-35% as compared to 8-10% in case of traditional chulhas. Therefore, supply of Improved Chulhas (Cook Stoves) amongst villagers is being considered as appropriate intervention in order to conserve available bio-resources of the area. It would be pertinent to mention here that providing LPG connection to villagers has not proved to be a sustainable approach as the villagers generally are not in a position to afford the high prices of cooking gas cylinders.

5.2.6. Development and Implementation of Appropriate Monitoring and Evaluation System

Monitoring is a process of continuous assessment of plan/project activities in the context of implementing schedules. It takes care of day-to-day progress and management of the project. It is the regular observation and recording of activities taking place in the project and also a process of routinely gathering information or data on all aspects of the project. It involves checking on how

the project activities are progressing. The gathered data are used in making decisions for improving project performance.

Evaluation gathers information from the observed data on monitoring and these are presented in a form which is easy to understand. Evaluation may require some additional studies to obtain data which are available for monitoring.

Numerous monitoring tools may be considered to determine the values of indicators over time. Some of the commonly used tools are as follows:

- Community workshops arranged to evaluate the extent of performance and achievement.
- Community may evaluate some technical indicators such as sediment yield etc.
- Geographical information system (GIS)
- Observation and measurements of field indicators such as soil denudation, advance or reduction in gullies, land use pattern and changes, channel scouring etc.
- Remote sensing satellite imaginaries and aerial photographs of the treated area taken before the implementation of the Plan and thereafter periodically.
- Video monitoring
- Hydro-meteorological data measurements

Evaluation of the Plan is a multi-dimensional task which is generally performed at different times during the implementation of the Plan. Typically, quantitative evaluations reflect a simplistic view that reality takes a single form that can be perceived and measured objectively. On the other hand, qualitative evaluations reflect a more constructive view, implying that reality can have multiple versions. It has been found better to mix both the qualitative and quantitative methods of evaluation. This comes from the fact that purely quantitative and purely qualitative approaches to the program evaluation, both have limitations. The strengths of each evaluation often compensate for the weaknesses of the other evaluation.

The quantitative evaluation attempts to attribute changes in various outcome variables to the treatment and determine whether such effects are statistically significant. An experimental approach is often considered as an acceptable standard for quantitative evaluation of watershed programs. Yet, in many cases the results of such a study may not extrapolate beyond the project examined.

There are many situations wherein an experimental approach to quantitative program evaluation may not be possible. In such situations, various approaches have been used, each with their own strengths and limitations.

The first approach is called a "before/after" study. The evaluator measures the levels of outcome indicators in the area before and after the treatment. This is a fairly weak but feasible approach that involves an unlikely assumption that there have been no other significant changes during the study period. A second approach consisting of a "with/without" study, is useful when no baseline data are available.

Thus, there are clearly multiple challenges associated with using quantitative evaluation methods for evaluation of a project involving catchment area treatment. Most challenges are introduced by the fact that soil and water conservation projects are not amenable to the same controlled conditions as in the experiments which provide the data for a simplistic analysis.

In contrast to quantitative evaluation, qualitative evaluators typically place less emphasis on measurement and more on context and on understanding the subtle manifestations. In general, a qualitative approach tends to be flexibly structured and uses open-ended questions in an inductive fashion. The objective is not to obtain a numerical estimate of some phenomenon, but to develop an in-depth understanding of an issue by probing, clarifying, and listening to stakeholders talk about a topic in their own words. The in-depth nature of the qualitative approach means that a study's scale is usually smaller than that found in quantitative research.

As with quantitative evaluation, sampling issues in qualitative evaluation also raise questions about biases in data. While quantitative researchers use random sampling whenever possible, qualitative researchers use several strategies to increase the internal validity of their findings. In qualitative evaluation, data collection and analysis become inseparable; as such evaluators collect much of the data themselves, rather than relegating this task to field assistants.

Thus, in sum and substance, the monitoring and evaluation functions may include:

(a) Internal monitoring by the Forest Department through Pakur Forest Division.
(b) Progress monitoring:
    (i) GIS/Web based online monitoring;
    (ii) Self-monitoring by communities;
    (iii) External monitoring by independent agencies
(c) Evaluation based on Key Performance Indicators (KPIs)

The technical Key Performance Indicators (KPI) may be identified as follows:

- The extent of soil loss and runoff,
- The amount of discharge in the stream and the amount of sediments in flowing water at the outlet point,
- The increase in the yield of wells and rise in water table,
- Average annual water flow and flood peak,
- Changes in soil moisture,
- Concentration of suspended sediments,
- Annual sediment yield,
- Turbidity of water,
- Biological and chemical properties of water, pH, annual reservoir sedimentation, pesticide concentration, etc.
- Stabilization of slopes
- Areas of treated gullies
- Number and depth of gullies
- Soil fertility
- Organic matter content of soil, etc.

As for the stages of plan evaluation, commonly four stages are prescribed in standard project evaluation methods:

(a) Baseline Evaluation: This is evaluation at the initial stage. The data on the indicators are used as benchmark for evaluation. A reliable baseline data on different selected parameters is provided for this evaluation.
(b) Mid-term Evaluation: This evaluation is proposed to be done in the middle of the plan implementation. The purpose of such mid-term evaluation is to check the effectiveness of each individual activity. This evaluation quantifies the short and mid-term benefits of the project.
(c) Terminal Evaluation: This evaluation shall be done at the end of the plan period. It indicates the efficiency of project implementation, accuracy of the project estimates, etc.
(d) Post-Terminal Evaluation: This evaluation may be carried out after 5 to 15 years of the end of the plan period. Long-term effects and impacts become visible in this post-terminal evaluation. However, as far as the instant plan is concerned, this evaluation may not be

possible and even if it is taken up, the results would not reflect the reality for the reason that the Impact area may be subject to similar other interventions through different schemes of the Forest Department.

5.2.7. Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan

Under this head following are being proposed under the Plan:

- Procurement of vehicles on hire/purchase for intensive supervision of works under the Plan as per need.
- Purchase of Drone System and other equipment like GPS, Mobile phones, instruments meant for monitoring soil moisture etc. as per requirement.
- Purchase of software/hardware/peripherals etc.
- Development of appropriate IT/mobile applications for monitoring & evaluation of the plan.
- Engagement of IT/GIS professionals etc.

The detailed Plan under this head shall be chalked out by the concerned DFO as per need assessment and the sub-components of this head shall not be restricted to the abovementioned subjects only.

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6. SITE-SPECIFIC DESCRIPTION OF YEAR-WISE PROPOSALS UNDER THE PLAN

6.1. SITE-SPECIFIC PROPOSALS FOR YEAR-1 UNDER THE PLAN

Table 17: Site-Specific Physical and Financial Proposals under the Plan in Year-1

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/I	**Bakua**	Earthen Check Dam	24.4772	87.3641	30m L x 3m H	420747
		Gully Plugging	24.4749	87.3609	2m L x 1m H	14147
		Gully Plugging	24.4783	87.3646	2m L x 1m H	14147
	Bara Pahari	Earthen Check Dam	24.4766	87.3786	25m L x 3m H	368428
		Gully Plugging	24.4828	87.3754	2m L x 1m H	14147
		Gully Plugging	24.4780	87.3734	2m L x 1m H	14147
		Gully Plugging	24.4785	87.3737	2m L x 1m H	14147
		LBS*	24.4808	87.3769	5m L x 2m H	91435
		LBS	24.4832	87.3756	6m L x 2m H	109476
		LBS	24.4785	87.3727	6m L x 2m H	109476
	Burhnia	Gully Plugging	24.5083	87.3645	2m L x 1m H	14147
		Gully Plugging	24.5101	87.3663	2m L x 1m H	14147
		Gully Plugging	24.4991	87.3727	2m L x 1m H	14147
		Gully Plugging	24.5000	87.3734	2m L x 1m H	14147
		LBS	24.5087	87.3634	6m L x 2m H	109476
		WAT**	24.5091	87.3631	6.00 ha	116052
		WAT	24.5083	87.3613	8.00 ha	154736
	Koilo	Gully Plugging	24.4952	87.3812	2m L x 1m H	14147
		Gully Plugging	24.5012	87.3819	2m L x 1m H	14147
		Gully Plugging	24.5000	87.3877	2m L x 1m H	14147
		LBS	24.4841	87.3757	6m L x 2m H	109476
		LBS	24.4986	87.3840	6m L x 2m H	109476
		LBS	24.4994	87.3833	6m L x 2m H	109476
		LBS	24.5000	87.3843	6m L x 2m H	109476
		LBS	24.4928	87.3848	6m L x 2m H	109476

		LBS	24.4985	87.3830	6m L x 2m H	109476
		LBS	24.4923	87.3789	6m L x 2m H	109476
		LBS	24.4846	87.3750	6m L x 2m H	109476
		LBS	24.4948	87.3818	7m L x 2m H	127518
		LBS	24.4953	87.3822	7m L x 2m H	127518
		LBS	24.4941	87.3828	7m L x 2m H	127518
		LBS	24.4985	87.3818	7m L x 2m H	127518
	Kolha	Gully Plugging	24.4908	87.3919	2m L x 1m H	14147
		LBS	24.4974	87.3974	5m L x 2m H	91435
		LBS	24.4997	87.3982	6m L x 2m H	109476
		LBS	24.4966	87.3967	6m L x 2m H	109476
		LBS	24.4971	87.4007	7m L x 2m H	127518
		LBS	24.4948	87.3954	8m L x 2m H	145560
	Kolha Pahar	Gully Plugging	24.4856	87.3908	2m L x 1m H	14147
		Gully Plugging	24.4877	87.3921	2m L x 1m H	14147
		Gully Plugging	24.4884	87.3911	2m L x 1m H	14147
	Kulapathar	Gully Plugging	24.4904	87.3599	2m L x 1m H	14147
		LBS	24.4826	87.3611	6m L x 2m H	109476
		LBS	24.4900	87.3584	6m L x 2m H	109476
	Mahuadangal	Gully Plugging	24.4744	87.3653	2m L x 1m H	14147
		Gully Plugging	24.4731	87.3644	2m L x 1m H	14147
		Gully Plugging	24.4739	87.3647	3m L x 1m H	20608
		Gully Plugging	24.4741	87.3659	2m L x 1m H	14147
	Mahuapathar	LBS	24.5131	87.3519	5m L x 2m H	91435
		LBS	24.5210	87.3502	6m L x 2m H	109476
		Stop Dam (De-siltation)***	24.5130	87.3556	12m L x 3m H	75000
	Pardaniduma	Gully Plugging	24.4919	87.3505	2m L x 1m H	14147
		LBS	24.4928	87.3500	6m L x 2m H	109476
		Stop Dam	24.4935	87.3506	25m L x 3m H	2280495
		Stop Dam	24.4897	87.3510	15m L x 3m H	1836548
	Raidih	Gully Plugging	24.5251	87.3616	2m L x 1m H	14147
		LBS	24.5216	87.3517	6m L x 2m H	109476
		LBS	24.5213	87.3545	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5227	87.3568	15m L x 3m H	100000

		Stop Dam (De-siltation)	24.5221	87.3602	20m L x 3m H	125000
	Rajamar	LBS	24.4998	87.3549	6mL x 2m H	109476
		Stop Dam (De-siltation)	24.4966	87.3573	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.4950	87.3533	30m L x 3m H	150000
	Rangamatia	Gully Plugging	24.5150	87.3619	3m L x 1m H	20608
		Gully Plugging	24.5119	87.3599	3m L x 1m H	20608
		LBS	24.5154	87.3614	6m L x 2m H	109476
	Sahara	Gully Plugging	24.4996	87.3759	2m L x 1m H	14147
		Gully Plugging	24.4882	87.3728	2m L x 1m H	14147
		Gully Plugging	24.4991	87.3763	3m L x 1m H	20608
		LBS	24.4920	87.3766	5m L x 2m H	91435
		LBS	24.4927	87.3770	5m L x 2m H	91435
		LBS	24.4929	87.3782	6m L x 2m H	109476
		LBS	24.5004	87.3756	6m L x 2m H	109476
		LBS	24.4892	87.3731	6m L x 2m H	109476
		LBS	24.4840	87.3745	6m L x 2m H	109476
		LBS	24.4991	87.3752	7m L x 2m H	127518
		LBS	24.4912	87.3739	8m L x 2m H	145560
		LBS	24.4925	87.3749	8m L x 2m H	145560
		LBS	24.4872	87.3721	8m L x 2m H	145560
		LBS	24.4857	87.3738	8m L x 2m H	145560
		LBS	24.4862	87.3720	8m L x 2m H	145560
	Simra	Earthen Check Dam	24.4532	87.3788	25m L x 3m H	368428
		Earthen Check Dam	24.4582	87.3710	30m L x 3m H	420747
		Gully Plugging	24.4485	87.3830	2m L x 1m H	14147
		Gully Plugging	24.4495	87.3792	2m L x 1m H	14147
		Gully Plugging	24.4520	87.3778	2m L x 1m H	14147
		Gully Plugging	24.4598	87.3705	2m L x 1m H	14147
		Gully Plugging	24.4603	87.3693	2m L x 1m H	14147
		Gully Plugging	24.4584	87.3685	2m L x 1m H	14147
		Gully Plugging	24.4591	87.3698	2m L x 1m H	14147
		Gully Plugging	24.4527	87.3802	2m L x 1m H	14147
		Gully Plugging	24.4522	87.3802	2m L x 1m H	14147
		Gully Plugging	24.4519	87.3791	2m L x 1m H	14147
		Gully Plugging	24.4518	87.3816	2m L x 1m H	14147

		Gully Plugging	24.4477	87.3839	2m L x 1m H	14147
		Gully Plugging	24.4483	87.3838	2m L x 1m H	14147
		Gully Plugging	24.4617	87.3689	2m L x 1m H	14147
		LBS	24.4527	87.3788	5m L x 2m H	91435
		LBS	24.4500	87.3804	6m L x 2m H	109476
		LBS	24.4506	87.3794	6m L x 2m H	109476
		LBS	24.4603	87.3714	6m L x 2m H	109476
		LBS	24.4525	87.3798	6m L x 2m H	109476
		LBS	24.4522	87.3799	6m L x 2m H	109476
		LBS	24.4518	87.3799	6m L x 2m H	109476
		LBS	24.4515	87.3801	6m L x 2m H	109476
		LBS	24.4510	87.3811	6m L x 2m H	109476
		LBS	24.4497	87.3815	6m L x 2m H	109476
		LBS	24.4520	87.3747	6m L x 2m H	109476
		LBS	24.4523	87.3766	6m L x 2m H	109476
		LBS	24.4526	87.3776	6m L x 2m H	109476
		LBS	24.4492	87.3818	6m L x 2m H	109476
		Stop Dam	24.4608	87.3703	15m L x 3m H	1836548
	Tesaphuli	Gully Plugging	24.4653	87.3818	2m L x 1m H	14147
D/SMC/II	**Amgachhi**	Gully Plugging	24.4265	87.4051	2m L x 1m H	14147
		Gully Plugging	24.4153	87.4086	2m L x 1m H	14147
		Gully Plugging	24.4275	87.4074	2m L x 1m H	14147
		Stop Dam	24.4253	87.4091	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.4147	87.4124	25m L x 3m H	125000
	Balidih	Gully Plugging	24.4568	87.3877	2m L x 1m H	14147
		Gully Plugging	24.4706	87.3863	2m L x 1m H	14147
		Gully Plugging	24.4710	87.3855	2m L x 1m H	14147
		Gully Plugging	24.4585	87.3859	2m L x 1m H	14147
		Gully Plugging	24.4695	87.3863	2m L x 1m H	14147
		Gully Plugging	24.4700	87.3858	2m L x 1m H	14147
		Gully Plugging	24.4707	87.3880	2m L x 1m H	14147
		Gully Plugging	24.4679	87.3906	2m L x 1m H	14147
		Gully Plugging	24.4559	87.3877	2m L x 1m H	14147
		Gully Plugging	24.4565	87.3876	2m L x 1m H	14147

		Gully Plugging	24.4602	87.3875	2m L x 1m H	14147
		Gully Plugging	24.4602	87.3865	2m L x 1m H	14147
		Gully Plugging	24.4586	87.3867	2m L x 1m H	14147
		Gully Plugging	24.4591	87.3857	2m L x 1m H	14147
		Gully Plugging	24.4582	87.3852	2m L x 1m H	14147
		Gully Plugging	24.4585	87.3854	2m L x 1m H	14147
		Gully Plugging	24.4589	87.3863	2m L x 1m H	14147
		Gully Plugging	24.4584	87.3847	2m L x 1m H	14147
		Gully Plugging	24.4586	87.3841	2m L x 1m H	14147
		Gully Plugging	24.4592	87.3823	2m L x 1m H	14147
		Gully Plugging	24.4595	87.3821	2m L x 1m H	14147
		Gully Plugging	24.4597	87.3855	2m L x 1m H	14147
		Gully Plugging	24.4453	87.3863	2m L x 1m H	14147
		Gully Plugging	24.4650	87.3853	2m L x 1m H	14147
		Gully Plugging	24.4625	87.3840	2m L x 1m H	14147
		Gully Plugging	24.4612	87.3835	4m L x 1m H	27068
		Gully Plugging	24.4593	87.3847	4m L x 1m H	27068
		LBS	24.4691	87.3875	6m L x 2m H	109476
		LBS	24.4663	87.3857	6m L x 2m H	109476
		LBS	24.4637	87.3860	6m L x 2m H	109476
		LBS	24.4624	87.3852	6m L x 2m H	109476
		LBS	24.4478	87.3853	6m L x 2m H	109476
		LBS	24.4481	87.3854	6m L x 2m H	109476
		LBS	24.4682	87.3868	6m L x 2m H	109476
		LBS	24.4567	87.3892	6m L x 2m H	109476
		LBS	24.4697	87.3879	6m L x 2m H	109476
		LBS	24.4574	87.3849	6m L x 2m H	109476
		LBS	24.4578	87.3851	6m L x 2m H	109476
		LBS	24.4582	87.3841	6m L x 2m H	109476
		LBS	24.4487	87.3847	6m L x 2m H	109476
		Stop Dam	24.4619	87.3865	30m L x 3m H	2509359
		Stop Dam	24.4559	87.3851	15m L x 3m H	1836548
		Stop Dam	24.4507	87.3839	15m L x 3m H	1836548
		Stop Dam	24.4673	87.3907	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4638	87.3888	20m L x 3m H	125000

		Stop Dam (De-siltation)	24.4591	87.3827	25m L x 3m H	125000
					LBS (Loose Boulder Structures) – 69 nos.	77,70,354
					Gully Plugging – 73 nos.	10,84,417
					Earthen Check Dams – 4 nos.	15,78,350
					Stop Dams – 8 nos.	1,60,33,412
					Water Absorption Trenches (WAT) – 14 ha	2,70,788
					De-siltation of Existing Stop Dams – 8 nos.	9,25,000
					Total	**2,76,62,321.00**
Silvicultural Operations with Gap Plantation around the Periphery of Lease; 15.56 ha (Advance Work)						**10,87,472.00**
Total (Dumka Forest Division) – SMC Works (Year-1)						**2,87,49,793.00**
GODDA FOREST DIVISION						
G/SMC/I	**Bajrajogosami**	Gully Plugging	24.5725	87.4065	2m L x 1m H	14147
		Gully Plugging	24.5726	87.4057	2m L x 1m H	14147
		Gully Plugging	24.5727	87.4066	2m L x 1m H	14147
		Gully Plugging	24.5804	87.4102	2m L x 1m H	14147
		Gully Plugging	24.5805	87.4107	2m L x 1m H	14147
		LBS	24.5650	87.4107	6m L x 2m H	109476
		LBS	24.5651	87.4119	6m L x 2m H	109476
		LBS	24.5675	87.4156	6m L x 2m H	109476
		LBS	24.5698	87.4104	8m L x 2m H	145560
		LBS	24.5700	87.4114	8m L x 2m H	145560
		LBS	24.5709	87.4119	12m L x 2m H	217726
		LBS	24.5724	87.4061	6m L x 2m H	109476
		Stop Dam	24.5834	87.4068	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.5716	87.4126	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.5738	87.4132	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.5805	87.4128	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.5772	87.4117	15m L x 3m H	100000
	Bara Dangapara	Gully Plugging	24.5833	87.4287	2m L x 1m H	14147
		Gully Plugging	24.5834	87.4283	2m L x 1m H	14147
		Gully Plugging	24.5926	87.4277	2m L x 1m H	14147
		Gully Plugging	24.5927	87.4274	2m L x 1m H	14147
		LBS	24.5884	87.4360	6m L x 2m H	109476
		LBS	24.5903	87.4362	8m L x 2m H	145560

		LBS	24.5917	87.4361	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.5851	87.4361	20m L x 3m H	125000
	Bokrabandh	Gully Plugging	24.5857	87.3928	2m L x 1m H	14147
		Gully Plugging	24.5858	87.3932	2m L x 1m H	14147
		Gully Plugging	24.5879	87.3900	2m L x 1m H	14147
		Gully Plugging	24.5881	87.3901	2m L x 1m H	14147
		Gully Plugging	24.5881	87.3901	2m L x 1m H	14147
		Gully Plugging	24.5906	87.3848	2m L x 1m H	14147
		Gully Plugging	24.5912	87.3847	2m L x 1m H	14147
		Gully Plugging	24.5919	87.3846	2m L x 1m H	14147
		LBS	24.5923	87.3844	5m L x 2m H	91435
		LBS	24.5932	87.3852	8m L x 2m H	145560
		LBS	24.5938	87.4063	5m L x 2m H	91435
		LBS	24.5953	87.3938	5m L x 2m H	91435
		LBS	24.5960	87.3989	5m L x 2m H	91435
		LBS	24.5959	87.3928	5m L x 2m H	91435
		LBS	24.5963	87.3896	6m L x 2m H	109476
		LBS	24.5963	87.3920	5m L x 2m H	91435
		LBS	24.5964	87.3910	5m L x 2m H	91435
		LBS	24.5964	87.3910	5m L x 2m H	91435
		LBS	24.5969	87.3938	5m L x 2m H	91435
		Stop Dam	24.5836	87.4034	15m L x 3m H	1836548
	Barai	Gully plugging	24.5858	87.4168	2m L x 1m H	14147
		Gully plugging	24.5858	87.4168	2m L x 1m H	14147
		Gully plugging	24.5862	87.4168	2m L x 1m H	14147
		Gully plugging	24.5864	87.4173	2m L x 1m H	14147
		Gully Plugging	24.5842	87.4206	3m L x 1m H	20608
		LBS	24.5769	87.4205	10m L x 2m H	181643
		LBS	24.5818	87.4181	6m L x 2m H	109476
		LBS	24.5826	87.417	6m L x 2m H	109476
		LBS	24.5830	87.4168	6m L x 2m H	109476
		LBS	24.5836	87.4165	8m L x 2m H	145560
		LBS	24.5839	87.4161	6m L x 2m H	109476
		LBS	24.584	87.4199	6m L x 2m H	109476

		LBS	24.5861	87.4170	6m L x 2m H	109476
		LBS	24.5870	87.4179	8m L x 2m H	145560
		LBS	24.5873	87.4188	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5743	87.4184	15m L x 3m H	100000
	Chhota Dangapara	Gully plugging	24.5780	87.4273	2m L x 1m H	14147
		Gully plugging	24.5784	87.4278	2m L x 1m H	14147
		Stop Dam (De-siltation)	24.5739	87.4298	18m L x 3m H	100000
		Stop Dam (De-siltation)	24.5759	87.432	18m L x 3m H	100000
	Damakol	Gully plugging	24.5747	87.4365	2m L x 1m H	14147
		Gully Plugging	24.5753	87.4367	2m L x 1m H	14147
		LBS	24.5770	87.4325	12m L x 2m H	217726
		LBS	24.5793	87.4340	6m L x 2m H	109476
		LBS	24.5810	87.4364	6m L x 2m H	109476
		LBS	24.5830	87.4383	6m L x 2m H	109476
	Doriya	Gully Plugging	24.6012	87.4555	2m L x 1m H	14147
		Gully Plugging	24.6031	87.4549	2m L x 1m H	14147
		Gully Plugging	24.6038	87.4552	2m L x 1m H	14147
		Gully Plugging	24.6051	87.456	2m L x 1m H	14147
		LBS	24.61352	87.44707	8m L x 2m H	145560
		Gully Plugging	24.6145	87.4543	2m L x 1m H	14147
		LBS	24.613	87.4447	5m L x 2m H	91435
		LBS	24.61489	87.44895	6m L x 2m H	109476
	Dumara Palampura	Gully plugging	24.5574	87.4183	2m L x 1m H	14147
		Gully plugging	24.5653	87.4335	2m L x 1m H	14147
		Gully plugging	24.5656	87.4329	2m L x 1m H	14147
	Golkunda	Earthen Check Dam	24.5989	87.4465	25m L x 3m H	368428
		Gully Plugging	24.5994	87.4422	2m L x 1m H	14147
		Gully Plugging	24.6016	87.4466	2m L x 1m H	14147
		Gully Plugging	24.6036	87.4464	2m L x 1m H	14147
		LBS	24.5979	87.4554	6m L x 2m H	109476
		LBS	24.5986	87.4472	6m L x 2m H	109476
		LBS	24.5989	87.4558	6m L x 2m H	109476
		LBS	24.5990	87.4464	5m L x 2m H	91435
		LBS	24.5996	87.4569	6m L x 2m H	109476
		LBS	24.5998	87.4557	5m L x 2m H	91435

		LBS	24.5999	87.4425	6m L x 2m H	109476
		LBS	24.5999	87.4467	5m L x 2m H	91435
		LBS	24.6002	87.4574	6m L x 2m H	109476
		LBS	24.6005	87.4466	5m L x 2m H	91435
		LBS	24.6008	87.4399	5m L x 2m H	91435
		LBS	24.6015	87.4408	6m L x 2m H	109476
		LBS	24.6020	87.4419	6m L x 2m H	109476
		LBS	24.6021	87.4439	6m L x 2m H	109476
		LBS	24.6021	87.4448	6m L x 2m H	109476
		LBS	24.6022	87.4428	6m L x 2m H	109476
		LBS	24.6022	87.4463	6m L x 2m H	109476
		LBS	24.6024	87.4456	6m L x 2m H	109476
		LBS	24.6029	87.4463	6m L x 2m H	109476
		LBS	24.6097	87.4407	5m L x 2m H	91435
		LBS	24.6108	87.4417	6m L x 2m H	109476
		LBS	24.6115	87.4425	6m L x 2m H	109476
		LBS	24.6052	87.4376	8m L x 2m H	145560
		LBS	24.6062	87.4385	8m L x 2m H	145560
	Hardisol	Earthen Check Dam	24.6026	87.3998	30m L x 3m H	420747
		Gully Plugging	24.6010	87.4013	2m L x 1m H	14147
		Gully Plugging	24.6010	87.4022	2m L x 1m H	14147
		Gully Plugging	24.6022	87.4004	2m L x 1m H	14147
		Gully Plugging	24.6036	87.3993	2m L x 1m H	14147
		Gully Plugging	24.6040	87.3984	2m L x 1m H	14147
		Gully Plugging	24.6046	87.3962	2m L x 1m H	14147
		Gully Plugging	24.6122	87.3982	2m L x 1m H	14147
		Gully Plugging	24.6122	87.3988	2m L x 1m H	14147
		Gully Plugging	24.6125	87.3987	2m L x 1m H	14147
		Gully Plugging	24.6026	87.4072	2m L x 1m H	14147
		LBS	24.6021	87.4018	5m L x 2m H	91435
		LBS	24.6021	87.4078	5m L x 2m H	91435
		LBS	24.6026	87.402	5m L x 2m H	91435
		LBS	24.6034	87.4019	6m L x 2m H	109476
		LBS	24.6042	87.3979	5m L x 2m H	91435
		LBS	24.6042	87.3979	5m L x 2m H	91435

		LBS	24.6042	87.4027	6m L x 2m H	109476
		LBS	24.6050	87.4027	6m L x 2m H	109476
		LBS	24.6053	87.4016	6m L x 2m H	109476
		LBS	24.6054	87.4038	5m L x 2m H	91435
		LBS	24.6086	87.4030	5m L x 2m H	91435
		LBS	24.5960	87.4059	6m L x 2m H	109476
		LBS	24.6102	87.4013	8m L x 2m H	145560
		Stop Dam	24.6116	87.3993	15m L x 3m H	1836548
LBS (Loose Boulder Structures) – 75 nos.						84,81,348
Gully Plugging – 47 nos.						6,71,370
Earthen Check Dams – 2 nos.						7,89,175
Stop Dams – 3 nos.						57,33,914
Water Absorption Trenches (WAT) –ha						-
De-siltation of Existing Stop Dams – 8 nos.						9,00,000
Total (Godda Forest Division) – SMC Works (Year-1)						**1,65,75,807.00**

***L.B.S. stands for Loose Boulder Structure. This is also referred to as L.B.C.D. i.e., Loose Boulder Check Dam.**

****W.A.T. – Water Absorption Trench – This work shall be done primarily on suitable forest land. However, suitable common land may also be taken up in case of non-availability of forest land.**

*****A lumpsum cost for de-siltation/repair of stop dams has been taken into account.**

6.2. SITE-SPECIFIC PROPOSALS FOR YEAR-2 UNDER THE PLAN

Table 18: Site-Specific Physical and Financial Proposals under the Plan in Year-2

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/II	**Banjhiam**	Gully Plugging	24.4626	87.4436	2m L x 1m H	14147
		LBS	24.4650	87.4448	10m L x 2m H	181643
	Bara Bhuibhanga	Earthen Check Dam	24.4488	87.4017	60m L x 3m H	734660
		Gully Plugging	24.4405	87.3983	2m L x 1m H	14147
		Gully Plugging	24.4379	87.3992	2m L x 1m H	14147
		Gully Plugging	24.4403	87.3970	2m L x 1m H	14147
		Gully Plugging	24.4439	87.4033	3m L x 1m H	20608
		Gully Plugging	24.4422	87.3966	3m L x 1m H	20608
		LBS	24.4355	87.3952	12m L x 2m H	217726
		LBS	24.4399	87.3958	6m L x 2m H	109476
		LBS	24.4374	87.3957	6m L x 2m H	109476
		LBS	24.4410	87.3961	8m L x 2m H	145560
		LBS	24.4321	87.3965	8m L x 2m H	145560
	Bara Chaparia	Earthen Check Dam	24.4536	87.3995	30m L x 3m H	420747
		Gully Plugging	24.4431	87.3898	2m L x 1m H	14147
		Gully Plugging	24.4406	87.3915	2m L x 1m H	14147
		Gully Plugging	24.4397	87.3912	2m L x 1m H	14147
		Gully Plugging	24.4443	87.3890	2m L x 1m H	14147
		Gully Plugging	24.4408	87.3925	2m L x 1m H	14147
		Gully Plugging	24.4513	87.3994	2m L x 1m H	14147
		Gully Plugging	24.4510	87.3986	2m L x 1m H	14147
		Gully Plugging	24.4514	87.3981	2m L x 1m H	14147
		Gully Plugging	24.4422	87.3874	2m L x 1m H	14147
		Gully Plugging	24.4432	87.3870	2m L x 1m H	14147
		Gully Plugging	24.4439	87.3871	2m L x 1m H	14147
		Gully Plugging	24.4412	87.3880	2m L x 1m H	14147
		Gully Plugging	24.4505	87.4009	4m L x 1m H	27068

		Gully Plugging	24.4503	87.4016	4m L x 1m H	27068
		LBS	24.4468	87.3922	12m L x 2m H	217726
		LBS	24.4460	87.3922	6m L x 2m H	109476
		LBS	24.4515	87.3900	6m L x 2m H	109476
		LBS	24.4495	87.3986	6m L x 2m H	109476
		LBS	24.4506	87.3892	6m L x 2m H	109476
		LBS	24.4509	87.3972	6m L x 2m H	109476
		LBS	24.4504	87.3965	6m L x 2m H	109476
		LBS	24.4498	87.3958	6m L x 2m H	109476
		LBS	24.4492	87.3994	8m L x 2m H	145560
		Stop Dam	24.4496	87.3976	20m L x 3m H	2060818
		Stop Dam	24.4478	87.3941	15m L x 3m H	1836548
		Stop Dam	24.4521	87.3925	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4547	87.3948	15m L x 3m H	100000
	Baskia	Earthen Check Dam	24.4477	87.3814	30m L x 3m H	420747
		Gully Plugging	24.4462	87.3781	2m L x 1m H	14147
		Gully Plugging	24.4461	87.3777	2m L x 1m H	14147
		Gully Plugging	24.4476	87.3787	2m L x 1m H	14147
		Gully Plugging	24.4477	87.3781	2m L x 1m H	14147
		Gully Plugging	24.4465	87.3785	2m L x 1m H	14147
		Gully Plugging	24.4477	87.3791	2m L x 1m H	14147
		Gully Plugging	24.4480	87.3792	2m L x 1m H	14147
		Gully Plugging	24.4492	87.3811	2m L x 1m H	14147
		Gully Plugging	24.4472	87.3823	2m L x 1m H	14147
		Gully Plugging	24.4493	87.3809	2m L x 1m H	14147
		Gully Plugging	24.4440	87.3771	2m L x 1m H	14147
		Gully Plugging	24.4458	87.3784	2m L x 1m H	14147
		Gully Plugging	24.4455	87.3790	2m L x 1m H	14147
		Gully Plugging	24.4444	87.3775	2m L x 1m H	14147
		Gully Plugging	24.4449	87.3776	2m L x 1m H	14147
		Gully Plugging	24.4462	87.3845	2m L x 1m H	14147
		Gully Plugging	24.4459	87.3843	2m L x 1m H	14147
		Gully Plugging	24.4458	87.3796	2m L x 1m H	14147
		Gully Plugging	24.4466	87.3822	2m L x 1m H	14147
		Gully Plugging	24.4470	87.3808	2m L x 1m H	14147

		Gully Plugging	24.4480	87.3818	2m L x 1m H	14147
		Gully Plugging	24.4457	87.3775	3m L x 1m H	20608
		LBS	24.4488	87.3818	6m L x 2m H	109476
		LBS	24.4489	87.3807	6m L x 2m H	109476
		LBS	24.4476	87.3831	6m L x 2m H	109476
		LBS	24.4469	87.3834	6m L x 2m H	109476
		Stop Dam	24.4455	87.3839	18m L x 3m H	1971110
		WAT	24.4451	87.3803	6.00 ha	116052
	Chhota Bhuibhanga	Gully Plugging	24.4301	87.4028	2m L x 1m H	14147
		Gully Plugging	24.4336	87.4027	2m L x 1m H	14147
		LBS	24.4305	87.4037	6m L x 2m H	109476
		LBS	24.4280	87.4017	6m L x 2m H	109476
		LBS	24.4319	87.4010	6m L x 2m H	109476
		Stop Dam	24.4331	87.4100	18m L x 3m H	1971110
		Stop Dam	24.4294	87.4090	22m L x 3m H	2141340
		Stop Dam (De-siltation)	24.4271	87.4012	10m L x 3m H	75000
	Chhota Chaparia	Gully Plugging	24.4544	87.4161	2m L x 1m H	14147
		Gully Plugging	24.4544	87.4161	3m L x 1m H	20608
		Gully Plugging	24.4517	87.4144	2m L x 1m H	14147
		Stop Dam (De-siltation)	24.4542	87.4182	15m L x 3m H	100000
	Dhibri	Gully Plugging	24.4328	87.3930	2m L x 1m H	14147
		Gully Plugging	24.4328	87.3930	2m L x 1m H	14147
		Gully Plugging	24.4348	87.3916	3m L x 1m H	20608
		Stop Dam	24.4367	87.3916	22m L x 3m H	2141340
		Stop Dam (De-siltation)	24.4326	87.3948	15m L x 3m H	100000
	Dumra Pahar	Earthen Check Dam	24.4718	87.4236	20m L x 3m H	316110
		Earthen Check Dam	24.4610	87.4351	60m L x 3m H	734660
		Gully Plugging	24.4626	87.4435	2m L x 1m H	14147
		Gully Plugging	24.4756	87.4471	2m L x 1m H	14147
		LBS	24.4703	87.4429	5m L x 2m H	91435
		LBS	24.4691	87.4291	5m L x 2m H	91435
		LBS	24.4758	87.4493	6m L x 2m H	109476
		LBS	24.4745	87.4497	6m L x 2m H	109476
		Stop Dam	24.4629	87.4409	15m L x 3m H	1836548
		Stop Dam	24.4576	87.4347	15m L x 3m H	1836548

		Stop Dam	24.4727	87.4493	15m L x 3m H	1836548
		Stop Dam	24.4601	87.4371	15m L x 3m H	1836548
		Stop Dam	24.4700	87.4429	22m L x 3m H	2141340
		Stop Dam (De-siltation)	24.4705	87.4463	12m L x 3m H	75000
		Stop Dam (De-siltation)	24.4670	87.4426	15m L x 3m H	100000
					LBS (Loose Boulder Structures) – 26 nos.	32,07,213
					Gully Plugging – 52 nos.	7,93,791
					Earthen Check Dams – 5 nos.	26,26,924
					Stop Dams – 12 nos.	2,34,46,346
					Water Absorption Trenches (WAT) – 6 ha	1,16,052
					De-siltation of Existing Stop Dams – 6 nos.	5,50,000
					Total	**3,07,40,326.00**
Silvicultural Operations with Gap Plantation around the Periphery of Lease; 15.56 ha (Completion Work)						**2,09,232.00**
Total (Dumka Forest Division) – SMC Works (Year-2)						**3,09,49,558.00**
GODDA FOREST DIVISION						
G/SMC/I	**Kadamba**	Earthen Check Dam	24.5840	87.4407	30m L x 3m H	420747
		Gully plugging	24.5834	87.4407	2m L x 1m H	14147
		Gully plugging	24.5837	87.4402	2m L x 1m H	14147
		Gully plugging	24.5838	87.4406	2m L x 1m H	14147
		Gully plugging	24.5842	87.4413	2m L x 1m H	14147
	Kathaldih	Gully plugging	24.5690	87.4419	2m L x 1m H	14147
		Gully plugging	24.5691	87.4422	2m L x 1m H	14147
		Gully plugging	24.5697	87.4397	2m L x 1m H	14147
		Gully plugging	24.5780	87.4395	2m L x 1m H	14147
		Gully plugging	24.5766	87.4400	3m L x 1m H	20608
		LBS	24.5669	87.4430	6m L x 2m H	109476
		LBS	24.5692	87.4473	6m L x 2m H	109476
		LBS	24.5697	87.4466	6m L x 2m H	109476
		LBS	24.5704	87.4506	6m L x 2m H	109476
		LBS	24.5693	87.4390	6m L x 2m H	109476
		LBS	24.5725	87.4542	6m L x 2m H	109476
		LBS	24.5710	87.4384	12m L x 2m H	217726
		LBS	24.5775	87.4411	6m L x 2m H	109476
		LBS	24.5777	87.4428	6m L x 2m H	109476
		LBS	24.5786	87.4467	6m L x 2m H	109476

		LBS	24.5789	87.4439	6m L x 2m H	109476
		LBS	24.5789	87.4486	6m L x 2m H	109476
		LBS	24.5858	87.4522	6m L x 2m H	109476
		LBS	24.5728	87.4380	6m L x 2m H	109476
		LBS	24.5871	87.4531	8m L x 2m H	145560
		Stop Dam	24.5823	87.4512	15m L x 3m H	1836548
	Kamupahari	Earthen Check Dam	24.5608	87.4061	40m L x 3m H	525385
		Gully Plugging	24.5611	87.4068	2m L x 1m H	14147
		Gully Plugging	24.5617	87.4066	2m L x 1m H	14147
		Gully Plugging	24.562	87.4067	2m L x 1m H	14147
		Gully Plugging	24.562	87.4093	2m L x 1m H	14147
		Gully Plugging	24.5624	87.4069	2m L x 1m H	14147
		Gully Plugging	24.5628	87.4069	2m L x 1m H	14147
		Gully Plugging	24.5629	87.4024	2m L x 1m H	14147
		Gully Plugging	24.5630	87.4063	2m L x 1m H	14147
		Gully Plugging	24.5631	87.4067	2m L x 1m H	14147
		Gully Plugging	24.5632	87.4071	2m L x 1m H	14147
		Gully Plugging	24.5633	87.4028	2m L x 1m H	14147
		Gully Plugging	24.5636	87.4029	2m L x 1m H	14147
		Gully Plugging	24.5725	87.4052	2m L x 1m H	14147
		LBS	24.5605	87.4052	6m L x 2m H	109476
		LBS	24.5609	87.4076	8m L x 2m H	145560
		LBS	24.5619	87.4080	6m L x 2m H	109476
		LBS	24.5615	87.4058	6m L x 2m H	109476
		LBS	24.5624	87.4089	6m L x 2m H	109476
		LBS	24.5629	87.4084	6m L x 2m H	109476
		LBS	24.5702	87.4089	12m L x 2m H	217726
		LBS	24.5706	87.4009	6m L x 2m H	109476
		LBS	24.5715	87.4059	6m L x 2m H	109476
		Gully Plugging	24.5719	87.4055	4m L x 1m H	27068
		LBS	24.5722	87.4051	6m L x 2m H	109476
	Malipara	Gully Plugging	24.5971	87.4292	2m L x 1m H	14147
		Gully Plugging	24.5975	87.429	2m L x 1m H	14147
		Gully Plugging	24.6004	87.4345	2m L x 1m H	14147
		LBS	24.5935	87.4366	6m L x 2m H	109476

		LBS	24.5950	87.4333	6m L x 2m H	109476
		LBS	24.5955	87.4328	5m L x 2m H	91435
		LBS	24.5968	87.4386	6m L x 2m H	109476
		LBS	24.5984	87.4373	6m L x 2m H	109476
		LBS	24.5986	87.4381	6m L x 2m H	109476
		LBS	24.5998	87.4359	8m L x 2m H	145560
		LBS	24.6005	87.4346	5m L x 2m H	91435
		LBS	24.6008	87.435	6m L x 2m H	109476
		LBS	24.6026	87.4286	6m L x 2m H	109476
		LBS	24.6031	87.4291	6m L x 2m H	109476
		LBS	24.6033	87.4305	8m L x 2m H	145560
		LBS	24.6034	87.4297	6m L x 2m H	109476
		LBS	24.6037	87.4313	6m L x 2m H	109476
		LBS	24.6085	87.4394	6m L x 2m H	109476
		LBS	24.6095	87.4287	5m L x 2m H	91435
	Mulgipur	Gully Plugging	24.5672	87.4361	2m L x 1m H	14147
		Gully Plugging	24.5670	87.4265	2m L x 1m H	14147
		Gully Plugging	24.5678	87.4267	2m L x 1m H	14147
		LBS	24.5653	87.4436	6m L x 2m H	109476
		LBS	24.5675	87.4407	6m L x 2m H	109476
		LBS	24.5676	87.4372	6m L x 2m H	109476
		LBS	24.5686	87.4386	6m L x 2m H	109476
	Pakrikhuta	Gully Plugging	24.5844	87.44	2m L x 1m H	14147
		Gully Plugging	24.5844	87.4403	2m L x 1m H	14147
		Gully Plugging	24.5901	87.4448	2m L x 1m H	14147
		Gully Plugging	24.5914	87.4494	2m L x 1m H	14147
		Gully Plugging	24.5917	87.4494	2m L x 1m H	14147
		LBS	24.5883	87.4508	6m L x 2m H	109476
		LBS	24.5885	87.4472	6m L x 2m H	109476
		LBS	24.5888	87.4428	5m L x 2m H	91435
		LBS	24.5894	87.4492	5m L x 2m H	91435
		LBS	24.5900	87.4545	6m L x 2m H	109476
		LBS	24.5908	87.4546	5m L x 2m H	91435
		LBS	24.5909	87.4436	6m L x 2m H	109476
		LBS	24.5914	87.4455	6m L x 2m H	109476

		LBS	24.5919	87.4475	5m L x 2m H	91435
		LBS	24.5963	87.4407	6m L x 2m H	109476
		LBS	24.5964	87.4430	6m L x 2m H	109476
		LBS	24.5962	87.4418	6m L x 2m H	109476
		Stop Dam	24.5950	87.4379	15m L x 3m H	1836548
	Pipra	Gully Plugging	24.5795	87.3928	2m L x 1m H	14147
		Gully Plugging	24.5795	87.3928	2m L x 1m H	14147
		Gully Plugging	24.5798	87.3924	2m L x 1m H	14147
		Gully Plugging	24.5806	87.3947	2m L x 1m H	14147
		Gully Plugging	24.5812	87.3947	2m L x 1m H	14147
		LBS	24.5740	87.4022	5m L x 2m H	91435
		LBS	24.5747	87.4014	6m L x 2m H	109476
		LBS	24.5751	87.4026	6m L x 2m H	109476
		LBS	24.5766	87.4012	6m L x 2m H	109476
		LBS	24.5779	87.4007	5m L x 2m H	91435
		LBS	24.5791	87.4005	5m L x 2m H	91435
		Stop Dam	24.5804	87.3981	15m L x 3m H	1836548
		Stop Dam	24.5823	87.3956	22m L x 3m H	2141340
LBS (Loose Boulder Structures) – 63 nos.						70,77,414
Gully Plugging – 39 nos.						5,71,115
Earthen Check Dams – 2 nos.						9,46,132
Stop Dams – 4 nos.						76,50,984
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams						-
Total (Godda Forest Division) – SMC Works (Year-2)						**1,62,45,645.00**

6.3. SITE-SPECIFIC PROPOSALS FOR YEAR-3 UNDER THE PLAN

Table 19: Site-Specific Physical and Financial Proposals under the Plan in Year-3

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/II	**Dumaria**	Gully Plugging	24.4374	87.4093	2m L x 1m H	14147
		Gully Plugging	24.4375	87.4079	2m L x 1m H	14147
		Gully Plugging	24.4374	87.4067	2m L x 1m H	14147
		Gully Plugging	24.4369	87.4136	2m L x 1m H	14147
		Gully Plugging	24.4362	87.4138	2m L x 1m H	14147
		Gully Plugging	24.4359	87.4141	2m L x 1m H	14147
		Gully Plugging	24.4349	87.4134	2m L x 1m H	14147
		LBS	24.4378	87.4073	6m L x 2m H	109476
		Stop Dam	24.4360	87.4125	25m L x 3m H	2280495
	Dumria	Gully Plugging	24.4609	87.4314	2m L x 1m H	14147
		Gully Plugging	24.4628	87.4300	2m L x 1m H	14147
		Gully Plugging	24.4628	87.4300	2m L x 1m H	14147
		Gully Plugging	24.4640	87.4305	2m L x 1m H	14147
		Gully Plugging	24.4512	87.4260	2m L x 1m H	14147
		Gully Plugging	24.4517	87.4275	2m L x 1m H	14147
		Gully Plugging	24.4552	87.4353	2m L x 1m H	14147
		Gully Plugging	24.4554	87.4360	2m L x 1m H	14147
		Gully Plugging	24.4551	87.4259	3m L x 1m H	20608
		Gully Plugging	24.4577	87.4265	4m L x 1m H	27068
		LBS	24.4635	87.4304	6m L x 2m H	109476
		Stop Dam	24.4565	87.4304	15m L x 3m H	1836548
		Stop Dam	24.4548	87.4282	15m L x 3m H	1836548
	Jogiduba	Gully Plugging	24.4423	87.4145	2m L x 1m H	14147
		Stop Dam	24.4497	87.4177	15m L x 3m H	1836548
		Stop Dam	24.4460	87.4166	15m L x 3m H	1836548
		Stop Dam	24.4425	87.4186	15m L x 3m H	1836548
		Stop Dam	24.4406	87.4155	15m L x 3m H	1836548
	Kotaldih	Gully Plugging	24.4580	87.4247	2m L x 1m H	14147

		Gully Plugging	24.4506	87.4229	2m L x 1m H	14147
		Gully Plugging	24.4422	87.4207	2m L x 1m H	14147
		Gully Plugging	24.4413	87.4197	2m L x 1m H	14147
		Gully Plugging	24.4500	87.4220	2m L x 1m H	14147
		Gully Plugging	24.4509	87.4248	2m L x 1m H	14147
		Gully Plugging	24.4558	87.4248	4m L x 1m H	27068
		LBS	24.4489	87.4209	6m L x 2m H	109476
		LBS	24.4549	87.4239	7m L x 2m H	127518
		LBS	24.4541	87.4251	8m L x 2m H	145560
		Stop Dam	24.4575	87.4235	15m L x 3m H	1836548
		Stop Dam	24.4523	87.4243	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4489	87.4232	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.4458	87.4217	20m L x 3m H	125000
	Kulkant	Gully Plugging	24.4278	87.4173	2m L x 1m H	14147
		Gully Plugging	24.4281	87.4203	2m L x 1m H	14147
		Gully Plugging	24.4281	87.4190	2m L x 1m H	14147
		Gully Plugging	24.4289	87.4214	3m L x 1m H	20608
		Gully Plugging	24.4296	87.4226	3m L x 1m H	20608
	Kurcho	Earthen Check Dam	24.4808	87.4541	40m L x 3m H	525385
		Gully Plugging	24.4814	87.4551	2m L x 1m H	14147
		Gully Plugging	24.4799	87.4529	4m L x 1m H	27068
		Gully Plugging	24.4776	87.4499	4m L x 1m H	27068
	Mahuapathar	Gully Plugging	24.4407	87.3852	2m L x 1m H	14147
		Gully Plugging	24.4423	87.3846	2m L x 1m H	14147
		Gully Plugging	24.4451	87.3850	2m L x 1m H	14147
		Gully Plugging	24.4440	87.3856	2m L x 1m H	14147
		Gully Plugging	24.4347	87.3794	2m L x 1m H	14147
		Gully Plugging	24.4431	87.3850	2m L x 1m H	14147
		Gully Plugging	24.4444	87.3858	2m L x 1m H	14147
		Gully Plugging	24.4349	87.3788	2m L x 1m H	14147
		Gully Plugging	24.4319	87.3793	3m L x 1m H	20608
		LBS	24.4409	87.3857	6m L x 2m H	109476
		LBS	24.4339	87.3793	6m L x 2m H	109476
		LBS	24.4331	87.3794	6m L x 2m H	109476
		Stop Dam	24.4414	87.3869	18m L x 3m H	1971110

		WAT	24.4422	87.3848	6.00 ha	116052
					LBS (Loose Boulder Structures) – 8 nos.	9,29,934
					Gully Plugging – 42 nos.	6,71,702
					Earthen Check Dams – 1 no.	5,25,385
					Stop Dams – 10 nos.	1,89,43,989
					Water Absorption Trenches (WAT) – 6 ha	1,16,052
					De-siltation of Existing Stop Dams – 2 nos.	2,50,000
					Total	**2,14,37,062.00**
Silvicultural Operations with Gap Plantation around the Periphery of Lease; 15.56 ha (Maintenance, 1st Year)						**82,503.00**
Total (Dumka Forest Division) – SMC Works (Year-3)						**2,15,19,565.00**
GODDA FOREST DIVISION						
G/SMC/I	**Sidapara**	Gully Plugging	24.6142	87.4318	2m L x 1m H	14147
		Gully Plugging	24.6146	87.4322	2m L x 1m H	14147
		LBS	24.6138	87.4316	6m L x 2m H	109476
		LBS	24.6141	87.4321	6m L x 2m H	109476
	Simlipara	Gully plugging	24.5659	87.4199	2m L x 1m H	14147
		Gully plugging	24.5675	87.4224	2m L x 1m H	14147
		Gully plugging	24.5734	87.4216	2m L x 1m H	14147
		Gully Plugging	24.5740	87.4213	2m L x 1m H	14147
		Gully Plugging	24.5603	87.4197	2m L x 1m H	14147
		Gully plugging	24.5607	87.4190	2m L x 1m H	14147
		Gully plugging	24.5622	87.4203	2m L x 1m H	14147
		Gully plugging	24.5624	87.4188	2m L x 1m H	14147
		Gully Plugging	24.5665	87.4193	2m L x 1m H	14147
		Gully Plugging	24.5669	87.4186	2m L x 1m H	14147
		Gully plugging	24.5678	87.4170	2m L x 1m H	14147
		Gully plugging	24.5690	87.4262	2m L x 1m H	14147
		Gully Plugging	24.5715	87.4253	2m L x 1m H	14147
		Gully Plugging	24.5738	87.4203	2m L x 1m H	14147
		LBS	24.5744	87.4214	6m L x 2m H	109476
		LBS	24.5747	87.4199	6m L x 2m H	109476
		LBS	24.5770	87.4224	8m L x 2m H	145560
	Telopara	Earthen Check Dam	24.5758	87.4627	30m L x 3m H	420747
		Gully plugging	24.5717	87.4575	2m L x 1m H	14147
		Gully plugging	24.5717	87.4583	2m L x 1m H	14147

		Gully plugging	24.5725	87.4575	2m L x 1m H	14147
		Gully Plugging	24.5845	87.4563	2m L x 1m H	14147
		Gully Plugging	24.5839	87.4553	2m L x 1m H	14147
		LBS	24.5697	87.4592	6m L x 2m H	109476
		LBS	24.5702	87.4592	6m L x 2m H	109476
		LBS	24.5706	87.4595	6m L x 2m H	109476
		LBS	24.5713	87.4596	8m L x 2m H	145560
		LBS	24.5716	87.4598	8m L x 2m H	145560
		LBS	24.5719	87.465	6m L x 2m H	109476
		LBS	24.5720	87.4631	5m L x 2m H	91435
		LBS	24.5720	87.4642	6m L x 2m H	109476
		LBS	24.5722	87.4599	6m L x 2m H	109476
		LBS	24.5723	87.4563	6m L x 2m H	109476
		LBS	24.5728	87.4600	6m L x 2m H	109476
		LBS	24.5728	87.4553	6m L x 2m H	109476
		LBS	24.5736	87.4564	6m L x 2m H	109476
		LBS	24.5739	87.4607	5m L x 2m H	91435
		LBS	24.5741	87.4548	5m L x 2m H	91435
		LBS	24.5743	87.4601	6m L x 2m H	109476
		LBS	24.5748	87.4597	5m L x 2m H	91435
		LBS	24.5749	87.4567	6m L x 2m H	109476
		LBS	24.5750	87.4619	6m L x 2m H	109476
		LBS	24.5754	87.4510	6m L x 2m H	109476
		LBS	24.5757	87.4568	5m L x 2m H	91435
		LBS	24.5764	87.4571	6m L x 2m H	109476
		LBS	24.5791	87.4562	6m L x 2m H	109476
		LBS	24.5796	87.4553	6m L x 2m H	109476
		LBS	24.5806	87.4576	6m L x 2m H	109476
		LBS	24.5817	87.4567	5m L x 2m H	91435
	Tilaypara	Gully plugging	24.5889	87.4157	2m L x 1m H	14147
		Gully plugging	24.5892	87.4156	2m L x 1m H	14147
		Gully plugging	24.5904	87.4144	2m L x 1m H	14147
		Gully plugging	24.5905	87.4177	2m L x 1m H	14147
		Gully plugging	24.5910	87.4148	2m L x 1m H	14147
		Gully plugging	24.5895	87.4228	2m L x 1m H	14147

		Gully plugging	24.5899	87.4224	2m L x 1m H	14147
		Gully plugging	24.5928	87.4261	2m L x 1m H	14147
		Gully plugging	24.59311	87.4256	2m L x 1m H	14147
		Gully plugging	24.5948	87.4262	2m L x 1m H	14147
		Gully plugging	24.5950	87.4257	2m L x 1m H	14147
		Gully Plugging	24.5954	87.4262	2m L x 1m H	14147
		Gully Plugging	24.5950	87.4246	2m L x 1m H	14147
		Gully Plugging	24.6031	87.4229	3m L x 1m H	20608
		Gully Plugging	24.6035	87.4229	3m L x 1m H	20608
		Gully Plugging	24.6033	87.4157	2m L x 1m H	14147
		Gully Plugging	24.6038	87.4166	2m L x 1m H	14147
		Gully Plugging	24.6039	87.4231	3m L x 1m H	20608
		Gully Plugging	24.6038	87.4156	2m L x 1m H	14147
		Gully Plugging	24.6044	87.4159	2m L x 1m H	14147
		LBS	24.5902	87.4146	6m L x 2m H	109476
		LBS	24.5910	87.4179	6m L x 2m H	109476
		LBS	24.5912	87.4161	8m L x 2m H	145560
		LBS	24.5915	87.4176	6m L x 2m H	109476
		LBS	24.5916	87.4183	6m L x 2m H	109476
		LBS	24.5928	87.4173	6m L x 2m H	109476
		LBS	24.5899	87.4127	6m L x 2m H	109476
		LBS	24.5903	87.4112	8m L x 2m H	145560
		LBS	24.5907	87.4091	8m L x 2m H	145560
		LBS	24.6027	87.4224	6m L x 2m H	109476
		Stop Dam	24.5905	87.4075	15m L x 3m H	1836548
G/SMC/II	**Babupur**	Gully Plugging	24.5047	87.3914	2m L x 1m H	14147
		Gully Plugging	24.5055	87.3919	2m L x 1m H	14147
		Gully Plugging	24.5063	87.3857	2m L x 1m H	14147
		Gully Plugging	24.5072	87.3921	2m L x 1m H	14147
		Gully Plugging	24.5075	87.3838	2m L x 1m H	14147
		Gully Plugging	24.5085	87.3886	2m L x 1m H	14147
		Gully Plugging	24.5087	87.3864	2m L x 1m H	14147
		Gully Plugging	24.5097	87.3896	2m L x 1m H	14147
		Gully Plugging	24.5097	87.384	2m L x 1m H	14147
		Gully Plugging	24.5102	87.3863	2m L x 1m H	14147

		Gully Plugging	24.5109	87.3899	2m L x 1m H	14147
		Gully Plugging	24.5121	87.3916	2m L x 1m H	14147
		Gully Plugging	24.5133	87.3914	2m L x 1m H	14147
		LBS	24.5033	87.3869	6m L x 2m H	109476
		LBS	24.5043	87.3848	5m L x 2m H	91435
		LBS	24.5050	87.3795	5m L x 2m H	91435
		LBS	24.5054	87.3869	6m L x 2m H	109476
		LBS	24.5058	87.3846	5m L x 2m H	91435
		LBS	24.5065	87.3902	6m L x 2m H	109476
		LBS	24.5069	87.3837	6m L x 2m H	109476
		LBS	24.5070	87.3870	5m L x 2m H	91435
		LBS	24.5090	87.3834	6m L x 2m H	109476
	Bankatti	Gully Plugging	24.5694	87.3766	2m L x 1m H	14147
		Gully Plugging	24.5695	87.3773	2m L x 1m H	14147
		LBS	24.5707	87.3772	8m L x 2m H	145560
		Stop Dam	24.5662	87.3750	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.5684	87.3764	15m L x 3m H	100000
	Bargo	Earthen Check Dam	24.5068	87.3949	20m L x 3m H	316110
		Gully Plugging	24.5034	87.3973	2m L x 1m H	14147
		Gully Plugging	24.5045	87.3961	2m L x 1m H	14147
		Gully Plugging	24.5050	87.3999	2m L x 1m H	14147
		Gully Plugging	24.5055	87.3998	2m L x 1m H	14147
		Gully Plugging	24.5056	87.3950	2m L x 1m H	14147
		Gully Plugging	24.5062	87.3943	2m L x 1m H	14147
		Gully Plugging	24.5083	87.3963	2m L x 1m H	14147
		Gully Plugging	24.5087	87.3972	2m L x 1m H	14147
		LBS	24.5059	87.3972	6m L x 2m H	109476
		LBS	24.5069	87.4008	6m L x 2m H	109476
		LBS	24.5075	87.3967	6m L x 2m H	109476
	Belpahari	Gully Plugging	24.5669	87.3915	2m L x 1m H	14147
		Gully Plugging	24.5671	87.3916	2m L x 1m H	14147
		Gully Plugging	24.5723	87.3931	2m L x 1m H	14147
		Gully Plugging	24.5625	87.3963	2m L x 1m H	14147
		Gully Plugging	24.5626	87.3956	2m L x 1m H	14147
		Gully Plugging	24.5627	87.3936	2m L x 1m H	14147

		Gully Plugging	24.5627	87.3947	2m L x 1m H	14147
		Gully Plugging	24.5636	87.3967	2m L x 1m H	14147
		Gully Plugging	24.5639	87.3957	2m L x 1m H	14147
		Gully Plugging	24.5668	87.3965	2m L x 1m H	14147
		Gully Plugging	24.5669	87.3959	2m L x 1m H	14147
		Gully Plugging	24.5686	87.3949	2m L x 1m H	14147
		Gully Plugging	24.5701	87.3937	2m L x 1m H	14147
		Gully Plugging	24.5702	87.3944	2m L x 1m H	14147
		Gully Plugging	24.5717	87.3964	2m L x 1m H	14147
		Gully Plugging	24.5718	87.3958	2m L x 1m H	14147
		Gully Plugging	24.5719	87.3955	2m L x 1m H	14147
		Gully Plugging	24.5721	87.3938	2m L x 1m H	14147
		Gully Plugging	24.5721	87.3948	2m L x 1m H	14147
		LBS	24.5668	87.3903	5m L x 2m H	91435
		LBS	24.5672	87.3948	6m L x 2m H	109476
		LBS	24.5682	87.3865	6m L x 2m H	109476
		LBS	24.5690	87.3883	6m L x 2m H	109476
		LBS	24.5707	87.3899	6m L x 2m H	109476
		LBS	24.5721	87.3907	6m L x 2m H	109476
	Baigni	Earthen Check Dam	24.5220	87.3761	25m L x 3m H	368428
		Gully Plugging	24.5083	87.3821	2m L x 1m H	14147
		Gully Plugging	24.5202	87.3775	2m L x 1m H	14147
		Gully Plugging	24.5211	87.3807	2m L x 1m H	14147
		Gully Plugging	24.5222	87.3795	2m L x 1m H	14147
		LBS	24.5093	87.3828	6m L x 2m H	109476
		LBS	24.5109	87.3829	5m L x 2m H	91435
		LBS	24.5152	87.3793	6m L x 2m H	109476
		LBS	24.5173	87.3776	5m L x 2m H	91435
		LBS	24.5195	87.3805	5m L x 2m H	91435
		LBS	24.5207	87.3859	6m L x 2m H	109476
		LBS	24.5210	87.3830	6m L x 2m H	109476
		LBS	24.5213	87.3841	5m L x 2m H	91435
		LBS	24.5219	87.3858	5m L x 2m H	91435
		LBS	24.5227	87.3831	6m L x 2m H	109476
		LBS	24.5234	87.3767	5m L x 2m H	91435

		LBS	24.5238	87.3811	5m L x 2m H	91435
	Daharlangi	Gully Plugging	24.5716	87.3688	2m L x 1m H	14147
		Gully Plugging	24.5702	87.3688	2m L x 1m H	14147
		Gully Plugging	24.5710	87.3690	2m L x 1m H	14147
		Stop Dam	24.5620	87.3730	15m L x 3m H	1836548
LBS (Loose Boulder Structures) – 72 nos.						78,10,122
Gully Plugging – 90 nos.						12,92,613
Earthen Check Dams – 3 no.						11,05,285
Stop Dams – 3 nos.						55,09,644
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 1 no.						1,00,000
Total (Godda Forest Division) – SMC Works (Year-3)						**1,58,17,664.00**

6.4. SITE-SPECIFIC PROPOSALS FOR YEAR-4 UNDER THE PLAN

Table 20: Site-Specific Physical and Financial Proposals under the Plan in Year-4

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/II	**Mahuagari**	Earthen Check Dam	24.4701	87.3908	20m L x 3m H	316110
		Earthen Check Dam	24.4699	87.3917	30m L x 3m H	420747
		Earthen Check Dam	24.4777	87.4075	40m L x 3m H	525385
		Gully Plugging	24.4750	87.4044	2m L x 1m H	14147
		Gully Plugging	24.4749	87.4027	2m L x 1m H	14147
		Gully Plugging	24.4744	87.4027	2m L x 1m H	14147
		Gully Plugging	24.4739	87.4040	2m L x 1m H	14147
		Gully Plugging	24.4726	87.3859	2m L x 1m H	14147
		Gully Plugging	24.4708	87.3938	2m L x 1m H	14147
		Gully Plugging	24.4733	87.3938	2m L x 1m H	14147
		Gully Plugging	24.4719	87.3927	2m L x 1m H	14147
		LBS	24.4759	87.4027	8m L x 2m H	145560
		WAT	24.4752	87.4103	10.00 ha	193420
	Paharchapri	Earthen Check Dam	24.4561	87.4162	30m L x 3m H	420747
		Gully Plugging	24.4537	87.4133	2m L x 1m H	14147
		Gully Plugging	24.4516	87.4136	2m L x 1m H	14147
		Gully Plugging	24.4581	87.4138	2m L x 1m H	14147
		Gully Plugging	24.4595	87.3989	2m L x 1m H	14147
		LBS	24.4553	87.4162	6m L x 2m H	109476
		Stop Dam	24.4590	87.4163	15m L x 3m H	1836548
	Pirjorwa	Gully Plugging	24.4413	87.4300	2m L x 1m H	14147
		Gully Plugging	24.4435	87.4275	2m L x 1m H	14147
		Gully Plugging	24.4369	87.4272	2m L x 1m H	14147
		Gully Plugging	24.4387	87.4207	2m L x 1m H	14147
		Gully Plugging	24.4377	87.4281	2m L x 1m H	14147
		Gully Plugging	24.4377	87.4252	2m L x 1m H	14147
		Gully Plugging	24.4421	87.4289	3m L x 1m H	20608

		Gully Plugging	24.4389	87.4290	2m L x 1m H	14147
		LBS	24.4380	87.4216	6m L x 2m H	109476
		LBS	24.4386	87.4213	6m L x 2m H	109476
	Pokharia	Earthen Check Dam	24.4677	87.4256	30m x 3m H	420747
		Earthen Check Dam	24.4633	87.4235	30m x 3m H	420747
		Gully Plugging	24.4640	87.4244	2m L x 1m H	14147
		Gully Plugging	24.4640	87.4244	2m L x 1m H	14147
		Gully Plugging	24.4646	87.4307	2m L x 1m H	14147
		Gully Plugging	24.4656	87.4300	3m L x 1m H	20608
		Gully Plugging	24.4673	87.4308	2m L x 1m H	14147
		LBS	24.4624	87.4233	5m L x 2m H	91435
		LBS	24.4681	87.4290	5m L x 2m H	91435
		LBS	24.4683	87.4267	5m L x 2m H	91435
		LBS	24.4669	87.4284	6m L x 2m H	109476
		LBS	24.4656	87.4264	6m L x 2m H	109476
		LBS	24.4642	87.4235	6m L x 2m H	109476
		LBS	24.4673	87.4273	6m L x 2m H	109476
		LBS	24.4634	87.4247	8m L x 2m H	145560
		Stop Dam	24.4614	87.4226	20m L x 3m H	2060818
		WAT	24.4722	87.4227	5.00 ha	96710
D/SMC/III	**Ambajora**	Earthen Check Dam	24.4106	87.4444	60m L x 3m H	734660
		Gully Plugging	24.4063	87.4376	3m L x 1m H	20608
		Gully Plugging	24.4115	87.4432	2m L x 1m H	14147
		Gully Plugging	24.4120	87.4444	2m L x 1m H	14147
		Gully Plugging	24.4111	87.4469	2m L x 1m H	14147
		LBS	24.4064	87.4352	6m L x 2m H	109476
		LBS	24.4050	87.4355	6m L x 2m H	109476
		LBS	24.4039	87.4338	6m L x 2m H	109476
		LBS	24.4058	87.4365	6m L x 2m H	109476
	Babupur	Gully Plugging	24.4586	87.4827	2m L x 1m H	14147
		Gully Plugging	24.4592	87.4830	2m L x 1m H	14147
		LBS	24.4594	87.4919	10m L x 2m H	181643
		LBS	24.4561	87.4937	6m L x 2m H	109476
		LBS	24.4541	87.4947	6m L x 2m H	109476
	Bankijor	Gully Plugging	24.4429	87.4635	2m L x 1m H	14147

		Gully Plugging	24.4437	87.4663	2m L x 1m H	14147
		Gully Plugging	24.4417	87.4666	2m L x 1m H	14147
		Gully Plugging	24.4409	87.4665	2m L x 1m H	14147
		Gully Plugging	24.4413	87.4675	2m L x 1m H	14147
		Gully Plugging	24.4420	87.4659	2m L x 1m H	14147
		Gully Plugging	24.4404	87.4681	2m L x 1m H	14147
		LBS	24.4402	87.4695	6m L x 2m H	109476
		LBS	24.4395	87.4653	6m L x 2m H	109476
		LBS	24.4407	87.4647	10m L x 2m H	181643
		LBS	24.4439	87.4615	6m L x 2m H	109476
		LBS	24.4449	87.4603	6m L x 2m H	109476
		LBS	24.4426	87.4670	6m L x 2m H	109476
		LBS	24.4399	87.4670	6m L x 2m H	109476
		Stop Dam	24.4385	87.4656	15m L x 3m H	1836548
		Stop Dam	24.4385	87.4682	22m L x 3m H	2141340
		Stop Dam (De-siltation)	24.4464	87.4598	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.4414	87.4681	12m L x 3m H	75000
		WAT	24.4443	87.4653	8.00 ha	154736
	Baratalli	Gully Plugging	24.4335	87.4610	2m L x 1m H	14147
		Gully Plugging	24.4311	87.4613	2m L x 1m H	14147
		Gully Plugging	24.4301	87.4586	2m L x 1m H	14147
		Gully Plugging	24.4291	87.4594	2m L x 1m H	14147
		Gully Plugging	24.4303	87.4608	2m L x 1m H	14147
		LBS	24.4332	87.4580	6m L x 2m H	109476
		LBS	24.4285	87.4586	6m L x 2m H	109476
		LBS	24.4306	87.4600	8m L x 2m H	145560
		LBS	24.4337	87.4591	6m L x 2m H	109476
		LBS	24.4326	87.4564	6m L x 2m H	109476
		LBS	24.4288	87.4604	6m L x 2m H	109476
		LBS	24.4296	87.4593	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.4280	87.4589	15m L x 3m H	100000
	Baskia	Gully Plugging	24.4479	87.4267	2m L x 1m H	14147
		Gully Plugging	24.4481	87.4249	3m L x 1m H	20608
		Gully Plugging	24.4411	87.4463	3m L x 1m H	20608
		Gully Plugging	24.4447	87.4500	3m L x 1m H	20608

		Gully Plugging	24.4465	87.4261	3m L x 1m H	20608
		LBS	24.4465	87.4280	10m L x 2m H	181643
		LBS	24.4415	87.4444	6m L x 2m H	109476
		LBS	24.4381	87.4442	6m L x 2m H	109476
	Bhagabandh	LBS	24.4177	87.4652	6m L x 2m H	109476
		Stop Dam	24.4188	87.4676	15m L x 3m H	1836548
	Chandramali	Gully Plugging	24.4305	87.4759	2m L x 1m H	14147
		Gully Plugging	24.4381	87.4703	2m L x 1m H	14147
		Gully Plugging	24.4389	87.4751	2m L x 1m H	14147
		Gully Plugging	24.4390	87.4706	2m L x 1m H	14147
		LBS	24.4390	87.4699	6m L x 2m H	109476
		LBS	24.4348	87.4784	6m L x 2m H	109476
		LBS	24.4324	87.4770	6m L x 2m H	109476
		LBS	24.4285	87.4775	6m L x 2m H	109476
		Stop Dam	24.4371	87.4696	30m L x 3m H	2509359
LBS (Loose Boulder Structures) – 41 nos.						47,95,230
Gully Plugging – 52 nos.						7,80,871
Earthen Check Dams – 7 nos.						32,59,143
Stop Dams – 6 nos.						1,22,21,161
Water Absorption Trenches (WAT) – 23 ha						4,44,866
De-siltation of Existing Stop Dams – 3 nos.						2,75,000
Total						**2,17,76,271.00**
Silvicultural Operations with Gap Plantation around the Periphery of Lease; 15.56 ha (Maintenance, 2nd Year)						**82,503.00**
Total (Dumka Forest Division) – SMC Works (Year-4)						**2,18,58,774.00**
GODDA FOREST DIVISION						
G/SMC/II	**Hathiapathar**	Gully Plugging	24.5509	87.369	2m L x 1m H	14147
		Gully Plugging	24.5410	87.3709	2m L x 1m H	14147
		LBS	24.5561	87.3667	6m L x 2m H	109476
		LBS	24.5573	87.3669	6m L x 2m H	109476
		LBS	24.5584	87.3675	6m L x 2m H	109476
		LBS	24.5498	87.3610	6m L x 2m H	109476
		LBS	24.5539	87.3666	6m L x 2m H	109476
		LBS	24.5610	87.3678	6m L x 2m H	109476
		Stop Dam	24.5530	87.3716	20m L x 3m H	2060818
	Jagusama	Earthen Check Dam	24.5615	87.4095	50m L x 3m H	630022

		Gully Plugging	24.5575	87.4179	2m L x 1m H	14147
		Gully Plugging	24.5577	87.4176	2m L x 1m H	14147
		Gully Plugging	24.5581	87.4172	2m L x 1m H	14147
		Gully Plugging	24.5611	87.4106	2m L x 1m H	14147
		Gully Plugging	24.5612	87.4101	2m L x 1m H	14147
		Gully Plugging	24.5614	87.4110	2m L x 1m H	14147
		Gully Plugging	24.5615	87.4101	2m L x 1m H	14147
		Gully Plugging	24.5617	87.4103	2m L x 1m H	14147
		Gully Plugging	24.5629	87.4108	2m L x 1m H	14147
		LBS	24.5619	87.4109	8m L x 2m H	145560
		LBS	24.5622	87.4114	6m L x 2m H	109476
		LBS	24.5636	87.4128	6m L x 2m H	109476
	Jamropani (23)	Gully Plugging	24.5275	87.3787	2m L x 1m H	14147
		Gully Plugging	24.5275	87.3789	2m L x 1m H	14147
		Gully Plugging	24.5277	87.3793	2m L x 1m H	14147
		LBS	24.5364	87.3800	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5366	87.3778	18m L x 3m H	100000
	Jamropani (213)	LBS	24.5335	87.3709	6m L x 2m H	109476
		LBS	24.5341	87.3734	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5322	87.3717	25m L x 3m H	125000
	Jogimarna	Gully Plugging	24.5769	87.3770	2m L x 1m H	14147
		Gully Plugging	24.5770	87.3741	2m L x 1m H	14147
		Gully Plugging	24.5783	87.3757	2m L x 1m H	14147
		Gully Plugging	24.5786	87.3759	2m L x 1m H	14147
		Gully Plugging	24.5791	87.3762	2m L x 1m H	14147
		Gully Plugging	24.5792	87.3760	2m L x 1m H	14147
		Gully Plugging	24.5818	87.3759	2m L x 1m H	14147
		Gully Plugging	24.5821	87.3759	2m L x 1m H	14147
		Gully Plugging	24.5828	87.3756	2m L x 1m H	14147
		LBS	24.5724	87.3769	6m L x 2m H	109476
		LBS	24.5744	87.3760	6m L x 2m H	109476
		LBS	24.5768	87.3745	6m L x 2m H	109476
		LBS	24.5774	87.3743	6m L x 2m H	109476
		LBS	24.5780	87.3748	6m L x 2m H	109476
		LBS	24.5786	87.3749	6m L x 2m H	109476

	Paharpur	Gully Plugging	24.5551	87.3823	2m L x 1m H	14147
		Gully Plugging	24.5555	87.3787	2m L x 1m H	14147
		Gully Plugging	24.5559	87.3816	2m L x 1m H	14147
		Gully Plugging	24.5563	87.3815	2m L x 1m H	14147
		Gully Plugging	24.5564	87.3825	2m L x 1m H	14147
		Gully Plugging	24.5591	87.3813	2m L x 1m H	14147
		Gully Plugging	24.5666	87.3814	2m L x 1m H	14147
		Gully Plugging	24.5666	87.3856	2m L x 1m H	14147
		Gully Plugging	24.5670	87.3807	2m L x 1m H	14147
		Gully Plugging	24.5672	87.3803	2m L x 1m H	14147
		Gully Plugging	24.5682	87.3841	2m L x 1m H	14147
		Gully Plugging	24.5710	87.3857	2m L x 1m H	14147
		Gully Plugging	24.5715	87.3864	2m L x 1m H	14147
		Gully Plugging	24.5543	87.3783	3m L x 1m H	14147
		Gully Plugging	24.5547	87.3777	3m L x 1m H	20608
		Gully Plugging	24.5549	87.3770	3m L x 1m H	20608
		Gully Plugging	24.5558	87.3775	3m L x 1m H	20608
		Gully Plugging	24.5565	87.3834	2m L x 1m H	14147
		Gully Plugging	24.5577	87.3813	2m L x 1m H	14147
		Gully Plugging	24.5578	87.38401	2m L x 1m H	14147
		Gully Plugging	24.5578	87.3804	2m L x 1m H	14147
		Gully Plugging	24.5581	87.3889	2m L x 1m H	14147
		Gully Plugging	24.5585	87.3892	2m L x 1m H	14147
		Gully Plugging	24.5585	87.3805	2m L x 1m H	14147
		Gully Plugging	24.5588	87.3893	2m L x 1m H	14147
		Gully Plugging	24.5593	87.3822	2m L x 1m H	14147
		LBS	24.5556	87.3764	8m L x 2m H	145560
		LBS	24.5563	87.3768	8m L x 2m H	145560
		LBS	24.5565	87.3759	8m L x 2m H	145560
		LBS	24.5565	87.3794	6m L x 2m H	109476
		LBS	24.5567	87.3777	6m L x 2m H	109476
		LBS	24.5680	87.3797	6m L x 2m H	109476
		LBS	24.5682	87.3775	6m L x 2m H	109476
		LBS	24.5693	87.3776	8m L x 2m H	145560
		LBS	24.5697	87.3781	8m L x 2m H	145560

		LBS	24.5698	87.3790	6m L x 2m H	109476
		LBS	24.5554	87.3745	8m L x 2m H	145560
		LBS	24.5575	87.3793	6m L x 2m H	109476
		LBS	24.5679	87.3814	6m L x 2m H	109476
		LBS	24.5679	87.3831	6m L x 2m H	109476
		LBS	24.5610	87.3813	6m L x 2m H	109476
		LBS	24.5696	87.3830	6m L x 2m H	109476
	Pairgadih	LBS	24.5322	87.3683	6m L x 2m H	109476
		LBS	24.5328	87.3690	6m L x 2m H	109476
		LBS	24.5391	87.3636	6m L x 2m H	109476
		LBS	24.5392	87.3656	6m L x 2m H	109476
		LBS	24.5394	87.3647	6m L x 2m H	109476
		LBS	24.5459	87.3712	8m L x 2m H	145560
		LBS	24.5460	87.3731	8m L x 2m H	145560
		Stop Dam	24.5313	87.3669	15m L x 3m H	1836548
		Stop Dam	24.5369	87.3614	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.5421	87.3633	30m L x 3m H	150000
LBS (Loose Boulder Structures) – 41 nos.						48,13,272
Gully Plugging – 49 nos.						7,12,586
Earthen Check Dams – 1 no.						6,30,022
Stop Dams – 3 nos.						57,33,914
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 3 nos.						3,75,000
Total (Godda Forest Division) – SMC Works (Year-4)						**1,22,64,794.00**

6.5. SITE-SPECIFIC PROPOSALS FOR YEAR-5 UNDER THE PLAN

Table 21: Site-Specific Physical and Financial Proposals under the Plan in Year-5

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/III	**Chhota Maruapani**	Earthen Check Dam	24.4225	87.4196	50m L x 3m H	630022
		Gully Plugging	24.4239	87.4220	2m L x 1m H	14147
	Dubrajpur	Gully Plugging	24.4299	87.4706	2m L x 1m H	14147
		Gully Plugging	24.4212	87.4702	2m L x 1m H	14147
		LBS	24.4284	87.4697	6m L x 2m H	109476
		LBS	24.4231	87.4724	6m L x 2m H	109476
		Stop Dam	24.4296	87.4741	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.4259	87.4745	15m L x 3m H	100000
		WAT	24.4223	87.4684	6.00 ha	116052
	Jhariapani	Gully Plugging	24.4346	87.4613	2m L x 1m H	14147
		Gully Plugging	24.4338	87.4625	2m L x 1m H	14147
		Gully Plugging	24.4410	87.4528	3m L x 1m H	20608
		Gully Plugging	24.4404	87.4542	3m L x 1m H	20608
		LBS	24.4338	87.4625	6m L x 2m H	109476
		LBS	24.4341	87.4616	6m L x 2m H	109476
		LBS	24.4336	87.4619	6m L x 2m H	109476
		Stop Dam	24.4336	87.4726	20m L x 3m H	2060818
	Jhutichapar	Gully Plugging	24.4480	87.4776	2m L x 1m H	14147
		Gully Plugging	24.4482	87.4723	2m L x 1m H	14147
		Gully Plugging	24.4472	87.4735	2m L x 1m H	14147
		Gully Plugging	24.4492	87.4725	2m L x 1m H	14147
		Gully Plugging	24.4489	87.4743	2m L x 1m H	14147
		Gully Plugging	24.4462	87.4735	2m L x 1m H	14147
		LBS	24.4471	87.4722	12m L x 2m H	217726
		LBS	24.4507	87.4786	6m L x 2m H	109476
		LBS	24.4478	87.4733	6m L x 2m H	109476
		LBS	24.4456	87.4708	6m L x 2m H	109476

		LBS	24.4486	87.4754	6m L x 2m H	109476
		LBS	24.4486	87.4763	6m L x 2m H	109476
		LBS	24.4467	87.4793	6m L x 2m H	109476
		LBS	24.4463	87.4718	6m L x 2m H	109476
		LBS	24.4451	87.4701	6m L x 2m H	109476
		LBS	24.4503	87.4765	6m L x 2m H	109476
	Kairashol	LBS	24.4455	87.4579	6m L x 2m H	109476
		LBS	24.4456	87.4569	8m L x 2m H	145560
	Kumarbandh	Gully Plugging	24.4470	87.4907	2m L x 1m H	14147
		Gully Plugging	24.4470	87.4905	2m L x 1m H	14147
		LBS	24.4469	87.4909	6m L x 2m H	109476
		LBS	24.4472	87.4904	6m L x 2m H	109476
		LBS	24.4471	87.4901	6m L x 2m H	109476
	Majhila Sarwapani	Earthen Check Dam	24.4170	87.4344	170m L x 3m H	1885672
		Gully Plugging	24.4167	87.4157	3m L x 1m H	20608
		Gully Plugging	24.4174	87.4166	2m L x 1m H	14147
		Gully Plugging	24.4173	87.4141	2m L x 1m H	14147
		Gully Plugging	24.4162	87.4146	3m L x 1m H	20608
		Gully Plugging	24.4169	87.4285	3m L x 1m H	20608
		Gully Plugging	24.4144	87.4309	2m L x 1m H	14147
		Gully Plugging	24.4179	87.4286	3m L x 1m H	20608
		LBS	24.4148	87.4326	8m L x 2m H	145560
		LBS	24.4149	87.4317	6m L x 2m H	109476
		LBS	24.4160	87.4338	8m L x 2m H	145560
		Stop Dam	24.4132	87.4296	15m L x 3m H	1836548
	Pujadih	Gully Plugging	24.4531	87.4577	2m L x 1m H	14147
		LBS	24.4604	87.4577	6m L x 2m H	109476
		LBS	24.4538	87.4566	5m L x 2m H	91435
		LBS	24.4578	87.4556	6m L x 2m H	109476
		Stop Dam	24.4606	87.4593	15m L x 3m H	1836548
		Stop Dam	24.4538	87.4590	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4585	87.4576	13m L x 3m H	75000
	Pusaldih	Gully Plugging	24.4581	87.4429	2m L x 1m H	14147
		Gully Plugging	24.4578	87.4422	2m L x 1m H	14147
		Gully Plugging	24.4561	87.4412	2m L x 1m H	14147

	R. F.	Gully Plugging	24.4654	87.4544	2m L x 1m H	14147
		LBS	24.4520	87.4570	6m L x 2m H	109476
		LBS	24.4548	87.4558	8m L x 2m H	145560
		LBS	24.4678	87.4601	8m L x 2m H	145560
		Stop Dam	24.4651	87.4583	15m L x 3m H	1836548
					LBS (Loose Boulder Structures) – 29 nos.	34,45,433
					Gully Plugging – 27 nos.	4,20,735
					Earthen Check Dams – 2 nos.	25,15,694
					Stop Dams – 6 nos.	1,13,78,120
					Water Absorption Trenches (WAT) – 6 ha	1,16,052
					De-siltation of Existing Stop Dams – 2 nos.	1,75,000
Total (Dumka Forest Division) – SMC Works (Year-5)						**1,80,51,034.00**
GODDA FOREST DIVISION						
G/SMC/II	**Sundrijola**	Earthen Check Dam	24.5540	87.4053	50m L x 3m H	630022
		Gully Plugging	24.5482	87.4116	2m L x 1m H	14147
		Gully Plugging	24.5492	87.4113	2m L x 1m H	14147
		Gully Plugging	24.5492	87.4183	2m L x 1m H	14147
		Gully Plugging	24.5528	87.4172	2m L x 1m H	14147
		Gully Plugging	24.5531	87.4158	2m L x 1m H	14147
		Gully Plugging	24.5531	87.4164	2m L x 1m H	14147
		Gully Plugging	24.5538	87.4144	2m L x 1m H	14147
		Gully Plugging	24.5536	87.4170	2m L x 1m H	14147
		Gully Plugging	24.5580	87.4089	2m L x 1m H	14147
		Gully Plugging	24.5582	87.4085	2m L x 1m H	14147
		Gully Plugging	24.5583	87.4039	2m L x 1m H	14147
		Gully Plugging	24.5517	87.4032	3m L x 1m H	20608
		Gully Plugging	24.5519	87.4038	3m L x 1m H	20608
		LBS	24.5495	87.4106	6m L x 2m H	109476
		LBS	24.5497	87.4096	6m L x 2m H	109476
		LBS	24.5549	87.4055	6m L x 2m H	109476
		LBS	24.5549	87.4058	6m L x 2m H	109476
		LBS	24.5561	87.4061	6m L x 2m H	109476
		LBS	24.5580	87.4082	6m L x 2m H	109476
		LBS	24.5581	87.4064	6m L x 2m H	109476
		LBS	24.5583	87.4094	6m L x 2m H	109476

		LBS	24.5586	87.4064	6m L x 2m H	109476
		LBS	24.5521	87.4046	6m L x 2m H	109476
	Susni	Gully Plugging	24.5397	87.3875	2m L x 1m H	14147
		Gully Plugging	24.5403	87.3867	2m L x 1m H	14147
		Gully Plugging	24.5406	87.3867	2m L x 1m H	14147
		Gully Plugging	24.5406	87.3878	2m L x 1m H	14147
		Gully Plugging	24.5408	87.3858	2m L x 1m H	14147
		Gully Plugging	24.5414	87.3856	2m L x 1m H	14147
		Gully Plugging	24.5414	87.3878	2m L x 1m H	14147
		Gully Plugging	24.5416	87.3815	2m L x 1m H	14147
		Gully Plugging	24.5417	87.3799	2m L x 1m H	14147
		Gully Plugging	24.5417	87.3861	2m L x 1m H	14147
		Gully Plugging	24.5417	87.3872	2m L x 1m H	14147
		Gully Plugging	24.5418	87.3814	2m L x 1m H	14147
		Gully Plugging	24.5419	87.3858	2m L x 1m H	14147
		Gully Plugging	24.5422	87.3861	2m L x 1m H	14147
		Gully Plugging	24.5425	87.3864	2m L x 1m H	14147
		Gully Plugging	24.5428	87.3811	2m L x 1m H	14147
		Gully Plugging	24.5431	87.3808	2m L x 1m H	14147
		Gully Plugging	24.5431	87.3836	2m L x 1m H	14147
		Gully Plugging	24.5431	87.3853	2m L x 1m H	14147
		Gully Plugging	24.5433	87.3803	2m L x 1m H	14147
		Gully Plugging	24.5435	87.3798	2m L x 1m H	14147
		Gully Plugging	24.5438	87.3804	2m L x 1m H	14147
		Gully Plugging	24.5439	87.3828	2m L x 1m H	14147
		Gully Plugging	24.5439	87.385	2m L x 1m H	14147
		Gully Plugging	24.544	87.3797	2m L x 1m H	14147
		Gully Plugging	24.5444	87.3836	2m L x 1m H	14147
		Gully Plugging	24.5447	87.3787	2m L x 1m H	14147
		Gully Plugging	24.5447	87.3818	2m L x 1m H	14147
		Gully Plugging	24.5449	87.379	2m L x 1m H	14147
		Gully Plugging	24.5449	87.3814	2m L x 1m H	14147
		Gully Plugging	24.5452	87.3806	2m L x 1m H	14147
		Gully Plugging	24.5454	87.3795	2m L x 1m H	14147
		Gully Plugging	24.5456	87.3831	2m L x 1m H	14147

		Gully Plugging	24.5456	87.3883	2m L x 1m H	14147
		Gully Plugging	24.5463	87.389	2m L x 1m H	14147
		Gully Plugging	24.5477	87.3841	2m L x 1m H	14147
		Gully Plugging	24.5478	87.3836	2m L x 1m H	14147
		Gully Plugging	24.5481	87.3828	2m L x 1m H	14147
		LBS	24.5423	87.3816	8m L x 2m H	145560
		LBS	24.5439	87.3796	8m L x 2m H	145560
		LBS	24.5444	87.3778	6m L x 2m H	109476
		LBS	24.5445	87.3818	6m L x 2m H	109476
		LBS	24.5449	87.3812	6m L x 2m H	109476
		LBS	24.5453	87.3793	6m L x 2m H	109476
		LBS	24.5454	87.3805	6m L x 2m H	109476
		LBS	24.5463	87.3883	6m L x 2m H	109476
		LBS	24.5466	87.3894	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.5439	87.3785	15m L x 3m H	100000
LBS (Loose Boulder Structures) – 19 nos.						21,52,212
Gully Plugging – 51 nos.						7,34,419
Earthen Check Dams – 1 no.						6,30,022
Stop Dams						-
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 1 no.						1,00,000
Total (Godda Forest Division) – SMC Works (Year-5)						**36,16,653.00**

6.6. SITE-SPECIFIC PROPOSALS FOR YEAR-6 UNDER THE PLAN

Table 22: Site-Specific Physical and Financial Proposals under the Plan in Year-6

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/III	**Sarwan**	Gully Plugging	24.4237	87.4417	2m L x 1m H	14147
		Gully Plugging	24.4178	87.4479	2m L x 1m H	14147
	Sarwan Pahari	Earthen Check Dam	24.4243	87.4307	70m L x 3m H	839297
		Gully Plugging	24.4250	87.4428	3m L x 1m H	20608
	Soruapani	Gully Plugging	24.4434	87.4668	2m L x 1m H	14147
		Gully Plugging	24.4542	87.4685	2m L x 1m H	14147
		Gully Plugging	24.4543	87.4685	2m L x 1m H	14147
		Gully Plugging	24.4543	87.4684	2m L x 1m H	14147
		Gully Plugging	24.4543	87.4684	2m L x 1m H	14147
		Gully Plugging	24.4545	87.4681	2m L x 1m H	14147
		Gully Plugging	24.4543	87.4683	2m L x 1m H	14147
		Gully Plugging	24.4434	87.4677	2m L x 1m H	14147
		LBS	24.4550	87.4675	6m L x 2m H	109476
		LBS	24.4547	87.4677	8m L x 2m H	145560
		LBS	24.4472	87.4681	8m L x 2m H	145560
		LBS	24.4466	87.4678	8m L x 2m H	145560
		Stop Dam	24.4541	87.4675	15m L x 3m H	1836548
		Stop Dam	24.4471	87.4652	15m L x 3m H	1836548
		Stop Dam	24.4493	87.4617	20m L x 3m H	2060818
	Upar Pujadih	LBS	24.4690	87.4604	8m L x 2m H	145560
		LBS	24.4693	87.4613	8m L x 2m H	145560
D/SMC/IV	**Balia**	Gully Plugging	24.4149	87.4993	2m L x 1m H	14147
		Gully plugging	24.4093	87.4990	3m L x 1m H	20608
		Gully Plugging	24.4196	87.5015	2m L x 1m H	14147
		Gully Plugging	24.4182	87.5002	2m L x 1m H	14147
		LBS	24.4149	87.4970	8m L x 2m H	145560
		LBS	24.4197	87.4969	6m L x 2m H	109476

		LBS	24.4151	87.4949	10m L x 2m H	181643
		Stop Dam	24.4177	87.4941	15m L x 3m H	1836548
	Bhuskidangal	Gully Plugging	24.4083	87.4711	2m L x 1m H	14147
		Gully Plugging	24.4120	87.4776	3m L x 1m H	20608
		LBS	24.4091	87.4726	6m L x 2m H	109476
		WAT	24.4127	87.4759	7.00 ha	135394
	Burhichapar	Stop Dam	24.4582	87.5065	22m L x 3m H	2141340
	Chhatarchuan	Stop Dam (De-siltation)	24.4429	87.5027	25m L x 3m H	125000
	Dharampur	Stop Dam (De-siltation)	24.4373	87.5037	12m L x 3m H	75000
		Stop Dam (De-siltation)	24.4361	87.5126	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.4339	87.5084	15m L x 3m H	100000
	Dumartola	Gully Plugging	24.4076	87.5060	3m L x 1m H	20608
		Gully Plugging	24.4076	87.5068	2m L x 1m H	14147
		Gully Plugging	24.4069	87.5065	3m L x 1m H	20608
		Gully Plugging	24.4068	87.5093	3m L x 1m H	20608
		Gully Plugging	24.4057	87.5085	3m L x 1m H	20608
		Gully plugging	24.4086	87.5101	2m L x 1m H	14147
		Gully plugging	24.4105	87.5052	3m L x 1m H	20608
		Gully plugging	24.4103	87.5070	3m L x 1m H	20608
		Gully plugging	24.4185	87.5117	2m L x 1m H	14147
		Gully plugging	24.4172	87.5142	2m L x 1m H	14147
		LBS	24.4045	87.5063	6m L x 2m H	109476
		LBS	24.4069	87.4995	10m L x 2m H	181643
		Stop dam	24.4047	87.5049	30m L x 3m H	2509359
	Gariapani	Gully Plugging	24.3950	87.4818	2m L x 1m H	14147
		Gully plugging	24.3993	87.4800	3m L x 1m H	20608
		Gully plugging	24.3998	87.4813	3m L x 1m H	20608
		LBS	24.4021	87.4779	6m L x 2m H	109476
		LBS	24.4068	87.4960	6m L x 2m H	109476
		LBS	24.4076	87.4899	6m L x 2m H	109476
		LBS	24.4002	87.4789	6m L x 2m H	109476
		Stop Dam	24.4104	87.4975	30m L x 3m H	2509359
					LBS (Loose Boulder Structures) – 16 nos.	21,12,454
					Gully Plugging – 30 nos.	4,95,481
					Earthen Check Dams – 1 no.	8,39,297

Stop Dams – 7 nos.	1,47,30,520
Water Absorption Trenches (WAT) – 7 ha	1,35,394
De-siltation of Existing Stop Dams – 4 nos.	4,00,000
Total (Dumka Forest Division) – SMC Works (Year-6)	**1,87,13,146.00**

6.7. SITE-SPECIFIC PROPOSALS FOR YEAR-7 UNDER THE PLAN

Table 23: Site-Specific Physical and Financial Proposals under the Plan in Year-7

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/IV	**Gopikandar**	LBS	24.4237	87.4922	6m L x 2m H	109476
		LBS	24.4209	87.4928	6m L x 2m H	109476
		LBS	24.4220	87.4888	6m L x 2m H	109476
		Stop Dam	24.4202	87.4906	25m L x 3m H	2280495
		Stop Dam	24.4204	87.4874	15m L x 3m H	1836548
		Stop Dam	24.4206	87.4853	22m L x 3m H	2141340
		Stop Dam	24.4249	87.4780	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4223	87.4795	30m L x 3m H	150000
	Janamdih	Earthen Check Dam	24.4368	87.5208	40m L x 3m H	525385
		Gully Plugging	24.4363	87.5136	2m L x 1m H	14147
		Gully Plugging	24.4363	87.5136	2m L x 1m H	14147
		Gully Plugging	24.4384	87.5181	2m L x 1m H	14147
		Gully Plugging	24.4399	87.5208	2m L x 1m H	14147
		Gully Plugging	24.4334	87.5206	2m L x 1m H	14147
		Gully Plugging	24.4333	87.5215	2m L x 1m H	14147
		Gully Plugging	24.4333	87.5221	2m L x 1m H	14147
		LBS	24.4371	87.5164	5m L x 2m H	91435
		LBS	24.4371	87.5140	5m L x 2m H	91435
		LBS	24.4372	87.5173	6m L x 2m H	109476
		LBS	24.4395	87.5202	6m L x 2m H	109476
		LBS	24.4397	87.5194	6m L x 2m H	109476
		Stop Dam	24.4347	87.5129	15m L x 3m H	1836548
		Stop Dam	24.4322	87.5136	15m L x 3m H	1836548
	Jitpur	LBS	24.4409	87.5194	6m L x 2m H	109476
	Kheribari	LBS	24.4326	87.4893	6m L x 2m H	109476
		LBS	24.4279	87.4910	5m L x 2m H	91435
	Kochapani	Gully Plugging	24.4237	87.5142	2m L x 1m H	14147

		Gully Plugging	24.4173	87.5168	2m L x 1m H	14147
		Gully Plugging	24.4293	87.5217	2m L x 1m H	14147
		Gully Plugging	24.4277	87.5237	2m L x 1m H	14147
		Gully Plugging	24.4280	87.5260	2m L x 1m H	14147
		Gully Plugging	24.4286	87.5247	2m L x 1m H	14147
		Gully Plugging	24.4276	87.5149	3m L x 1m H	20608
		Gully Plugging	24.4247	87.5142	3m L x 1m H	20608
		Gully Plugging	24.4229	87.5144	3m L x 1m H	20608
		Gully Plugging	24.4195	87.5185	3m L x 1m H	20608
		Gully Plugging	24.4194	87.5149	3m L x 1m H	20608
		Gully Plugging	24.4314	87.5207	3m L x 1m H	20608
		Gully Plugging	24.4272	87.5237	3m L x 1m H	20608
		Gully Plugging	24.4285	87.5212	3m L x 1m H	20608
		LBS	24.4168	87.5169	6m L x 2m H	109476
		Stop Dam	24.4208	87.5144	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4159	87.5157	15m L x 3m H	100000
	Kurumba	Earthen Check Dam	24.4307	87.4972	30m L x 3m H	420747
		Gully Plugging	24.4296	87.4996	2m L x 1m H	14147
		LBS	24.4323	87.4967	6m L x 2m H	109476
		LBS	24.4330	87.5003	6m L x 2m H	109476
	Lakraphela	Gully Plugging	24.3933	87.4481	2m L x 1m H	14147
	Lakraphela Pahar	Earthen Check Dam	24.4037	87.4718	25m L x 3m H	368428
		Gully Plugging	24.3937	87.4558	2m L x 1m H	14147
		Gully Plugging	24.4046	87.4733	2m L x 1m H	14147
		Gully Plugging	24.4046	87.4724	2m L x 1m H	14147
		Gully Plugging	24.3928	87.4559	2m L x 1m H	14147
		Gully Plugging	24.3892	87.4741	2m L x 1m H	14147
		Gully Plugging	24.4073	87.4702	2m L x 1m H	14147
		Gully Plugging	24.3972	87.4569	2m L x 1m H	14147
		Gully Plugging	24.3976	87.4463	2m L x 1m H	14147
		LBS	24.3940	87.4585	5m L x 2m H	91435
		LBS	24.3937	87.4579	6m L x 2m H	109476
		LBS	24.3947	87.4598	6m L x 2m H	109476
		LBS	24.3928	87.4577	6m L x 2m H	109476
		LBS	24.3922	87.4584	6m L x 2m H	109476

		WAT	24.3828	87.4584	6.00 ha	116052
		WAT	24.3881	87.4662	16.00 ha	309472
	Talberia	Earthen Check Dam	24.4267	87.5098	30m x 3m H	420747
		Gully Plugging	24.4265	87.5021	2m L x 1m H	14147
		Gully Plugging	24.4268	87.5024	2m L x 1m H	14147
		Gully Plugging	24.4229	87.5071	2m L x 1m H	14147
		Gully Plugging	24.4217	87.5130	2m L x 1m H	14147
		Gully Plugging	24.4246	87.5109	2m L x 1m H	14147
		Gully Plugging	24.4255	87.5101	2m L x 1m H	14147
		Gully Plugging	24.4264	87.5093	2m L x 1m H	14147
		Gully Plugging	24.4277	87.5026	3m L x 1m H	20608
		Gully Plugging	24.4278	87.5029	3m L x 1m H	20608
		Gully Plugging	24.4264	87.4992	3m L x 1m H	20608
		Gully Plugging	24.4286	87.5000	3m L x 1m H	20608
		LBS	24.4231	87.5103	5m L x 2m H	91435
		LBS	24.4225	87.5117	5m L x 2m H	91435
		LBS	24.4250	87.5113	5m L x 2m H	91435
		LBS	24.4260	87.5087	5m L x 2m H	91435
		Stop Dam (De-siltation)	24.4246	87.5126	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.4280	87.5137	15m L x 3m H	100000
		WAT	24.4258	87.5042	6.00 ha	116052
LBS (Loose Boulder Structures) – 23 nos.						23,73,620
Gully Plugging – 42 nos.						6,71,706
Earthen Check Dams – 4 nos.						17,35,307
Stop Dams – 7 nos.						1,36,04,575
Water Absorption Trenches (WAT) – 28 ha						5,41,576
De-siltation of Existing Stop Dams – 4 nos.						4,75,000
Total (Dumka Forest Division) – SMC Works (Year-7)						**1,94,01,784.00**

6.8. SITE-SPECIFIC PROPOSALS FOR YEAR-8 UNDER THE PLAN

Table 24: Site-Specific Physical and Financial Proposals under the Plan in Year-8

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/V	**Amjhari**	Earthen Check Dam	24.4621	87.5629	60m L x 3m H	734660
	Babuikhura	LBS	24.4812	87.5649	10m L x 2m H	181643
		LBS	24.4913	87.5592	5m L x 2m H	91435
		Stop Dam (De-siltation)	24.4843	87.5604	14m L x 3m H	75000
	Bhadradighi	Stop Dam (De-siltation)	24.4713	87.5578	30m L x 3m H	150000
	Bhangahir	Gully Plugging	24.4816	87.5423	2m L x 1m H	14147
	Dhobarna	Gully Plugging	24.5013	87.5479	2m L x 1m H	14147
	Digha Parbat	LBS	24.4667	87.5543	8m L x 2m H	145560
	Durgapur	Gully Plugging	24.4903	87.5322	2m L x 1m H	14147
		Gully Plugging	24.4893	87.5360	2m L x 1m H	14147
		LBS	24.4889	87.5344	12m L x 2m H	217726
		Stop Dam	24.4907	87.5333	22m L x 3m H	2141340
		Stop Dam (De-siltation)	24.4922	87.5326	18m L x 3m H	100000
	Gumapahari	Gully Plugging	24.5026	87.5690	2m L x 1m H	14147
		Gully Plugging	24.4966	87.5560	2m L x 1m H	14147
		LBS	24.5017	87.5647	10m L x 2m H	181643
		LBS	24.5034	87.5658	10m L x 2m H	181643
	Jamchua	Gully Plugging	24.4495	87.5650	3m L x 1m H	20608
		Stop Dam	24.4398	87.5642	25m L x 3m H	2280495
		Stop Dam (De-siltation)	24.4412	87.5620	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.4440	87.5540	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.4419	87.5560	25m L x 3m H	125000
	Jorasimal	LBS	24.4699	87.5192	5m L x 2m H	91435
		Stop Dam	24.4700	87.5169	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4733	87.5172	25m L x 3m H	125000
	Kajikend	Gully Plugging	24.4660	87.5361	2m L x 1m H	14147
	Karmo	Earthen Check Dam	24.4351	87.5444	20m L x 3m H	316110

		Gully Plugging	24.4353	87.5431	2m L x 1m H	14147
		LBS	24.4389	87.5622	5m L x 2m H	91435
		LBS	24.4378	87.5612	5m L x 2m H	91435
		LBS	24.4346	87.5573	8m L x 2m H	145560
		Stop Dam	24.4362	87.5589	15m L x 3m H	1836548
	Kuskira	Gully Plugging	24.5164	87.5539	2m L x 1m H	14147
		Gully Plugging	24.5119	87.5526	2m L x 1m H	14147
		Stop Dam (De-siltation)	24.5100	87.5680	15m L x 3m H	100000
	Lakhibad	LBS	24.4683	87.5389	6m L x 2m H	109476
		LBS	24.4651	87.5393	6m L x 2m H	109476
		LBS	24.4615	87.5376	6m L x 2m H	109476
		LBS	24.4631	87.5385	7m L x 2m H	127518
	Majurbari	Gully Plugging	24.4903	87.5511	2m L x 1m H	14147
	Musna	Stop Dam	24.4493	87.5388	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.4489	87.5435	18m L x 3m H	100000
	Paharpur	LBS	24.4776	87.5359	12m L x 2m H	217726
	Palasbani	Stop Dam (De-siltation)	24.4669	87.5135	20m L x 3m H	125000
	Pindargara	Gully Plugging	24.4737	87.5399	4m L x 1m H	27068
		LBS	24.4765	87.5413	12m L x 2m H	217726
	Pipra	Earthen Check Dam	24.4786	87.5505	30m L x 3m H	420747
		LBS	24.4783	87.5489	8m L x 2m H	145560
	Rambani	LBS	24.4478	87.5306	6m L x 2m H	109476
		LBS	24.4413	87.5311	6m L x 2m H	109476
		LBS	24.4409	87.5321	6m L x 2m H	109476
	Ramgarh	LBS	24.4446	87.5454	5m L x 2m H	91435
		LBS	24.4438	87.5436	6m L x 2m H	109476
		LBS	24.4432	87.5412	6m L x 2m H	109476
	Sogapahari	Gully Plugging	24.4379	87.5395	2m L x 1m H	14147
		LBS	24.4329	87.5400	6m L x 2m H	109476
D/SMC/VI	**Champa Pahar**	Earthen Check Dam	24.4835	87.4783	100m L x 3m H	1153210
		Gully Plugging	24.4757	87.4715	2m L x 1m H	14147
		LBS	24.4765	87.4799	6m L x 2m H	109476
		LBS	24.4817	87.4798	6m L x 2m H	109476
		LBS	24.4813	87.4739	6m L x 2m H	109476
	Chetopoka	Gully Plugging	24.4868	87.4990	2m L x 1m H	14147

		Gully Plugging	24.4868	87.5008	2m L x 1m H	14147
		Gully Plugging	24.4864	87.4996	2m L x 1m H	14147
		Gully Plugging	24.4853	87.4987	2m L x 1m H	14147
		Gully Plugging	24.4876	87.4985	2m L x 1m H	14147
		LBS	24.4862	87.5010	12m L x 2m H	217726
		LBS	24.4890	87.5096	12m L x 2m H	217726
		LBS	24.4862	87.5000	6m L x 2m H	109476
		LBS	24.4868	87.5046	6m L x 2m H	109476
	Chirudih	Gully Plugging	24.5138	87.4932	2m L x 1m H	14147
		Gully Plugging	24.5151	87.4944	2m L x 1m H	14147
		Gully Plugging	24.5154	87.4960	2m L x 1m H	14147
		Gully Plugging	24.5144	87.4939	2m L x 1m H	14147
		Gully Plugging	24.5157	87.4941	2m L x 1m H	14147
		Gully Plugging	24.5145	87.4927	2m L x 1m H	14147
		Gully Plugging	24.5118	87.4892	2m L x 1m H	14147
		Gully Plugging	24.5082	87.4924	2m L x 1m H	14147
		Gully Plugging	24.5067	87.4884	2m L x 1m H	14147
	Dhobachapar	LBS	24.4776	87.4955	8m L x 2m H	145560
	Dundhapahari	Gully Plugging	24.5000	87.5414	2m L x 1m H	14147
		Stop Dam	24.5017	87.5347	15m L x 3m H	1836548
LBS (Loose Boulder Structures) – 32 nos.						43,33,156
Gully Plugging – 30 nos.						4,43,792
Earthen Check Dams – 4 nos.						26,24,727
Stop Dams – 6 nos.						1,19,02,589
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 10 nos.						11,25,000
Total (Dumka Forest Division) – SMC Works (Year-8)						**2,04,29,264.00**

6.9. SITE-SPECIFIC PROPOSALS FOR YEAR-9 UNDER THE PLAN

Table 25: Site-Specific Physical and Financial Proposals under the Plan in Year-9

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/VI	**Jhanjhko**	Gully Plugging	24.4908	87.4872	2m L x 1m H	14147
		Gully Plugging	24.4910	87.4878	2m L x 1m H	14147
		Gully Plugging	24.4906	87.4910	3m L x 1m H	20608
		LBS	24.4860	87.4835	5m L x 2m H	91435
		LBS	24.4843	87.4820	5m L x 2m H	91435
		LBS	24.4904	87.4864	6m L x 2m H	109476
		LBS	24.4841	87.4807	6m L x 2m H	109476
		LBS	24.4789	87.4802	6m L x 2m H	109476
		Stop Dam	24.4859	87.4820	15m L x 3m H	1836548
		Stop Dam	24.4830	87.4809	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.4912	87.4936	15m L x 3m H	100000
	Khajurdangal	LBS	24.4659	87.4832	5m L x 2m H	91435
		LBS	24.4669	87.4836	5m L x 2m H	91435
		LBS	24.4705	87.4887	8m L x 2m H	145560
	Kulaipura	LBS	24.4918	87.5183	6m L x 2m H	109476
		Stop Dam	24.4790	87.5156	18m L x 3m H	1971110
		Stop Dam	24.4829	87.5171	18m L x 3m H	1971110
		Stop Dam (De-siltation)	24.4904	87.5181	18m L x 3m H	100000
		Stop Dam (De-siltation)	24.4877	87.5170	20m L x 3m H	125000
	Madhuban	LBS	24.4952	87.5038	8m L x 2m H	145560
		LBS	24.4930	87.5090	10m L x 2m H	181643
		LBS	24.4938	87.5061	12m L x 2m H	217726
		LBS	24.4965	87.4929	5m L x 2m H	91435
		LBS	24.4961	87.4879	5m L x 2m H	91435
		LBS	24.4931	87.5055	5m L x 2m H	91435
		LBS	24.4908	87.5118	6m L x 2m H	109476
		LBS	24.4947	87.5000	8m L x 2m H	145560

		Stop Dam	24.4926	87.5114	20m L x 3m H	2060818
		Stop Dam (De-siltation)	24.4932	87.5153	20m L x 3m H	125000
	Ormo	Gully Plugging	24.4929	87.5189	2m L x 1m H	14147
		Gully Plugging	24.4969	87.5130	4m L x 1m H	27068
		Stop Dam (De-siltation)	24.4967	87.5227	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.5122	87.5094	14m L x 3m H	75000
		Stop Dam (De-siltation)	24.4976	87.5307	22m L x 3m H	125000
		Stop Dam (De-siltation)	24.4965	87.5284	25m L x 3m H	125000
	Puranakhora	Stop Dam (De-siltation)	24.4757	87.5166	24m L x 3m H	125000
	Talkhora	Gully Plugging	24.4883	87.4929	2m L x 1m H	14147
		Gully Plugging	24.4887	87.4924	2m L x 1m H	14147
		Gully Plugging	24.4856	87.4981	3m L x 1m H	20608
		LBS	24.4813	87.4971	6m L x 2m H	109476
		Stop Dam	24.4788	87.4959	18m L x 3m H	1971110
		Stop Dam	24.4844	87.4991	20m Lx 3m H	2060818
LBS (Loose Boulder Structures) – 18 nos.						21,32,950
Gully Plugging – 8 nos.						1,39,019
Earthen Check Dams						-
Stop Dams – 7 nos.						1,37,08,062
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 9 nos.						10,25,000
Total (Dumka Forest Division) – SMC Works (Year-9)						**1,70,05,031.00**

6.10. SITE-SPECIFIC PROPOSALS FOR YEAR-10 UNDER THE PLAN

Table 26: Site-Specific Physical and Financial Proposals under the Plan in Year-10

Stream Corridor	Village	Structure/Activity	Latitude	Longitude	Dimension	Estimated Cost (in Rs.)
DUMKA FOREST DIVISION						
D/SMC/VII	**Amdiha**	Earthen Check Dam	24.4937	87.4065	30m L x 3m H	420747
		Gully Plugging	24.4927	87.4027	2m L x 1m H	14147
		LBS	24.4964	87.4014	6m L x 2m H	109476
		LBS	24.4973	87.4034	7m L x 2m H	127518
		LBS	24.4994	87.4039	8m L x 2m H	145560
		LBS	24.4935	87.4012	8m L x 2m H	145560
		Stop Dam (De-siltation)	24.5011	87.4046	12m L x 3m H	75000
	Chunjo	Stop Dam	24.5007	87.4246	15m L x 3m H	1836548
		Stop Dam (De-siltation)	24.5106	87.4271	16m L x 3m H	100000
		Stop Dam (De-siltation)	24.5088	87.4275	16m L x 3m H	100000
		Stop Dam (De-siltation)	24.4905	87.4239	30m L x 3m H	150000
	Hethsilangi	Gully Plugging	24.5085	87.4332	2m L x 1m H	14147
		Gully Plugging	24.5056	87.4347	2m L x 1m H	14147
		Stop Dam (De-siltation)	24.5151	87.4351	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.5126	87.4362	15m L x 3m H	100000
		Stop Dam (De-siltation)	24.5106	87.4379	18m L x 3m H	100000
	Kachuakandar	Gully Plugging	24.4943	87.4153	2m L x 1m H	14147
		LBS	24.5026	87.4157	6m L x 2m H	109476
		Stop Dam (De-siltation)	24.4991	87.4181	20m L x 3m H	125000
		Stop Dam (De-siltation)	24.4937	87.4169	25m L x 3m H	125000
	Kharikasol	Earthen Check Dam	24.5140	87.4514	30m L x 3m H	420747
		Earthen Check Dam	24.5171	87.4575	60m L x 3m H	734660
		Gully Plugging	24.5143	87.4562	2m L x 1m H	14147
		Gully Plugging	24.5134	87.4483	2m L x 1m H	14147
		Gully Plugging	24.5128	87.4542	2m L x 1m H	14147
		Gully Plugging	24.5067	87.4535	2m L x 1m H	14147
		Gully Plugging	24.5042	87.4570	2m L x 1m H	14147

		Gully Plugging	24.5066	87.4573	2m L x 1m H	14147
		Gully Plugging	24.5039	87.4548	2m L x 1m H	14147
		Gully Plugging	24.5059	87.4559	2m L x 1m H	14147
		LBS	24.5119	87.4577	6m L x 2m H	109476
		LBS	24.5129	87.4574	6m L x 2m H	109476
	Khatangi	Gully Plugging	24.5113	87.4481	2m L x 1m H	14147
		Gully Plugging	24.5063	87.4465	2m L x 1m H	14147
		Gully Plugging	24.5021	87.4449	2m L x 1m H	14147
	Khatganwa	Earthen Check Dam	24.4861	87.4454	30m L x 3m H	420747
		LBS	24.4865	87.4459	6m L x 2m H	109476
	Kundapahari	Gully Plugging	24.5069	87.4706	2m L x 1m H	14147
		Gully Plugging	24.4946	87.4818	4m L x 1m H	27068
		Gully Plugging	24.5094	87.4808	2m L x 1m H	14147
		Gully Plugging	24.5051	87.4798	2m L x 1m H	14147
	Mahaldabar	Earthen Check Dam	24.5011	87.4716	30m L x 3m H	420747
		Gully Plugging	24.4988	87.4722	2m L x 1m H	14147
		Gully Plugging	24.4909	87.4682	2m L x 1m H	14147
		Gully Plugging	24.5030	87.4574	2m L x 1m H	14147
		Gully Plugging	24.5009	87.4592	2m L x 1m H	14147
		Gully Plugging	24.4977	87.4682	2m L x 1m H	14147
		LBS	24.5027	87.4673	12m L x 2m H	217726
		LBS	24.5001	87.4677	6m L x 2m H	109476
		LBS	24.5024	87.4669	8m L x 2m H	145560
		LBS	24.4982	87.4690	8m L x 2m H	145560
		LBS	24.5014	87.4669	8m L x 2m H	145560
	Murguja	Gully Plugging	24.4970	87.4524	2m L x 1m H	14147
		Gully Plugging	24.4979	87.4537	2m L x 1m H	14147
		Gully Plugging	24.4958	87.4534	2m L x 1m H	14147
		Gully Plugging	24.4976	87.4573	2m L x 1m H	14147
		Gully Plugging	24.4934	87.4570	2m L x 1m H	14147
		Gully Plugging	24.4946	87.4595	2m L x 1m H	14147
		Gully Plugging	24.4921	87.4594	2m L x 1m H	14147
		Gully Plugging	24.4934	87.4612	2m L x 1m H	14147
		Gully Plugging	24.4892	87.4589	2m L x 1m H	14147
		Gully Plugging	24.4901	87.4613	2m L x 1m H	14147

		Gully Plugging	24.4890	87.4608	2m L x 1m H	14147
		Gully Plugging	24.4889	87.4619	2m L x 1m H	14147
		Gully Plugging	24.4907	87.4603	2m L x 1m H	14147
		LBS	24.4924	87.4618	5m L x 2m H	91435
		LBS	24.4880	87.4492	6m L x 2m H	109476
	Sarkhi	Earthen Check Dam	24.5009	87.4110	30m L x 3m H	420747
		Gully Plugging	24.5013	87.4135	2m L x 1m H	14147
		Gully Plugging	24.5032	87.4103	2m L x 1m H	14147
		LBS	24.5042	87.4109	12m L x 2m H	217726
		LBS	24.5026	87.4117	6m L x 2m H	109476
	Sarkhi Pahar	Gully Plugging	24.4853	87.4241	2m L x 1m H	14147
		Gully Plugging	24.4858	87.4259	2m L x 1m H	14147
		LBS	24.4785	87.4214	6m L x 2m H	109476
	Silangi Pahar	Earthen Check Dam	24.4832	87.4359	40m L x 3m H	525385
		Gully Plugging	24.4824	87.4365	2m L x 1m H	14147
		Gully Plugging	24.4979	87.4380	2m L x 1m H	14147
		LBS	24.4842	87.4348	6m L x 2m H	109476
LBS (Loose Boulder Structures) – 19 nos.						24,76,965
Gully Plugging – 43 nos.						6,21,242
Earthen Check Dams – 7 nos.						33,63,780
Stop Dams – 1 no.						18,36,548
Water Absorption Trenches (WAT)						-
De-siltation of Existing Stop Dams – 9 nos.						**9,75,000**
Total (Dumka Forest Division) – SMC Works (Year-10)						**92,73,535.00**

6.11. ABSTRACT OF EXPENDITURES UNDER THE PLAN – DUMKA FOREST DIVISION

Table 27: Year-wise Financial Forecast of the SMC Plan – Dumka Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in Lakh)
		Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year 10	
A.	**Natural Resource Management/Soil and Moisture Conservation Measures – Refer Para 5.2.1.**											
A.1.	Strengthening of Forest Protection Network (Seed Money to 36 JFMCs*) @ Rs. 5.00 Lakh/JFMC – 6 JFMCs/year	30.00	30.00	30.00	30.00	30.00	30.00	-	-	-	-	180.00
A.2.	LBS (Loose Boulder Structures)	77.70	32.07	9.30	47.95	34.45	21.12	23.74	43.33	21.33	24.77	335.76
A.3.	Gully Plugging	10.84	7.94	6.72	7.81	4.21	4.95	6.72	4.44	1.39	6.21	61.23
A.4.	Earthen Check Dams	15.78	26.27	5.25	32.59	25.16	8.39	17.35	26.25	-	33.64	190.68
A.5.	Stop Dams	160.33	234.46	189.44	122.21	113.78	147.31	136.05	119.03	137.08	18.37	1378.06
A.6.	Water Absorption Trenches (WAT)	2.71	1.16	1.16	4.45	1.16	1.35	5.42	-	-	-	17.41
A.7.	De-siltation of Existing Stop Dams	9.25	5.50	2.50	2.75	1.75	4.00	4.75	11.25	10.25	9.75	61.75
A.8.	Silvicultural Operations with Gap Plantation (Within 100m periphery of the lease area) – In compliance of specific condition no. xix.	10.87	2.09	0.83	0.83	-	-	-	-	-	-	14.62
A.9.	Contour trenches (150 ha) – 50 ha each in Year-1,2 &3. @ 55md/ha	11.03	11.03	11.03	-	-	-	-	-	-	-	33.09
											Total (NRM/SMC)	**2272.60**
B.	**Capacity Building of Frontline Forest Staff – Refer Para 5.2.2.**	3.00	2.50	2.50	2.50	2.50	2.00	2.00	2.00	1.00	-	**20.00**
C.	**Awareness Development Programmes – Refer Para 5.2.3.**	1.50	1.50	1.50	1.50	1.00	1.00	1.00	0.50	0.50	-	**10.00**
D.	**Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption – Refer Para 5.2.4. & 5.2.5.**	10.00	10.00	10.00	10.00	10.00	-	-	-	-	-	**50.00**
E.	**Monitoring and Evaluation – Refer Para 5.2.6.**	0.50	1.00	1.50	1.50	1.50	1.50	1.00	0.50	0.50	0.50	**10.00**
F.	**Infrastructural Strengthening – Manpower, Mobility (Purchase/hire), Purchase of equipment/software/drones etc.; Development of appropriate IT applications for M&E etc.; Engagement of IT/GIS professionals etc. – Refer Para 5.2.7.**	25.00	10.00	10.00	10.00	10.00	10.00	10.00	5.00	5.00	5.00	**100.00**
G.	**Administrative Cost**	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	**50.00**

H.	**Total**	373.51	380.52	286.73	279.09	240.51	236.62	213.03	217.30	182.05	103.24	**2512.60**
I.	**Cost Escalation Provision @ 20%**	74.70	76.10	57.35	55.82	48.10	47.32	42.61	43.46	36.41	20.65	**502.52**
Grand Total (Dumka Forest Division)		**448.21**	**456.62**	**344.08**	**334.91**	**288.61**	**283.94**	**255.64**	**260.76**	**218.46**	**123.89**	**3015.12**

***A total of 72 JFMCs are registered in the Impact Area falling under Dumka Forest Division. 36 JFMCs are proposed to be funded with Seed money under the instant plan. Rest of 36 JFMCs are being proposed to be funded through the Wildlife Management Plan.**

6.12. ABSTRACT OF EXPENDITURES UNDER THE PLAN – GODDA FOREST DIVISION

Table 28: Year-wise Financial Forecast of the SMC Plan – Godda Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in Lakh)
		Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year 10	
A.	**Natural Resource Management/Soil and Moisture Conservation Measures – Refer Para 5.2.1.**											
A.1.	Strengthening of Forest Protection Network (Seed Money to 13 JFMCs**) @ Rs. 5.00 Lakh/JFMC	25.00	20.00	20.00	-	-	-	-	-	-	-	65.00
A.2.	LBS (Loose Boulder Structures)	84.81	70.77	78.10	48.13	21.52	-	-	-	-	-	303.33
A.3.	Gully Plugging	6.71	5.71	12.93	7.13	7.34	-	-	-	-	-	39.82
A.4.	Earthen Check Dams	7.89	9.46	11.05	6.30	6.30	-	-	-	-	-	41.00
A.5.	Stop Dams	57.34	76.51	55.10	57.34	-	-	-	-	-	-	246.29
A.6.	De-siltation of Existing Stop Dams	9.00	-	1.00	3.75	1.00	-	-	-	-	-	14.75
A.7.	Contour trenches (50 ha) in Year-1 @ 55md/ha	11.03	-	-	-	-	-	-		-	-	11.03
											Total (NRM/SMC)	**721.22**
B.	**Capacity Building of Frontline Forest Staff – Refer Para 5.2.2.**	2.50	2.50	2.00	1.50	1.50	-	-	-	-	-	**10.00**
C.	**Awareness Development Programmes – Refer Para 5.2.3.**	1.00	1.00	1.00	1.00	1.00						**5.00**
D.	**Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption – Refer Para 5.2.4. & 5.2.5.**	5.00	5.00	5.00	5.00	5.00	-	-	--	-	-	**25.00**
E.	**Monitoring and Evaluation – Refer Para 5.2.6.**	0.50	1.00	1.50	1.00	1.00	-	-	-	-	-	**5.00**
F.	**Infrastructural Strengthening – Manpower, Mobility (Purchase/hire), Purchase of equipment/software/drones etc.; Development of appropriate IT applications for M&E etc.; Engagement of IT/GIS professionals etc. – Refer Para 5.2.7.**	15.00	10.00	10.00	7.50	7.50	-	-	-	-	-	**50.00**
G.	**Administrative Cost**	2.50	2.50	2.50	2.50	2.50	-	-	-	-	-	**12.50**
H.	**Total**	228.28	204.45	200.18	141.15	54.66	-	-	-	-	-	**828.72**
I.	**Cost Escalation Provision @ 20%**	45.66	40.89	40.04	28.23	10.93	-	-	-	-	-	**165.75**
Grand Total (Godda Forest Division)		**273.94**	**245.34**	**240.22**	**169.38**	**65.59**	**-**	**-**	**-**	**-**	**-**	**994.47**

****A total of 26 JFMCs are registered in the Impact Area falling under Godda Forest Division. 13 JFMCs are proposed to be funded with Seed money under the instant plan. Rest of 13 JFMCs are being proposed to be funded through the Wildlife Management Plan.**

6.13. ABSTRACT OF EXPENDITURES UNDER THE SMC PLAN

Table 29: Abstract of Financial Forecast under the SMC Plan

Sl. No.	Activity Head	Dumka Forest Division (Rs. in Lakh)	Godda Forest Division (Rs. in Lakh)	Total (Rs. in Lakh)
A.	Natural Resource Management/ Soil and Moisture Conservation Measures	**2272.60**	**721.22**	**2993.82**
B.	Capacity Building of Frontline Forest Staff	**20.00**	**10.00**	**30.00**
C.	Awareness Development Programmes	**10.00**	**5.00**	**15.00**
D.	Development of Alternative Livelihoods & Promotion of Renewable Energy Consumption	**50.00**	**25.00**	**75.00**
E.	Monitoring and Evaluation	**10.00**	**5.00**	**15.00**
F.	Infrastructural Strengthening towards Implementation of the Plan & its Monitoring and Evaluation	**100.00**	**50.00**	**150.00**
G.	Administrative Cost	**50.00**	**12.50**	**62.50**
H.	Total	**2512.60**	**828.72**	**3341.32**
I.	Cost Escalation Provision @ 20%	**502.52**	**165.75**	**668.27**
Grand Total		**3015.12**	**994.47**	**4009.59**

Cost to the User Agency towards implementation of the SMC Plan = Rs. 4009.59 Lakh

6.14. NOTABLE POINTS REGARDING IMPLEMENTATION OF THE PLAN

Following points are worth noting while implementing the Plan:

- The coordinates of the structures have been provided after gross survey of the area. However, during implementation of the Plan, a situation may arise where the implementing agency may take a view to change the location and specification of a particular structure as per need and convenience of the implementing agency. This may be allowed by the authorities with due care and diligence.
- The Plan may be revised every three years depending upon the feedback of the implementing agency and taking into consideration the properly assessed gap between the expected outcome and the actual results. Though it is somewhat difficult to assess the gaps in an objective manner, the experience of the field staff and villagers' views may come in handy at times. As for the cost of revision of the SMC Plan, the User Agency shall submit an undertaking to the respective DFOs to the effect that the cost of revision of the Plan shall be borne by them.
- Though provision of a flat rate of 20% has been made towards cost escalation in the Plan viz. increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the respective DFOs to the effect that they will deposit extra cost of the Plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.
- The Plan has been formulated taking into consideration the available Schedule of Rates, copies of which are being annexed with the Plan. Since the Plan is expected to begin its journey not any time before the next financial year i.e., 2026-27 when it is expected to be included in the State APO (CAMPA), cost escalation of 20% has been provided for even against the estimates for Year-1.
- The Plan should not be taken as the last word. The DFOs may be given sufficient amplitude to change the locations, specifications and numbers of the structural interventions. The Divisional Forest administration may devise a framework in consultation with superior authorities so as to facilitate the implementation of the Plan considering all the site-specific technical as well as community demands.
- While estimating the cost of various activities under the Plan, departmental schedule of rates has been followed. However, these are based on some broad assumptions. The

implementing agency is expected to prepare site-specific estimates considering the rates approved by the Department against specific items required for a specific activity.

- For successful implementation of the Plan, it would be desirable that a comprehensive APO is prepared after the funds are received. It is a common practice that the amount estimated in the instant Plan for a specific year is not received by the implementing agency in full. Therefore, prioritisation of works would be an exercise which may call for due care and diligence in the interest of meeting the objectives under the Plan.

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7. REFERENCES

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3. https://villageinfo.in
4. https://cgwb.gov.in
5. https://bhuvan.nrsc.gov.in/home/index.php
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7. https://pmksy.gov.in
8. https://naip.icar.gov.in/download/77735/AFC_final.pdf/AFC_final.pdf

ANNEXURES

Annexure 1: Stage-I Forest Clearance Order issued in favour of Pachhwara South Coal Block Project

8-37/2022-FC

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-3464 V.P. dated 29.11.2022 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the propcsal of the State Government & on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand subject to fulfilment of the following conditions:

i. Legal status of the diverted forest land shall remain unchanged;

ii. **Compensatory Afforestation**:

a. *Details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion including the area for safety zone/green belt shall be submitted by the State Government along with the compliance report of the Stage-I approval.*
b. *The non-forest land to be identified shall be transferred and mutated in favour*

of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval.

c. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

iii. **Net Present Value:**

a. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

b. At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

iv. *Trees should be felled in a phased manner and when become absolutely necessary and under strict supervision of State Forest Department and wherever feasible suitable species should be transplanted.*

v. *The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.*

vi. *As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*

vii. *Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost.*

viii. *A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*

ix. *User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be*

repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

x. *As recommended by the State, the Water security plan prepared by the group of experts shall be adhered to.*

xi. The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;

xii. All the funds received from the user agency under the project shall be transferred/depsoted in CAMPA account only through **e-portal** (https://parivesh.nic.in/); Amount depsoted through other mode will not be accepted as compliance of the Stage-I clearance;

xiii. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent Reclamation Plan as per the approved Mining Plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

xiv. The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

xv. The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

xvi. Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:

a. User agency shall ensure demarcation of safety zone (7.5 meter strip all

along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the State Forest Department;

b. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
c. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department; and
d. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

xvii. Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department:

a. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;
b. Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved Plan/scheme;
c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;
d. Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and
e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

xviii. The validity of approval granted under the Adhiniyam shall be for a period co-terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;

xx. The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

xxi. The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;

xxii. Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

xxiv. The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and

xxv. Under no circumstances, approval granted for the use of forest land for underground mining, shall subsequently be converted to opencast mining operations.

xxvi. The R&R Plan shall be implemented as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones;

xxvii. The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled;

xxviii. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

xxix. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

xxx. No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

xxxi. The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;\The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;

xxxii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

xxxiii. No damage to the flora and fauna of the adjoining area shall be caused;

xxxiv. The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;

xxxv. The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

xxxvi. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency; and

xxxvii. Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 as issued by this Ministry's letter dated 29.12.2023;

xxxviii. The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Signed by
Dheeraj Mittal
Date: 18-09-2024 14:10:45

Yours sincerely,

(Dr. Dheeraj Mittal)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi for uploading on PARIVESH portal.

Annexure 2: Estimate – Loose Boulder Structure (5m Length x 2m Height)

LOOSE BOULDER STRUCTURE 5m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	5	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	5.5		6.05		33.275	9.74	Sq. Mt.	₹ 323.93
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	5	1.50	5.50	2.00	35.00	1640.17	Cu.Mt.	₹ 57,405.81
		Sub Total								**58932.74**
		Less Total of MR /Analysis								-58608.81
		Sub Total of SOR (A)								323.93
		Less-CP @ 9.09% of (A)						323.93	9.09%	-29.45
		Sub Total(B)								294.49
		Total of MR /Analysis								58608.81
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					35.00	878.25	Cu.Mt.	₹ 30,738.79
		Sub Total(C)								**89642.08**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 89,642.08
		Add contengency & consultancy @ 2%								₹ 1,792.84
		Grand Total								₹ 91,434.92
		Say								₹ 91,435.00

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Annexure 3: Estimate – Loose Boulder Structure (6m Length x 2m Height)

LOOSE BOULDER STRUCTURE 6m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	6	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Layout					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	6.6		6.05		39.93	9.74	Sq. Mt.	₹ 388.72
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	6	1.50	5.50	2.00	42.00	1640.17	Cu.Mt.	₹ 68,886.97
		Sub Total								**70478.69**
		Less Total of MR /Analysis								-70089.97
		Sub Total of SOR (A)								388.72
		Less-CP @ 9.09% of (A)						388.72	9.09%	-35.35
		Sub Total(B)								353.38
		Total of MR /Analysis								70089.97
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					42.00	878.25	Cu.Mt.	₹ 36,886.54
		Sub Total(C)								**107329.90**
		Add due to increase in wagerate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ **1,07,329.90**
		Add contengency & consultancy @ 2%								₹ **2,146.60**
		Grand Total								₹ **1,09,476.50**
		Say								₹ **1,09,476.00**

Annexure 4: Estimate – Loose Boulder Structure (7m Length x 2m Height)

LOOSE BOULDER STRUCTURE 7m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	7	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Layout					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	7.7		6.05		46.585	9.74	Sq. Mt.	₹ 453.50
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	7	1.50	5.50	2.00	49.00	1640.17	Cu.Mt.	₹ 80,368.13
		Sub Total								**82024.64**
		Less Total of MR /Analysis								-81571.13
		Sub Total of SOR (A)								453.50
		Less-CP @ 9.09% of (A)						453.50	9.09%	-41.22
		Sub Total(B)								412.28
		Total of MR /Analysis								81571.13
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					49.00	878.25	Cu.Mt.	₹ 43,034.30
		Sub Total(C)								**125017.71**
		Add due to increase in wagerate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ **1,25,017.71**
		Add contengency & consultancy @ 2%								₹ **2,500.35**
		Grand Total								₹ **1,27,518.07**
		Say								₹ **1,27,518.00**

Annexure 5: Estimate – Loose Boulder Structure (8m Length x 2m Height)

LOOSE BOULDER STRUCTURE 8m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	8	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	8.8		6.05		53.24	9.74	Sq. Mt.	₹ 518.29
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	8	1.50	5.50	2.00	56.00	1640.17	Cu.Mt.	₹ 91,849.30
		Sub Total								**93570.59**
		Less Total of MR /Analysis								-93052.30
		Sub Total of SOR (A)								518.29
		Less-CP @ 9.09% of (A)						518.29	9.09%	-47.11
		Sub Total(B)								471.18
		Total of MR /Analysis								93052.30
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					56.00	878.25	Cu.Mt.	₹ 49,182.06
		Sub Total(C)								**142705.53**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 1,42,705.53
		Add contengency & consultancy @ 2%								₹ 2,854.11
		Grand Total								₹ 1,45,559.64
		Say								₹ 1,45,560.00

Annexure 6: Estimate – Loose Boulder Structure (10m Length x 2m Height)

LOOSE BOULDER STRUCTURE 10m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	10	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height [Avr.] in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	11		6.05		66.55	9.74	Sq. Mt.	₹ 647.86
3	5.6.4 [W.R.D.]	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	10	1.50	5.50	2.00	70.00	1640.17	Cu.Mt.	₹ 1,14,811.62
		Sub Total								**116662.48**
		Less Total of MR /Analysis								-116014.62
		Sub Total of SOR (A)								647.86
		Less CP @ 9.09% of (A)						647.86	9.09%	-58.89
		Sub Total(B)								588.97
		Total of MR /Analysis								116014.62
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					70.00	878.25	Cu.Mt.	₹ 61,477.57
		Sub Total(C)								**178081.16**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 1,78,081.16
		Add contengency & consultancy @ 2%								₹ 3,561.62
		Grand Total								₹ 1,81,642.79
		Say								₹ 1,81,643.00

Annexure 7: Estimate – Loose Boulder Structure (12m Length x 2m Height)

LOOSE BOULDER STRUCTURE 12m L x 2m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 29/07/2022/DSR-2021/NS										
		Length of Structure	12	Mt.			Wage Rate			₹ 401.00
		Height of Structure	2	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	5.50	Mt.						
		Side Slope	1.01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	13.2		6.05		79.86	9.74	Sq. Mt.	₹ 777.44
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	12	1.50	5.50	2.00	84.00	1640.17	Cu.Mt.	₹ 1,37,773.94
		Sub Total								**139754.38**
		Less Total of MR /Analysis								-138976.94
		Sub Total of SOR (A)								777.44
		Less-CP @ 9.09% of (A)						777.44	9.09%	-70.67
		Sub Total(B)								706.77
		Total of MR /Analysis								138976.94
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					84.00	878.25	Cu.Mt.	₹ 73,773.08
		Sub Total(C)								**213456.80**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ **2,13,456.80**
		Add contengency & consultancy @ 2%								₹ **4,269.14**
		Grand Total								₹ **2,17,725.93**
		Say								₹ **2,17,726.00**

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Annexure 8: Estimate – Gully Plugging (2m Length x 1m Height)

GULLY PLUGGING 2m L x 1m H										
BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS										
		Length of Structure	2	Mt.			Wage Rate			₹ 401.00
		Height of Structure	1	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottom Width of Structure	3.50	Mt.						
		Side Slope	1:01							
Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	2.2		3.85		8.47	9.74	Sq. Mt.	₹ 82.46
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel trenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	2	1.50	3.50	1.00	5.00	1640.17	Cu.Mt.	₹ 8,200.83
		Sub Total								**9486.29**
		Less Total of MR /Analysis								-9403.83
		Sub Total of SOR (A)								82.46
		Less CP @ 9.09% of (A)						82.46	9.09%	-7.50
		Sub Total(B)								74.96
		Total of MR /Analysis								9403.83
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					5.00	878.25	Cu.Mt.	₹ 4,391.26
		Sub Total(C)								**13870.05**
		Add due to increase in wage rate from 401/- to ...../- @ .....%								
		Sub Total(D)								₹ 13,870.05
		Add contengency & consultancy @ 2%								₹ **277.40**
		Grand Total								₹ **14,147.45**
		Say								₹ **14,147.00**

Annexure 9: Estimate – Gully Plugging (3m Length x 1m Height)

GULLY PLUGGING 3m L x 1m H

BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS

		Length of Structure	3	Mt.			Wage Rate			₹	401.00
		Height of Structure	1	Mt.							
		Top Width of Structure	1.5	Mt.							
		Bottom Width of Structure	3.50	Mt.							
		Side Slope	1:01								

Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height [Avr.] in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	3.3		3.85		12.705	9.74	Sq. Mt.	₹ 123.68
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel trenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	3	1.50	3.50	1.00	7.50	1640.17	Cu.Mt.	₹ 12,301.25
		Sub Total								**13627.93**
		Less Total of MR /Analysis								-13504.25
		Sub Total of SOR (A)								123.68
		Less-CP @ 9.09% of (A)						123.68	9.09%	-11.24
		Sub Total (B)								112.44
		Total of MR /Analysis								13504.25
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					7.50	878.25	Cu.Mt.	₹ 6,586.88
		Sub Total(C)								**20203.57**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total (D)								₹ **20,203.57**
		Add contengency & consultancy @ 2%								₹ **404.07**
		Grand Total								₹ **20,607.64**
		Say								₹ **20,608.00**

Annexure 10: Estimate – Gully Plugging (4m Length x 1m Height)

GULLY PLUGGING 4m L x 1m H

BASED ON S.O.R. W.R.D.GOVT. OF JHARKHAND EFFECTIVE FROM 28/07/2022/DSR-2021/NS

		Length of Structure	4	Mt.			Wage Rate			₹ 401.00
		Height of Structure	1	Mt.						
		Top Width of Structure	1.5	Mt.						
		Bottam Width of Structure	3.50	Mt.						
		Side Slope	1:01							

Sl.no.	Code no.	Item of Works	Length in Mt.	Top width in Mt.	Bottom width in Mt.	Height (Avr.) in Mt.	Volume of Boulder	Rate	Unit	Amount
1		Survey & Lay out					3	401	M.D.	₹ 1,203.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	4.4		3.85		16.94	9.74	Sq. Mt.	₹ 164.91
3	5.6.4 (W.R.D.)	Supplying laying boulder in rock toe, heel tenches of the dam as per design, drawing including the cost of materials royalty and all taxes etc. but excluding the cost of carriage all complete as per specification and direction of E/I.	4	1.50	3.50	1.00	10.00	1640.17	Cu.Mt.	₹ 16,401.66
		Sub Total								**17769.57**
		Less Total of MR /Analysis								-17604.66
		Sub Total of SOR (A)								164.91
		Less-CP @ 9.09% of (A)						164.91	9.09%	-14.99
		Sub Total(B)								149.92
		Total of MR /Analysis								17604.66
4		**Carriage of Materials with loading & unloading:-**								
		Boulder (15Km)					10.00	878.25	Cu.Mt.	₹ 8,782.51
		Sub Total(C)								**26537.09**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%								
		Sub Total(D)								₹ 26,537.09
		Add contergency & consultancy @ 2%								₹ 530.74
		Grand Total								₹ 27,067.83
		Say								₹ 27,068.00

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Annexure 11: Estimate – Stop Dam (15m Length x 3m Height)

STOP DAM 15m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	15	Mt.	Wall Column Width (foundat			0.6	Mt.	
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth			1.5	Mt.	
		Length of Appron (Avr.)	7.5	Mt.	ApronFoundationDepth			1.2	Mt.	
		Length of Toe wall	15	Mt.	FoundationLowerP.C.C.			0.15	Mt.	
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary			0.9	Mt.	
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.			0.3	Mt.	
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height			4.5	Mt.	Wage Rate
		Wing wall Length	2	Mt.	Free Board			1.5	Mt.	₹ 401.00
		Weir Slope	1:01		Top Width of Weir			0.45	Mt.	
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	30	15		450	Sq.Mt.	9.74	4380.75
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	15.00	0.60	1.50	13.50			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	15.00	0.60	1.20	10.80			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**112.50**	**Cum**	**240.86**	**27096.30**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its outting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	15.00	0.60	0.15	5.40			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Sidewall	4	7.50	0.60	0.15	2.70			
		Wingwall	2	2.00	0.60	0.15	0.36			
		Toewall	1	15.00	0.60	0.15	1.35			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**27.05**	**Cum**	**4120.82**	**111447.58**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	15.00	0.60	0.30	10.80			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Sidewall	4	7.50	0.60	0.30	5.40			
		Wingwall	2	2.00	0.60	0.30	0.72			
		Toewall	1	15.00	0.60	0.30	2.70			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**49.82**	**Cum**	**4120.82**	**205315.74**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per speification and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	15.00		0.30	36.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Sidewall	8	7.50		0.30	18.00			
		Wingwall	4	2.00		0.30	2.40			
		Toewall	2	15.00		0.30	9.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**264.36**	**Sqm**	**459.83**	**121561.45**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	20.34	140.00	2847.60				
		Columns	KG	27.22	160.00	4354.56				
						7406.28				
		8mm dia TMT Fe 500					**2221.88**	**Kg.**	**91.65**	**203625.50**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1110.94**	**Kg.**	**90.31**	**100324.94**
	(iii)	12mm dia TMT Fe 502					**4073.45**	**Kg.**	**88.97**	**362402.89**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/Anti seeepage wall	1	15.00	1.50	3.00	67.50			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wal	1	15.00	0.45	0.45	3.04			
		Total					**127.78**	**Cum**	**3013.65**	**385076.41**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	15.00		3.00	90.00			
		Top face	1	15.00		0.60	18.00			
		Head wall Slope part	1	15.00		4.10	123.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	15.00		0.45	20.25			
		Top face	1	15.00		0.60	27.00			
		Total					**387.45**	**Sqm**	**303.53**	**117604.25**
		Sub Total								1642845.80
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1638835.80**
		Less-CP @ 9.09% of (A)								-148970.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1493875.62**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					88.61	cum	820.92	72742.42
		Stone Chip's					68.41	cum	1234.20	84435.83
		Cement					38.75	MT	807.26	31283.77
		Steel					7.41	MT	807.26	5978.77
		Boulder					127.78	cum	878.25	112220.72
		Sub Total(C)								**1800537.14**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							850921.02	0.00
		Sub Total(D)								**1800537.14**
		Add contengency & consultancy @ 2% of(C)								36010.74
		Total								**₹ 18,36,547.88**
		Say								**₹ 18,36,548.00**

Annexure 12: Estimate – Stop Dam (18m Length x 3m Height)

STOP DAM 18m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. Of Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	18	Mt.	Wall Column Width (foundation)			0.6	Mt.	
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth			1.5	Mt.	
		Length of Appron (Avr.)	7.5	Mt.	ApproonFoundationDepth			1.2	Mt.	
		Length of Toe wall	18	Mt.	FoundationLowerP.C.C.			0.15	Mt.	
		Height of Toe wall	0.45	Mt.	Foundation Rubble Masonary			0.9	Mt.	
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.			0.3	Mt.	
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height			4.5	Mt.	Wage Rate
		Wing wall Length	2	Mt.	Free Board			1.5	Mt.	₹ 401.00
		Weir Slope	1:01		Top Width of Weir			0.45	Mt.	
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	36	15		540	Sq.Mt.	9.74	5256.9
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	18.00	0.60	1.50	16.20			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	18.00	0.60	1.20	12.96			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**117.36**	**Cum**	**240.86**	**28266.86**

4	5.3.6 (W.R.D) Refer RCD 11.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	18.00	0.60	0.15	6.48			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toewall	1	18.00	0.60	0.15	1.62			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**28.40**	**Cum**	**4120.82**	**117010.68**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	18.00	0.60	0.30	12.96			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toewall	1	18.00	0.60	0.30	3.24			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**52.52**	**Cum**	**4120.82**	**216441.95**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per spelfication and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	18.00		0.30	43.20			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toewall	2	18.00		0.30	10.80			
		For Columns, Pillars, Piers, Abutments, Posts and Struts								
		Columns	56	0.60		5.40	181.44			
		Total					**273.36**	**Sqm**	**459.83**	**125699.95**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	23.04	140.00	3225.60				
		Columns	KG	27.22	160.00	4354.56				
						7784.28				
		8mm dia TMT Fe500					2335.28	Kg.	91.65	214018.09
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					1167.64	Kg.	90.31	105445.30
	(iii)	12mm dia TMT Fe 502					4281.35	Kg.	88.97	380899.12
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/Anti seepage wall	1	18.00	1.50	3.00	81.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	18.00	0.45	0.45	3.65			
		Total					141.89	Cum	3013.65	427591.45

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	18.00		3.00	108.00			
		Top face	1	18.00		0.60	21.60			
		Head wall Slope part	1	18.00		4.10	147.60			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	18.00		0.45	24.30			
		Top face	1	18.00		0.60	32.40			
		Total					**443.10**	**Sqm**	**303.53**	**134495.92**
		Sub Total								1759136.22
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1755126.22**
		Less-CP @ 9.09% of (A)								-159540.97
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1599595.25**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000 each	1676.99	0.00
		Coarse Sand					96.73	cum	820.92	79406.48
		Stone Chip's					72.02	cum	1234.20	88884.50
		Cement					41.72	MT	807.26	33680.00
		Steel					7.78	MT	807.26	6283.91
		Boulder					141.89	cum	878.25	124610.64
		Sub Total(C)								**1932460.79**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							929063.76	0.00
		Sub Total(D)								**1932460.79**
		Add contengency & consultancy @ 2% of(C)								38649.22
		Total								**₹ 19,71,110.01**
		Say								**₹ 19,71,110.00**

Annexure 13: Estimate – Stop Dam (20m Length x 3m Height)

STOP DAM 20m L x 3m H										
BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	20	Mt.	Wall Column Width (foundati		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	ApronFoundationDepth		1.2	Mt.		
		Length of Toe wall	20	Mt.	FoundationLowerP.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	40	15		600	Sq.Mt.	9.74	5841
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	103.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	20.00	0.60	1.50	18.00			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	20.00	0.60	1.20	14.40			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**120.60**	**Cum**	**240.86**	**29047.23**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of(1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	20.00	0.60	0.15	7.20			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	20.00	0.60	0.15	1.80			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**29.30**	**Cum**	**4120.82**	**120719.42**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	20.00	0.60	0.30	14.40			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	20.00	0.60	0.30	3.60			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**54.32**	**Cum**	**4120.82**	**223859.43**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per spelfication and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	20.00		0.30	48.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	20.00		0.30	12.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**279.36**	**Sqm**	**459.83**	**128458.95**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	24.84	140.00	3477.60				
		Columns	KG	27.22	160.00	4354.56				
						8036.28				
		8mm dia TMT Fe500					2410.88	Kg.	91.65	220946.48
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					1205.44	Kg.	90.31	108858.88
	(iii)	12mm dia TMT Fe 502					4419.95	Kg.	88.97	393229.95
7	5.2.2B (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seepage wall	1	20.00	1.50	3.00	90.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	20.00	0.45	0.45	4.05			
		Total					**151.29**	**Cum**	**3013.65**	**455934.81**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	20.00		3.00	120.00			
		Top face	1	20.00		0.60	24.00			
		Head wall Slope part	1	20.00		4.10	164.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	20.00		0.45	27.00			
		Top face	1	20.00		0.60	36.00			
		Total					**480.20**	**Sqm**	**303.53**	**145757.03**
		Sub Total								1836663.17
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1832653.17**
		Less-CP @ 9.09% of (A)								-166588.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1670074.99**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					102.14	cum	820.92	83849.18
		Stone Chip's					74.42	cum	1234.20	91850.29
		Cement					43.70	MT	807.26	35277.49
		Steel					8.04	MT	807.26	6487.34
		Boulder					151.29	cum	878.25	132870.59
		Sub Total(C)								**2020409.89**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							981158.91	0.00
		Sub Total(D)								**2020409.89**
		Add contengency & consultancy @ 2% of(C)								40408.20
		Total								**₹ 20,60,818.09**
		Say								**₹ 20,60,818.00**

Annexure 14: Estimate – Stop Dam (22m Length x 3m Height)

STOP DAM 22m x 3m

BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022

		Nala Width / Head Wall Length	22	Mt.	Wall Column Width (foundati		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	ApronFoundationDepth		1.2	Mt.		
		Length of Toe wall	22	Mt.	FoundationLowerP.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation\upperP.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						

Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	44	15		660	Sq.Mt.	9.74	6425.1
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	203.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	22.00	0.60	1.50	19.80			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	22.00	0.60	1.20	15.84			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**123.84**	**Cum**	**240.86**	**29827.61**
4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C. M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								

		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	22.00	0.60	0.15	7.92			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	22.00	0.60	0.15	1.98			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**30.20**	**Cum**	**4120.82**	**124428.16**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	22.00	0.60	0.30	15.84			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	22.00	0.60	0.30	3.96			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**56.12**	**Cum**	**4120.82**	**231276.90**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per spelfication and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	22.00		0.30	52.80			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	22.00		0.30	13.20			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	36	0.60		5.40	181.44			
		Total					**285.36**	**Sqm**	**459.83**	**131217.94**
6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	66	2.27	90.00	204.12				
		For Tie Band	66	26.64	140.00	3729.60				
		Columns	66	27.22	160.00	4354.56				
						8288.28				
		8mm dia TMT Fe 500					**2486.48**	**Kg.**	**91.65**	**227874.88**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								

	(ii)	10mm dia TMT Fe 501					1243.24	Kg.	90.31	112272.45
	(iii)	12mm dia TMT Fe 502					4558.55	Kg.	88.97	405560.77
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seepage wall	1	22.00	1.50	3.00	99.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	22.00	0.45	0.45	4.46			
		Total					**160.70**	**Cum**	**3013.65**	**484278.17**
8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	22.00		3.00	132.00			
		Top face	1	22.00		0.60	26.40			
		Head wall Slope part	1	22.00		4.10	180.40			
		Head Extention wall outer side	1	2.00		4.50	18.00			
		Top face	1	2.00		0.60	2.40			
		Side wall inner side	1	7.50		4.50	67.50			
		Top face	1	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	22.00		0.45	29.70			
		Top face	1	22.00		0.60	39.60			
		Total					**517.30**	**Sqm**	**303.53**	**157018.14**
		Sub Total								1914190.11
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**1910180.11**
		Less-CP @ 9.09% of (A)								-173635.37
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1740554.74**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					102.14	cum	820.92	83849.18
		Stone Chip's					74.42	cum	1234.20	91850.29
		Cement					43.70	MT	807.26	35277.49
		Steel					8.29	MT	807.26	6690.77
		Boulder					160.70	cum	878.25	141130.54
		Sub Total(C)								**2099353.02**
		Add due to increase in wage rate from 401.00/-to ...../-@ .....%							1033254.07	0.00
		Sub Total(D)								**2099353.02**
		Add contengency & consultancy @ 2% of(C)								41987.06
		Total								**₹ 21,41,340.08**

Annexure 15: Estimate – Stop Dam (25m Length x 3m Height)

STOP DAM 25m L x 3m H										
BASED ON S.O.R W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022										
		Nala Width / Head Wall Length	25	Mt.	Wall Column Width (foundat		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	AppronFoundationDepth		1.2	Mt.		
		Length of Toe wall	25	Mt.	FoundationLower?.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	FoundationRubbleMasonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation(upper)P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.	Free Board		1.5	Mt.	₹	401.00
		Weir Slope	1.01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						
Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
2	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	50	15		750	Sq.Mt.	9.74	7301.25
3	5.1.8 (W.R.D.)	E/W in excavation of fourdation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	203.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	25.00	0.60	1.50	22.50			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	25.00	0.60	1.20	18.00			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**128.70**	**Cum**	**240.86**	**30998.17**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of(1:2:4) in foundation of various components of canal or embankment structures with approved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E/I.								
		For PCC of Wall/ Tie Beam								
		Weir /Head wall	4	25.00	0.60	0.15	9.00			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Sidewall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	25.00	0.60	0.15	2.25			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**31.55**	**Cum**	**4120.82**	**129991.27**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir /Head wall	4	25.00	0.60	0.30	18.00			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Sidewall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	25.00	0.60	0.30	4.50			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**58.82**	**Cum**	**4120.82**	**242403.12**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per speification and direction of E/I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir /Head wall	8	25.00		0.30	60.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Sidewall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	25.00		0.30	15.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**294.36**	**Sqm**	**459.83**	**135356.44**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.00	204.12				
		For Tie Band	KG	29.34	140.00	4107.60				
		Columns	KG	27.22	160.00	4354.56				
						8666.28				
		8mm dia TMT Fe 500					**2599.88**	**Kg.**	**91.65**	**238267.47**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1299.94**	**Kg.**	**90.31**	**117392.81**
	(iii)	12mm dia TMT Fe 502					**4766.45**	**Kg.**	**88.97**	**424057.00**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seepage wall	1	25.00	1.50	3.80	112.50			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	25.00	0.45	0.45	5.06			
		Total					**174.80**	**Cum**	**3013.65**	**526793.20**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	25.00		3.00	150.00			
		Top face	1	25.00		0.60	30.00			
		Head wall Slope part	1	25.00		4.10	205.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Sidewall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	25.00		0.45	33.75			
		Top face	1	25.00		0.60	45.00			
		Total					**572.95**	**Sqm**	**303.53**	**173909.81**
		Sub Total								2030480.54
		Less Total of MR /Analysis								-4010.00
		Sub Total of SOR (A)								**2026470.54**
		Less-CP @ 9.09% of (A)								-184206.17
		Total of MR /Analysis								4010.00
		Sub Total(B)								**1846274.36**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000each	1676.99	0.00
		Coarse Sand					112.96	cum	820.92	92734.59
		Stone Chip's					79.23	cum	1234.20	97781.85
		Cement					47.66	MT	807.26	38472.47
		Steel					8.67	MT	807.26	6995.92
		Boulder					174.80	cum	878.25	153520.47
		Sub Total(C)								**2235779.66**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							1111396.81	0.00
		Sub Total(D)								**2235779.66**
		Add contengency & consultancy @ 2% of(C)								44715.59
		Total								**₹ 22,80,495.25**
		Say								**₹ 22,80,495.00**

Annexure 16: Estimate – Stop Dam (30m Length x 3m Height)

STOP DAM 30m L x 3m H

BASED ON S.O.R. W.R.D., B.C.D. & R.C.D. GOVT. OF Jharkhand EFFECTIVE FROM 28/07/2022

		Nala Width / Head Wall Length	30	Mt.	Wall Column Width (foundation)		0.6	Mt.		
		Nala Depth / Height of Weir	3	Mt.	Wall Foundation Depth		1.5	Mt.		
		Length of Appron (Avr.)	7.5	Mt.	Appron Foundation Depth		1.2	Mt.		
		Length of Toe wall	30	Mt.	Foundation Lower P.C.C.		0.15	Mt.		
		Height of Toe wall	0.45	Mt.	Foundation Rubble Masonary		0.9	Mt.		
		Length of Side wall	7.5	Mt.	Foundation (upper) P.C.C.		0.3	Mt.		
		Head Wall Extention Length	2	Mt.	Head Wall Extention Height		4.5	Mt.		Wage Rate
		Wing wall Length	2	Mt.			1.5	Mt.	₹	401.00
		Weir Slope	1:01		Top Width of Weir		0.45	Mt.		
		No. of Column	14	Pc.						

Sl. No.	Code no.	Item of Works	no.	L Mt.	W Mt.	H Mt.	Quantity	Unit	Rate	Amount
1		Survey & Layout	10					M.D.	401	4010.00
7	5.1.3.2 (W.R.D)	Jungle clearance including weeding out shrubs and small trees upto 150mm dia and their removal as per specification and direction of E/I.	1	60	15		900	Sq.Mt.	9.74	8761.5
3	5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.						Cu.Mt.	203.58	
	7.1.10 (W.R.D)	Extra for earth work in hard soil (vide classification of soil item-B) all complete as per specification and direction of E/I.						Cu.Mt.	15.38	
		Weir /Head wall	1	30.00	0.60	1.50	27.00			
		Head Extention wall	2	2.00	0.60	1.50	3.60			
		Side wall	2	7.50	0.60	1.50	13.50			
		Wing wall	2	2.00	0.60	1.50	3.60			
		Toe wall	1	30.00	0.60	1.20	21.60			
		Appron	1	7.50	7.50	1.20	67.50			
		Total					**136.80**	**Cum**	**240.86**	**32949.10**

4	5.3.6 (W.R.D) Refer RCD 13.05 (A)	Providing and laying P.C.C or R.C.C.M-150 with nominal mix of (1:2:4) in foundation of various components of canal or embenkment structures with aparoved quality of 20mm graded coarse aggregate of required grade(as per design) and approved quality of sand of requisite F.M (2.5 to 3.0) washed and screened including necessary tools and plants, vibrating, curing royalty and all taxes etc. excluding cost of form work as well reinforcement, its cutting bending, binding and placing complete job as per specification and direction of E\I.								
		For PCC of Wall/ Tie Beam								
		Weir/Head wall	4	30.00	0.60	0.15	10.80			
		Head Extention wall	2	2.00	0.60	0.15	0.36			
		Side wall	4	7.50	0.60	0.15	2.70			
		Wing wall	2	2.00	0.60	0.15	0.36			
		Toe wall	1	30.00	0.60	0.15	2.70			
		Appron	1	7.50	7.50	0.30	16.88			
		Total					**33.80**	**Cum**	**4120.82**	**139263.11**
		RCC Works								
		For Footing RCC	14	0.60	0.60	0.45	2.27			
		For Tie Band								
		Weir/Head wall	4	30.00	0.60	0.30	21.60			
		Head Extention wall	2	2.00	0.60	0.30	0.72			
		Side wall	4	7.50	0.60	0.30	5.40			
		Wing wall	2	2.00	0.60	0.30	0.72			
		Toe wall	1	30.00	0.60	0.30	5.40			
		Columns	14	0.60	0.60	5.40	27.22			
		Total					**63.32**	**Cum**	**4120.82**	**260946.81**
5	5.3.17 (W.R.D.)	Providing shuttering including strutting proping etc. and its removal after use in foundation as per sperification and direction of E\I.								
		For Footing RCC	56	0.60		0.45	15.12			
		For Tie Band								
		Weir/Head wall	8	30.00		0.30	72.00			
		Head Extention wall	4	2.00		0.30	2.40			
		Side wall	8	7.50		0.30	18.00			
		Wing wall	4	2.00		0.30	2.40			
		Toe wall	2	30.00		0.30	18.00			
		For Columns, Pillars, Piers, Abutments, Posts and Struts.								
		Columns	56	0.60		5.40	181.44			
		Total					**309.36**	**Sqm**	**459.83**	**142253.94**

6	5.5.4 (B.C.D.)	Providing Tor steel reinforcement of 8mm dia rods as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/I.								
		Calculation of reinf.								
		For Footing RCC	KG	2.27	90.60	204.12				
		For Tie Band	KG	33.84	140.60	4737.60				
		Columns	KG	27.22	160.60	4354.56				
						9296.28				
		8mm dia TMT Fe 500					**2788.88**	**Kg.**	**91.65**	**255588.45**
	5.5.5 (B.C.D.)	Providing Tor steel reinforcement of 10mm, 12mm & 16mm dia bars as per approved design and drawing excluding carriage of M.S bars to work site, cutting, bending, and binding with annealed wire with cost of wire, removal of rust, placing the rods in position all complete as per building specification and direction of E/								
	(ii)	10mm dia TMT Fe 501					**1394.44**	**Kg.**	**98.31**	**125926.75**
	(iii)	12mm dia TMT Fe 502					**5112.95**	**Kg.**	**88.97**	**454884.06**
7	5.2.28 (W.R.D) Part A	Providing random rubble stone masonry in C.M (1:4) in foundation and plinth with hammer dressed stone of less than 0.03 M^3 in volume and clean coarse sand of F.M 2 to 2.5 including cost of screening, raking out joints to 20 mm depth, curing, taxes and royalty all complete as per building specification and direction of E/I.								
		Weir/Cut off Wall/ Anti seeepage wall	1	30.00	1.50	3.00	135.00			
		Head Extention wall	2	2.00	0.60	4.50	10.80			
		Side wall	2	7.50	0.60	4.50	40.50			
		Wing wall	2	2.00	0.60	2.48	5.94			
		Toe wall/Cut off wall/Anti seepage wall	1	30.00	0.45	0.45	6.08			
		Total					**198.32**	**Cum**	**3013.65**	**597651.60**

8	5.7.16 (W.R.D) Part A	Providing 25mm thick water proof cement plaster (1:3) with clean coarse sand of F.M 1.5 with 5% cico or any other approved water proofing compound including screening, curing with all leads and lifts of water, scaffolding taxes and royalty all complete as per building specification and direction of E/I.								
		Head wall Length X Height both side	1	30.00		3.00	180.00			
		Top face	1	30.00		0.60	36.00			
		Head wall Slope part	1	30.00		4.10	246.00			
		Head Extention wall outer side	2	2.00		4.50	18.00			
		Top face	2	2.00		0.60	2.40			
		Side wall inner side	2	7.50		4.50	67.50			
		Top face	2	7.50		0.60	9.00			
		Wing wall inner side	2	2.00		2.48	9.90			
		Top face	2	2.00		0.60	2.40			
		Toe wall (three side)	1	30.00		0.45	40.50			
		Top face	1	30.00		0.60	54.00			
		Total					**665.70**	**Sqm**	**303.53**	**202062.58**
		Sub Total								2224297.90
		Less Total of MR/Analysis								-4010.00
		Sub Total of SOR (A)								**2220287.90**
		Less-CP @ 9.09% of (A)								-201824.17
		Total of MR/Analysis								4010.00
		Sub Total(B)								**2022473.73**
		Carriage of material								
		Bricks (local lead 1K+7P)					0.00	1000 each	1676.99	0.00
		Coarse Sand					129.20	cum	820.92	106062.69
		Stone Chip's					86.44	cum	1234.20	106679.20
		Cement					53.60	MT	807.26	43264.94
		Steel					9.30	MT	807.26	7504.49
		Boulder					198.32	cum	878.25	174170.35
		Sub Total(C)								**2460155.40**
		Add due to increase in wage rate from 401.00/- to ...../- @ .....%							1241634.71	0.00
		Sub Total(D)								**2460155.40**
		Add contengency & consultancy @ 2% of(C)								49203.11
		Total								**₹ 25,09,358.51**
		Say								**₹ 25,09,359.00**

Annexure 17: Estimate – Earthen Check Dam (20m Length x 3m Height)

Earthen Checkdam 20m L x 3m H							
General Information		Technical Information					
P.F.		Length (Ave.)	20.00	Mt.	Key trench size in Mt.		
Block		Height(Ave.)	2.40	Mt.	Top width	5.0	
Beat		Top	5.00	Mt.	Bottom width	2.0	
Range		Base(Ave.)	12.60	Mt.	Depth	1.5	
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0	
		Free board	1.00	Mt.	(note width+1+1mt.)		
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate /'	Amount in '		Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00		
2 7.1.18 (W.R.O.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,413.88		
3 5.1.11.2.1 (W.R.O.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2cm from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99		
4. 7.1.30 (W.R.O)	Earthwork in filling foundation trenches and back filling of structures in layor not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 31,012.44		
5. 7.1.34 (W.R.O.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.69	₹ 459.83		
6. 5.1.8(W.R .O.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 1500M and initial lift of 1.5M all lifts as per specification and direction of E/I.	374.40	Cu.Mt.	225.94	₹ 84,642.39		
7. 7.1.25 (W.R.O.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I. (Mode of measurement sectional measurement shall be of compacted earth).	374.400	Cu.Mt.	140.72	₹ 52,686.65		
8. 7.1.34 (W.R.O.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	89.856	Cu.Mt.	34.68	₹ 1,513.83		
9. 7.1.38 (W.R.O.)	Watering and consolidation of earth laid in 150mm to 215mm layers by manual labour with C.I. hammers to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	374.40	Cu.Mt.	43.78	₹ 16,390.33		
10. 6.6.6 (W.R.O.)	Labour charge for pitching with stone boulder duly packed in slope and aprone with materials within 150M of work site and all lifts as per specification and direction of E/I.	26.83	Cu.Mt.	968.17	₹ 25,978.73		
11. 7.1.42.1 (W.R.O)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	187.33	Sq.Mt.	35.00	₹ 6,556.75		
12. 7.1.42.2 (W.R.O)	Extra for each lead of 150M over initial lead of 150M.	187.33	Sq.Mt.	5.64	₹ 943.08		
	Add for transporting Grass in en motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	187.33	Sq.Mt.	100.35	₹ 16,774.96		
	Sub Total				**244822.52**		
	Less Total of MR /Analysis				-18378.96		
	Sub Total of SOR (A)				226043.57		
	Less CP @ 9.09% of (A)		226044	9.09%	-20547.36		
	Sub Total(B)				205496.21		
	Total of MR /Analysis				18378.96		
	Carriage of Materials with loading & unloading:-						
	Beldari (15 Km)	26.83	Cu.Mt.	798.41	₹ 21,423.59		
	Sub Total(C)				**245298.75**		
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%						
	Sub Total(D)				**₹ 2,45,298.75**		
	Add contengency & consultancy @ 2%				**₹ 4,905.98**		
	Add Cost of Waste weir				**₹ 65,905.80**		
	Grand Total				**₹ 3,16,109.73**		
	Say				**₹ 3,16,110.00**		

Annexure 18: Estimate – Earthen Check Dam (25m Length x 3m Height)

Earthen Check Dam 25m x 3m						
General Information		Technical Information				
P.F.		Length (Avr.)	25.00	Mt.	Key trench size in Mt.	
Block		Height(Avr.)	2.40	Mt.	Top width	5.0
Post		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Avr.)	12.60	Mt.	Depth	1.5
District		Slope2:1(H:V	5.37	Mt.	Length	6.0
		Free Board	1.06	Mt.	(sula width+1+1=mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate/-	Amount in ₹	Remarks
1	Survey & lay out.	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88	
3. 1.11.2.1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in sot rock (where blasting is not required) (vide type of soil Item-C) with disposal of spoil beyond 1/3km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in Filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	468.00	Cu.Mt.	223.94	₹ 1,04,802.98	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil Item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I (Mode of measurement sectional measurement shall be of compacted earth).	468.000	Cu.Mt.	140.72	₹ 65,858.36	
8. 7.1.44	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil(vide classification of soil Item A and B)	112.320	Cu.Mt.	14.60	₹ 1,639.54	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessry tools and plants with all leads and lifts all complete as per specification and direction of E/I.	468.00	Cu.Mt.	43.78	₹ 20,489.04	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	33.54	Cu.Mt.	968.17	₹ 32,473.41	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M including the cost of watering the grass surface till it accuires greenness as per specification and direction of E/I.	209.16	Sq.Mt.	15.03	₹ 3,143.44	
12. 7.1.42.2	Extra for each lead of 150M over initial lead of 150M.	209.16	Sq.Mt.	5.64	₹ 1,178.79	
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	209.16	Sq.Mt.	100.25	₹ 20,968.70	
	Sub Total				**294533.38**	
	Less Total of MR /Analysis				-22572.70	
	Sub Total of SOR (A)				271960.68	
	Less CP @ 9.09% of (A)		271961	9.09%	-24721.23	
	Sub Total(B)				247239.45	
	Total of M.R./Analysis				22572.70	
	Carriage of Materials with loading & unloading:-					
	Boulder (15 Km)	33.54	Cu.Mt.	798.41	₹ 26,779.69	
	Sub Total(C)				**296591.64**	
	Add due to increase in wage rate from 401.00/- to ____/- @ _____%					
	Sub Total(D)				**₹ 2,96,591.64**	
	Add contongency & consultancy @ 2%				**₹ 5,931.83**	
	Add Cost of Waste weir				**₹ 65,905.00**	
	Grand Total				**₹ 3,68,428.47**	
	Say				₹ 3,68,428.00	

Annexure 19: Estimate – Earthen Check Dam (30m Length x 3m Height)

Earthen Checkdam 30m L x 3m H							
General Information		Technical Information					
PJ:		Length (Ave)	30.00	Mt.	Key trench size in Mt.		
Block		Height (Ave.)	2.40	Mt.	Top width	5.0	
Dept.		Top	5.00	Mt.	Bottom width	2.0	
Range		Base (Ave.)	12.60	Mt.	Depth	1.5	
District		Deposit (Ave)	9.37	Mt.	Length	6.0	
		Free Board	1.00	Mt.	(side width+1+1 mt.)		
		Sand depth	0.60	Mt.	Wage Rate	₹	401.00
Item code	Item of Work	Quantity	Unit	Rate /-	Amount in ₹		Remarks
1	Survey & lay out	4	M.D.	401.00	₹	1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying 7.5 discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoil etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.37	₹	4,417.88	
3 5.1.11.2.3 W.R.D.)	Earth work in excavation in cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) in/de type of soil item-C) with disposal of spoil beyond 1/10th from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.10	₹	5,484.99	
4 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil/pide classification of soil item A and B)	31.5	Cu.Mt.	14.80	₹	466.20	
6. 5.1.8(B) & D)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	561.60	Cu.Mt.	226.04	₹	1,26,969.50	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item A) obtained from borrow area or any other sources free from logs, roots or any other ingredients etc. with initial lead of 1KM and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I (Mode of measurement sectional measurement shall be of completed earth).	561.600	Cu.Mt.	140.72	₹	79,030.04	
8 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)						
7.1.34.1	For ordinary and hard soil/pide classification of soil item A and B)	134.784	Cu.Mt.	14.80	₹	1,957.40	
9 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layer by manual labour with CI. hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	561.60	Cu.Mt.	49.78	₹	24,586.85	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	40.25	Cu.Mt.	968.17	₹	38,968.89	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	251.00	Sq.Mt.	15.03	₹	3,772.53	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M	251.00	Sq.Mt.	5.64	₹	1,414.64	
	Add for transporting grass in an motorable road or head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	251.00	Sq.Mt.	100.25	₹	25,162.44	
	Sub Total					**5,48,664.33**	
	Less Total of NR /Analysis					-29,766.44	
	Sub Total-of SOR (A)					3,17,877.79	
	Less CP (@ 9.03% of (A)			3,17,878	9.03%	-28,695.89	
	Sub Total (B)					2,88,882.30	
	Total of NR /Analysis					29,766.44	
	Carriage of Materials with loading & unloading:-						
	Boulder (15 Km)	40.25	Cu.Mt.	799.41	₹	32,175.39	
	Sub Total(C)					**3,47,824.13**	
	Add due to increase in wage rate from 401.00/- to ____/- @ ____%						
	Sub Total(D)					₹	**3,47,824.13**
	Add contingency & consultancy @ 2%					₹	**6,957.65**
	Add Cost of Waste wier					₹	**65,565.00**
	Grand Total					₹	**4,20,347.78**
	Say					₹	**4,20,347.00**

Annexure 20: Estimate – Earthen Check Dam (40m Length x 3m Height)

Earthen Checkdam 40m L x 3m H						
General Information		Technical Information				
P.F.		Length (Av.)	40.00	Mt.	Key trench size in Mt.	
Block		Height(Av.)	2.40	Mt.	Top width	5.0
Said		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Av.)	12.60	Mt.	Depth	1.5
District		Slope2:1(H:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	[nalla width+14 mt]	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00

Item code	Item of Work	Quantity	Unit	Rate / `	Amount in `	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoil etc. with initial lead of 50m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.37	₹ 4,411.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile with in a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	748.80	Cu.Mt.	223.94	₹ 1,67,684.77	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile(vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots ,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	748.800	Cu.Mt.	140.72	₹ 1,05,373.88	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume.)					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	179.712	Cu.Mt.	14.60	₹ 2,623.16	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225 mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	748.80	Cu.Mt.	43.78	₹ 32,780.46	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder dulo packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	53.67	Cu.Mt.	968.17	₹ 51,957.45	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and surfing with 75mm thick grass sods, obtained within lead of 150mt, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	334.66	Sq.Mt.	15.08	₹ 5,029.51	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	334.66	Sq.Mt.	5.64	₹ 1,886.06	
	Add for transporting Grass in an motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	334.66	Sq.Mt.	100.25	₹ 33,549.92	
	Sub Total				**441865.93**	
	Less Total of NR (Analysis				-35153.92	
	Sub Total of SOR (A)				406712.01	
	Less-CP @ 9.09% of (A)		406712	9.09%	-37242.82	
	Sub Total(B)				371469.19	
	Total of NR /Analysis				35153.92	
	Carriage of Materials with loading & unloading:					
	Boulder (1.5 Km)	53.67	Cu.Mt.	798.41	₹ 42,847.18	
	Sub Total(C)				**450470.29**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				₹ **450,470.29**	
	Add contengency & consultancy @ 2%				₹ **9,009.41**	
	Add Cost of Waste weir				₹ **65,905.00**	
	Grand Total				₹ **525384.69**	
	Say				₹ **5,25,385.00**	

Annexure 21: Estimate – Earthen Check Dam (50m Length x 3m Height)

Earthen Check Dam 50m L x 3m H						
General Information		Technical Information				
P.F.		Length (Av.)	50.00	Mt.	Key trench size in Mt.	
Block		Height (Av.)	2.40	Mt.	Top width	3.0
Dist		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Av.)	12.60	Mt.	Depth	1.5
District		Slope(2.5H:1V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	Side width=1:1 (Av.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /'	Amount in '	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in soil clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusecs) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soil rock (where blasting is not required) (side type of soil item-C) with disposal of spoil beyond 1/2 km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.52	₹ 5,496.89	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	[illegible]	₹ 32,052.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8(W. R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	935.00	Cu.Mt.	223.94	₹ 2,09,605.37	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from sigs, roots,or any other ingredients etc. with initial lead of 1SM and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 215mm thick complete as per specification and direction of E/I (Mode of measurement sectional measurement shall be of compacted earth).	986.008	Cu.Mt.	140.72	₹ 1,31,718.73	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 %of total volume)					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	224.640	Cu.Mt.	14.60	₹ 3,279.37	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth bid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	935.00	Cu.Mt.	43.78	₹ 40,929.08	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder dully packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	67.08	Cu.Mt.	968.17	₹ 64,946.82	
11 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	418.33	Sq.Mt.	15.03	₹ 6,286.89	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	418.33	Sq.Mt.	5.64	₹ 2,357.57	
	Add for transporting Grass in un motorable road or head load & other means from average 500mt. 8.25 M.D. per Sq.Mt.	418.33	Sq.Mt.	100.25	₹ 41,937.40	
	Sub Total				**545087.84**	
	Less Total of MR /Analysis				-43541.40	
	Sub Total of SOR (A)				501546.24	
	Less: CP @ 9.09% of (A)			9.09%	-45590.55	
	Sub Total(B)				455955.69	
	Total of MR /Analysis				43541.40	
	Carriage of Materials with loading & unloading-					
	Boulder (15 Km)	67.08	Cu.Mt.	798.41	₹ 53,558.37	
	Sub Total(C)				**553056.05**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				₹ **553,056.05**	
	Add contengency & consultancy @ 2%				₹ **11,061.12**	
	Add Cost of Waste work				₹ **65,905.00**	
	Grand Total				₹ **630,022.18**	
	Say				₹ **6,30,022.00**	

Annexure 22: Estimate – Earthen Check Dam (60m Length x 3m Height)

Earthen Checkdam 60m L x 3m H						
General Information		Technical Information				
P.F.		Length (Ave.)	60.00	Mt.	Key trench size in Mt.	
Block		Height (Ave.)	2.40	Mt.	Top width	5.0
Beat		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Ave.)	12.60	Mt.	Depth	1.5
District		Slope (1:M:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	(main width+1+1mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /	Amount in ₹	Remarks
1	Survey & lay out	4	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 10m and lift of 1.5m as per specification and direction of E/I.	31.640	Cu.Mt.	135.17	₹ 4,413.88	
3. 5.1.11.2 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in sat rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by dipper including construction and maintenance of haul road all complete as per	11.5	Cu.Mt.	174.31	₹ 5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per	11.5	Cu.Mt.	########	₹ 32,013.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	11.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.8 (W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and	1123.20	Cu.Mt.	123.94	₹ 2,51,527.16	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots, or any other ingredients etc. with initial lead of 1.5M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 215mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	1113.200	Cu.Mt.	140.71	₹ 1,58,060.97	
8 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil (vide classification of soil item A and B)	269.568	Cu.Mt.	14.60	₹ 3,934.88	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1123.20	Cu.Mt.	43.78	₹ 49,173.70	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	80.50	Cu.Mt.	968.17	₹ 77,936.18	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of I/I.	501.99	Sq.Mt.	15.03	₹ 7,544.28	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	501.99	Sq.Mt.	5.64	₹ 2,829.99	
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	501.99	Sq.Mt.	100.25	₹ 50,324.88	
	Sub Total				**645309.34**	
	Less Total of WR /Analysis				-51928.88	
	Sub Total of SOR (A)				593380.46	
	Less CP @ 9.09% of (A)		########	9.09%	-53938.28	
	Sub Total(B)				539442.18	
	Total of WR /Analysis				51928.88	
	Carriage of Materials with loading & unloading-					
	Boulder (15 KM)	80.50	Cu.Mt.	798.41	₹ 64,270.77	
	Sub Total(C)				**655643.82**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				**₹ 6,55,643.82**	
	Add contingency & consultancy @ 2%				**₹ 13,113.04**	
	Add Cost of Waste weir				**₹ 65,900.00**	
	Grand Total				**₹ 7,34,656.86**	
	Say				**₹ 7,34,660.00**	

Annexure 23: Estimate – Earthen Check Dam (70m Length x 3m Height)

Earthen Checkdam 70m L x 3m H						
General Information		Technical Information				
P.F.		Length (Aw.)	70.00	Mt.	Key trench size in Mt.	
Block		Height(Aw.)	2.40	Mt.	Top width	5.0
Brick		Top	3.00	Mt.	Bottom width	2.0
Range		Base (Aw.)	12.60	Mt.	Depth	1.5
District		Slope(2:1)(H:V)	5.37	Mt.	Length	6.0
		Free Board	1.00	Mt.	(sole width+1+1mt.)	
		Sand depth	0.60	Mt.	Wage Rate	₹ 401.00
Item code	Item of Work	Quantity	Unit	Rate /`	Amount in`	Remarks
1	Survey & lay out	1	M.D.	401.00	₹ 1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (3000 cusec) or more in dead course of rivers etc. in ordinary soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88	
3. 5.1.13.2.1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not resulted) (vide type of soil Item-C) with disposal of spoil beyond 1/2m from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.59	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in suitable profile within a lead of 300M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
6. 5.1.1(W.R.D.)	C/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	1310.40	Cu.Mt.	223.94	₹ 2,93,448.39	
7. 7.1.25 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	1310.400	Cu.Mt.	140.72	₹ 1,84,403.42	
8. 7.1.34	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	314.496	Cu.Mt.	14.60	₹ 4,590.70	
9. 7.1.26 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 95% of maximum dry density including supply of water and necessary tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1310.40	Cu.Mt.	43.78	₹ 57,369.31	
10. 6.6.8 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	93.91	Cu.Mt.	968.17	₹ 90,925.55	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	585.66	Sq.Mt.	15.03	₹ 8,801.64	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	585.66	Sq.Mt.	5.64	₹ 3,300.60	
	Add for transporting Grass in un motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq Mt.	585.66	Sq.Mt.	100.23	₹ 58,712.39	
	Sub Total				**745531.05**	
	Less Total of MR /Analysis				-60816.36	
	Sub Total of SOR (A)				685214.69	
	Less CP @ 9.09% of (A)		685215	9.09%	-62286.02	
	Sub Total(B)				622928.67	
	Total of MR /Analysis				60816.36	
	Carriage of Materials with loading & unloading:					
	Boulder (15 Km)	93.91	Cu.Mt.	798.41	₹ 74,982.56	
	Sub Total(C)				**758227.59**	
	Add due to increase in wage rate from 401.00/- to ...../- @ .....%					
	Sub Total(D)				₹ **7,58,227.59**	
	Add contingency & consultancy @ 2%				₹ **15,164.55**	
	Add Cost of Waste weir				₹ **65,905.00**	
	Grand Total				₹ **8,39,297.14**	
	Say				₹ **8,39,297.00**	

Annexure 24: Estimate – Earthen Check Dam (100m Length x 3m Height)

Earthen Check Dam 100m L x 3m H							
General Information		Technical Information					
P.F.		Length (Avr.)	100.00	Mt.	Key trench size in Mt.		
Block		Height (Avr.)	2.40	Mt.	Top width	5.8	
Beat		Top	3.00	Mt.	Bottom width	2.8	
Range		Base (Avr.)	12.60	Mt.	Depth	1.5	
District		(Slope1:1)(1:1)	5.37	Mt.	Length	6.8	
		Free Board	1.00	Mt.	(male width+1+1mt.)		
		Sand depth	0.50	Mt.	Wage Rate	₹ 401.00	
Item code	Item of Work	Quantity	Unit	Rate /'	Amount in '		Remarks
1	Survey & lay out	4	M.D	101.00	₹	1,604.00	
2 7.1.18 (W.R.D.)	Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cusec) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 10m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹	4,411.88	
3. 5.1.11.2. 1(W.R.D.)	Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (vide type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹	5,490.99	
4. 7.1.30 (W.R.D)	Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 10M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹	32,012.44	
5. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹	459.81	
6. 5.1.8(W.R.D.)	E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	1872.80	Cu.Mt.	223.94	₹	4,19,211.94	
7. 7.1.35 (W.R.D.)	Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (Vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots,or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement: sectional measurement shall be of compacted earth).	1872.000	Cu.Mt.	140.72	₹	2,63,433.44	
8. 7.1.34 (W.R.D.)	Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)						
7.1.34.1	For ordinary and hard soil(vide classification of soil item A and B)	449.280	Cu.Mt.	14.60	₹	6,558.14	
9. 7.1.38 (W.R.D.)	Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessry tools and plants with all leads and lifts all complete as per specification and direction of E/I.	1872.80	Cu.Mt.	43.78	₹	81,956.16	
10. 6.6.6 (W.R.D.)	Labour charge for pitching with stone boulder duly packed in slops and apron with materials within 150M of work site and all lifts as per specification and direction of E/I.	134.16	Cu.Mt.	968.17	₹	1,29,893.64	
11. 7.1.42.1 (W.R.D)	Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	836.66	Sq.Mt.	15.05	₹	12,573.77	
12. 7.1.42.2 (W.R.D)	Extra for each lead of 150M over initial lead of 150M.	836.66	Sq.Mt.	5.64	₹	4,715.14	
	Add for transporting Grass in so motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	836.66	Sq.Mt.	100.25	₹	83,874.80	
	Sub Total					**1046196.36**	
	Less Total of MR./Analysis					-85478.80	
	Sub Total of SOR (A)					960717.36	
	Less CP @ 9.09% of (A)		960717	9.09%		-87329.21	
	Sub Total(B)					873388.15	
	Total of MR./Analysis					85478.80	
	Carriage of Materials with loading & unloading:						
	Boulder (15 Km)	134.16	Cu.Mt.	798.41	₹	1,07,117.94	
	Sub Total(C)					**1065984.89**	
	Add due to increase in wage rate from 401.00/- to ___/- @ ____%						
	Sub Total(D)				₹	**10,65,984.89**	
	Add contengency & consultancy @ 2%				₹	**21,319.70**	
	Add Cost of Waste weir				₹	**65,905.00**	
	Grand Total				₹	**11,53,209.59**	
	Say				₹	**11,53,210.00**	

Annexure 25: Estimate – Earthen Check Dam (170m Length x 3m Height)

Earthen Check Dam 170m L x 3m H

General Information		Technical Information			
	Length (Avr.)	170.00	Mt.	Key trench size in Mt.	
	Height(Avr.)	2.40	Mt.	Top width	5.0
	Top	3.00	Mt.	Bottom width	2.0
	Base (Avr.)	12.60	Mt.	Depth	1.5
	Slope3:1(H:V)	5.37	Mt.	Length	6.0
	Free Board	1.00	Mt.	(rule width+1+1mt.)	
	Sand depth	0.60	Mt.	Wage Rate	₹ 401.00

Item of Work	Quantity	Unit	Rate / `	Amount in `	Remarks
Survey & lay out	4	N.O.	401.00	₹ 1,604.00	
Earth work in bed clearance or desilting of canals carrying F.S discharge of 28 cumecs (1000 cuses) or more in dead course of rivers etc. in ordinay soil and removing the excavated earth in proper profile in spoils etc. with initial lead of 30m and lift of 1.5m as per specification and direction of E/I.	32.640	Cu.Mt.	135.17	₹ 4,411.88	
Earth work in excavation of cut off trenches by the hydraulic excavator as per designed section in soft rock (where blasting is not required) (side type of soil item-C) with disposal of spoil beyond 1/2km from centre of trench but upto 1 km with all lifts by tipper including construction and maintenance of haul road all complete as per specification and direction of E/I.	31.5	Cu.Mt.	174.32	₹ 5,490.99	
Earthwork in filling foundation trenches and back filling of structures in layer not exceeding 150mm thick well watered, rammed and fully compacted and finely dressed with suitable earth obtained from excavation of foundation trenches and placed in a suitable profile within a lead of 30M and lift of 1.5M complete job as per specification and direction of E/I.	31.5	Cu.Mt.	1016.27	₹ 32,012.44	
Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M					
For ordinary and hard soil(vide classification of soil item A and B)	31.5	Cu.Mt.	14.60	₹ 459.81	
E/W in excavation of foundation trenches as per designed section in all kinds of soil, including moorum soil, soil mixed with kankar, pebbles and boulders upto 300mm size and disposal of the same (beyond 50m away from the toe of dam in the country side) within initial lead of 150M and initial lift of 1.5M all lifts as per specification and direction of E/I.	3182.40	Cu.Mt.	223.84	₹ 7,12,660.29	
Earth work in filling in canal banks (canal discharge upto 28 cumecs) as well as special repair of canal banks in ordinary soil in proper profile (vide classification of soil item-A) obtained from borrow area or any other sources free from logs, roots or any other ingredients etc. with initial lead of 15M and lift of 1.5M including breaking clods to maximum 50mm cube placing the earth in layers not exceeding 225mm thick complete as per specification and direction of E/I.(Mode of measurement sectional measurement shall be of compacted earth).	3182.400	Cu.Mt.	140.72	₹ 4,47,836.88	
Extra for earth work for each subsequent lift of 1M over the initial lift of 1.5M. (Approx 24 % of total volume)					
For ordinary and hard soil(vide classification of soil item A and B)	763.776	Cu.Mt.	14.60	₹ 11,148.84	
Watering and consolidation of earth laid in 150mm to 225mm layers by manual labour with C.I hammer to achieve minimum 85% of maximum dry density including supply of water and necessry tools and plants with all leads and lifts all complete as per specification and direction of E/I.	3182.40	Cu.Mt.	43.78	₹ 1,39,325.47	
Labour charge for pitching with stone boulder duly packed in slope and apron with materials within 150M of work site and all lifts as per specification and direction of E/I	228.08	Cu.Mt.	968.17	₹ 2,20,819.18	
Fine dressing of the canal banks or embankment and turfing with 75mm thick grass sods, obtained within lead of 150M, including the cost of watering the grass surface till it acquires greenness as per specification and direction of E/I.	1422.32	Sq.Mt.	15.03	₹ 21,375.41	
Extra for each lead of 150M over initial lead of 150M.	1422.32	Sq.Mt.	5.64	₹ 8,015.74	
Add for transporting Grass in us motorable road on head load & other means from average 500mt. 0.25 M.D. per Sq.Mt.	1422.32	Sq.Mt.	100.25	₹ 1,42,587.15	
Sub Total				**1747748.09**	
Less Total of MR /Analysis				-144191.15	
Sub Total of SOR (A)				1603556.93	
Less-CP @ 9.09% of (A)		1603557	9.09%	-145763.33	
Sub Total(B)				1457793.61	
Total of MR /Analysis				144191.15	
Carriage of Materials with loading & unloading:-					
Boulder (1.5 Km)	228.08	Cu.Mt.	798.41	₹ 1,82,100.50	
Sub Total(C)				**1784085.26**	
Add due to increase in wage rate from 401.00/- to ..../- @ ....%					
Sub Total(D)				₹ **17,84,085.26**	
Add contengency & consultancy @ 2%				₹ **35,681.71**	
Add Cost of Waste weir				₹ **65,906.00**	
Grand Total				₹ **18,85,671.97**	
Say				₹ **18,85,672.00**	

Annexure 26: Silvicultural Operations with Gap Plantation

कार्यालय : अपर प्रधान मुख्य वन संरक्षक, विकास,
झारखण्ड, राँची।
वन भवन, डोरण्डा, राँची
e-mail : pccf-development@gov.in
- 0651-2481813/ 9304727852

कार्यालय आदेश

संख्या–01 / यो0व0–30 / 2020 10 दिनांक 26/04/2023

वन एवं पर्यावरण विभाग के अधिसूचना संख्या सा0स0–4 / यो0व0प्र0–42 / 2010–2371 व0प0, दिनांक 09.05.2015 द्वारा वृक्षारोपण एवं पौधशाला कार्य हेतु दर निर्धारण के लिए राज्य स्तर पर एक स्थायी समिति का गठन किया गया।

अपर प्रधान मुख्य वन संरक्षक, विकास, झारखण्ड, राँची के अध्यक्षता में राज्य स्तरीय दर निर्धारण समिति की बैठक दिनांक 15.09.2022 को आयोजित की गई।

समिति द्वारा रायीशांपसन्त सिल्विकल्चरल ऑपरेशन योजना का अनुसूचित कार्यवार की अनुशंसा की गई। समिति की अनुशंसा पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है। यह दर तत्काल प्रभाव से वित्तीय वर्ष 2023–24 के लिए लागू होंगी एवं अगले पुनरीक्षण तक प्रभावी रहेगी।

योजना का नाम : सिल्विकल्चरल ऑपरेशन योजना का दर निर्धारण

(औसतन 10%-25% वृक्ष / 0.8 स्टॉक विहीन खुले वन क्षेत्र हेतु)

मजदूरी प्रति मानव दिवस (रु0 में) : 346.01 कार्य दर प्रति हे0

क्र0 सं0	कार्य का विवरण	इकाई	मानव दिवस	मजदूरी (रु0 में)	सामग्री (रु0 में)	कुल व्यय (रु0 में)	अभियुक्ति
i	ii	iii	iv	v	vi	vii	viii
(A)	अधिक कार्य (प्रथम वर्ष)						
1	सर्वेक्षण एवं चीन्हाकरण	हे0	3	1038.03	50.00	1088.03	
2	कटबेक / कंपसिंग, क्लाइमर कटिंग, स्टम्प ट्रेसिंग, along with debris removal आदि (All live stumps should be touched)	हे0	30	10380.30	0.00	10380.30	इन कार्यों को करने के क्रम में कटाई किसी भी वृक्ष का पातन नहीं किया जायेगा। उपरोक्त कार्यों को करने से पूर्व इन कार्य संपादित करने के पश्चात् संपूर्ण कराय की विडीयोग्राफी / फोटोग्राफी कराया जाई जाय।

3	मुक्तन आवश्यकता अनुसार स्वीकृत डिजाईन एवं माप का संलग्नक के अनुमोदन से मशीन द्वारा ट्रेंच खोदन अथवा पत्थर चेतन किया जायेगा (i) ट्रेंच खोदन– ऊपर की चौड़ाई 1.83 मी0, नीचे की चौड़ाई 1.22 मी0, गहराई 1.22 मी0, इंडिंग सहित (ii) पत्थर चेतन– ऊपर की चौड़ाई 0.30 मी0, नीचे की चौड़ाई 1.26 मी, ऊँचाई 1.00 मी0 (iii) झाड़ी चेतन	चेन	12	4152.12	15942.90	20095.02	प्रति हे0 ट्रेंच चेतन प्रति चेन का प्रावधान है किन्तु वास्तविक स्थल पर भूगठन वास्तविक कार्य परिमाण के अनुसार किया जायेगा। उपर्युक्त ट्रेंच कार्य पर स्थानीय प्रजाति के बीजों का दृढ़रोपण किया जायेगा, जिसे Live Hedge/Fence तैयार हो सके।
4	वृक्षा कार्य (0.45 मी. X 0.45 मी. X 0.45 मी) 0.091 घन0 मी0 अधिकतम 200 पौध प्रति हे0 (खरेदन एवं वृक्षा बीकाईट पिट सहित)	हे0	20	6920.20	0.00	6920.20	अधिकतम 200 पौधे प्रति हे0 रोपण के लिए। उन्य जीव क्षेत्रों में पूर्वतः उन्य जीवों के पारीक्षण के विपरीत के अनुकूल प्रजाति के।
5	मृदा एवं जल संरक्षण कार्य – कंटूर ट्रेंच – 98, कंटूर लाईन 5 मी. X 0.30 मी. X 0.30 मी. का खोदा जाना जिसको बीच की दूरी कम से कम 2 मीटर ढलान के ऐस्पेक्ट के अनुसार हो तथा इसकी मिट्टी का नीचे ढाल पर 0.15 मीटर हट कर 0.30 मीटर की चौड़ाई में 0.15 मी गहरा खोदनी कर रखा जाना।		45	15570.45	625.00	16195.45	आवश्यकतानुसार ढलान पर ही कंटूर ट्रेंच का निर्माण किया जायेगा। कंटूर ट्रेंच के बर्म पर स्थानीय प्रजाति के बीजों को भी बोया जायेगा।
6	गली प्लांटिंग	हे0	10	3460.10	0.00	3460.10	नोट देखें
7	सिल्ट कैचमेन्ट डैम, चेक डैम, रिटेनिंग एवं बैफ्ल वाल टी वाल, रपट एवं टॉरेन्ट नियंत्रण कार्य आदि	हे0	25	8650.25		8650.25	नोट देखें
8	लघाई चैम्बशालाओं में उत्पादन (10% प्रतिरिक्त) सहित Root-Shoot को 6"x12" आकार की ट्यूब में Pre-sprout कवालेन्ट बीज तैयार करना।		2	692.02	1200.00	1892.02	स्थानीय पौधशाला से क्रय किये गये Tube Plants/ Root-Shoot के क्रय के लिए रु 5.00 की दर से राशि जमा कराई जाएगी। स्थानीय एवं फलदार प्रजाति के बड़े पौधे की प्राथमिकता दी जायेगी
9	पत्थों की सुरक्षा		2.00	692.02	0.00	692.02	
10	लेबर चेस सलदूरी का 1 प्रतिशत				515.55	515.55	
	योग–		149.00	51555.49	18333.45	69888.94	

(B)	स्थापन खर्च (द्वितीय वर्ष)						
1	Preprouted Root-Shoot एवं Poly Tube Seedling स्थाई पौधशाला (न्यूनतम 40 प्रतिशत)	220	5	1730.05	800.00	2530.05	स्थाई पौधशाला से क्रय किये गये Tube Plants/ Root-Shoot के क्रय के लिए रू 5.00 की दर से राशि जोड़ कराई जाएगी
2	कृषिरोपण		6.40	2214.46	0.00	2214.46	
3	दो कोड़नी निकोनी	श्रे0	7	2422.07	0.00	2422.07	
4	खाद्यी (जैविक कम्पोस्ट खाद)	श्रे0	0	0.00	625.00	625.00	
5	सिंगलिंग कार्य		5	1730.05	0.00	1730.05	
6	पौधों की सुरक्षा (25 श्रे0 तक के लिए पशुरक्षक)		11.00	3806.11	0.00	3806.11	ट्रेन्च घेरान की मरम्मति
7	लेबर सेस मजदूरी का 1 प्रतिशत				119.03	119.03	
	योग–		**34.40**	**11902.74**	**1544.03**	**13446.77**	
(C)	संधोषण कार्य (तृतीय वर्ष)						
1	सुरक्षा एवं संधोषण		14.60	5051.75	200.00	5251.75	घेरान, कंटूर ट्रेंच की मरम्मति, मृत पौधों का प्रतिस्थापन, रोपित पौधे की निकौनी/ पटवैस/ कटवैक/ सिंगलिंग
2	लेबर सेस मजदूरी का 1 प्रतिशत				50.52	50.52	
	योग–		**14.60**	**5051.75**	**250.52**	**5302.26**	
(D)	संधोषण कार्य (चतुर्थ वर्ष)						
1	सुरक्षा एवं संधोषण		14.60	5051.75	200.00	5251.75	घेरान, कंटूर ट्रेंच की मरम्मति, मृत पौधों का प्रतिस्थापन, रोपित पौधे की निकौनी/ पटवैस/ कटवैक/ सिंगलिंग
2	लेबर सेस मजदूरी का 1 प्रतिशत				50.52	50.52	
	योग–		**14.60**	**5051.75**	**250.52**	**5302.26**	
	सकल योग –		**212.60**	**73561.73**	**20378.52**	**93940.24**	

नोट–

1. प्रत्येक वनरोपण स्थल पर स्थल आवश्यकतानुसार प्रस्तावित कार्यों का प्राक्कलन तैयार कर सक्षम स्तर से तकनीकी स्वीकृति उपरान्त कार्य संपादित किए जायेंगे।

2. इन कार्यों को छोड़ने की क्रम में कटाई किसी भी दृश्य का चयन नहीं किया जाएगा।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, रांची

ज्ञापांक–01/वो0स0–30/2020– 282 दिनांक– 26/04/2025

प्रतिलिपि :

1. सभी प्रधान मुख्य वन संरक्षक।
2. सभी अपर प्रधान मुख्य वन संरक्षक।
3. सभी क्षेत्रीय मुख्य वन संरक्षक।
4. सभी मुख्य वन संरक्षक।
5. सभी वन संरक्षक।
6. सभी उप वन संरक्षक।
7. सभी वन प्रमण्डल पदाधिकारी।

को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

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Annexure 27: Estimate – Water Absorption Trench

Model Estimate for Construction of Water Absorption Trench (WAT) - AREA 5 ha										
Sl.	**Particulars**		**Description**							
1	Land Type/ Land Use		Upland/Wasteland/ Just bellow the steep slope/ Forest land							
2	Position of structure		Slope 10% & above, where upland meet with forest land or on transition point where							
3	Top width of trench		1.0 M							
4	Depth of trench		1.0 M							
5	Bottom width of trench		1.0 M							
6	Average length of one WAT		6.0 M							
7	Equalizer width		1.0 M							
8	Berm width		1.0 M							
9	Cross section of the trench		1.0 sqm							
10	Size of bund		B.W-2.0 m, T.W-0.5 m, Ht-							
11	Length of designed bund		292							
12	No. of trench in one Hect.		42	No.						
13	Estimated for 5 Hect.		210	No.					**Wage**	**401.00**
Sl. No	SOR	Particulars	Length (m)	Bottom width (m)	Top width (m)	Cross section area	Quantity	Unit	Rate (Rs.)	Amount
1	3. (Forest Dept.	Labour charge for making the contour line and alignment through A-frame					2	MD	401.00	802.00
2	3.13 (B) Chapter-III of Erosion, control and Drainage (RCD effective from 28	Excavation for structure (Earth work in excavation of foundation of structure as per drawing and technical specification, including setting out,... Dressing of side and bottom, backfilling the excavation of earth to the extent required and utilizing the remaining earth locally as per engineer I/C)								
		For 42 No. WAT (1 Hect.) ~ 42No.x 6m x 1m x 1m = 210.00	252	1	1	1	252	m^3	61.4	15,467.76
3		Compaction of bund by labour/Beneficiaries @1000					9	MD	401.00	3,609.00
4	N.S.	Display Board						L.S.		330.00
5		Two stage Photography with work completion certificate						L.S.		55.00
6	N.S.	Miscellaneous expenditure like strings, making power, A-frame, first aid box etc.						L.S.		165.00
		Sub Total (A)								**20,428.76**
		Less Total of MR /Analysis								-4,306.11
		Sub Total of SOR (A)								16,122.65
		Less-CP @ 9.09% of (A)					9.09%		16,122.65	-1,465.55
		Sub Total(B)								**14,657.10**
		Total of MR /Analysis								4,306.11
		Sub Total(C)								**18,963.21**
		Add for Contigency and Consultancy					2%		18,963.21	379.26
		Total								**19,342.48**
		Say								**₹ 19,342.48**
		For 5 Hect.					**5**	**Hect.**	**19,342.48**	**96,712.38**

SITE-SPECIFIC WILDLIFE MANAGEMENT PLAN

Prepared in compliance of Condition bearing **Sl. No. viii** laid by MoEF&CC, Govt. of India while granting Stage-I approval under Section 2 of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 vide F. No. 8-37/2022-FC dated 18th September, 2024 **for diversion of 455.1108 ha of forest land in Dumka district for Pachhwara South Coal Block Project** in favour of M/s Neyveli Uttar Pradesh Power Ltd. (NUPPL).

Submitted by:
M/s Neyveli Uttar Pradesh Power Ltd.

Prepared by:
Rajiv Ranjan, IFS (Retd.)

EXECUTIVE SUMMARY

Pachhwara South Coal Block has been allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL), a joint venture of NLC India Limited and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited, by the Ministry of Coal, Govt. of India for mining of coal. The project area is spread over 715.00 ha as per approved Mine Plan of Pachhwara South Coal Mine Project. Opencast mechanized mining methodology is planned in the Project. Removal of Overburden is planned with conventional Drilling, and blasting with Shovel Dumper combination, while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

The Environmental Clearance has been granted to the Project by the MoEF&CC. The total cost of the project is Rs. 1795.01 crores and the estimated Corporate Environmental Responsibility (CER) cost is Rs. 8.97 crores. The Environmental Management Plan (EMP) capital cost is Rs. 4150.76 lakhs and recurring cost to be spent on environment is Rs. 8787.12 lakhs.

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for the project, subject to fulfilment of a number of conditions. One of the conditions, in fulfilment of which the instant Plan is being formulated, is as follows:

> "*viii. A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*"

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the bifurcating boundary between Dumka and Pakur forest divisions/districts. Both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearance has been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of SMC plan and Site-specific Wildlife Conservation plan independently. In order to comply with the aforesaid

conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the said plans have been formulated restricting the respective project impact areas within Pakur forest division; within 10 km periphery of the Lease in case of Pachhwara North and within 10-20 km distance from the lease in case of Pachhwara Central. Therefore, in the best interest of the conservation needs of the area, the instant Wildlife Management Plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions within 10 km radius of the boundary of the coal block. Further, enrichment of elephant movement paths, both within the territorial jurisdiction of Dumka and Godda divisions, has also been prescribed under this Plan.

The Impact Area consists of altogether 169 number of villages, 133 in Dumka Forest Division and 36 in Godda Forest Division. It would be relevant to mention here that the areas of villages which fall partly outside the 10 km boundary have also been considered for prescribing management interventions under the plan. The geographical extent of the Impact Area thus delineated is about 257.73 sq.km.

Chapter 3 of the Plan deals with the impact of the Project on environment. Environmental impacts of mining operations are numerous and diverse. It includes land degradation, noise, dust, poisonous gases and pollution of water and so on. The most immediate environmental impact of open cast mining is the loss of habitat. A vast stretch of land cleared for mining operations displaces flora and fauna, causing a ripple effect throughout the ecosystem. Species lose not only their homes but also their food sources, and the delicate balance of the local biodiversity is upset.

Chapter 4 of the Plan discusses objectives of management and strategies to address the wildlife conservation issues. The identified objectives of management and strategies **within the project area** are:

(a) Protection of wild animals within the Project Area;
(b) Implementation of mitigation measures as specified under the Environmental Management Plan (EMP) approved while granting Environmental Clearance to the Project (Described in detail in Chapter 5); and
(c) Development of habitat in such a way that after mine closure the project area could again be brought back to a semblance of its present configuration.

The objectives identified under this Plan to address the wildlife conservation issues **within the Impact Area** are as follows:

(a) To conserve and sustainably manage the biodiversity and ecosystem of the Project Impact Area;
(b) To maintain and restore the natural, biological and physical attributes within the Impact Area;
(c) To restore and enhance the productivity of the depleted habitat so as to provide adequate food, water and cover to the wild animals;
(d) To provide suitable habitat for spillover population of wild animals from Project Area to Impact Area as well as from Impact Area to neighbouring forest areas outside;
(e) To provide a relatively stress-free habitat to wildlife in the Impact Area that would be capable of meeting the basic needs of resident/migrant wildlife;
(f) To augment the hydrological regime in the Impact Area through Drainage Line Treatment (DLT) and appropriate measures for soil and moisture conservation;
(g) To effectively control incidences of forest fire in the Impact Area and surrounding forests;
(h) To provide for participatory eco-development inputs to local stakeholders for reducing their resource dependency on forests and for eliciting their support towards conservation needs of the area;
(i) To minimize existing human-elephant conflict;
(j) To provide for suitable measures towards protection of forests and wildlife from unsavoury elements;
(k) To enhance the level of awareness for biological conservation amongst the relevant stakeholders including younger generation and students;
(l) To improve managerial and technical capacity of the frontline forest staff through appropriate training programs with special emphasis on implementation of the Plan; and
(m) To provide the frontline forest staff with required resources and infrastructure to help implement the Plan.

The objectives of management and strategies **outside the Impact Area** primarily deal with the strengthening of such areas, which are generally taken as pathways by elephants during their migration, by planting suitable species so as to make available an amenable habitat for elephants. The strategies involved aim at the following:

(a) To identify areas/migration paths which have historically been frequented by elephants.
(a) To identify the ways and means of habitat development over such areas.
(b) To develop the existing water bodies and creation of fresh water bodies in such areas.
(c) To put in place infrastructure in such areas so as to minimise human-elephant conflict.

Chapter 5 of the Plan deals with management interventions to be carried out by the Project Proponent within the project area.

Chapter 6 exclusively deals with delineation of elephant movement paths in Dumka and Godda forest divisions and its enrichment. It is being proposed under this Plan to enrich the areas falling within one km of distance, on both sides of the elephant movement path, with plantation of species which are preferred by elephants as well as silvicultural operations in forest areas and decongestion of bamboo clumps. Towards this end, villages involved in the pathways of elephants have been pinpointed. It may also be noted that the delineated elephant movement path passes through the Impact Area too. Thus, the enrichment activities with respect to the elephant movement path are planned to extend within and beyond the Impact Area.

Chapter 7 deals with proposed interventions to be carried out by the Forest Department under the Plan whereas Chapter 8 mentions the financial forecast against the proposed interventions.

To facilitate smooth implementation of the Plan, different activities have been divided into following broad heads.

(A) Habitat Management;
(B) Enrichment of the elephant movement path in Dumka and Godda divisions;
(C) Human-Elephant Conflict Management;
(D) Awareness Development Programmes;
(E) Capacity Building of the Frontline Forest Staff;
(F) Development of Alternative Livelihoods;
(G) Promotion of Renewable/Alternative Energy Consumption;
(H) Development of Appropriate Monitoring and Evaluation System and Implementation thereof; and
(I) Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan.

It would be pertinent to mention here that in compliance of one of the conditions laid by MoEF&CC towards Forest Clearance to the Project, **a dedicated Soil and Moisture Conservation Plan has been prepared for the area within 10 km periphery of the lease boundary**. **A Catchment Area Treatment Plan with respect to Bansloi river taking the Impact Area between 10 and 15 km of radius from the periphery of mining lease area has also been prepared.** Therefore, measures towards soil and moisture conservation within 15 km

radius of the lease periphery have not been included under the instant Plan. However, certain check dams have been proposed to be constructed under this plan beyond the 15 km boundary of the lease area so as to meet the water requirement of elephants in and around the elephant movement path.

The total cost to the User Agency towards implementation of the proposed Wildlife Management Plan is Rs. **5216.98 Lakh** spread over 10 years (2026-27 to 2035-36). The proposed financial projection under the Plan may be summarized as follows.

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)		Total (Rs. in Lakh)
		Dumka Forest Division	Godda Forest Division	
A.	Habitat Management (Refer Para 4.4.1. & 7.1.)	802.24	547.42	1349.66
B.	Enrichment of the Elephant Movement Path (Refer Chapter 6)	1634.15	449.17	2083.32
C.	Human-Elephant Conflict Management (Refer Para 4.4.2. & 7.2.)	70.00	35.00	105.00
D.	Awareness Development Programmes (Refer Para 4.4.3. & 7.3.)	50.00	25.00	75.00
E.	Capacity Development Programmes for Frontline Forest Staff (Refer Para 4.4.4. & 7.4.)	50.00	25.00	75.00
F.	Development of Alternative Livelihoods (Refer Para 4.4.5. & 7.5.)	200.00	100.00	300.00
G.	Promotion of Alternative Energy Consumption (Refer Para 4.4.6. & 7.6.)	50.00	25.00	75.00
H.	Development and Implementation of appropriate Monitoring & Evaluation System (Refer Paras 4.4.7. & 7.7.)	18.00	9.00	27.00
I.	Infrastructural Strengthening (Refer Paras 4.4.8. & 7.8.)	125.00	62.50	187.50
J.	Miscellaneous & Administrative Expenses	50.00	20.00	70.00
K.	Total	3049.39	1298.09	4347.48
L.	Cost Escalation Provision @20%	609.88	259.62	869.50
M.	Grand Total	3659.27	1557.71	5216.98

Cost to the User Agency towards implementation of the Wildlife Management Plan = Rs. 5216.98 Lakh

----------xxx----------

ACKNOWLEDGEMENT

This Soil and Water Conservation Plan could not have been prepared without the committed collaboration of Mr. Satwik, IFS, Divisional Forest Officer, Dumka Forest Division, Mr. Wagh Pavan Shaligram, IFS, Divisional Forest Officer, Godda Forest Division, Mr. Maun Prakash, IFS, the then Divisional Forest Officer, Godda Forest Division and the frontline forest staff of Dumka and Godda forest divisions. Also, the interaction with Mr. Umesh Sahni, Conservator of Forests, Dumka Circle and Mr. Satish Chandra Rai, Regional Chief Conservator of Forests, Dumka Region played a vital role in shaping this Plan particularly in terms of its effective implementation in future.

I am grateful to Mr. Kislay Kumar (M/s. Ecos Offset Ltd.) and his team members who carried out an intensive survey of the Impact Area in question. Without their active support and sincere efforts this Plan could not have seen light of the day.

I owe special thanks to the officials of M/s NUPPL and M/s MIPL GCL Infracontract Pvt. Ltd., the MDO of the project who took utmost care to ensure all logistic support while undertaking field surveys.

Rajiv Ranjan IFS (Retd.)

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1. INTRODUCTION

1.1. ABOUT THE PROJECT

Pachhwara South Coal Block has been allotted to Neyveli Uttar Pradesh Power Ltd. (NUPPL), a joint venture of NLC India Limited and Uttar Pradesh RajyaVidyut Utpadan Nigam Limited, by the Ministry of Coal, Govt. of India for mining of coal. Coal from this project will be supplied to Ghatampur Thermal Power Plant, a Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. This is a new upcoming project, hence a Greenfield Project.

The project area is spread over 715.00 Ha in the approved Mine Plan of Pachhwara South Coal Mine Project of NUPPL. The net geological reserve of the block is about 354.82 Million Tons and mineable reserve of the block is about 258.91 Million tons. With due mining losses, the extractable reserve comes to about 252.44 Million tons. The Ministry of Coal has approved the normative capacity for coal production at 9.00 MTPA with peak rated capacity at 13.50 MTPA. The land schedule authenticated by DFO, Dumka states that 455.1108 ha falls under forest category and remaining 259.7445 ha falls under non forest category. With the rated capacity of 9 MTPA (normative), life of the mine will be around 38 years including two years of pre-mining activity.

Opencast mechanized mining methodology is planned in Pachhwara South Coal Mine Project. Removal of Overburden is planned with conventional Drilling, and blasting with Shovel Dumper combination, while coal production is planned with environment friendly surface mining with selective mining technology. The top soil to be generated during the mining process shall be stacked separately and used for reclamation.

1.2. LOCATION OF THE PROJECT

Pachhwara South Coal block occupies the southernmost part of the Rajmahal Coalfield in Dumka District of Jharkhand. Pachhwara-Chirudih Sector lies in the western part of Pachhwara basin. The block is situated at villages Chirudih, Kundapahari and Mahuldabar in Gopikandar CD Block of Dumka District. The coal block area is covered in the Survey of India Toposheet No. G45V6 & G45V7 and bounded by coordinates as follows:

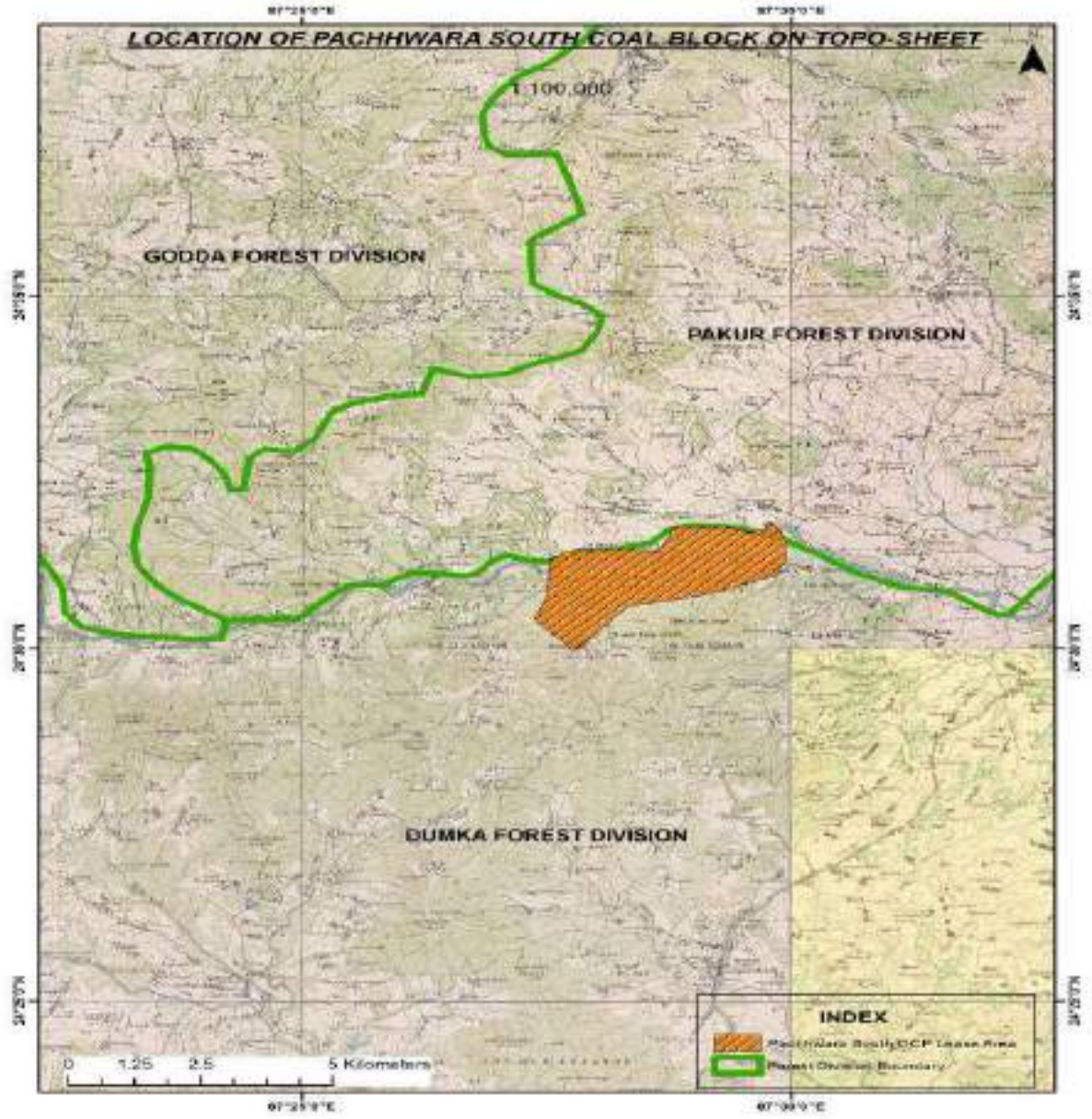
Latitude: 24° 29' 57.404" N – 24° 31' 46.956" N

Longitude: 87° 27' 22.010" E – 87° 29' 56.150" E

The Block is well connected with Dumka, the district headquarter at a distance of around 36 km (aerial) and 52 km by road. Amrapara is the nearest semi-urban area and well connected with both

Dumka and Pakur (district headquarters) through black-topped Dumka-Shahibganj Road and Amrapara-Maheshpur-Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around 38 km (aerial) and 41 km by road from the Block. The nearest public airport is situated at a distance of around 201 km by road (Aerial distance is around 111 km) from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. The location of Pachhwara South Coal Block is being shown in the following map on topo-sheet.

Map 1: Location of Pachhwara South Coal Block



1.3. STATUS OF FOREST CLEARANCE TO THE PROJECT – CONDITION OF PREPARATION OF SITE-SPECIFIC WILDLIFE MANAGEMENT PLAN

The Central Government (MoEF&CC), vide F. No. 8-37/2022-FC dated 18th September, 2024 (**Annexure-1**), has granted in-principle diversion (Stage-I) of 455.1108 ha of forest land for Pachhwara South Coal Block in favour of M/s Neyveli Uttar Pradesh Power Ltd. in Dumka District of Jharkhand subject to fulfilment of a number of conditions. One of the conditions, in fulfilment of which the instant Plan is being formulated, is as follows:

> "*viii. A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost."*

In the backdrop of the aforesaid condition, it is noteworthy to mention that Pachhwara South Coal Block is bounded by Pachhwara Central Coal Block in the North and Pachhwara North Coal Block in further North. All these three blocks form somewhat a continuum. It is also to be noted that while **Pachhwara South Block falls in Dumka Forest Division**, both Pachhwara **Central** and Pachhwara **North** Blocks lie in **Pakur Forest Division**, Bansloi river being the bifurcating boundary between Dumka and Pakur forest divisions/districts. Both Pachhwara Central and Pachhwara North Coal mines have forest land within and therefore, statutory forest clearance has been obtained by the respective user agencies. The forest clearance has been granted to these two mining projects subject to certain conditions including preparation and approval of SMC plans and Site-specific Wildlife Conservation plans independently. In order to comply with the aforesaid conditions, the respective user agencies have prepared the said plans which have duly been approved by the competent authority. Notably, the said plans have been formulated restricting the respective project impact areas within Pakur forest division; within 10 km periphery of the Lease in case of Pachhwara North and within 10-20 km distance from the lease in case of Pachhwara Central. Therefore, in the best interest of the conservation needs of the area, the instant Wildlife Management Plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions within 10 km radius of the boundary of the coal block. Further, enrichment of elephant movement paths, both within the territorial jurisdiction of Dumka and Godda divisions, has also been prescribed under this Plan.

1.4. STATUS OF ENVIRONMENTAL CLEARANCE TO THE PROJECT

Based on recommendations of the Expert Appraisal Committee (EAC), the Ministry of Environment, Forest and Climate Change has accorded approval for Environment Clearance(EC) vide F. No. J-11015/18/2020-IA. II (M) dated 23rd September, 2024 (**Annexure-2**), under the provisions of the Environment Impact Assessment Notification, 2006 to Pachhwara South Opencast Coal Mine of 9 MTPA (Normative & Peak) in mine lease area of 714.8553 ha. The said EC has been issued subject to the compliance of various terms & conditions.

The project is reported to be beneficial in terms of employment to local people directly and indirectly. Indirect employment will be in the form of service provides, shopkeepers, mechanic, drivers, transporters etc. According to the EC order, the lessee will be responsible for providing better social infrastructure benefits such as drinking water, health care measures, educational facilities, promotion of culture and religious activities in surroundings as part of their Corporate Environmental Responsibility (CER) activities. The proposed mine will bring economic benefits to the State by the way of Royalty and other statutory payments. The linked power plant of 1980 MW will produce of 14743.08 MU of power which will help the state of Uttar Pradesh state to meet out the shortfall in power requirements.

As per EC issued by the MoEF&CC, the total cost of the project is Rs. 1795.01 crores and the estimated CER cost for the project is Rs. 8.97 crores. The Environmental Management Plan (EMP) capital cost is Rs. 4150.76 lakhs and recurring cost to be spent on environment is Rs. 8787.12 lakhs.

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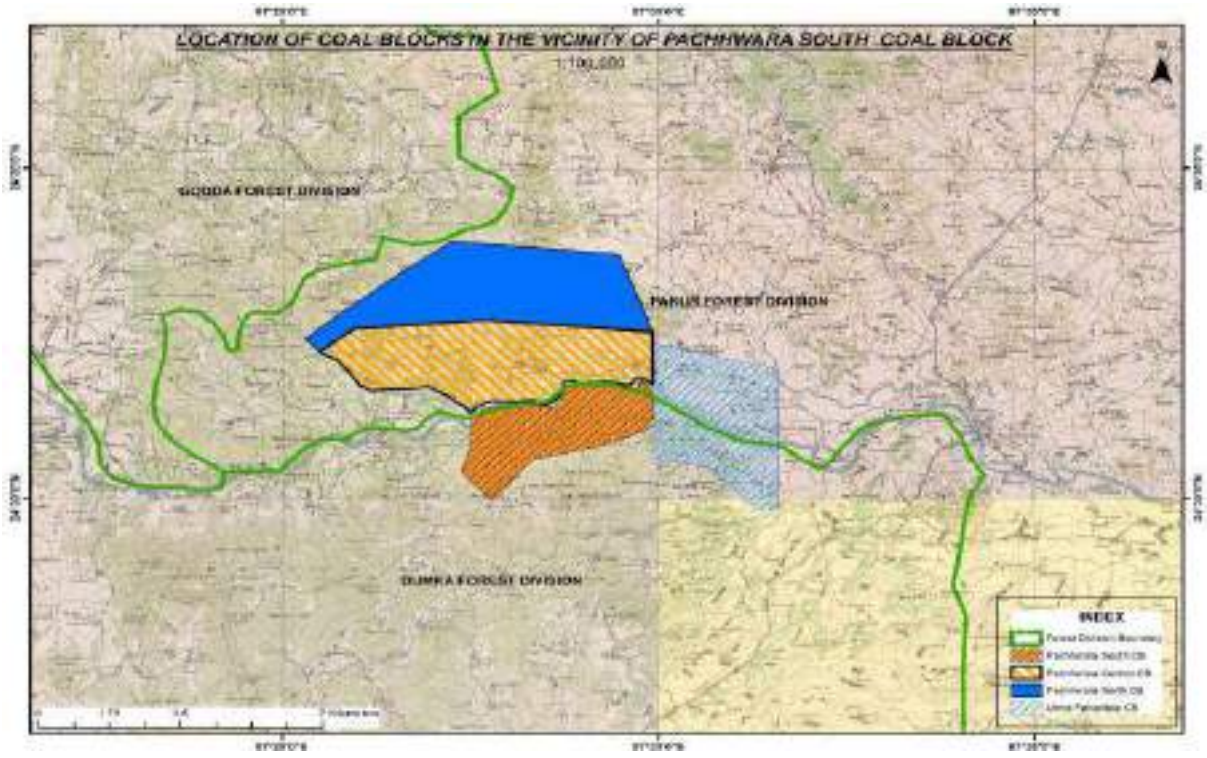
2. PROJECT IMPACT AREA

2.1. DEFINING THE IMPACT AREA/ZONE OF INFLUENCE OF THE PROJECT

The Impact Area or Zone of Influence (ZoI) around development footprints, in the instant case open cast mining, is the area indirectly affected by human activities, and is more difficult to define. The distance a ZoI may extend around a feature, and its effect on soil and water ecosystem, varies depending on the nature of the development feature and the level of activity associated with the feature. Conventionally 10 km buffer around any development feature is taken as the standard practice for planning interventions towards conservation needs oriented towards any particular objective or a set of objectives.

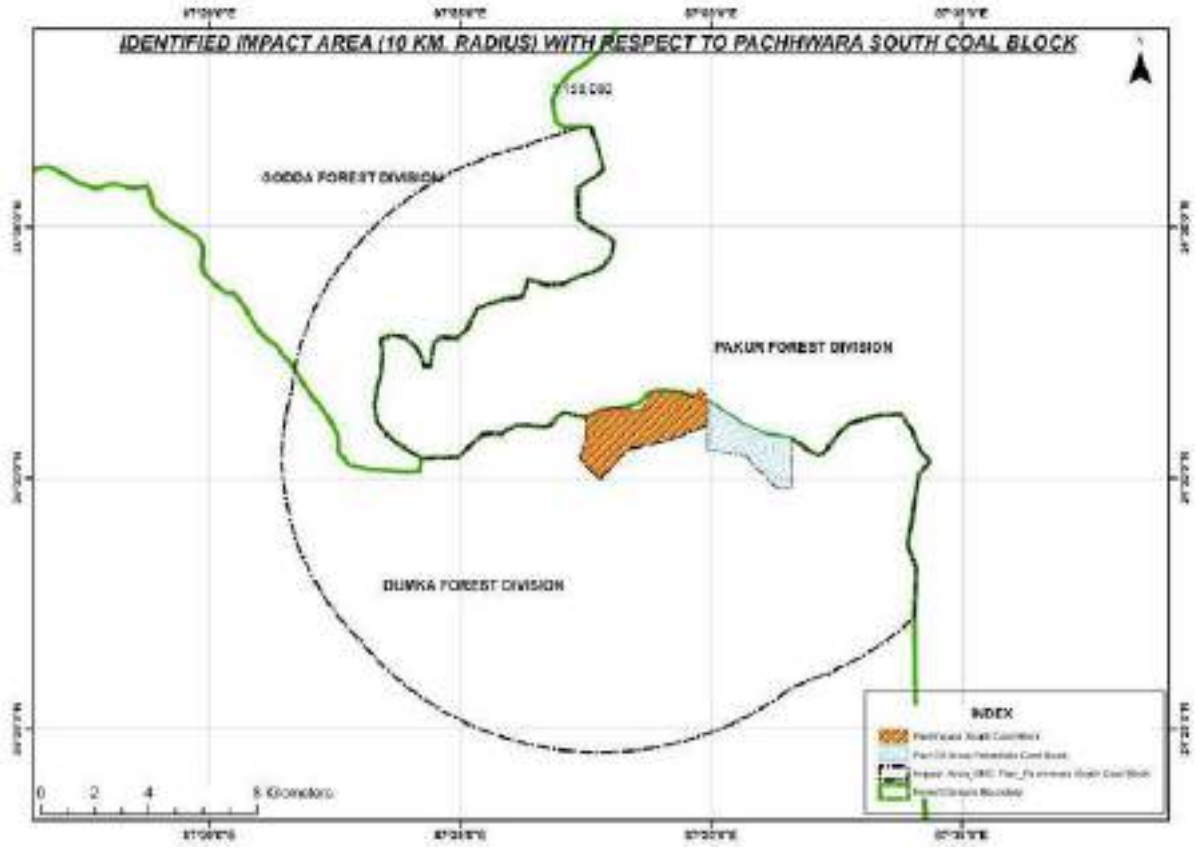
While defining the Impact Area of the instant Project it is important to note that two other coal blocks are located in close vicinity of Pachhwara South Coal Block (CB), namely Pachhwara Central and Pachhwara North CBs. Pachhwara South Block is situated within Dumka Forest Division/District whereas Pachhwara Central and Pachhwara North blocks fall within the administrative boundary of Pakur Forest Division/District, the Bansloi river being the bifurcating boundary of the two districts. Apart from the aforesaid coal blocks, there is one more upcoming coal block namely Urma Paharitola Coal Block located adjacent to Pachhwara South coal block. All the four coal blocks are being depicted in the following map on topo-sheet.

Map 2: Location of Existing Coal Blocks in the Vicinity of Pachhwara South Coal Block



It is to be noted that in compliance of conditions laid by MoEF&CC towards forest clearance with respect to Pachhwara Central CB and Pachhwara North CB, SMC plans and Wildlife Conservation plans have been formulated and approved by respective competent authorities. Notably, the said plans have been formulated restricting the respective project impact areas within Pakur forest division; within 10 km periphery of the Lease in case of Pachhwara North and within 10-20 km distance from the lease in case of Pachhwara Central. Therefore, in the best interest of the conservation needs of the area, the instant Wildlife Management Plan has been formulated restricting the impact area to the territorial boundaries of Dumka and Godda forest divisions within 10 km radius of the boundary of the coal block.

Map 3: Impact Area considered for Formulation of Wildlife Management Plan



2.1.1. Villages Enclaved within the Impact Area and Corresponding Administrative Units of Forest Department

The Impact Area consists of altogether 169 number of villages, 133 in Dumka Forest Division and 36 in Godda Forest Division. It would be relevant to mention here that the areas of villages which fall partly outside the 10 km boundary have also been considered for prescribing management interventions under the plan.

The geographical extent of the Impact Area is about 257.73 sq.km. The names of the villages are being tabulated hereunder in accordance with the sub-units of forest administration, namely Forest Range, Beat and Sub-Beat.

Table 1: Impact Area Villages and Corresponding Forest Administrative Units – Dumka Forest Division

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/Thana No.	Forest Land (ha)
Kathikund	**Gopikandar**	**Gopikandar East**	1.	Amjhari	Gopikandar-37	-
			2.	Balia	Gopikandar-24	10.99
			3.	Dharampur	Gopikandar-32	-
			4.	Dumaria	Gopikandar-55	29.28
			5.	Dumartola	Gopikandar-30	66.16
			6.	Jamchua	Gopikandar-38	-
			7.	Janamdih	Gopikandar-34	0.21
			8.	Jitpur	Gopikandar-33	-
			9.	Karmo	Gopikandar-40	-
			10.	Kochapani	Gopikandar-42	69.91
			11.	Musna	Gopikandar-36	-
			12.	Rambani	Gopikandar-35	-
			13.	Ramgarh	Gopikandar-39	-
			14.	Sugapahari	Gopikandar-41	-
			15.	Talberia	Gopikandar-31	24.90
		Gopikandar West	16.	Babupur	Gopikandar-21	-
			17.	Bankijor	Gopikandar-08	20.71
			18.	Baratalli	Gopikandar-10	8.70
			19.	Bhagabandh	Gopikandar-13	10.52
			20.	Bhuskidangal	Gopikandar-14	14.70
			21.	Burhichapar	Kuskira-11	-
			22.	Champa Pahar	-	-
			23.	Chandramali	Gopikandar-18	46.84
			24.	Chhatarchua	Gopikandar-22	-
			25.	Dubrajpur	Gopikandar-12	35.41
			26.	R.F.		
			27.	Gamharia	Kuskira-12	-
			28.	Gariapani	Gopikandar-15	12.63
			29.	Gopikandar	Gopikandar-16	-
			30.	Jhariapani	Gopikandar-09	39.30
			31.	Jhutichapar	Gopikandar-4	0.66
			32.	Jolo	Gopikandar-1	-
			33.	Jaropani	Gopikandar-2	-
			34.	Kairasol	Gopikandar-07	-
			35.	Katuidangal	Gopikandar-11	27.32
			36.	Kheribari	Gopikandar-17	1.22
			37.	Koyada	Gopikandar-19	1.21
			38.	Kuarpur	Gopikandar-3	-
			39.	Kumarbandh	Gopikandar-20	-
			40.	Kurumba	Gopikandar-23	-
			41.	Pujadih	Gopikandar-06	-

			42.	Soruapani	Gopikandar-05	-
		Korcho	43.	Amdiha	Silangi-08	-
			44.	Bara Pahari	Silangi-04	15.20
			45.	Kachuakandar	Silangi-10	17.19
			46.	Koilo	Silangi-06	22.17
			47.	Kolha	Silangi-07	-
			48.	Sahara	Silangi-3	59.85
			49.	Sarkhi	Silangi-09	0.05
			50.	Tesaphuli	Silangi-5	47.31
Kathikund	**Kathikund**	**Kathikund East**	51.	Lakraphela Pahar	Kathikund-25	-
Kathikund	**Chirudih**	**Durgapur East**	52.	Amarpur	Kuskira-32	-
			53.	Babuikhura	Kuskira-25	2.03
			54.	Bhadradighi	Kuskira-31	-
			55.	Bhangahir	Kuskira-24	7.26
			56.	Dhobachapar	Kuskira-07	-
			57.	Dhobarna	Kuskira-21	15.01
			58.	Digha Parbat	Kuskira-30	-
			59.	Gumapahari	Kuskira-20	61.33
			60.	Jhanjhko	Kuskira-03	-
			61.	Kajikend	Kuskira-14	-
			62.	Khajurdangal	Kuskira-06	-
			63.	Lakhibad	Kuskira-29	-
			64.	Majhdiha	Kuskira-23	1.86
			65.	Paharpur	Kuskira-28	0.27
			66.	Pindargara	Kuskira-27	12.93
			67.	Pipra	Kuskira-26	17.18
			68.	Rampur	Kuskira-13	-
			69.	Talkhora	Kuskira-05	-
		Durgapur West	70.	Dundhapahari	Kuskira-18	33.18
			71.	Durgapur	Kuskira-17	9.00
			72.	Jorasimal	Kuskira-15	8.09
			73.	Chetopoka	Kuskira-04	-
			74.	Kulaipura	Kuskira-08	80.67
			75.	Kuskira	Kuskira-19	13.17
			76.	Majurabari	Kuskira-22	35.20
			77.	Ormo	Kuskira-01	56.87
			78.	Palasbani	Kuskiraa-10	-
			79.	Puranakhora	Kuskira-09	-
			80.	Ranga	Kuskira-16	24.40
		Chirudih	81.	Chirudih	Silangi-20	85.01
			82.	Kundapahari	Silangi-19	65.55
			83.	Madhuban	Kuskira-02	59.79
		Silangi	84.	Chunjo	Silangi-12	87.45
			85.	Hethsilangi	Silangi-13	-
			86.	Kharikasol	Silingi-17	67.40
			87.	Khatangi	Silingi-16	13.91
			88.	Khatganwa	Silangi-15	-
			89.	Mahaldabar	Silangi-18	124.38
			90.	Sarkhi Pahar	Silangi-11	-
			91.	Silingi Pahar	Silangi-14	-
Kathikund	**Narganj**	**Baskia**	92.	Balidih	Narganj-36	175.57

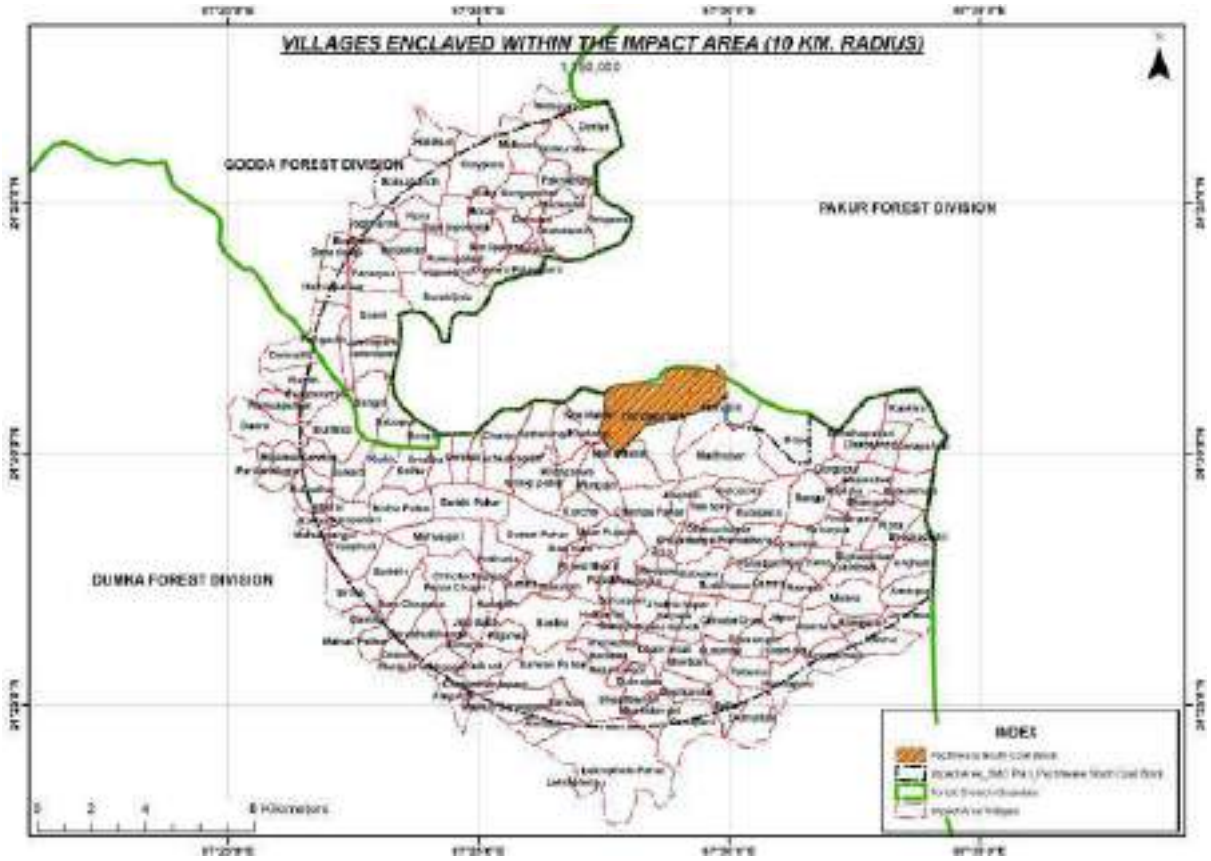
			93.	Baskia	Narganj-03	35.47
			94.	Dhibri	Narganj-05	2.99
			95.	Mahuapathar	Narganj-04	13.48
			96.	Simra	Narganj-01	71.71
		Narganj	97.	Ambajora	Narganj-57	15.75
			98.	Amgachhi	Narganj-32	22.00
			99.	Bara Chaparia	Narganj-35	112.37
			100.	Bara Bhuibhanga	Narganj-34	62.49
			101.	Chhota Chaparia	Narganj-49	27.24
			102.	Chhota Maruapani	Narganj-54	1.52
			103.	Chhota Bhuibhanga	Narganj-33	19.15
			104.	Jogiduba	Narganj-50	17.45
			105.	Kotaldih	Narganj-48	36.38
			106.	Kulkant	Narganj-53	24.36
			107.	Majhila Sarwapani	Narganj-55	78.85
			108.	Pahar Chapri	-	-
			109.	Pirjorwa	Narganj-52	46.57
			110.	Sarwan	Narganj-56	6.92
			111.	Sarwan Pahari	-	-
		Lakhanpur	112.	Pokharia	Narganj-39	-
		Bora Pahari	113.	Banjhiam	Narganj-44	-
			114.	Baskia	Narganj-03	35.47
			115.	Dumra Pahar	Narganj-40	-
			116.	Dumaria	Narganj-51	-
			117.	Kolha Pahar	Narganj-37	-
			118.	Kurcho	Narganj-41	32.63
			119.	Mahuagari	Narganj-38	-
			120.	Murguja	Narganj-42	-
			121.	Pusaldih	Narganj-45	-
			122.	Upar Pujadih	Narganj-43	-
Hizla West	**Nonihat**	**Amdiha**	123.	Bakua	-	-
			124.	Bhelai	-	-
			125.	Burhnia	Dodho-11	41.52
			126.	Damudih	-	-
			127.	Danro	-	-
			128.	Kendua	Dodho-12	9.77
			129.	Kulapathar	Bara-10	10.85
			130.	Mahuadangal	Kathikund-7	18.00
			131.	Raidih	-	-
			132.	Rajamar	-	-
			133.	Rangamatia	Lakhanpur-41	1.81
Total area of Forest Land within the Impact Area (Dumka Forest Division)						2384.70 ha

Table 2: Impact Area Villages and Corresponding Forest Administrative Units – Godda Forest Division

Range	Beat	Sub-Beat	Sl. No.	Village	Thana/Thana No.	Forest Land (ha)
Godda	**Poreyahat**	**Pindrahat**	1.	Daharlangi	Poreyahat-208	34.28
			2.	Hathiapathar	Poreyahat-209	13.05
			3.	Jamropani	Poreyahat-213	-
			4.	Pairgadih	Poreyahat-211	-
Sundarpahari	**Damru**	**Damruhat**	5.	Bara Dangapara	Sundarpahari-06	49.40
			6.	Damakol	Sundarpahari-07	8.49
			7.	Doriya	Sundarpahari-10	-
			8.	Golkunda	Sundarpahari-11	-
			9.	Malipara	Sundarpahari-04	42.74
			10.	Pakrikhunta	Sundarpahari	-
			11.	Sidapara	Sundarpahari-5	-
		Susni	12.	Babupur	Sundarpahari-25	149.58
			13.	Bankatti	Sundarpahari-20	5.23
			14.	Bargo	Sundarpahari-26	82.60
			15.	Belpahari	Sundarpahari-18	54.08
			16.	Baigni	Sundarpahari-24	49.24
			17.	Chhota Dangapara	Sundarpahari-09	21.30
			18.	Jamropani	Sundarpahari-23	76.71
			19.	Jogimarna	Sundarpahari-19	88.54
			20.	Karamba	Sundarpahari-08	14.40
			21.	Kathaldih	Sundarpahari-13	-
			22.	Kamupahari	Sundarpahari-15	70.73
			23.	Mulgipur	Sundarpahari-10	-
			24.	Paharpur	Sundarpahari-21	68.14
			25.	Sundrijola	Mahagama-17	374.33
			26.	Susni	Mahagama-22	179.95
			27.	Telopara	Sundarpahari-14	51.72
		Bokrabandh	28.	Bajrajogusami	Sundarpahari-13	100.75
			29.	Bokrabandh	Sundarpahari-02	112.21
			30.	Barai	Sundarpahari-05	44.70
			31.	Dumra Palampara	Sundarpahari-11	18.52
			32.	Hardisol	Sundarpahari-03	46.93
			33.	Jagusama	Sundarpahari-16	-
			34.	Pipra	Sundarpahari-14	52.68
			35.	Simlipara	Sundarpahari-12	-
			36.	Tilaypara	Sundarpahari-06	28.90
Total area of Forest Land within the Impact Area (Godda Forest Division)						1839.20

The villages located within the Impact Area are being shown in the following map:

Map 4: Villages Enclaved within the Impact Area



2.2. ECOSYSTEM AND BIODIVERSITY STATUS IN THE IMPACT AREA

Biodiversity constitutes the most important working component of a natural ecosystem. It helps maintain ecological processes, creates soils, recycles nutrients, has a moderating effect on the climate, degrades waste, controls diseases and above all, provides an index of health of an ecosystem. Providing food, medicines and a wide range of useful products, it is the natural wealth that exists on land, in freshwater etc. Plant diversity alone offers more than just food security and healthcare for the one-quarter of humanity who live their lives at or near subsistence levels; it provides them with a roof over their heads and fuel to cook, and, on an average, meets 90 per cent of their material needs.

2.2.1. Forest Flora

The forests of Dumka and Godda forest divisions broadly conform to Northern Tropical Dry Deciduous Forest and may be classified as 5-B as per Champion and Seth (1968) classification. According to the classification of forest types of India, the forests of Dumka and Godda Divisions fall into the following sub-types:

- Northern Dry Peninsular Sal Forest–5B/C-1 type
- Northern Tropical Dry Mixed Deciduous Forest– 5B/C-2 type
- Tropical Dry Deciduous Scrub Forest–5B/DS-1 type

Most of the forests are situated along the northern aspects where slope is moderate to steep. The primary associate species found in the Sal forests are Terminalia chebula, Semicarpus anacardium, along with occasional bamboo brakes. Miscellaneous forests are situated both on plains as well as hills where soil is shallow and degraded, on the warmer aspects and in comparatively drier localities (such as hill slopes and hill tops having poor soil and moisture content). Here, the primary species are Dhaura, Asan, Kend, Galgal, Piar, Amla and so on. Scattered Semal trees are found in moister localities. Sal occurs near the foot-hill and in well drained moist localities. The areas coming under Tropical Dry Deciduous Scrub category are home to thorny species such as Flacouria indica, Carissa spinerum, Randia species, Euphorbia species, Acacia species, zyzyphus species, Zinosa species, Boswellia, Anogeissus, Aegle marmelos, Butea monosperma, Daiospyros, Madhuca, Nyctanthes etc. The tree species are mostly malformed and have stunted growth. The bamboos occur scattered around the fringes of the forests and mainly along the hill slopes. However, bamboos are of generally poor quality.

2.2.2. Forest Fauna

No Sensitive Ecological Habitat like National Park, Wild Life Sanctuary, Tiger Reserve or Elephant Reserve is located within the Impact Area.

2.2.2.1. Herpetofauna

Two species of amphibians viz. Common Toad (Duttaphrynus melanostictus) and Indian Bullfrog (Hoplobatrachus tigerinus) etc. are found in the study area. All the species are listed as species of Least Concern as per IUCN Classification (IUCN Version 2017-3). Six species of reptiles have been reported from the study area. The list includes Indian Cobra (Naja naja), Common Krait (Bungarus caeruleus), Indian Rat Snake (Ptyas mucosus), Russel's Viper (Daboia russellii), Checkered Keelback (Xenochrophis piscator) and Oriental Garden Lizard (Calotes versicolor). The list includes four Schedule II species as per the Wildlife Protection Act, 1972 viz. Indian Cobra, Indian Rat Snake, Russel's Viper and Checkered Keelback.

2.2.2.2. Avifauna

A total of 39 species have been recorded from the study area. The species list includes terrestrial and aquatic birds.

Terrestrial birds include Asian Pied Starling, House Crow (Corvus splendens), Shikra (Accipiter badius), Common Myna (Acridotheres tristis), Paddyfield Pipit (Anthus rufulus), House Swift (Apus nipalensis), Common Pigeon (Columba livia), Asian Palm Swift (Cypsiurus balasiensis), Ashy Prinia, Black Drongo (Dicrurus macrocercus), Asian Koel (Eudynamys scolopaceus), Coppersmith Barbet (Psilopogon haemacephalus), Little Green bee-eater (Merops orientalis), Black Kite (Milvus migrans), Black Winged Kite (Elanus caeruleus), House sparrow (Passer domesticus), Baya weaver (Ploceus philippinus), Indian Silverbill, Plain Prinia (Prinia inornata), Rose-ringed Parakeet (Psittacula krameri), Red-vented Bulbul (Pycnonotus cafer), Indian Robin (Copsychus fulicatus), Spotted Dove, Eurasian Collared Dove (Streptopelia decaocto), Jungle babbler (Turdoides striata),etc.

Aquatic birds include White-breasted Waterhen (Amaurornis phoenicurus), Grey Heron (Ardea cinerea), Indian Pond Heron (Ardeola grayii), Purple Heron (Ardea purpurea), Cattle Egret (Bubulcus ibis), Intermediate Egret (Ardea intermedia), Pied Kingfisher (Ceryle rudis), Little Egret (Egretta garzetta), White- throated Kingfisher (Halcyon smyrnensis), Little Cormorant (Microcarbo niger), Purple Swamphen (Porphyrio porphyrio), Red-wattled Lapwing (Vanellus indicus) etc. Shikra (Accipiter badius), Black Kite (Milvus migrans) and Black Winged Kite (Elanus caereleus) are listed as Schedule I of Wildlife Protection Act, 1972.

All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.2.2.3. Mammals

A total of 6 species of mammals are reported from the study area. The mammals reported are: Five-striped Palm Squirrel (Funambulus pennantii), Golden Jackal (Canis aureus), Common Grey Mongoose (Herpestes edwardsii), Rhesus macaque (Macaca mulatta), Indian Flying Fox (Pteropus giganteus), Lesser Bandicoot Rat (Bandicota bengalensis) etc. Large mammals were reported to be absent in the study area. The list includes three Schedule II species namely Golden Jackal, Common Grey Mongoose and Rhesus macaque. All the species are listed as species of Least Concern as per IUCN Classification (IUCN version 2017-3).

2.3. DEMOGRAPHIC PROFILE OF VILLAGES FALLING WITHIN THE IMPACT AREA

The demographic profile of the villages involved in the Impact Area is being presented in the following table.

Table 3: Demographic Profile of Villages falling within the Impact Area

Forest Division	CD Block	Village	Area (ha)	Total Population	Sex Ratio*	Total no. of households	Total Literacy (%)
DUMKA	**Gopikandar**	Amarpur	163.53	270	1061	61	51.69
		Amdiha	98.00	72	1000	16	51.67
		Amjhari	189.22	348	881	81	38.97
		Babuikhura	153	447	987	104	52.74
		Babupur	255.45	214	1140	53	45.76
		Balia	174.71	260	985	57	61.58
		Bankijor	77.19	89	1023	24	23.75
		Barapahari	138.34	223	1124	51	71.12
		Baratalli	126.00	138	1029	30	20.17
		Bhadradighi	86.00	242	967	54	51.27
		Bhagabandh	61.70	154	901	34	50.41
		Bhuskidangal	135.89	288	1268	62	29.51
		Bhangahir	84.00	165	941	35	53.38
		Burhnia	94.01	248	879	49	60.38
		Burhichapar	147.00	341	874	74	51.69
		Champa Pahar	-	-	-	-	-
		Chandramali	109.54	59	903	13	34.04
		Chhatarchua	258.74	422	927	93	61.21
		Chirudih	444.91	554	1075	115	56.29
		Chunjo	245.66	287	1095	68	45.81
		Dhobarna	151.90	257	1024	57	39.39
		Dharampur	131.07	379	1016	80	62.65
		Dhobachapar	121.00	171	1085	39	52.70
		Dighaparbat	60.76	144	846	34	48.28
		Dubrajpur	136.85	145	883	32	51.18
		Dumariya	174.64	283	952	57	35.42
		Dumartola	253.42	279	860	64	22.87
		Dundhapahari	250.30	591	1081	125	52.43
		Durgapur	117.00	552	978	109	59.86
		Gamharia	142.25	262	1319	59	47.85
		Gariapani	335.43	509	1078	161	46.12
		Gopikandar	137.52	1293	977	283	64.77
		Gumapahari	212.00	540	1030	109	53.33
		Hethsilangi	189.87	200	1198	48	61.88
		Jamchua	163.00	430	1000	89	50.57
		Janamdih	98.85	157	1122	36	39.13
		Jhariapani	165.06	223	798	53	34.38
		Jhanjhko	137.97	90	957	22	25.00

		Jhutichapar	150.57	146	973	31	36.28
		Jitpur	135.14	262	885	51	28.64
		Jolo	97.40	278	1000	55	38.92
		Jorasimal	147.00	268	1078	57	55.40
		Jaropani	79.00	256	1065	53	64.73
		Kachuakandar	80.19	34	1429	6	65.52
		Kairasol	23.00	8	1000	2	66.67
		Kajikend	119.00	182	896	37	49.04
		Karmo	201.63	424	981	91	45.22
		Katuidangal	45.07	41	864	8	61.11
		Chetopoka	125.91	131	1047	24	31.96
		Kharikasol	135.82	93	898	21	55.70
		Khatangi	141.00	99	1302	23	55.68
		Khatganwa	110.00	121	921	26	32.23
		Kheribari	196.00	626	990	150	16.61
		Khajurdangal	132.86	131	845	29	24.43
		Koilo	120.17	59	967	16	20.34
		Kolha	173.04	267	1102	59	26.22
		Koyada	155.00	134	1680	30	15.67
		Kuarpur	35.00	55	719	10	21.82
		Kochapani	191.60	211	867	44	37.91
		Kulaipura	258.96	378	909	87	44.44
		Kumarbandh	159.00	313	1252	64	28.75
		Kundapahari	566.63	555	914	124	36.76
		Kurumba	126.00	204	1103	54	47.55
		Kuskira	186.81	1254	1013	276	62.92
		Lakhibad	191.00	291	877	62	36.43
		Madhuban	517.00	742	1005	160	38.95
		Mahaldabar	341.00	388	1000	76	47.16
		Majurabari	156.00	417	895	94	62.11
		Musna	272.46	545	1004	112	31.74
		Ormo	496.00	979	865	205	24.31
		Paharpur	124.00	380	854	84	34.21
		Palasbani	106.64	238	1088	43	44.12
		Pinargaria	110.00	203	1030	44	32.02
		Pipra	209.54	334	898	78	24.85
		Puranakhora	159.55	281	1081	59	43.42
		Pujadih	68.00	147	1227	34	49.66
		Rambani	186.71	276	1075	60	32.97
		Ramgarh	86.89	241	883	63	42.74
		Rampur	119.00	267	963	57	36.70
		Ranga	230.21	665	1118	143	50.83
		Sahara	150.61	75	744	14	61.33
		Sarkhi	92.00	117	773	25	39.32
		Sarkhi Pahar	325.00	53	1120	9	62.26
		Silingi Pahar	295.55	138	1060	27	36.23
		Sugapahari	175.00	226	1093	48	31.86
		Saruapani	119.19	115	917	26	33.04
		Talberia	153.79	252	909	58	41.27
		Talkhora	161.82	118	967	27	30.51
		Tesaphuli	260.23	256	1048	57	25.39
	Kathikund	Ambajora	188.00	403	1005	89	53.10
		Amgachhi	301.00	1119	1031	221	24.75
		Balidih	310.89	314	950	68	48.41

		Banjhiam	41.00	79	975	18	18.99
		Bara Chaparia	244.24	400	961	91	56.50
		Bara Bhuibhanga	179.42	131	955	28	25.95
		Baskia	102.86	105	944	24	31.43
		Baskia	-	-	-	-	-
		Chhota Chaparia	67.02	60	1143	12	41.67
		Chhota Maruapani	-	-	-	-	-
		Chhota Bhuibhanga	132.08	231	1081	49	57.58
		Dhibri	100.55	178	1171	39	29.21
		Dumrapahar	491.78	241	975	51	21.99
		Dumaria	109.21	204	1040	42	36.76
		Jogiduba	72.77	120	1308	30	23.33
		Kolha Pahar	279.00	-	-	-	-
		Kotaldih	86.00	163	831	34	39.88
		Kulkant	207.00	316	904	72	47.15
		Kurcho	159.29	109	1370	19	48.62
		Lakraphela Pahar	-	-	-	-	-
		Mahuapathar	105.33	282	1043	57	29.79
		Mahuagari	340.62	242	847	50	39.67
		Majhila Sarwapani	254.00	396	868	81	49.24
		Majhdiha	183.68	416	1039	89	52.88
		Murguja	246.93	168	909	30	12.50
		Paharchapri	-	-	-	-	-
		Pirjorwa	-	-	-	-	-
		Pokharia	248.13	834	949	167	41.13
		Pusaldih	85.86	169	1167	36	57.40
		Sarwan	-	-	-	-	-
		Sarwan Pahari	-	-	-	-	-
		Simra	198.41	196	922	43	33.16
		Upar Pujadih	136.57	162	1025	37	19.14
	Ramgarh	Bakua	87.03	177	863	40	50.85
		Bhelai	20.00	-	-	-	-
		Damudih	147.00	507	943	110	55.03
		Danro	322.00	2181	908	451	56.26
		Kendua	115.00	523	951	110	66.54
		Kulapathar	179.00	339	960	71	47.49
		Mahuadangal	28.00	-	-	-	-
		Raidih	182.00	402	887	85	56.97
		Rajamar	105.00	151	1068	34	34.44
		Rangamatiya	92.00	266	1094	58	43.61
GODDA	**Sundarpahari**	Babupur	213.00	14	1000	4	28.57
		Bajrajogusami	220.00	126	2818	26	43.65
		Bankatti	58.00	68	838	14	44.12
		Bara Dangapara	192.00	385	1225	89	26.49
		Barai	124.00	172	1024	29	23.26
		Bargo	179.00	111	1018	28	23.42
		Belpahari	173.00	263	1039	62	33.46
		Baigni	272.00	535	1106	118	25.79
		Bokrabandh	379.00	555	850	112	35.68
		Chhota Dangapara	121.00	70	795	17	10.00
		Damakol	55.67	61	968	12	13.11
		Doria	-	-	-	-	-

		Dumra Palampura	146.00	262	1015	58	31.30
		Golkunda	274.37	161	1147	37	29.19
		Hardisol	185.00	298	774	63	34.56
		Jagusama	77.00	9	800	2	44.44
		Jamropani	233.00	265	1087	56	43.02
		Jogimarna	215.00	187	1011	41	33.69
		Karamba	98.44	133	822	25	12.03
		Kathaldih	288.76	347	949	75	14.99
		Kamupahari	168.00	164	976	34	26.22
		Malipara	240.14	152	1054	36	13.82
		Mulgipur	44.00	-	-	-	-
		Paharpur	315.00	566	952	124	37.10
		Pakrikhunta	171.00	241	975	59	35.27
		Pipra	159.00	208	1019	43	50.00
		Sidapara	183.00	173	840	40	34.10
		Simlipara	149.00	106	710	29	29.25
		Sundrijola	458.00	231	974	73	32.90
		Susni	403.00	785	892	141	50.70
		Telopara	191.00	297	954	62	12.12
		Tilaypara	193.00	302	1068	64	38.08
	Poreyahat	Daharlangi	129.00	217	1009	41	36.41
		Hathiapathar	152.00	339	1146	75	36.28
		Jamropani	13.00	-	-	-	-
		Pairgadih	224.00	1235	921	267	51.90

*Sex Ratio means no. of females per 1000 males (Census, 2011)

The demographic profiles of Dumka and Godda districts are being shown in the following table.

Table 4: Demographic Profile of Dumka and Godda Districts

District	Total Population (No.)	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy
Dumka	13,21,442	6,68,514	6,52,928	6.02	21.87	93.18	6.82	61.02
Godda	13,13,551	6,77,927	6,35,624	8.80	10.71	94.90	5.10	56.40

The demographic profiles of the CD blocks involved in the Impact Area are being presented in the following table.

Table 5: Demographic Profile of CD Blocks involved in the Impact Area

District	CD Block	Total Population	Male Population (%)	Female Population (%)	SC Population (%)	ST Population (%)	Rural Population (%)	Urban Population (%)	Literacy (%)
Dumka	**Gopikandar**	42,063	20,999	21,064	1.58	42.40	100.00	-	50.12
	Kathikund	71,458	35,598	35,860	2.45	32.36	100.00	-	54.08
	Ramgarh	1,59,911	79,944	79,967	4.77	24.33	100.00	-	55.45
Godda	**Sundarpahari**	65,463	32,895	32,568	2.14	38.44	100.00	-	43.62
	Poreyahat	1,87,489	95,814	91,675	6.59	16.08	100.00	-	56.33

2.4. LIVELIHOOD STATUS OF THE POPULATION RESIDING IN THE IMPACT AREA

The Impact Area is predominantly agricultural in character. The main occupation of the people is cultivation. Kharif and Rabi are the main agricultural crops. The demographic profile of both Dumka and Godda districts is predominantly rural in character, with high level of poverty and low percentage of working population. The major crops grown are Paddy, Maize, Pulses, Oilseeds and Wheat. Paddy is grown intensively whereas other crops are grown by lesser number of farmers.

Rainfed farming system is the traditional practice followed by the farmers of the area. The Major crops grown in the district are rice, pulses such as moong, black-gram, pigeon pea and horse gram. Wheat is grown during rabi season and mustard and linseed, and pulses e.g. gram are also grown on stored or residual soil moisture. In some places, potato is also grown under irrigated condition. During the last five years there has been a marked increase in area under vegetables at some places in the district.

The important **cropping patterns** followed in different parts of Dumka and Godda are as follows: (a) Mono-cropping : Rice/Maize/Pigeon Pea / Groundnut / Horse gram. In some areas, farmers follow inter-cropping of Maize with Pigeon pea / Cow pea. (b) Double cropping : Rice wheat, Rice-Mustard, Maize-Wheat, Maize-Mustard, Rice-Potato, Rice-Vegetable, Maize-Vegetables. At few places, where irrigation water is available in summer also, farmers take rice and / vegetables at very scanty level.

Most of the cultivated lands suffer from soil erosion which results in poor soil fertility. In spite of having high rainfall (1000-1100 mm/year), farmers of these areas lack awareness about High Yield Varieties (HYVs). A study has revealed that poverty can be significantly reduced in sustainable manner by introduction of HYVs of paddy – a prominent crop of the region. Further, motivation of farmers towards crop diversification like wheat, chickpea and groundnut cultivation may a go a long way towards food security and improved socio-economic condition of the villagers.

In a project report entitled "Up-scaling Livelihood of Forest Communities through Enhanced Farm Productivity and Efficient Support Systems in Godda District of Jharkhand" prepared by Agricultural Finance Corporation (ICAR) in 2014, it has been observed that people would harvest bamboo culms either to sell them in the market or to use in house making and basket making. A need to diversify products from traditional to contemporary Bamboo crafts has been highlighted. The study has further noted that forest area of Sunderpahari and Godda forest ranges had abundant Sal (Shorea robusta) trees. Traditionally, local people collect Sal leaves, make the plates

manually and sell to the local traders @ Rs.20 per 100 plates. Local traders would mechanize them and further sell in the market at higher price ranging from Rs. 60 to Rs. 90 per 100 plates. Hence, mechanization of leaf plates may contribute significantly towards livelihood augmentation. Forests of Godda and Sundarpahari ranges have ample trees and plants that provide different kinds of NTFPs. Some of them are edible fruits viz., Jackfruit (Artocarpus heterophyllus), Mango (Mangifera indica), Amra (Spondia pinnata), Aonla (Embelica officianlis), etc. Traditionally local people would collect these fruits either for self-consumption or selling in the local market at throwaway prices. In order to generate higher market returns these fruits may be processed, preserved, packed, labelled and sold in the market in form of pickle etc. Multilayer Vegetable Cropping System (MVCS) also needs to be introduced. Under MVCS better results were recorded compared to traditional as well as hybrid varieties under sole crop. Nutritional security for the people living in disadvantaged area may be effectively addressed through providing a small kit of vegetables seeds to grow them in the backyard. In addition, improved varieties of crops may be provided to the farmers. Vermi-composting may also be introduced. Use of vermi-compost could help in enhancing land fertility and provide a better alternative to the traditional use of dung. Nurseries may also be developed / established on the farmers land which is not used for cultivation purpose and lying vacant. The seedlings of plants such as Mango, Aonla, Bamboo, etc. could be raised in the nursery. In addition, seedlings of Coriander, Chilli, Cauliflower, etc. may also be grown in the poly house built within the nursery premises.

2.4.1. Occupational Profile of the Residents in the Impact Area

The occupational profile of the CD Blocks constituting the Impact area are being profiled in the following table:

Table 6: Occupational Profile of the CD Blocks Constituting the Impact Area

District	CD Block	Total Population	Total No. of Workers	No. of Main Workers	Main Workers (%)	No. of Marginal Workers	Marginal Workers (%)	Non-working Persons
Dumka	**Gopikandar**	42,063	23,406	8,044	34.37	15,362	65.63	18,657
	Kathikund	71,458	34,846	13,251	38.03	21,595	61.97	36,612
	Ramgarh	1,59,911	82,265	21,738	26.42	60,527	73.58	77,646
Godda	**Sundarpahari**	65,463	35,347	11,515	32.58	23,832	67.42	30,116
	Poreyahat	1,87,489	81,334	42,008	51.65	39,326	48.35	1,06,155

(Census, 2011)

A main worker is defined as a person who is engaged in any economically productive work for at least 183 days in a year. The main workers include 10 categories of workers as defined by the Census Department, consisting of cultivators, agricultural labourers, those engaged in live-stock, forestry, fishing, mining and quarrying; manufacturing, processing and repairs in household

industry; and other than household industry, construction, trade and commerce, transport and communication and other services.

The marginal workers are those workers engaged in some work for a period of less than six months during the reference year prior to the census survey. A marginal worker is defined as one who engaged in only economically productive work for less than 183 days in a year.

The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc.; institutional inmates or all other nonworkers who do not fall under the above categories.

The data in the above table shows that percentage of the number of marginal workers to the number of total workers in all the CD blocks except Poreyahat, is quite high as these blocks are predominantly rural in character. Poreyahat CD block has some industrial installations which explains for significantly lesser percentage of marginal workers. Overall, it may be concluded that the Impact Area is affected by acute lack of employment opportunities. This is also being reflected through the fact that migration of residents to other urban destinations is quite common in the area.

2.4.2. Dependence of the Population Residing in the Impact Area on Forests/NTFPs

The primary requirements of the population from the forests are firewood; poles, small timber and bamboo for house building and agriculture purposes and grasses and leaves to be used as fodder for cattle. There is a good demand for bamboo for basket making industry also. Non-Timber Forest Produce (NTFP) like Mahua flowers, Mahua seeds, Sal seeds, sawai grass, kendu leaves, chironji etc. provide the poor villagers an additional source of income for sustenance. The need for fencing material is immense as the agricultural crops need to be protected from free roaming cattle. A considerable amount of forest produce in the form of poles is consumed by the villagers every year for fencing and house building purposes. The fencing material is used in the previous year is burnt as firewood etc.

Some Santhals depend on making baskets for their livelihood. Most of them are landless and bamboo basket weaving is the main source of their income. These tribal people make basket out of bamboo and sell these to middle men, who carry the baskets to distant markets. Collection of kendu leaves and other minor forest produce like sal seeds is done through the Jharkhand Forest Development Corporation (JSFDC).

The main items of forest origin that are brought to the markets and weekly hats apart from firewood and timber are being enumerated as follows:

- Sal seeds
- Mahua flowers
- Mahua seeds
- Palas seeds
- Lac
- Tasar Silk cocoons
- Harra
- Bahera
- Amla
- Chiraunji
- Karanj seeds
- Agricultural tools made out of wood
- Kendu leaves
- Gums
- Medicinal plants etc.

The above list is only illustrative and many other herbs, seeds, roots of medicinal value are traded in the markets.

The kendu leaves are collected and marketed by JSFDC. The villagers collect kendu leaves from the forests and bring these to a specified place called 'phanri' and the payment is made by the JSFDC to the villagers.

2.4.3. Information about Cattle Population and Dependency on the Forests for Grazing

Livestock is an integral component of the farming system in India. The livestock sector is socially and economically very significant due to its multi-functional outputs and contribution to socio-cultural security. According to 20th Livestock Census (2019) carried out by Ministry of Fisheries, Animal Husbandry and Dairying, Govt. of India, the livestock population in Dumka and Godda districts have been estimated as under:

Table 7: Estimated Number of Livestock in Dumka and Godda Districts

Livestock	Estimated No. in Dumka district	Estimated No. in Godda district
Cattle	747624	684653
Buffalo	48090	96016
Sheep	28645	4717
Goat	407126	288944
Pig	128562	104736

It is to be noted that almost all indigenous cattle and buffalo are dependent on grazing. Grazing in villages do happen mostly in forest and plantation areas. Particularly cows and goats feed on the forested areas wherever there is availability of such areas.

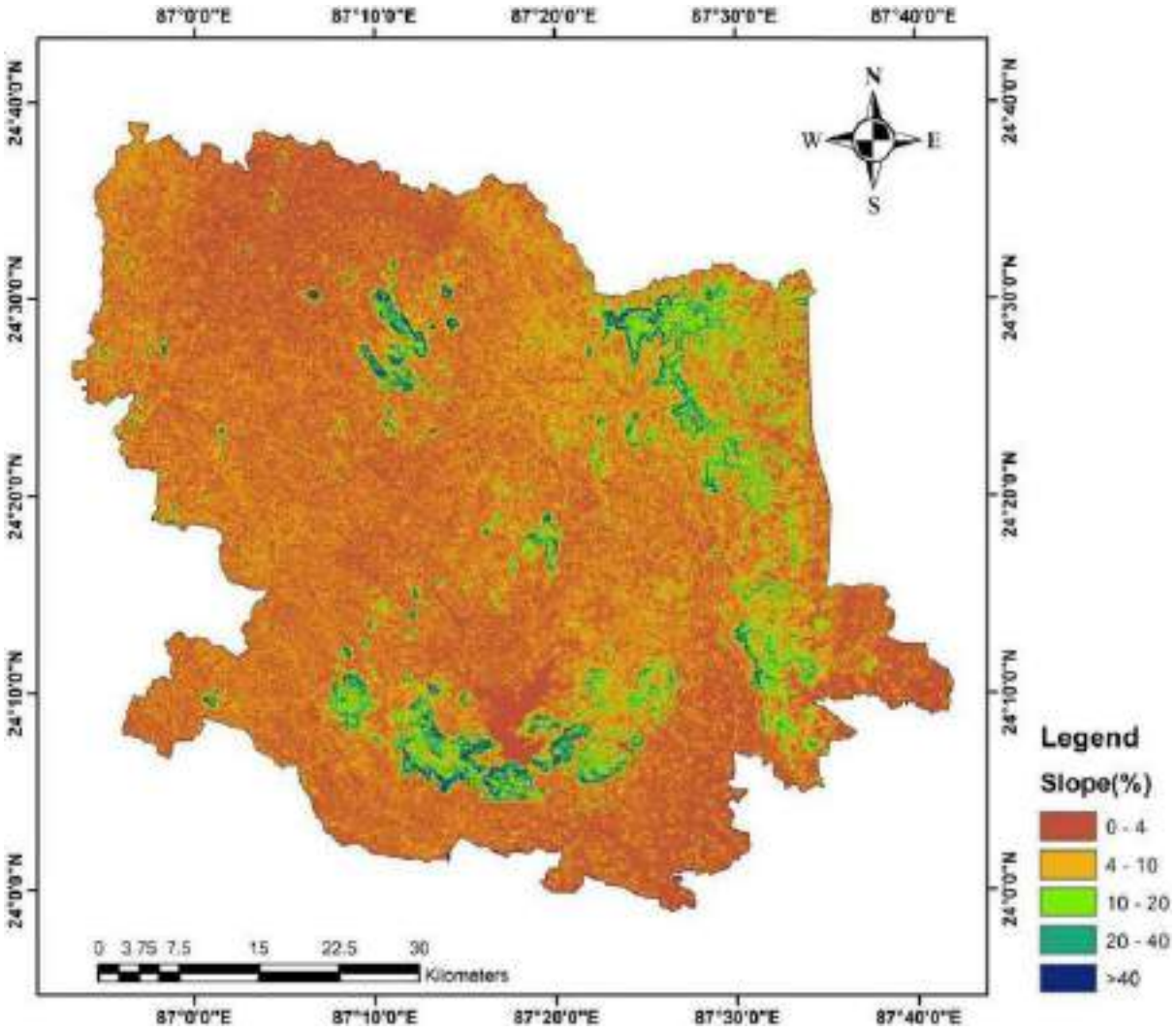
2.5. PHYSIOGRAPHY, GEOMORPHOLOGY, GEOLOGY AND CLIMATE OF THE IMPACT AREA

The Impact Area is predominantly located in Dumka District, CD blocks involved therein being Gopikandar, Kathikund and Ramgarh. Only a small portion of Godda district is a part of the Impact Area. Therefore, the details/data pertaining to physiography, geomorphology and climate of Dumka district have been taken into consideration for formulating the instant Plan. Moreover the said characteristics of both the districts are similar and the part of the impact area located in Godda district is adjacent to Dumka district.

2.5.1. Physiography, Type of Terrain and Topography

Topographically Dumka district is an upland tract with a hilly backbone running from north to south. The general elevation of the area is between 150 m to 640 m above msl. The prominent hills are Rajmahal hills, Ramgarh hills, Karakata and Sapchala hills. Among the loftiest peaks are: Mahuagachi (528 m), Korcho hills (640 m), Karakata (210 m). The general slope of the district is from North West to South East. The hills in many parts are covered with dense forests, while in the valleys small villages surrounded by cultivated clearing are found. The slope of the district is being shown in the following map.

Map 5: Slope Map of Dumka District



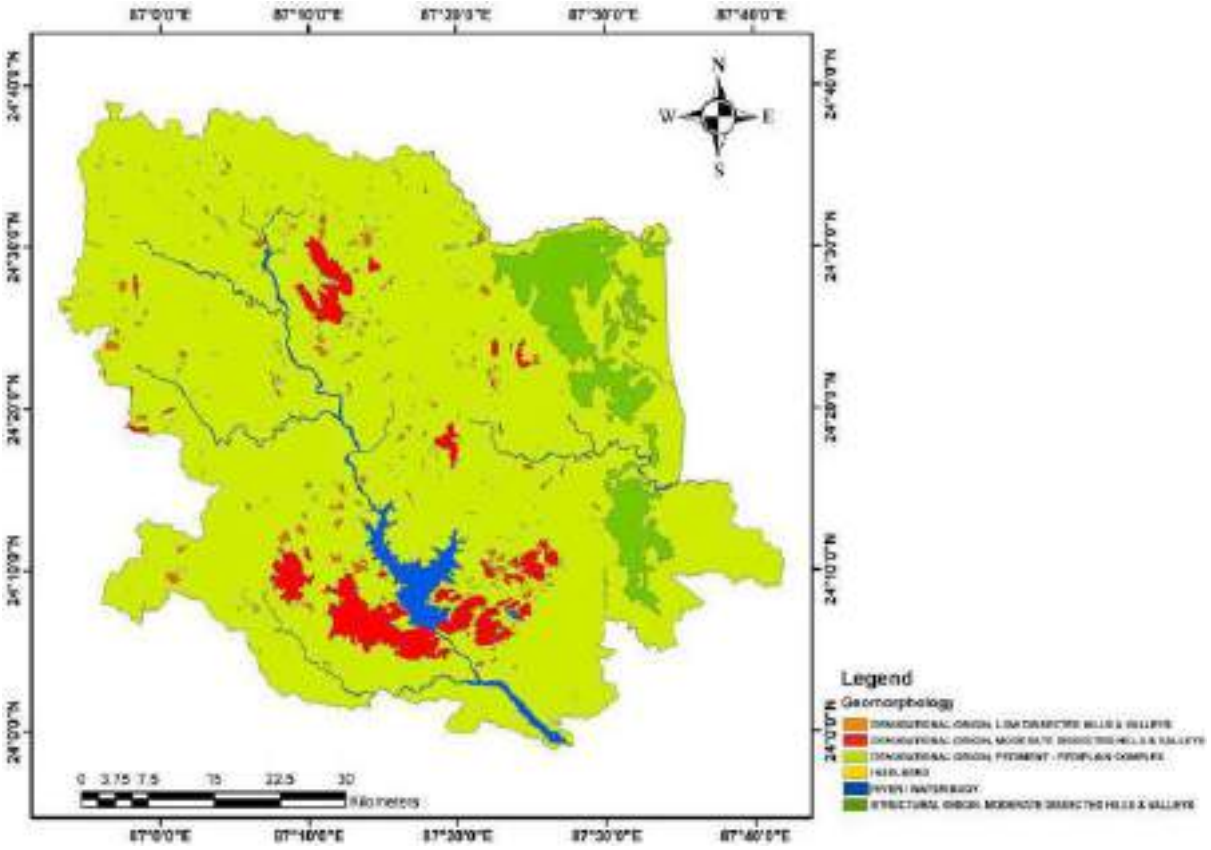
2.5.2. Geomorphology

The landscape of Dumka district to a large extent comprises of long undulated ridges forming rugged and coarse dissected topography between which runs the drainage channels. The trough in between the undulations is full of rich alluvial soil. Geomorphologically, the district can be broadly be divided into three well defined, physically identifiable and genetically significant units:

(a) the hilly area;
(b) the rolling country or valleys; and
(c) the pediplained flat country.

The indicative geomorphology of Dumka District is being depicted as follows.

Map 6: Geomorphological map of Dumka District



2.5.3. Geology

Geologically, Dumka district is represented by Chhotanagpur Granite-Gneiss of Archaean age to Proterozoic and Eastern Ghat super Group of Archean age, which are overlain by Gondwana Super Group, Rajmahal basaltic lava flows (Upper Jurrassic to lower cretaceous age) with intertrappean beds and at places Laterites.

The Chhotanagpur Gneissic complex is largely represented as lithological unit in the area and covers the major part of the district uninterruptedly. They form more or less gently undulating plains and high grounds pediments and buried pediments, seldom giving rise to small hillocks mounds. They are mostly biotite gneisses and granite gneisses and in general coarse grained with porphroblastic texture and traversed by pegmatitite and quartz vein of various dimensions. It contains enclave of amphibolites and mica schists. These rocks are highly folded and have very steep foliation dip. These gneissic rocks have been intruded by numerous dykes. Eastern Ghat Super Group is represented by Patches of acid to basic charnockite and Khondalite/Garnet Sillimanite-Biotite Gneiss.

The pre-cambrian formations are overlain by Gondwana formations. Gondwanas are represented by Barakar, Talchir and Dubrajpur formations in the form of a strip running roughly in the NW-SE direction. However isolated patches of this formation are also found to occur in the central part of the district. Talchir formations consist of sandstone and shales. Barakar formation consists of white to fawn colored coarse grained sandstone, grits with occasional conglomerates and carbonaceous shales, thin lenticles and streaks of coal are found in this formation.

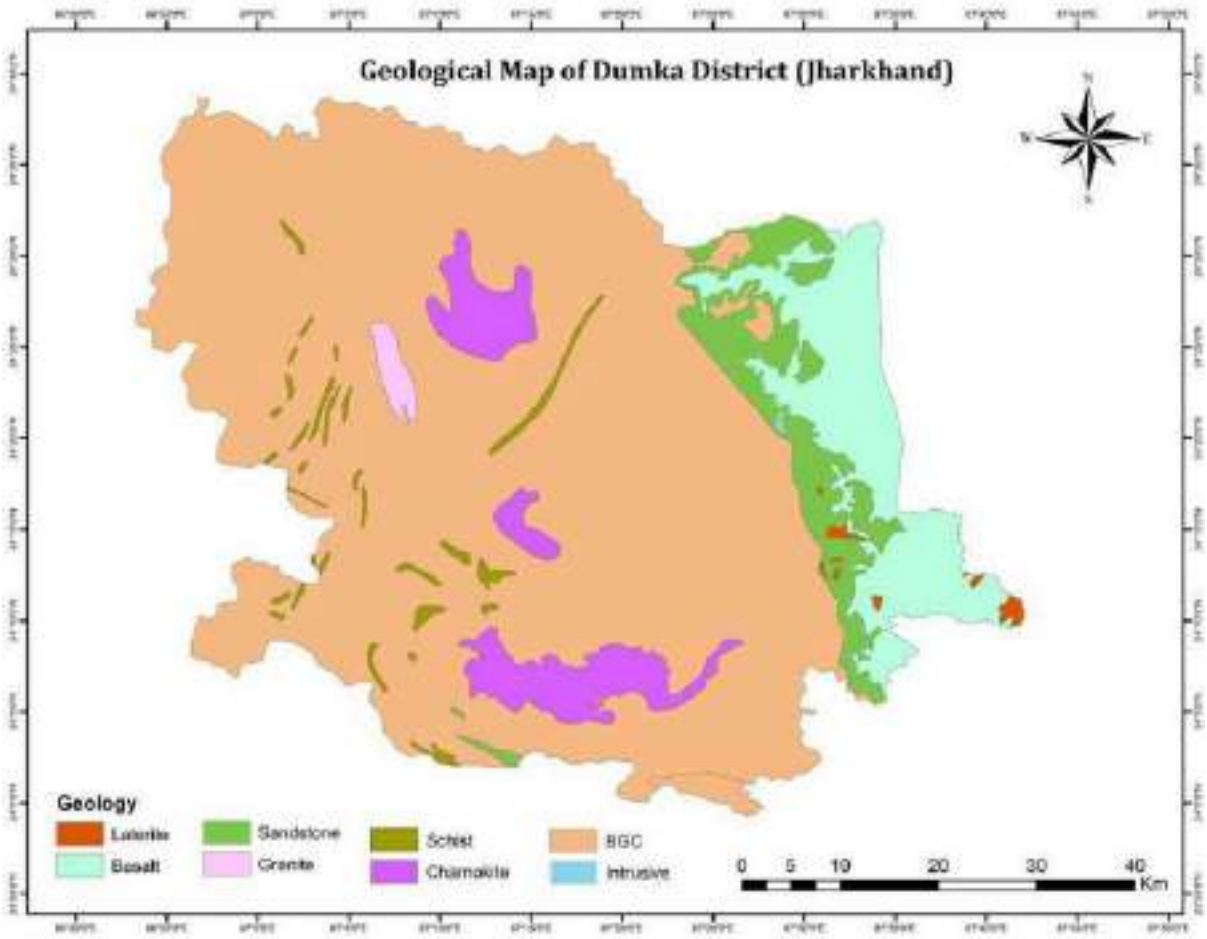
The pre-cambrian formations/Gondwana formations are further overlapped by Rajmahal Traps consisting of basaltic lava flows with sedimentary intertrappeans. The basaltic rocks are hard and fine to medium grained. Some of the lava flows are vesicular and cavities being filled by calcite and chalcedony. The non vesicular lava flows are hard, tough, compact and fine to medium grained in nature. The vesicular types are comparatively soft and break easily. In general the Rajmahal traps show vertical to horizontal joints trending E-W and N-S. Typical columnar joints are also common. These rocks are weathered with characteristic spherical exfoliation which give rise to large rounded boulders as the outcrops.

The Laterites are found in patches over Rajmahal traps. The alluvium patches are generally seen along major streams. Narrow, discontinuous patches of alluvium particularly in granitic country are identified. They comprise of medium to coarse grained sand associated with silt and clay. Occasionally calcareous nodules are also found to occur. They are light grey to brownish in colour. The thickness of the alluvium varies from place to place and is largely controlled by topography of the basement crystalliones.

In the district, the rocks are highly deformed and metamorphosed. The exposure of granite and other associated rocks show intricate folding. Based on morphotectonic analysis, the area has undergone several phases of tectonic deformations which led to various sets of fractures, fissures, faults etc which leads to lineaments. Based on lineament study of the area, various sets of fractures have been identified.

The indicative Geological map of the district is being shown as below.

Map 7: Geological Map of Dumka District



2.5.4. Hydrogeology

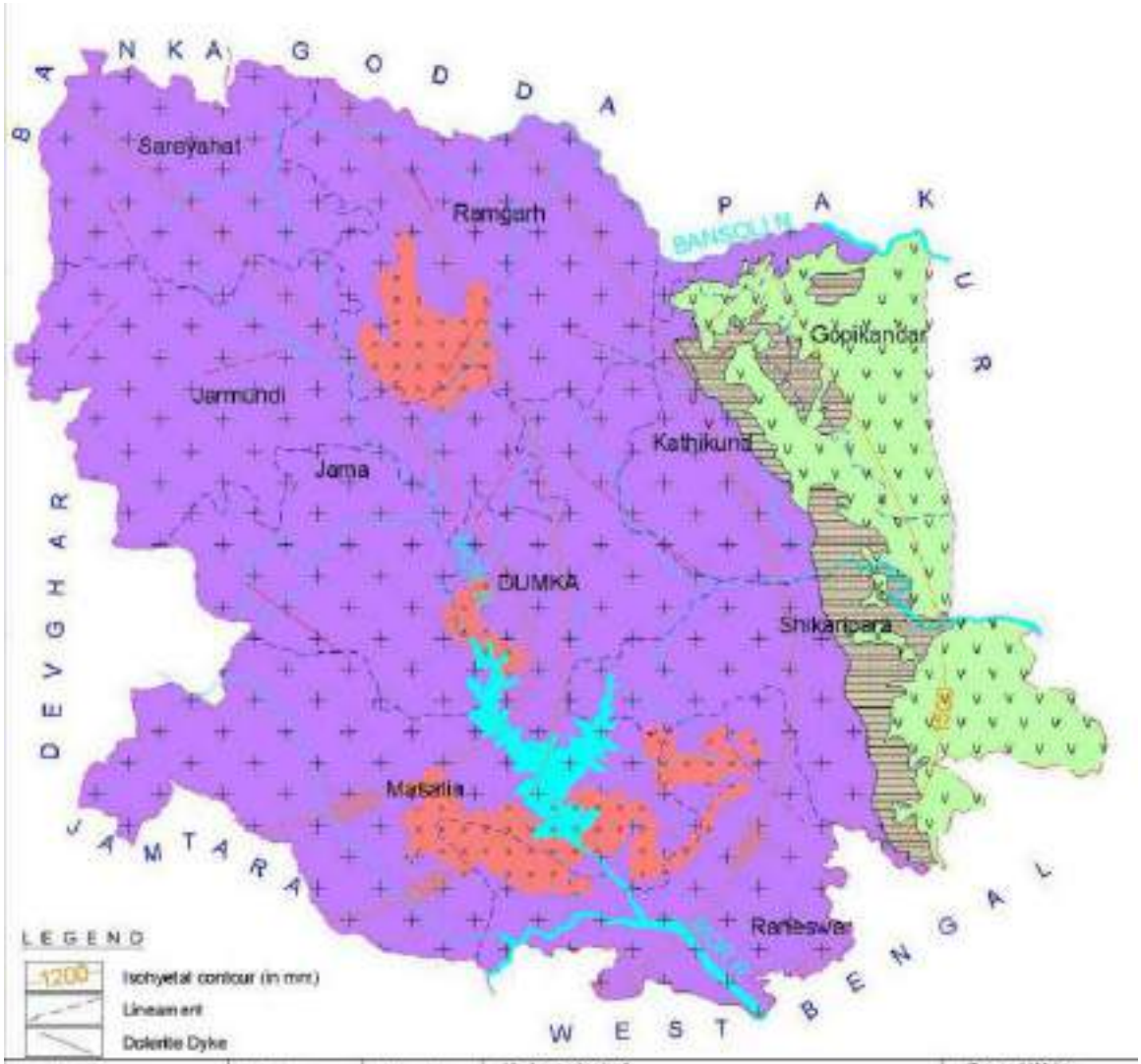
Ground water in the district is replenished mainly by the atmospheric precipitation. The depth to water and water level fluctuation depends mainly on the amount and distribution of rainfall, geomorphological set up, lithology etc. The occurrence and movement of Ground Water in the area is broadly governed by geological frameworks, i.e. nature of rock formations including their porosity and permeability. A fracture system roughly corresponds to a hydraulic system in the rock. A rock which has been exposed to a two-phase brittle deformation can also constitute one hydraulic system if there is a good connection between the two fracture systems. Based on morpho-genetic, geological diversities and relative ground water potentialities of the aquifers, the district can be broadly divided into following three Hydrogeological units:

- Consolidated or Fissured formations – Pre-cambrians and Rajmahal Trap
- Semi-Consolidated formations -Gondwanas
- Unconsolidated or Porous formations - Laterites and Alluvium

In major part of this district, Fissured formations, i.e. hard rock form the principal aquifers, which include mainly Chhotanagpur Granite gneissic complex and Rajmahal Traps. However, in isolated areas Gondwana formations, laterites, as well as valley fill materials along the vicinity of the rivers also form potential aquifers.

Hydrogeological map of Dumka district is being presented as below.

Map 8: Hydrogeological Map of Dumka District



Age Group	Lithology	Symbol	Hydrogeological Condition	Ground Water Potential
Middle Jurassic to lower cretaceous	Rajmahal Trap with interrappeans		Groundwater restricted to weathered residium/ Fractures, Joints. Groundwater occurs under unconfint and semi confined to confined state of disposition.	Limited yield prospect upto 20 m^3/ hr.
Upper Carbonefereous to Lower Jurrassic (Gondwana)	Sandstone and Shale		Groundwater restricted to fractures, fissures and joints ground water occurs ground water table and semi confined to confined condition	Limited yield prospect Upto 10 m^3/ hr.
Archean To Proterozoic	Granite-Gneiss with enclaves of Metamorphics		Groundwater restricted to weathered zone and inter connected fractures zones having secondary porosity. Groundwater occurs under water table and semi confined to confined state of disposition.	Moderate to good yield Upto 50 m^3/ hr.
Archean	Charnokites, Khondalites		Groundwater restricted to weathered zone and fractured zone. Groundwater occurs under water table and semi-confined condition mostly occurs as dykes.	Very Limited yield prospect below 10m^3/ h

2.5.5. Climate and Rainfall

The climate of Dumka district has been divided into three different seasons. The winter commences from middle November and extends up to middle of March, December and January being the coldest months. The winter is characterized by heavy dew, thick fog and associated cold wave. The winter is followed by summer which lasts up to middle June. The heat is sometimes oppressive but generally nights are pleasant due to cool breeze. The monsoon sets in by the middle of June and continues up to end of September. The beginning of monsoon is marked by the strong dust storms from north-west with thunder and lightning. Normal atmospheric temperature recorded in the district is of the order of 42^0C to 46^0C in summer. In winter the minimum temperature goes down to about 4^0C. The relative humidity varies from 50 – 60%.

The district receives its share of rainfall mainly by south–west monsoon during rainy period and from the retreating monsoon during the inter-monsoon period which originates in the Bay of Bengal. The district receives 80% of the annual rainfall during monsoon period. Rainy season sets in the middle of June and continues till middle of October. The rainfall generally decreases from South – East to North – West. The Decadal average monsoon rainfall (2008 to 2018) of the district is 1043.67 mm and block wise it varies from 776.12 to 1351.07 mm. The rainfall data for the period of 2008–19 has been worked out and analysed. Decadal annual monsoon rainfall, standard deviation and coefficient of variation are given in the following table.

Table 8: Analytical Data of Monsoon Rainfall (2008-2018) of Dumka District

Sl. No.	CD Block	Decadal Average Monsoon Rainfall (mm)	Standard Deviation	Coefficient of Variation (%)
1.	Dumka	1351.07	515.03	38.12
2.	Jama	776.12	256.02	32.99
3.	Jarmundi	1196.22	191.68	16.02
4.	Saraiyahat	1270.81	391.93	30.84
5.	**Ramgarh***	999.86	314.48	31.45
6.	**Gopikandar***	934.88	242.19	25.91
7.	**Kathikund***	855.02	404.63	47.32
8.	Sikaripara	869.34	190.66	21.93
9.	Raneshwar	1125.38	260.82	23.18
10.	Masalia	1058.00	203.69	19.25

*Part of Blocks shown in bold and marked with asterisk constitute the Impact Area

2.6. SOIL TYPES

Soils in Dumka district has formed as a result of in-situ weathering of the crystalline basement. Climate, topography and vegetation have all contributed in the formation of soils. The following different types of soil occur in the entire district.

- **Alluvial Soil**: All the river channels in this district are covered with alluvial soil of recent origin, deposited over crystalline bed rocks. Alluvial fills are also found in patches away from the river channels. Thickness of these fills depends upon the topographical control. The alluvial material consists mainly of silt and sand mixed with clay, silty material dominating over clayey material. These are yellowish – grey in colour.
- **Grey eroded scarp Soil**: This covers almost the entire area as a thin capping over granitic/ gneissic rocks.
- **Lateritic Soil**: Pallety, nodular, ferruginous, brownish laterites of Pleistocene age are found to occur as patches. The lateritic soil has been formed by the process of laterization of the weathering material aided by favourable climate and the local topography. They are highly permeable with poor holding capacity. However laterite formed due to the weathering of Rajmahal trap are generally brown to reddish in colour, porous, pitted and show vermicular cavities, and are good repository of ground water.
- **Forest soil**: Forest soil is confined to the forested area and has a surface layer of organic matter.

The pH value of all the soils varies from 5 – 6.5 indicating that these soils are acidic in nature. Undulating terrain and porous character of the soil have resulted in soil erosion all over the area.

2.7. GROUND WATER STATUS

Based on the morpho-genetic and geological diversities, and relative Ground Water potentialities of the aquifer belonging to different geological formations, the district of Dumka can be broadly sub – divided into two hydrogeological units.

- Fissured Formation
- Porous Formation

A total of 16 National Hydrograph Stations (NHS) have been established by Central Ground Water Board (CGWB) for the study of behaviour of the water level and their fluctuation.

- **Pre-monsoon depth to water level**: On the basis of the depth to water level of the year 2012, the pre-monsoon depth to water level varies between 4.45 to 12.3 mbgl (metre below ground level). Majority of the wells (85%) fall in the water level range of 5– 10 mbgl. About 10% wells fall in the water level range from 2 – 5 mbgl.
- **Post-monsoon depth to water level**: The post-monsoon depth to water level ranges between 3.10 to 8.4 mbgl. About 69% of the wells fall in the water level ranges between 2 – 5 mbgl and 31% of the wells fall in the depth to water level ranges between 5 -10 mbgl.
- **Seasonal Fluctuation**: From the pre-monsoon and post-monsoon depth to water level data collected during May 2012 and November 2012 respectively, water level fluctuation were computed for all NHS of the district. The water level fluctuation between pre monsoon and post monsoon period of the district varies from 1.64 to 6.75 m. About 33% wells are showing water level fluctuation between 0 – 4 m and while 67% wells show fluctuation > 4.0 m.

2.7.1. Salient Observations/Recommendations made by CGWB to enhance Groundwater potential in Dumka District

- Ground Water quality is generally potable, except few patches. Nitrate value has been found beyond permissible limit in 11 dug well samples and 12 samples of hand pump. Also, Fluoride value has been observed beyond permissible limit in 3 samples of dug well and 2 samples of bore well (hand pump). Purification/filtration of Nitrate and Fluoride may be adopted.
- Based on Ground water Resources estimation 2017, the stage of ground water development in Dumka district is 24.26% and the entire district comes under safe category. Therefore, there is sufficient scope for further ground water development.
- Three major ground water related issues in Dumka district are low ground water development, low ground water potential and nitrate/ fluoride contamination in the area.
- Ground Water Management strategy suggested are construction of 71681 dug wells and 11947 shallow bore wells in the feasible areas in the district to enhance the overall ground water development to 70%. This would bring an additional area of 28672 ha under assured irrigation.
- To suggest a sustainable ground water management plan there are two options – Supply Side Management Options (local water harvesting techniques) & Demand Side Management Options (real water-savings).

- The supply side interventions envisage construction of 2276 no. of Check Dams/Nala bunds, 363 no. of Percolation Tanks and 6267 no. of building Rooftop Rainwater Harvesting (RTRWH) in the areas feasible for construction of recharge structures based on the long term water level scenario and recharge potential of the aquifer. The implementation of water conservation through artificial recharge measures will have a positive impact on drinking water sources of the area. It will ensure that the wells do not go dry during summer/lean/stress period in the areas of implementation and sufficient ground water availability is there in the wells even during the summer season. Thus, not only the drinking and domestic water sources will be strengthened but additional irrigation potential can be created through artificial recharge structures.
- The demand side intervention envisages the real water savings. The main demand side interventions may be:
    (i) Promoting improved irrigation technologies (drip or sprinkler irrigation, etc.);
    (ii) Crop choice management and diversification (promote less intensive crops like pulses and horticulture),
    (iii) Promoting treated municipal waste water for irrigation and construction use,
    (iv) Managing energy and irrigation nexus (providing quality power supply when needed through separate feeders, high voltage distribution lines, solar pumps, etc.). The government should encourage and provide incentive for the use of drip irrigation and sprinkler system.

2.8. LAND USE AND LAND COVER (LULC)

The two main characteristics on the basis of which land is classified are land use (LU) and land cover (LC). Land Cover can be defined as observed physical features on the Earth's Surface, which transforms to Land Use when a socio-economic function is added to it. Given the fact that increasing anthropogenic activities around the biosphere are causing large-scale alterations of the Earth's land surface, land-use and land-cover (LULC) change is an important indicator for monitoring environmental changes and a vital input for informed decision making in the context of land management.

In India, land-use and land-cover (LULC) statistics are maintained by National Remote Sensing Centre (NRSC), Department of Space (DOS) through a component on National Land Use/ Land Cover (LULC) mapping of the Natural Resources Census (NRC) Project of National Natural Resources Repository (NRR) Program. LULC datasets are made available on a periodic basis by

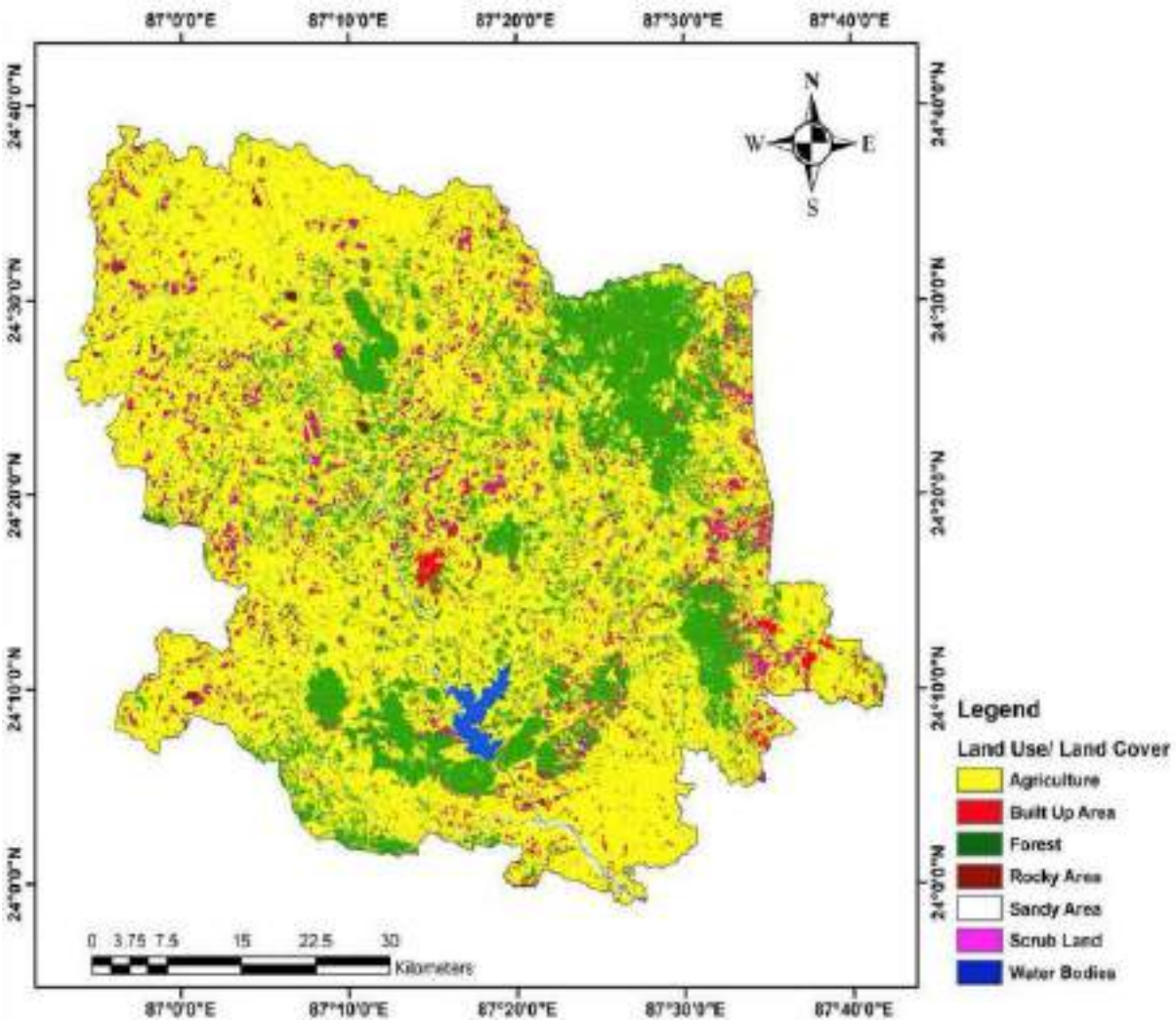
NRSC on a 1:50,000 scale, where the LULCdata is grouped as per the classes described in the following table.

2.8.1. Land Use and Land Cover of Dumka District

There is dominance of cultivation over other uses of land in plains whereas the significance of forest in high land attains almost the same significance as that of agricultural land use. The forests are store house of manifold resources like fuel, timber, herbs and are source of raw materials from farm to factories. Moreover, forests are linked with the culture and socio-economic conditions of the aborigines. Their survival depends on the existence of forests as they are rain bringer, soil binder and pasture preserver.

Out of total geographical area of the district i.e., 3716 Sq km, nearly 15 % area comes under net sown area,13% under forests and the rest area falls under barren, cultivable waste, pasture and other agricultural use. An indicative map of the Land Use in Dumka district is being shown below.

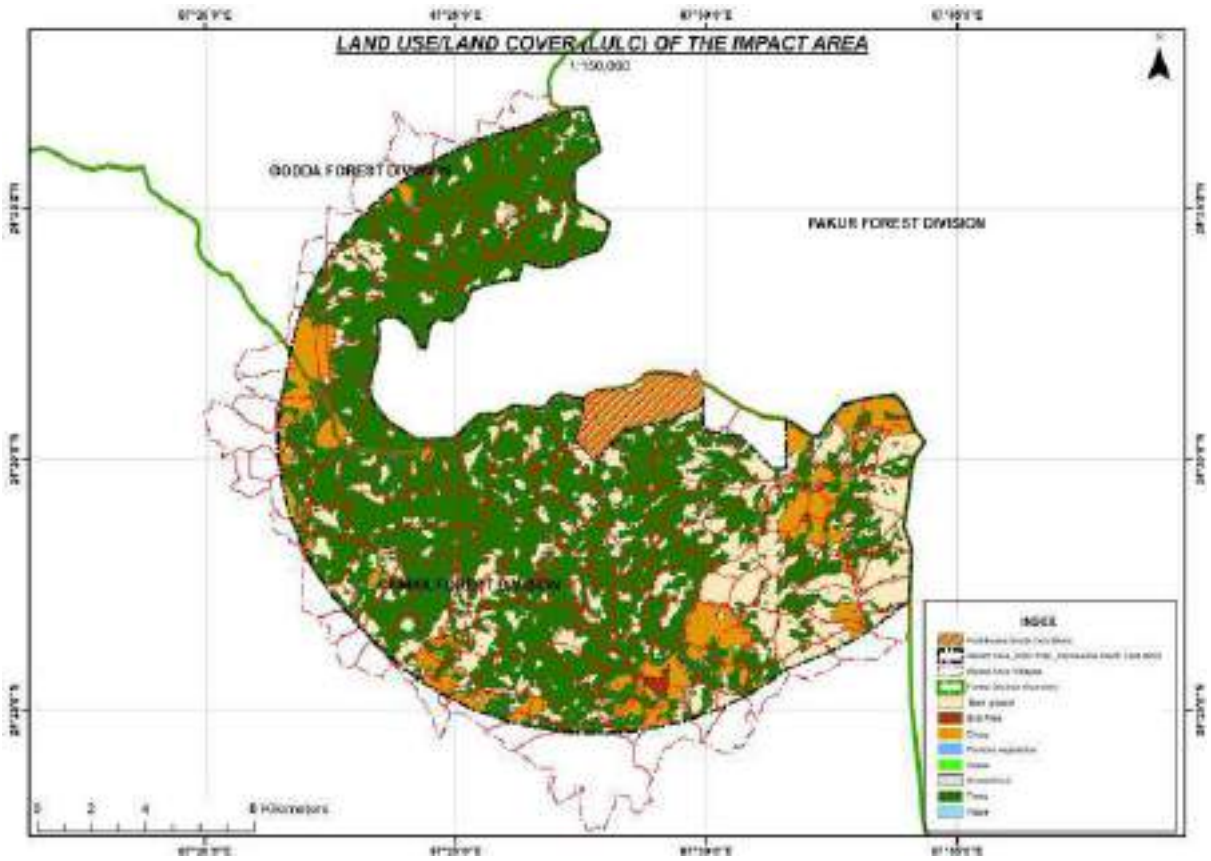
Map 9: Land Use Map of Dumka District



2.8.2. Land Use and Land Cover of the Impact Area

The Land Use and Land Cover map of the Impact Area may be depicted through the following map.

Map 10: Land Use/Land Cover of the Impact Area



The corresponding areas against different kinds of land use/land cover in the Impact Area are being tabulated as follows.

Table 9: Land Use and Land Cover of the Impact Area

Sl. No.	Land Use Class	Area (ha)	Percentage (%)
1.	Bare Ground	6459.97	24.88
2.	Built Area	182.21	0.71
3.	Crops	2593.31	10.14
4.	Flooded Vegetation	139.28	0.54
5.	Grass	151.61	0.59
6.	Shrub/Scrub	107.04	0.42
7.	Trees	16114.70	62.63
8.	Water	24.16	0.09
Total Area		**25772.88**	**100.00**

The LULC data of the Impact Area shows that the Impact Area is predominantly covered by trees.

2.9. DRAINAGE NETWORK

In geomorphology, a drainage system is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. Geomorphologists and hydrologists often view streams as being part of drainage basins. A drainage basin is the topographic region from which a stream receives runoff, through flow, and groundwater flow. Drainage basins are divided from each other by topographic barriers called a watershed. A watershed represents all of the stream tributaries that flow to some location along the stream channel. The number, size, and shape of the drainage basins found in an area varies and the larger the topographic map.

Since the Impact Area of the Project involves two districts, namely Dumka and Godda, the drainage systems in both the districts are briefly being discussed here.

2.9.1. Drainage Network of Dumka District

Dumka district is highly dissected with rivers of varying magnitude. The Brahmani, Bansloi, Mayurakshi, and their numerous tributaries form the main drainage of the district. These streams are ephemeral in nature. Most of these stream courses are structurally controlled. Mor river with its tributaries carry the drainage to the western part of the district which finally meet the Bhagirathi river below Murshidabad, West Bengal. The Brahmani raises in the west of the Dudhua hills in the north of the Dumka district. Dendritic drainage pattern, a typical of hard rock terrain has developed over the district. However, radial drainage is also developed locally in some areas. All these drainage are having rapid surface runoff. Surface flow of most of the rivers dries up during summer; however there is sub-surface flow for a considerable part of the year, which indicates the effluent nature of the rivers. The drainage map of Dumka district is shown below.

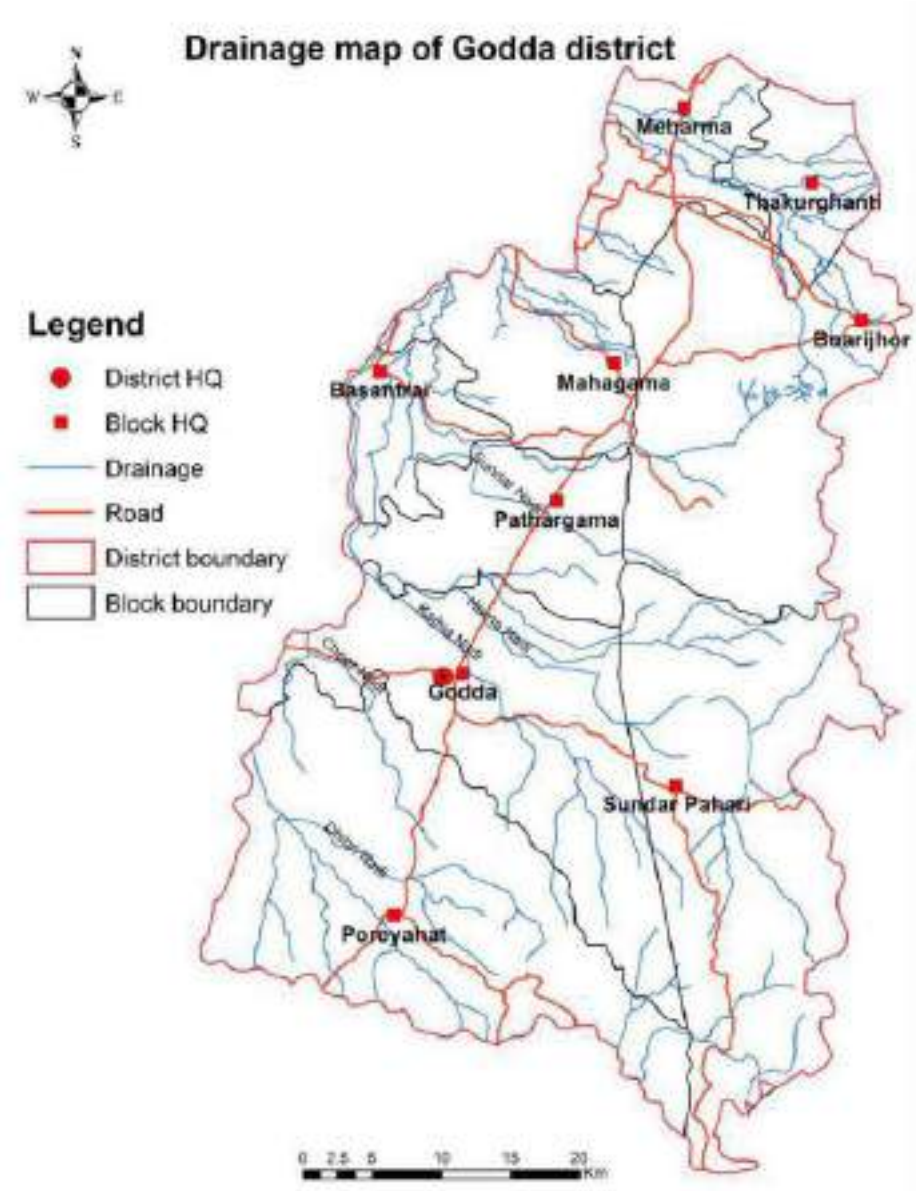
Map 11: Drainage Network of Dumka District



2.9.2. Drainage Network of Godda District

The principal rivers of the district are Kajhia, Burigeria , Harna, Sunder, Sapin, Kao, Cheer, Gerua, Gumani, Bansloi and their tributaries. Most of these are ephemeral in character. The general trend of the drainage is SE-NW. The structural features particularly the foliation and joints exert profound impact upon the drainage and control the drainage pattern of the district. The drainage map of Godda district is shown below.

Map 12: Drainage Network of Godda District

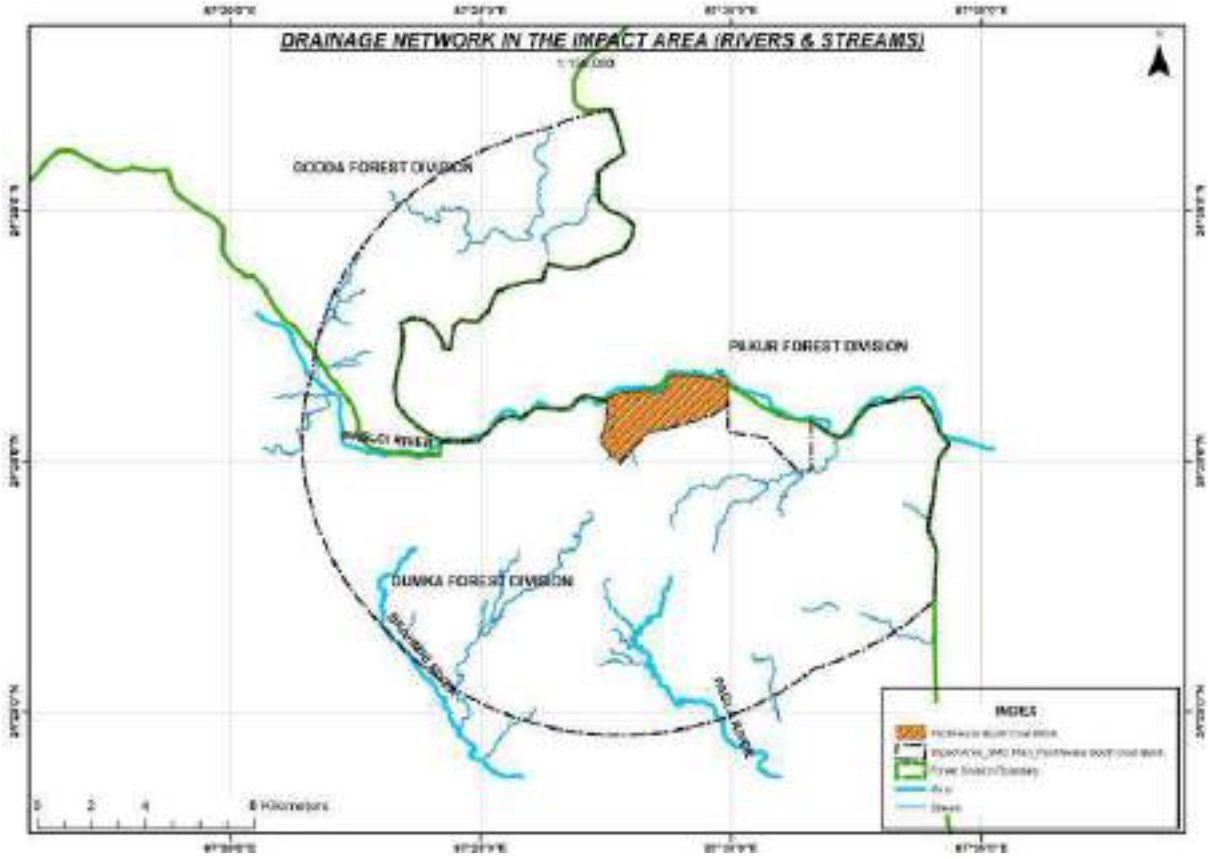


2.9.3. Drainage Network of the Project Impact Area

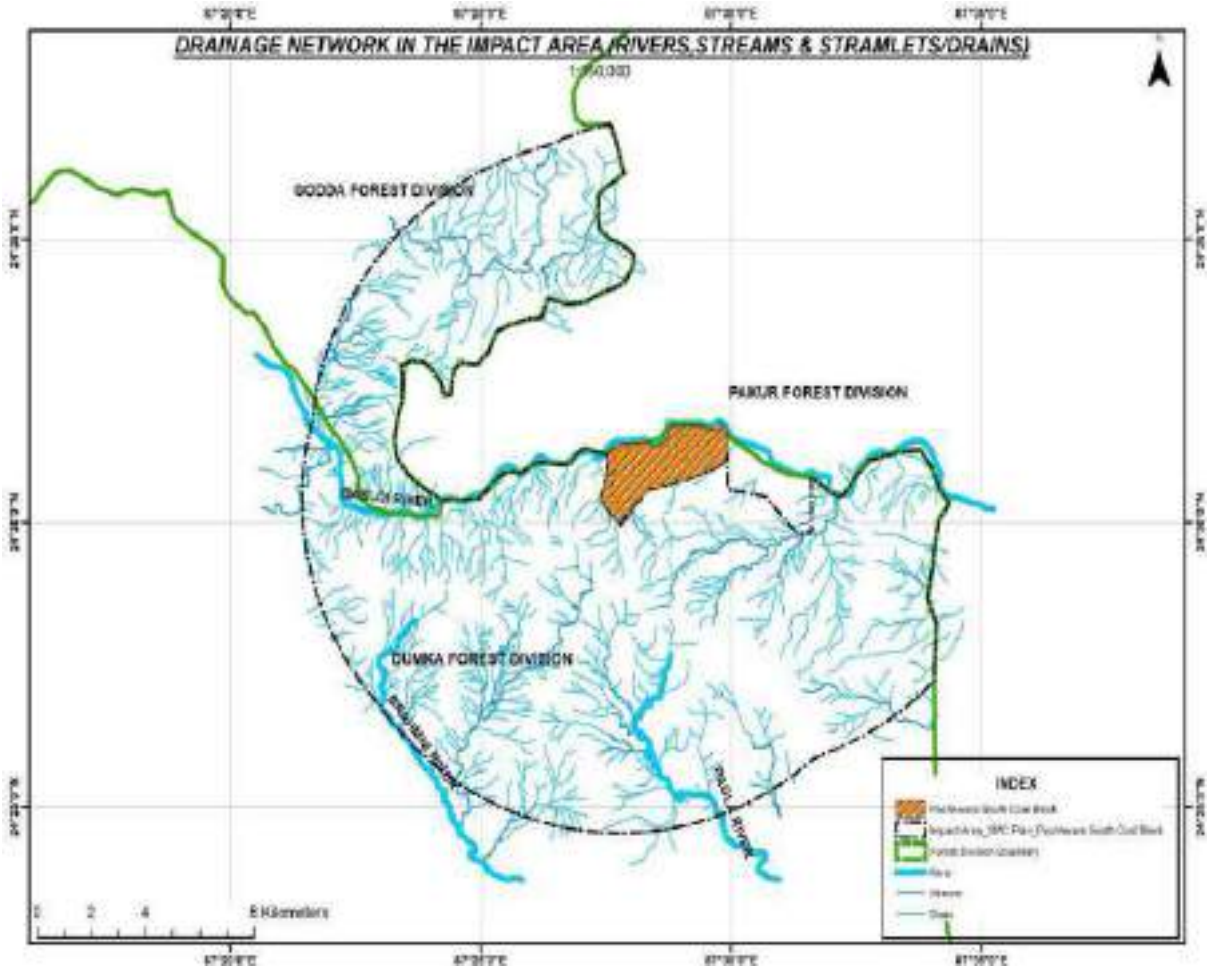
The Project Impact Area is endowed with three rivers namely Bansloi, Brahmni and Pagla. These rivers are fed by various streams and streamlets/drains. Out of these, the most important river is Bansloi which originates from Bans Hill in Sahebganj district of Jharkhand and flows through Pakur district of Jharkhand and Birbhum and Murshidabad districts of West Bengal before draining into the Ganges north of Jangipur. It flows from west to east with a few ephemeral streamlets like Darno river, Baroscorna nala, Okri jor nala & Makar kandi nala) descending from the catchment area of the Bansloi River forming the drainage system of the area.

The drainage network in the Impact Area is being shown in the following maps:

Map 13: Drainage Network of the Project Impact Area (Rivers & Streams)



Map 14: Drainage Network of the Project Impact Area (Rivers, Streams & Drains)



2.10. LINEAR INFRASTRUCTURES & OTHER DEVELOPMENTAL STRUCTURES

The rapid expansion of Linear Transport Infrastructure and its associated activities has significant direct, indirect, and cumulative ecological effects on wildlife. Such impacts may include:

- Mortality: Wildlife-vehicle collisions or train strikes result in the death or injury of wildlife, as well as human fatalities and injuries.
- Aversion: Traffic, noise, fumes, and lights can create unnatural disturbance that turns wildlife away from even attempting to cross the infrastructure.
- Movement barriers: Transport infrastructure can create either complete or partial impediments to wildlife crossings.
- Sensory disturbance: Noise, vibration, fumes or lights can result in the loss of habitat quality in adjacent habitats.
- Chemical effects: Air, water and soil pollution from trains and vehicles can often keep wildlife from approaching transport infrastructure.

- Habitat loss and fragmentation: Natural, intact habitats are lost or degraded through destruction and/or isolation, leading to increased human-elephant conflict.
- Attractants: Garbage as well as natural foods, such as palatable grasses, are often available in road verges, drawing elephants onto railways and roads.

Furthermore, transport infrastructure development can lead to significant social changes that impact elephants and other wildlife, such as increases in:

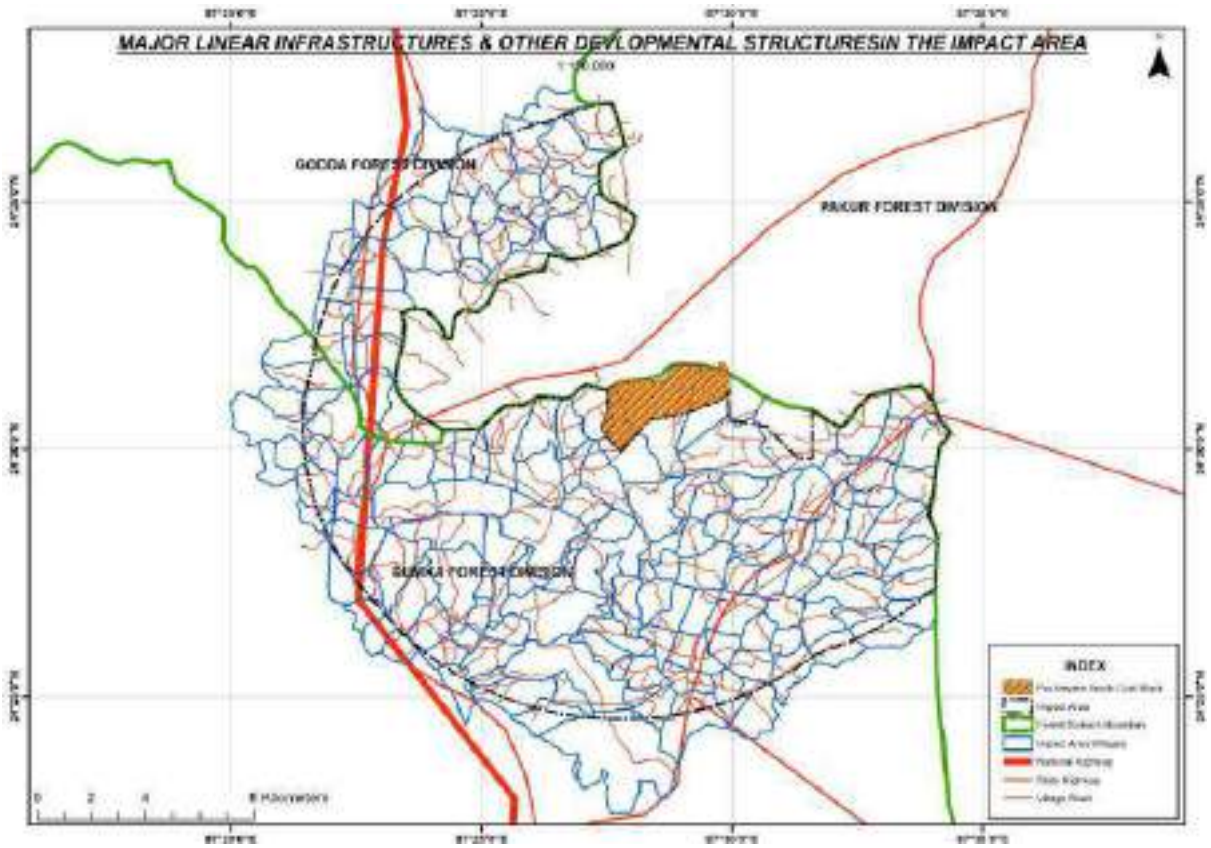
(a) legal and illegal human settlement;
(b) natural resource extraction;
(c) poaching and illegal wildlife trade; and
(d) deforestation.

It is now well established that unless action is taken to decrease the impacts of rapidly expanding Linear Transport Infrastructure development in landscapes carrying wildlife, the decline in the abundance of wildlife will only be exacerbated.

2.10.1. Major Linear Infrastructures in the Impact Area

The major linear infrastructures in the Impact Area have been shown in the following map.

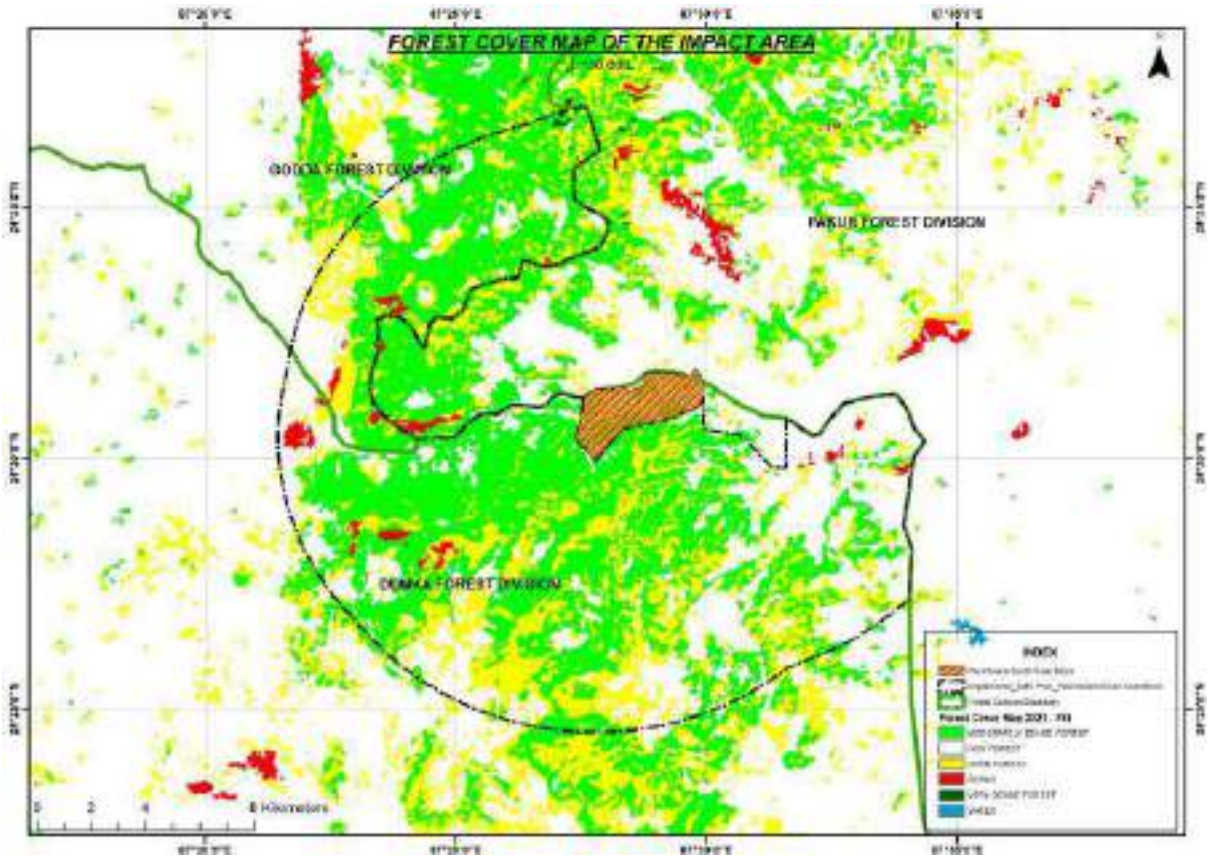
Map 15: Major Linear Infrastructures in the Impact Area



2.11. DESCRIPTION OF FORESTS AND WILDLIFE HABITAT IN THE IMPACT AREA

The Forest Cover Map (FSI, 2021) of the Impact Area is as follows.

Map 16: Forest Cover Map of the Impact Area (FSI, 2021)



Forest Cover reported by the Forest Survey of India (FSI) includes all lands having trees more than one hectare in area with tree canopy density of more than 10%, irrespective of ownership, legal status of the land and species composition of trees. It is based on satellite imageries and the classification of forest cover is as follows:

- Very Dense Forest: All lands with tree canopy density of 70% and above.
- Moderately Dense Forest: All lands with tree canopy density of 40% and more but less than 70%
- Open Forest: All lands with tree canopy density of 10% and more but less than 40%
- Scrub: Forest lands with canopy density less than 10%

Based on the aforesaid classification the Impact Area could be described to consist of following classes of forest cover:

Table 10: Impact Area under Different Tree Canopy Density Classes

Sl. No.	Forest Density Class	Tree Canopy Density	Area (ha)
1.	Very Dense Forest	≥ 70%	24.263
2.	Moderately Dense Forest	≥ 40%; < 70%	11415.300
3.	Open Forest	< 40%; ≥ 10%	6281.990
4.	Scrub Forest	< 10%	323.758
5.	Non-Forest	-	7453.590

The Forest Cover Map of the Impact Area clearly shows that the Impact Area predominantly constitutes of moderately dense forests and hence a potentially good habitat for wildlife. But the area contiguous to the Impact Area is not so endowed with better quality of forests.

2.11.1. Habitat Degradation

The Impact Area as well as the area outside this has been subjected to massive biotic pressure resulting into substantial habitat loss. Habitat loss, due to destruction, fragmentation, or degradation of habitat, is the primary threat to the survival of wildlife in the Impact Area. When an ecosystem has been dramatically changed by human activities – such as agriculture, industrial activity, commercial development, or water diversion – it may no longer be able to provide the food, water, cover, and places to raise young that wildlife needs to survive.

Major kinds of habitat loss could be of the following nature and the Impact Area is no exception.

- Habitat destruction: A bulldozer pushing down trees is the iconic image of habitat destruction. Other ways people directly destroy habitat include filling in wetlands, dredging rivers, mowing fields, and cutting down trees.
- Habitat fragmentation: Much of the remaining terrestrial wildlife habitat gets cut up into fragments by roads and development. Aquatic and even terrestrial species' habitats have been fragmented by dams and water diversions. These fragments of habitat may not be large or connected enough to support species that need a large territory where they can find mates and food. The loss and fragmentation of habitats makes it difficult for migratory species to find places to rest and feed along their migration routes.
- Habitat degradation: Pollution, invasive species, and disruption of ecosystem processes are some of the ways through which habitats can become so degraded that they no longer support native wildlife. Rising frequency and intensity of forest fires has also assumed alarming proportions resulting into habitat degradation.

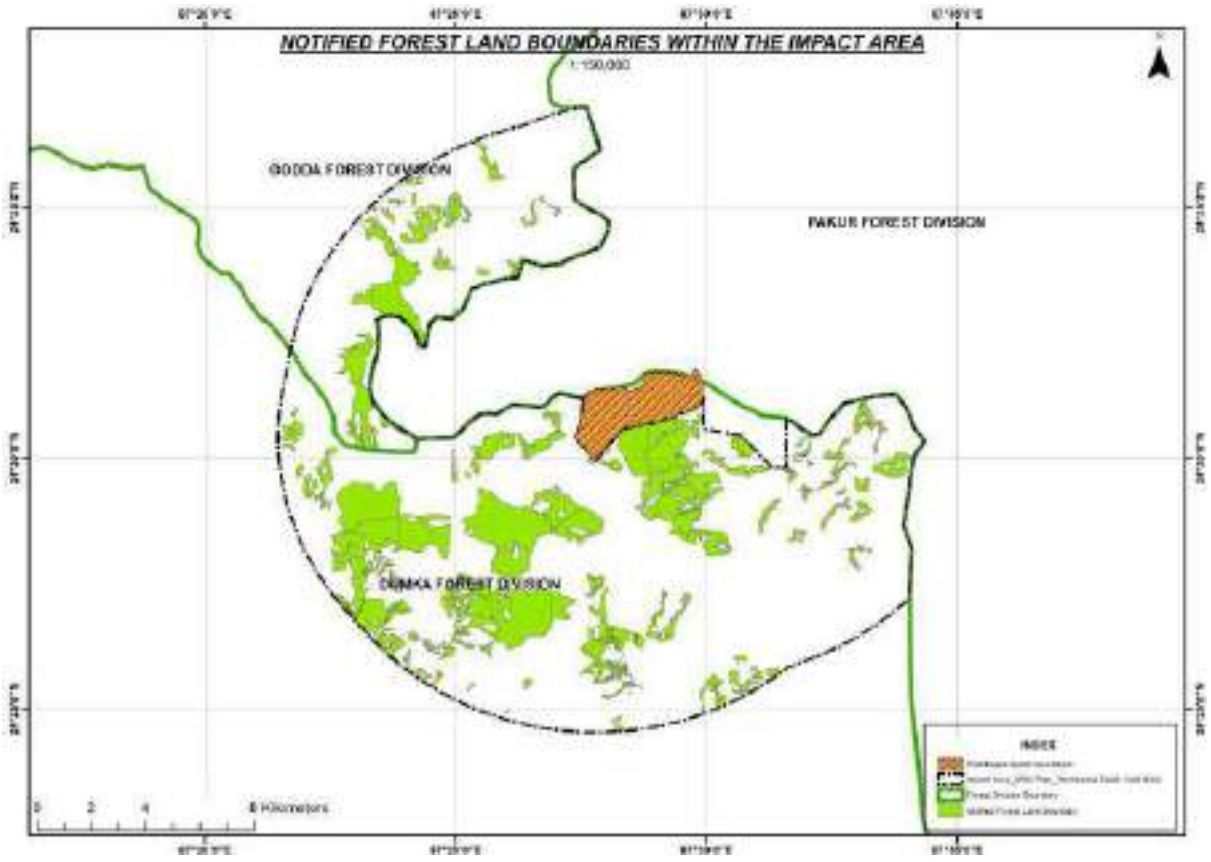
Habitat loss negatively influences biodiversity directly through its impact on species abundance, genetic diversity, species richness and species distribution. Habitat loss is a serious problem for wildlife and humans alike. Without habitat, there is no wildlife. It is that simple. And without wildlife, there is no healthy functioning of the ecosystem services upon which we depend on. Thus, habitat loss affects not only biodiversity but also impacts humans directly by decreasing production of ecosystem goods and services such as pollination, soil and water management, and carbon storage. Habitat loss has significant, consistently negative effects on biodiversity. Main Causes of Habitat Loss may be enumerated as under:

- Agriculture: Much of the habitat loss from agriculture was done long ago. Today, there is increasing pressure to redevelop conservation lands for food production.
- Fuelwood and fodder collection: Fuelwood and fodder collection are two major causes of habitat degradation, causing changes in habitat composition and species loss. This is particularly severe in the Impact Area where population pressure is significant.
- Overgrazing: Extensive grazing by domesticated livestock is another pervasive source of habitat and biodiversity loss throughout the area of the Sanctuary. Cattle are grazed throughout the forests and remove the understorey of the forests; damaging the composition of the natural ecosystems and associated biodiversity.
- Land conversion for development: The conversion of lands that once provided wildlife habitat to housing developments, roads, offices, parks etc. and industrial sites continue especially in the Impact Area within the jurisdiction of Jamshedpur and Saraikela forest divisions.
- Water development: Dams and other water diversions siphon off and disconnect waters, changing hydrology and water chemistry (when nutrients are not able to flow downstream). Subarnarekha Project is a burning example as far as the Impact Area is concerned.
- Pollution: Pollutants such as untreated sewage, mining waste, acid rain, fertilizers and pesticides concentrate in rivers, lakes and wetlands and eventually end up in the food web. Jamshedpur is a buzzing industrial township and therefore happens to be a large source of pollutants of all types and terrestrial biodiversity in and around the city is increasingly being negatively impacted.
- Climate change: The emerging driver of habitat loss is climate change. Changes in climate and extreme weather events have already begun to affect people and nature across the globe. And climate change exacerbates other threats like habitat destruction of wildlife in particular, and disease in humans as well as wildlife.

2.11.2. Forest Boundaries and Forest Cover within the Impact Area

The Notified Forest land boundaries are being shown in the following map.

Map 17: Notified Forest Land Boundaries within the Impact Area



2.11.3. Description of Notified Forest Land within the Impact Area and Corresponding Prescriptions under the Working Plan

Table 11: Working Plan Prescriptions with respect to Villages having notified Forest land – Dumka Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	CWSWC*	RCSWC*	PCPWC*	PWC*	TWC*
Kathikund/ Gopikandar/ Gopikandar East	Amjhari	Gopikandar-37	-	-	-	-	-	-
	Balia	Gopikandar-24	10.99	-	10.99	-	-	-
	Dharampur	Gopikandar-32	-	-	-	-	-	-
	Dumaria	Gopikandar-55	29.28	11.31	14.37	-	3.60	-
	Dumartola	Gopikandar-30	66.16	21.53	24.64	-	19.99	-
	Jamchua	Gopikandar-38	-	-	-	-	-	-
	Janamdih	Gopikandar-34	0.21	-	0.21	-	-	-
	Jitpur	Gopikandar-33	-	-	-	-	-	
	Karmo	Gopikandar-40	-	-	-	-	-	-
	Kochapani	Gopikandar-42	69.91	21.43	16.54	-	31.94	-
	Musna	Gopikandar-36	-	-	-	-	-	-
	Rambani	Gopikandar-35	-	-	-	-	-	-
	Ramgarh	Gopikandar-39	-	-	-	-	-	-
	Sugapahari	Gopikandar-41	-	-	-	-	-	-

	Talberia	Gopikandar-31	24.90	13.15	11.75	-	-	-
Kathikund/ Gopikandar/ Gopikandar West	Babupur	Gopikandar-21	-	-	-	-	-	-
	Bankijor	Gopikandar-08	20.71	6.98	13.73	-	-	-
	Baratalli	Gopikandar-10	8.70	-	8.70	-	-	-
	Bhagabandh	Gopikandar-13	10.52	-	10.52	-	-	-
	Bhuskidangal	Gopikandar-14	14.70	-	14.70	-	-	-
	Burhichapar	Kuskira-11	-	-	-	-	-	-
	Champa Pahar	-	-	-	-	-	-	-
	Chandramali	Gopikandar-18	46.84	8.91	17.32	20.61	-	-
	Chhatarchua	Gopikandar-22	-	-	-	-	-	-
	Dubrajpur	Gopikandar-12	35.41	8.67	8.74	-	18.00	-
	R.F.	-	-	-	-	-	-	-
	Gamharia	Kuskira-12	-	-	-	-	-	-
	Gariapani	Gopikandar-15	12.63	-	12.63	-	-	-
	Gopikandar	Gopikandar-16	-	-	-	-	-	-
	Jhariapani	Gopikandar-09	39.30	20.66	18.64	-	-	-
	Jhutichapar	Gopikandar-04	0.66	-	0.66	-	-	-
	Jolo	Gopikandar-01	-	-	-	-	-	-
	Jaropani	Gopikandar-02	-	-	-	-	-	-
	Kairasol	Gopikandar-07	-	-	-	-	-	-
	Katuidangal	Gopikandar-11	27.32	13.70	13.62	-	-	-
	Kheribari	Gopikandar-17	1.22	-	1.22	-	-	-
	Koyada	Gopikandar-19	1.21	-	1.21	-	-	-
	Kuarpur	Gopikandar-03	-	-	-	-	-	-
	Kumarbandh	Gopikandar-20	-	-	-	-	-	-
	Kurumba	Gopikandar-23	-	-	-	-	-	-
	Pujadih	Gopikandar-06	-	-	-	-	-	-
	Soruapani	Gopikandar-05	-	-	-	-	-	-
Kathikund/ Gopikandar/ Korcho	Amdiha	Silangi-08	-	-	-	-	-	-
	Bara Pahari	Silangi-04	15.20	-	15.20	-	-	-
	Kachuakandar	Silangi-10	17.19	8.32	8.87	-	-	-
	Koilo	Silangi-06	22.17	-	13.21	-	8.96	-
	Kolha	Silangi-07	-	-	-	-	-	-
	Sahara	Silangi-3	59.85	18.42	27.42	-	14.01	-
	Sarkhi	Silangi-09	0.05	-	0.05	-	-	-
	Tesaphuli	Silangi-5	47.31	7.43	31.56	-	8.32	-
Kathikund/ Kathikund/ Kathikund E.	Lakraphela Pahar	Kathikund-25	-	-	-	-	-	-
Kathikund/ Chirudih/ Durgapur E.	Amarpur	Kuskira-32	-	-	-	-	-	-
	Babuikhura	Kuskira-25	2.03	-	2.03	-	-	-
	Bhadradighi	Kuskira-31	-	-	-	-	-	-
	Bhangahir	Kuskira-24	7.26	-	7.26	-	-	-
	Dhobachapar	Kuskira-07	-	-	-	-	-	-
	Dhobarna	Kuskira-21	15.01	-	15.01	-	-	-
	Digha Parbat	Kuskira-30	-	-	-	-	-	-
	Gumapahari	Kuskira-20	61.33	-	-	61.33	-	-
	Jhanjhko	Kuskira-03	-	-	-	-	-	-
	Kajikend	Kuskira-14	-	-	-	-	-	-
	Khajurdangal	Kuskira-06	-	-	-	-	-	-
	Lakhibad	Kuskira-29	-	-	-	-	-	-
	Majhdiha	Kuskira-23	1.86	-	1.86	-	-	-
	Paharpur	Kuskira-28	0.27	-	0.27	-	-	-
	Pinargaria	Kuskira-27	12.93	-	12.93	-	-	-
	Pipra	Kuskira-26	17.18	-	17.18	-	-	-
	Rampur	Kuskira-13	-	-	-	-	-	-
	Talkhora	Kuskira-05	-	-	-	-	-	-
Kathikund/	Dundhapahari	Kuskira-18	33.18	10.21	7.65	-	15.32	-

Chirudih/ Durgapur W.	Durgapur	Kuskira-17	9.00	-	9.00	-	-	-
	Jorasimal	Kuskira-15	8.09	-	8.09	-	-	-
	Chetopoka	Kuskira-04	-	-	-	-	-	-
	Kulaipura	Kuskira-08	80.67	-	-	80.67	-	-
	Kuskira	Kuskira-19	13.17	-	13.17	-	-	-
	Majurabari	Kuskira-22	35.20	10.41	12.48	-	12.31	-
	Ormo	Kuskira-01	56.87	-	-	56.87	-	-
	Palasbani	Kuskira-10	-	-	-	-	-	-
	Puranakhora	Kuskira-09	-	-	-	-	-	-
	Ranga	Kuskira-16	24.40	9.14	6.95	-	8.31	-
Kathikund/ Chirudih/ Chirudih	Chirudih	Silangi-20	85.01	14.32	57.36	3.02	21.31	-
	Kundapahari	Silangi-19	65.55	26.32	8.47	-	30.76	-
	Madhuban	Kuskira-02	59.79	-	-	59.79	-	-
Kathikund/ Chirudih/ Silangi	Chunjo	Silangi-12	87.45	12.40	39.53	14.21	21.31	-
	Hethsilangi	Silangi-13	-	-	-	-	-	-
	Kharikasol	Silingi-17	67.40	19.32	34.65	-	13.43	-
	Khatangi	Silingi-16	13.91	-	13.91	-	-	-
	Khatganwa	Silangi-15	-	-	-	-	-	-
	Mahaldabar	Silangi-18	124.38	8.71	32.12	21.43	62.12	-
	Sarkhi Pahar	Silangi-11	-	-	-	-	-	-
	Silingi Pahar	Silangi-14	-	-	-	-	-	-
Kathikund/ Narganj/ Baskia	Balidih	Narganj-36	175.57	43.21	0.05	50.00	82.31	-
	Baskia	Narganj-03	35.47	-	-	35.47	-	-
	Dhibri	Narganj-05	2.99	-	2.99	-	-	-
	Mahuapathar	Narganj-04	13.48	-	-	13.48	-	-
	Simra	Narganj-01	71.71	-	-	71.71	-	-
Kathikund/ Narganj/ Narganj	Ambajora	Narganj-57	15.75	-	-	-	15.75	-
	Amgachhi	Narganj-32	22.00	8.37	13.63	-	-	-
	Bara Chaparia	Narganj-35	112.37	-	-	112.37	-	-
	Bara Bhuibhanga	Narganj-34	62.49	-	-	54.42	8.07	-
	Chhota Chaparia	Narganj-49	27.24	-	-	27.24	-	-
	Chhota Maruapani	Narganj-54	1.52	-	1.52	-	-	-
	Chhota Bhuibhanga	Narganj-33	19.15	-	-	19.15	-	-
	Jogiduba	Narganj-50	17.45	-	17.45	-	-	-
	Kotaldih	Narganj-48	36.38	-	-	36.38	-	-
	Kulkant	Narganj-53	24.36	-	-	24.36	-	-
	Majhila Sarwapani	Narganj-55	78.85	20.34	21.52	-	36.99	-
	Pahar Chapri	-	-	-	-	-	-	-
	Pirjorwa	Narganj-52	46.57	-	-	46.57	-	-
	Sarwan	Narganj-56	6.92	-	6.92	-	-	-
	Sarwan Pahari	-	-	-	-	-	-	-
Kathikund/ Narganj/ Lakhanpur	Pokharia	Narganj-39	-	-	-	-	-	-
Kathikund/ Narganj/ Bora Pahari	Banjhiam	Narganj-44	-	-	-	-	-	-
	Baskia	Narganj-03	35.47	-	-	35.47	-	-
	Dumra Pahar	Narganj-40	-	-	-	-	-	-
	Dumaria	Narganj-51	-	-	-	-	-	-
	Kolha Pahar	Narganj-37	-	-	-	-	-	-
	Kurcho	Narganj-41	32.63	11.03	-	-	21.60	-
	Mahuagari	Narganj-38	-	-	-	-	-	-
	Murguja	Narganj-42	-	-	-	-	-	-
	Pusaldih	Narganj-45	-	-	-	-	-	-
	Upar Pujadih	Narganj-43	-	-	-	-	-	-

Hizla West/ Nonihat/ Amdiha	Bakua	-	-	-	-	-	-	-
	Bhelai	-	-	-	-	-	-	-
	Burhnia	Dodho-11	41.52	-	23.41	18.11	-	-
	Damudih	-	-	-	-	-	-	-
	Danro	-	-	-	-	-	-	-
	Kendua	Dodho-12	9.77	-	9.77	-	-	-
	Kulapathar	Bara-10	10.85	-	-	10.85	-	-
	Mahuadangal	Kathikund-7	18.00	-	-	18.00	-	-
	Raidih	-	-	-	-	-	-	-
	Rajamar	-	-	-	-	-	-	-
	Rangamatia	Lakhanpur-41	1.81	-	1.81	-	-	-

*CWSWC – Coppice with Standard Working Circle
*RCSWC – Rehabilitation -cum- Soil & Moisture Conservation Working Circle
*PCPWC – Plantation and Pastureland Working Circle
*PWC – Protection Working Circle
*TWC – Tasar Working Circle

Table 12: Working Plan Prescriptions with respect to Villages having notified Forest land – Godda Forest Division

Range/ Beat/ Sub-Beat	Village (PF/RF)	Thana/ Thana No.	Forest Land (ha)	IWC*	RCSWC*	PLWC*	PRWC*	TWC*
Godda/ Poreyahat/ Pindrahat	Daharlangi	Poreyahat-208	34.28	-	-	-	34.28	-
	Hathiapathar	Poreyahat-209	13.05	-	-	-	13.05	-
	Jamropani	Poreyahat-213	-	-	-	-	-	-
	Pairgadih	Poreyahat-211	-	-	-	-	-	-
Sundarpahari/ Damru/ Damruhat	Bara Dangapara	Sundarpahari-06	49.40	-	-	-	49.40	-
	Damakol	Sundarpahari-07	8.49	3.50	3.19	1.80	-	-
	Doriya	Sundarpahari-10	-	-	-	-	-	-
	Golkunda	Sundarpahari-11	-	-	-	-	-	-
	Malipara	Sundarpahari-04	42.74	17.64	11.76	13.34	-	-
	Pakrikhunta	Sundarpahari	-	-	-	-	-	-
	Sidapara	Sundarpahari-5	-	-	-	-	-	-
Sundarpahari/ Damru/Susni	Babupur	Sundarpahari-25	149.58	-	119.68	29.90	-	-
	Bankatti	Sundarpahari-20	5.23	-	5.23	-	-	-
	Bargo	Sundarpahari-26	82.60	-	-	-	82.60	-
	Belpahari	Sundarpahari-18	54.08	-	-	-	54.08	-
	Baigni	Sundarpahari-24	49.24	34.54	-	14.70	-	-
	Chhota Dangapara	Sundarpahari-09	21.30	-	-	-	21.30	-
	Jamropani	Sundarpahari-23	76.71	53.90	22.80	-	-	-
	Jogimarna	Sundarpahari-19	88.54	61.97	26.57	-	-	-
	Karamba	Sundarpahari-08	14.40	5.80	-	8.60	-	-
	Kathaldih	Sundarpahari-13	-	-	-	-	-	-
	Kamupahari	Sundarpahari-15	70.73	42.10	18.03	-	10.60	-
	Mulgipur	Sundarpahari-10	-	-	-	-	-	-
	Paharpur	Sundarpahari-21	68.14	-	20.44	6.80	40.90	-
	Sundrijola	Mahagama-17	374.33	-	169.00	149.70	55.63	-
	Susni	Mahagama-22	179.95	67.10	49.20	18.95	44.70	-
	Telopara	Sundarpahari-14	51.72	-	-	-	-	51.72
Sundarpahari/ Damru/ Bokrabandh	Bajrajogusami	Sundarpahari-13	100.75	-	-	-	100.75	-
	Bokrabandh	Sundarpahari-02	112.21	47.80	20.60	1.00	-	42.81
	Barai	Sundarpahari-05	44.70	44.70	-	-	-	-
	Dumra Palampara	Sundarpahari-11	18.52	-	-	-	18.52	-
	Hardisol	Sundarpahari-03	46.93	17.98	7.70	11.01	10.24	-
	Jagusama	Sundarpahari-16	-	-	-	-	-	-

	Pipra	Sundarpahari-14	52.68	-	-	-	52.68	-
	Simlipara	Sundarpahari-12	-	-	-	-	-	-
	Tilaypara	Sundarpahari-06	28.90	-	-	-	-	28.90

*IWC – Improvement Working Circle
*RCSWC – Rehabilitation – cum- Soil Conservation Working Circle
*PLWC – Plantation Working Circle
*PRWC – Protection Working Circle
*TWC – Tasar Working Circle

2.11.4. Habitat Fragmentation – Most Disturbing Aspect concerning Wildlife, Particularly Elephants

At present, the Asian elephant occupies only a small fraction of its historical range (Choudhury et al.,2008; Sukumar, 2006). According to the report released by the Union Ministry of Environment, Forest and Climate Change in the year 2017, the elephant population across the country stood in the range of 29391 – 30711. As far as the State of Jharkhand is concerned, the number was estimated to be 688.

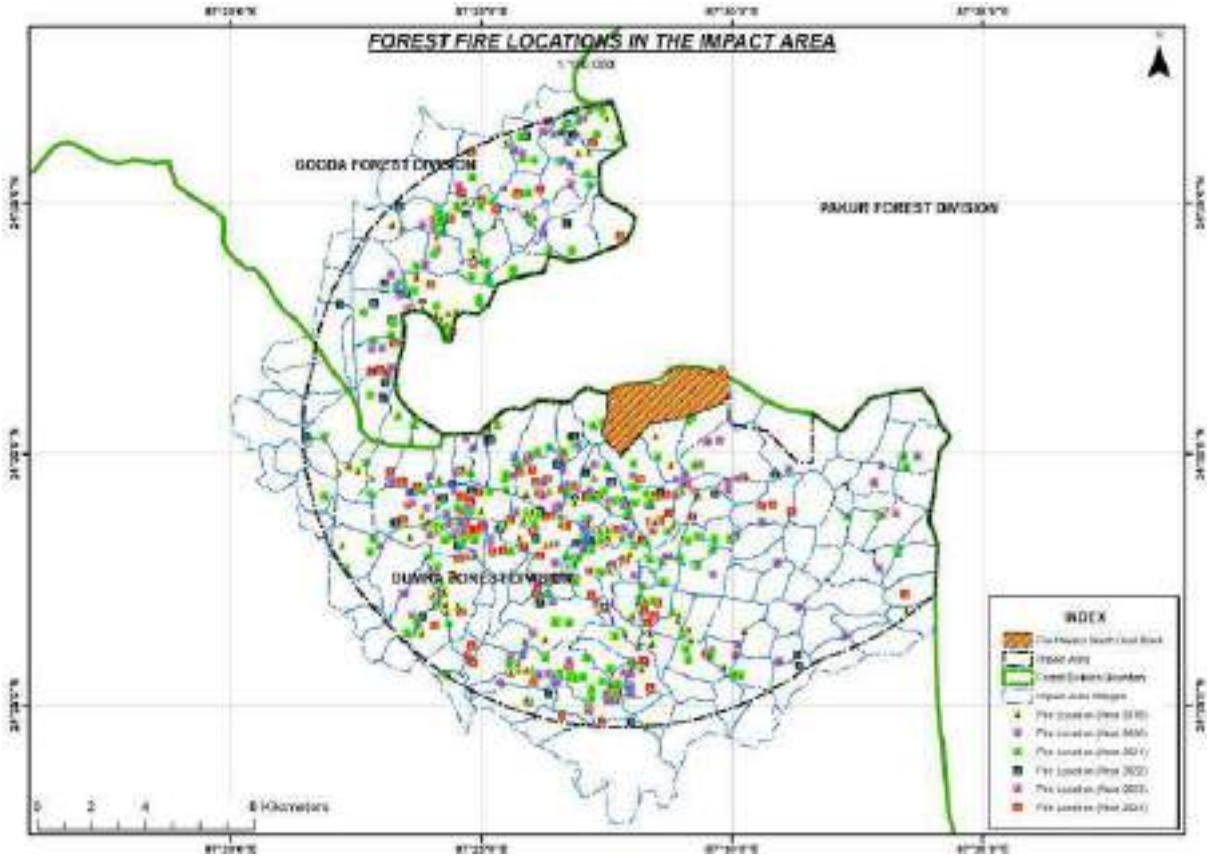
The fragmentation and loss of natural habitats are major drivers of ecosystem degradation and biodiversity loss globally. Mega-herbivores such as elephants, with large home range and food requirements, have been among the species most affected by habitat alteration and loss of habitat connectivity. The fragmented nature of the Indian landscape, with people all around, has increased human-elephant conflict in most parts of the country. On an average about 400-450 people lose their lives annually due to such conflict in India, and around 100 elephants are killed in retaliation for the damage they cause to human life and property.

Habitat loss, degradation, fragmentation, conversion and resource exploitation by humans thus result in spatial shrinkage and reconfiguration of the original habitat. Large-scale fragmentation leads to isolation of the habitat, which restricts the movement of wild animals. Land use configuration in a habitat creates patches and corridors, which ultimately impact the movement pattern of elephants. Mega herbivores like the elephant are compelled to move within the restricted fragmented habitat, causing human–elephant conflicts. Sometimes elephants disperse and wander well outside their habitat, causing severe problems of human–elephant conflict. Erosion of the habitat forces elephants into agricultural areas, where they destroy crops and inevitably enter into conflict with humans. Thus, forest degradation and habitat loss are major factors of human–elephant conflict.

2.11.5. Forest Fire

Forest fires have devastating effect on the forest biodiversity. The Impact Area is quite prone to forest fires. The locations of forest fire incidents in the Impact Area from fire season of year 2019 to 2024 have been mapped as follows.

Map 18: Forest Fire Locations in the Impact Area (Year 2019-2024)



2.12. MOVEMENT OF MEGA-WILDLIFE IN THE IMPACT AREA

In the Impact Area and its surroundings, movement of elephants has been reported. The elephant habitats of Central India are spread over an area of 21,000 sq. km. in the states of Jharkhand, Odisha, Chhattisgarh and part of southern West Bengal, at times extending to Madhya Pradesh and Bihar. The 3128-odd elephants (MoEF&CC,2017) in this range occupy the most fragmented elephant habitats in the country; habitats that have been degraded and fragmented due to mining, shifting cultivation and linear infrastructural elements (highways, railways, canals etc). The intensity of human-elephant conflict is very high and although the area supports less than 10% of the elephant population of the country, it accounts for almost 45% of all human deaths due to elephants in India.

Jharkhand has two distinct elephant populations, viz. Palamau and Singhbhum; presence of about 678 elephants have been recorded (MoEF&CC,2017). The Palamau population occupies about 1200 sq. km. of Palamau Tiger Reserve and adjoining areas. According to "Right of Passage – Elephant Corridors of India" (2017) published by Wildlife Trust of India, **in recent years, elephants have started moving into new areas of Hazaribagh, Ranchi, Ramgarh, Bokaro, Dhanbad, Giridih, Deoghar, Dumka, Pakur, Godda and Sahibganj, passing through fragmented forest patches, agricultural land and human settlements.** Elephants have also started moving to Bihar and West Bengal from these areas. This has increased human-elephant conflict, especially crop depredation, and it has become a major challenge for the Forest Department to manage these elephants and minimise conflict.

Recently "Elephant Corridors of India, 2023" has been published by Project Elephant, MoEF&CC, Government of India. The report defines 'elephant corridor' as a strip of land that facilitates the movement of elephants between two or more viable habitat patches. Movement of elephants away from forest habitats into the human domain without connecting to viable habitat patches may not be considered elephant corridors. Further, the said report classifies elephant corridors as "active" if effectively used by elephants, as reported by the State Forest Department during ground-validation surveys. The elephant corridors where elephant use was perceived to be virtually non-existent by the Forest Department were graded as "impaired". For elephant corridors that were reportedly active, different categories of current use of corridors by elephants have also been mentioned. The study has identified the following elephant corridors located in Jharkhand:

- Bhagabilla - Ratnasai – Chaibasa Forest Division.
- Jampani - Bhagabilla – Chaibasa Forest Division.
- Siyaljora - Dhobadhobin – Chaibasa Forest Division.
- Sangajata - Haldipokhar – Chaibasa & Saraikela Forest Division.
- Lepang - Dumuria – Chaibasa Forest Division
- Ankua - Ambia – Saranda & Kolhan Forest Division.
- Raibera - Pulbaburu – Kolhan & Porahat Forest Division.
- Dalapani - Suklara – Jamshedpur Forest Division & Dalma Wildlife Sanctuary.
- Dalma - Chandil – Dalma Wildlife Sanctuary & Saraikela Forest Division.
- Dalapani – Kakrajhor (Interstate Corridor) – Jharkhand & West Bengal.
- Dumariya - Nayagram – Jamshedpur Forest Division.
- Silli - Angara Corridor – Ranchi & Khunti Forest Division.

- Bharno - Bero – Karra – Ranchi & Khunti Forest Division.
- Dalma - Asanbani – Dalma Wildlife Sanctuary & Saraikela Forest Division.
- Dalma - Rugai – Dalma Wildlife Sanctuary & Saraikela Forest Division.
- Anjadbera – Bichaburu – Saranda & Kolhan Forest Division.
- Dumria-Kundaluka and Murakanjia Corridor – Jamshedpur Forest Division.
- Badampahar - Dhobadhobin Corridor (Interstate corridor) – Jharkhand & Odisha.
- Badampahar - Karida East Corridor (Interstate corridor) – Jharkhand & Odisha.
- Chandil - Matha Corridor (Interstate corridor) – Jharkhand & West Bengal.
- Mahilong-Kalimati (Interstate Corridor) – Jharkhand & West Bengal.
- Gobarghusi - Jhunjhaka - Banduan (Interstate corridor) – Jharkhand & West Bengal.

It is to be noted that the forest divisions involved in the Impact Area do not have any established elephant corridor. However, movement of Elephants have been reported in the area as would be evident from the elephant depredation details mentioned in the following para.

2.13. MAN-ANIMAL CONFLICT – DEPREDATION DETAILS

Being a mega herbivore, an elephant has a tremendous impact on the habitat through its feeding and other activities. Habitat selection of the elephant depends on its behavioural characteristics and the ecological carrying capacity of the habitat it inhabits. The unprecedented growth of the human population is responsible for the degradation and decline of the forest cover. Anthropogenic perturbation in the form of agricultural and settlement expansion results in depletion or loss of natural habitat, loss of biodiversity, fragmentation of habitat and loss of corridors. The disproportionate sharing of forest resources and shrinkage of the sojourn area creates a food scarcity for the elephant, which ultimately forces animals to change their original habitat and migrate to a new one. During this migration, human–elephant conflict is a common issue in the corridors and edges in between habitats.

2.13.1. Elephant Depredation Status in Dumka and Godda Forest Divisions

Both the Impact Area divisions, namely Dumka and Godda, are frequented by elephants. The depredation details and the corresponding nature of damages caused by elephants in both the forest divisions are being presented in the following table.

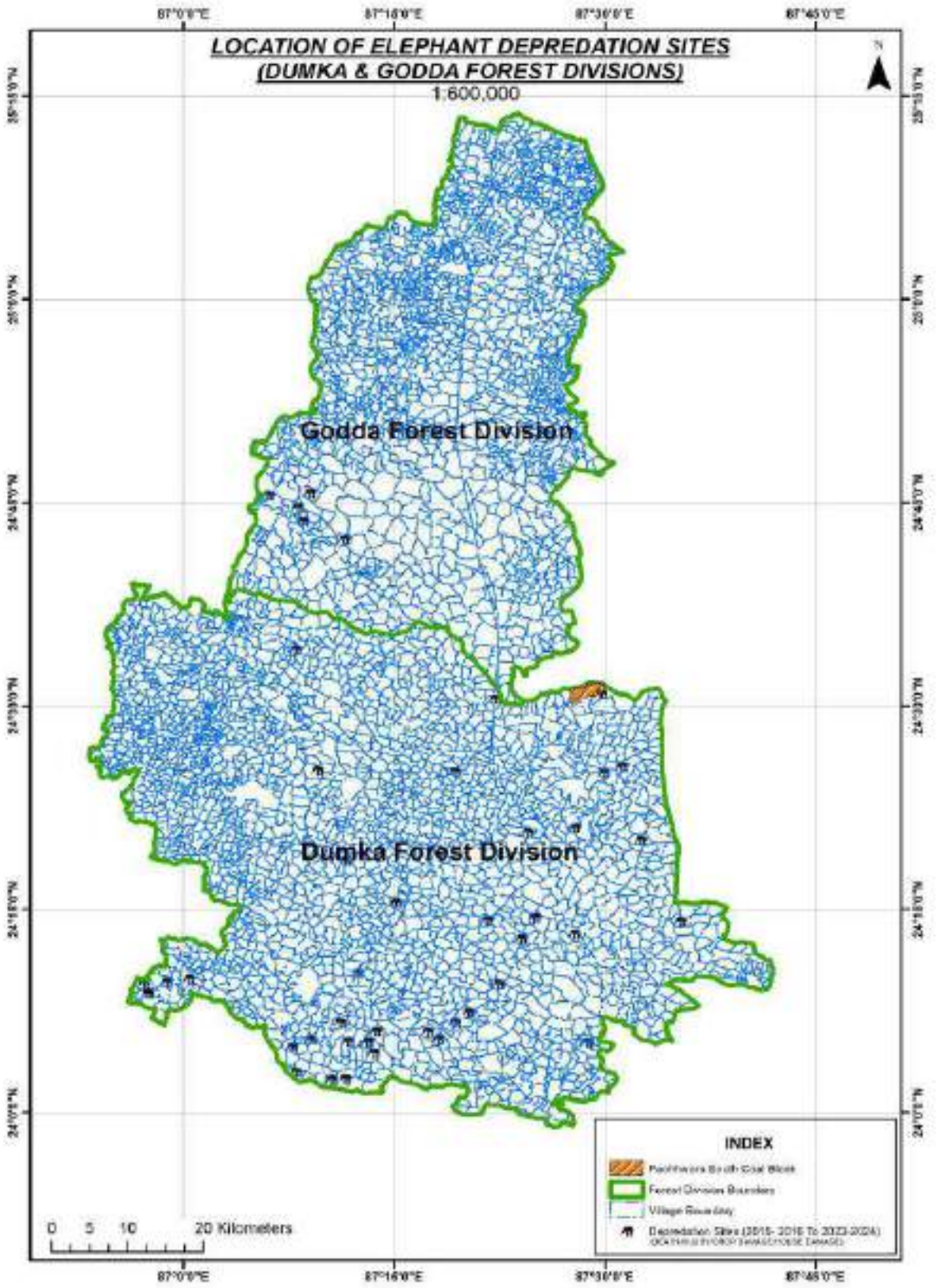
Table 13: Elephant Depredation Details of Dumka and Godda Forest Divisions (2015-16 to 2023-24)

Divn.	Range	Beat	Sub-Beat	Village	Latitude	Longitude	Nature of Damage	Number of Incidences								
								Year 2015-16	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Year 2021-22	Year 2022-23	Year 2023-24
Dumka	Hizla East	Asanbani	Asanbani	Kathaliya	24.1578	87.3727	Injury	-	-	-	1	-	-	-	-	-
		Ranibahal	Bagnal	Dhawadangal	24.1112	87.3214	House	-	-	-	1	-	-	-	-	-
		Ranibahal	Banskuli	Chuapani	24.1002	87.2276	Death	-	-	1	-	-	-	-	-	-
		Ranibahal	Banskuli	Chuapani	24.1002	87.2276	Injury	-	1	-	-	-	-	-	-	-
		Ranibahal	Banskuli	Gidhipahari	24.0895	87.3025	Crop	-	-	-	-	-	-	-	1	-
		Ranibahal	Banskuli	Lapsapara	24.0987	87.2891	Grain	-	-	-	-	-	-	-	1	-
		Ranibahal	Kumirdaha	Charkapathar	24.0862	87.4788	Injury	2	-	-	-	-	-	-	-	-
		Ranibahal	Ranibahal	Panjanpahari	24.1229	87.3379	Crop	-	-	-	14	-	-	-	-	-
		Shikaripara	Shikaripara	Balijor	24.2362	87.3595	Crop	-	-	-	10	-	-	-	-	-
		Shikaripara	Shikaripara	Kalbadar	24.2192	87.4630	Death	-	-	-	-	-	-	1	-	-
		Shikaripara	Shikaripara	Karmatanr	24.2390	87.4162	House	-	-	-	4	-	-	-	-	-
		Shikaripara	Shikaripara	Kushpahari	24.2135	87.4003	House	-	-	-	4	-	-	-	-	-
		Shikaripara	Simanijor	Latakandar	24.2354	87.5898	Death	-	-	1	-	-	-	-	-	-
		Shikaripara	Simanijor	Latakandar	24.2354	87.5898	Injury	-	-	1	-	-	-	-	-	-
	Hizla West	Basukinath	Belkupi	Daldali	24.3095	87.1918	Crop	-	-	-	1	-	-	-	-	-
		Khasmahal	Khasmahal	Bandarjori	24.2582	87.2519	Injury	-	-	-	-	-	1	-	-	-
		Masalia	Gormala	Asanshol	24.0405	87.1754	Crop	-	-	17	11	-	-	-	-	-
		Masalia	Gormala	Asanshol	24.0405	87.1754	House	-	-	1	-	-	-	-	-	-
		Masalia	Gormala	Beliajor	24.0418	87.1909	Crop	-	-	-	12	-	-	-	-	-
		Masalia	Gormala	Bhul	24.0732	87.2252	Crop	-	-	-	1	-	-	-	-	-
		Masalia	Gormala	Dumdumi	24.0873	87.1952	Crop	-	-	1	-	-	-	-	-	-
		Masalia	Gormala	Garduara	24.0867	87.2175	Crop	-	-	-	3	-	-	-	1	-
		Masalia	Gormala	Garduara	24.0867	87.2175	House	-	-	1	-	-	-	-	-	-
		Masalia	Gumro	Astajor	24.1463	86.9566	Crop	-	-	12	85	-	-	-	-	-
		Masalia	Gumro	Astajor	24.1463	86.9566	House	-	-	-	27	-	-	-	-	-
		Masalia	Gumro	Astajor	24.1463	86.9566	Injury	-	-	1	-	-	-	-	-	-
		Masalia	Gumro	Ghormundani	24.1597	86.9802	Crop	-	-	4	-	-	-	-	-	-
		Masalia	Gumro	Gumro	24.1646	87.0063	Crop	-	-	-	4	-	-	-	-	-
		Masalia	Gumro	Gumro	24.1646	87.0063	House	-	-	4	3	-	-	-	-	-
		Masalia	Gumro	Kapseo	24.1578	86.9524	House	-	-	1	-	-	-	-	-	-
		Masalia	Lakhanpur	Paharudi	24.1720	87.2059	House	-	-	-	1	-	-	-	-	-
		Masalia	Ranga Masaliya	Amgachhi	24.1105	87.1855	House	-	-	-	2	-	-	-	-	-
		Masaliya	Sapchala	Bariyabad	24.0900	87.1504	Crop	-	-	-	1	-	-	-	-	-
		Masaliya	Sapchala	Chandna	24.0499	87.1332	Crop	-	-	1	-	-	-	-	-	-
		Masaliya	Sapchala	Pathriya	24.0802	87.1283	House	-	-	1	-	-	-	-	-	-

		Masaliya	Sapchala	Pathriya	24.0802	87.1283	Injury	1	-	-	-	-	-	-	-	-
		Nonihat	Amarpur	Amarpur	24.4208	87.1585	Injury	-	-	-	1	-	-	-	-	-
		Nonihat	Amdiha	Burhnia	24.5086	87.3694	House	-	-	-	-	5	10	-	-	-
		Nonihat	Amdiha	Kauadhab	24.4191	87.3211	Crop	-	-	-	3	-	-	-	-	-
		Nonihat	Amdiha	Kendua	24.5687	87.1331	House	-	-	-	-	5	-	-	-	-
	Kathikund	Chirudih	Chirudih	Chirudih	24.5152	87.4950	Death	-	-	-	-	-	-	1	-	-
		Chirudih	Chirudih	Chirudih	24.5152	87.4950	Crop	-	-	-	7	-	-	-	-	-
		Gopikandar	Gopikandar E.	Balia	24.4176	87.4988	House	-	-	-	1	-	-	-	-	-
		Gopikandar	Gopikandar E.	Kuchapani	24.4253	87.5194	Crop	-	-	-	1	-	-	-	-	-
		Gopikandar	Karudih	Dundua	24.3351	87.5419	Crop	-	-	-	2	-	-	-	-	-
		Kathikund	Jhilimili	Chandpani	24.3444	87.4084	Death	-	-	-	-	-	-	1	-	-
		Kathikund	Kathikund E.	Balia	24.3499	87.4626	Injury	-	-	-	1	-	-	-	-	-
Godda	Godda	Godda	Godda	Dahupaghar	24.7616	87.1495	Death	-	1	-	-	-	-	-	-	-
		Poreyahat	Maheshkurto	Amjora	24.7272	87.1413	Death	-	-	-	-	1	-	-	-	-
		Poreyahat	Maheshkurto	Beldang	24.7443	87.1351	Death	-	-	-	-	1	-	-	-	-
		Poreyahat	Maheshkurto	Teliatikar	24.7593	87.0996	Death	-	-	-	-	1	-	-	-	-
		Poreyahat	Poreyahat	Sugathan	24.7047	87.1895	Death	-	-	-	-	1	-	-	-	-

The elephant depredation sites in Dumka and Godda forest divisions are being shown in the following map.

Map 19: Elephant Depredation Sites in Dumka and Godda Forest Divisions (2015-16 to 2023-24)



2.13.2. Elephant Depredation Status in the Impact Area

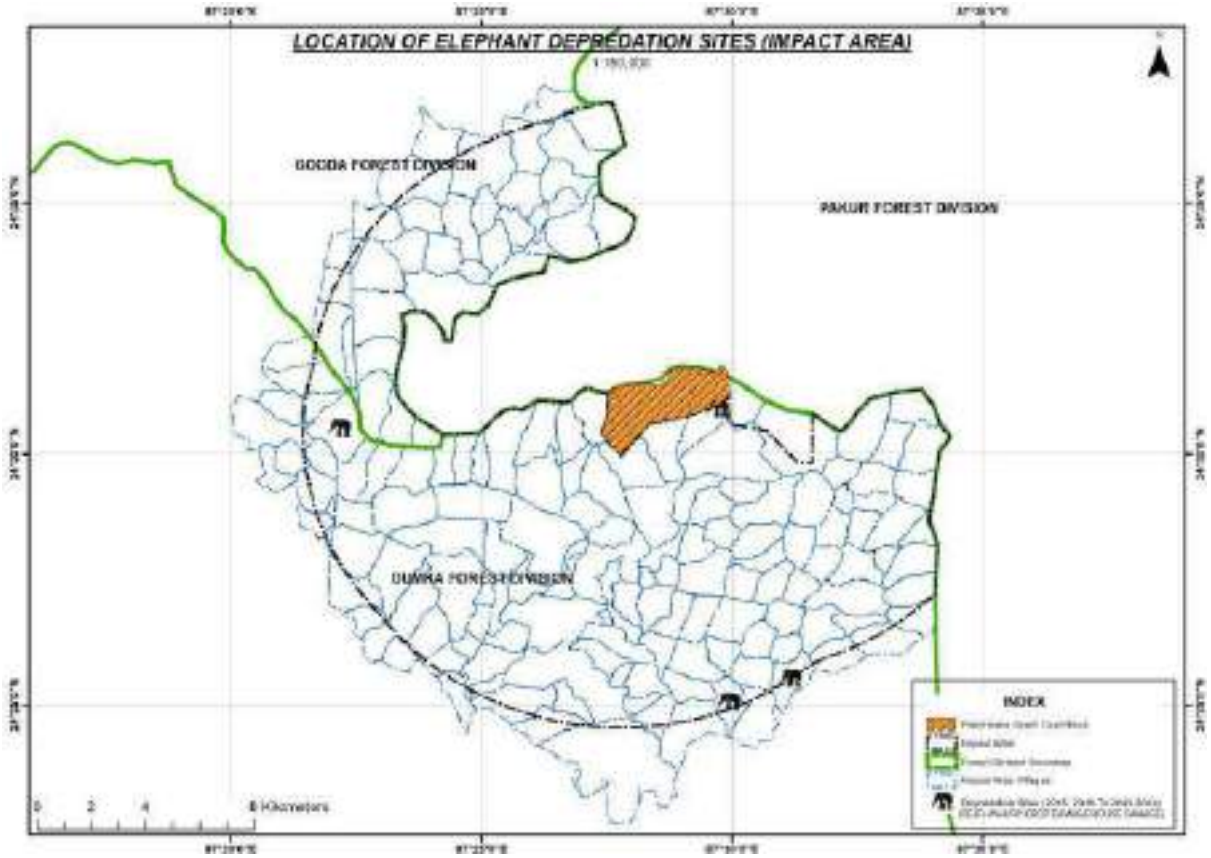
The location of depredation sites within the Impact Area are being tabulated as follows.

Table 14: Location of Depredation Sites within the Impact Area (2015-16 to 2023-24)

Village	Range	Beat	Sub-Beat	Latitude	Longitude	Year	Nature of Damage	No. of Incidents
Chirudih	Kathikund	Chirudih	Chirudih	24.515214	87.495023	2021-22	Death	1
Chirudih	Kathikund	Chirudih	Chirudih	24.515214	87.495023	2018-19	Crop Damage	7
Kuchapani	Kathikund	Gopikandar	Gopikandar East	24.425343	87.519415	2018-19	Crop Damage	1
Burhnia	Hizla West	Nonihat	Amdiha	24.508606	87.369408	2019-20	House Damage	5
						2020-21	House Damage	10
Balia	Kathikund	Gopikandar	Gopikandar East	24.417582	87.498815	2018-19	House Damage	1

The depredation sites in the Impact Area are being shown in the following map.

Map 20: Location of Depredation Sites within the Impact Area



2.14. LOCATION OF OTHER PROJECTS IN THE CLOSE VICINITY OF THE PROJECT

As discussed in para 2.1., there are two running open cast coal mining projects in close vicinity of Pachhwara South Coal Block – Pachhwara Central and Pachhwara North. These two projects are located in Pakur Forest Division. Apart from these two, one more upcoming coal block namely Urma Paharitola, is situated towards east just adjacent to Pachhwara South and Pachhwara Central coal blocks. This coal block is spread over both Dumka and Pakur forest divisions. However, this block is yet to get statutory approvals, after which it is expected to become operational.

2.15. FIELD SURVEY EXERCISE

The field survey of the whole area has been carried out by teams consisting of the following members:

Table 15: Qualifications & Experience of the Survey Team Members

Sl. No.	Name	Qualification	Experience
1.	Kislay Kumar	M. Sc. Ecology	10 years
2.	Anzar Anis	M. Tech. Geoinformatics	4 years
3.	Vicky Mahto	M. Sc. Botany	3 years
4.	Lamboder Mahto	B. Sc. Zoology (Hons.)	2 years
5.	Vikas Kumar Sen	B. A.	2 years
6.	Biswa Darshi Behera	M. Sc. Geoinformatics	Fresher
7.	Sugandha Ganguli	M. Sc. Geoinformatics	Fresher
8.	Sujata Nath	M. Sc. Geoinformatics	Fresher

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3. IMPACT OF THE PROJECT ON ENVIRONMENT

3.1. IMPACT OF THE PROJECT ON ENVIRONMENT IN GENERAL

Environmental impacts of mining operations are numerous and diverse. It includes land degradation, noise, dust, poisonous gases and pollution of water and so on. Open cast mining changes the topography and vegetation, as well. From the noise and vibration point of view, drilling and blasting operations as well as application of heavy vehicles are very important. Blasting, haulage and transportation are the main reasons for the dust generation. Water pollution is another aspect of mine operations greatly impacting the environment. The contaminated water in the mining operation has vital impacts on the rivers, agriculture, fresh drinking waters and ecosystems, because of abundance of heavy metals, suspended solid particles and decreasing level of pH. It causes undesirable changes in the nearby water bodies and can also pose a serious threat to the aquatics. Mining operations with degradation of the land largely contribute to the corrosion of soil. Further, much of the mine wastes has high concentration of heavy metals and toxic materials which are harmful for the environment.

The most immediate environmental impact of open cast mining is the loss of habitat. A vast stretch of land cleared for mining operations displaces flora and fauna, causing a ripple effect throughout the ecosystem. Species lose not only their homes but also their food sources, and the delicate balance of the local biodiversity is upset.

3.2. IMPACT OF THE PROJECT ON SOIL

The disturbance of the earth's surface significantly alters soil composition, leading to erosion and degradation. This soil loss not only affects the immediate area but can also contaminate waterways, impacting regions far beyond the mining site. The negative impacts of open cast mining may be elaborated as follows.

3.2.1. Soil Erosion

Soil erosion is one of the most immediate and visible impacts of open cast mining. During the mining process, large swathes of vegetation are cleared, leaving the soil exposed. Vegetation plays a crucial role in preventing erosion by holding the soil together with root systems. Without this protective cover, the soil becomes vulnerable to both wind and water erosion.

Rainwater, in particular, can wash away the unprotected topsoil, which is the most fertile and nutrient-rich layer. As a result, erosion causes the loss of valuable topsoil, reducing the land's capacity for agriculture and forestry. The sedimentation caused by erosion can also flow into

nearby rivers, leading to water pollution, clogged waterways, and disrupted aquatic ecosystems. Further, erosion can lead to the formation of gullies or ravines, further destabilizing the land and making it difficult to restore the ecosystem after mining operations cease.

3.2.2. Soil Compaction

The heavy machinery used in open cast mining, including trucks, bulldozers, and excavators, causes significant compaction of the soil. Soil compaction occurs when soil particles are pressed together by the weight of equipment, reducing the pore spaces between them. As a result, the soil becomes denser, and its ability to retain water, air, and nutrients is compromised.

Soil compaction has a number of negative consequences. For example, compacted soil has poor water infiltration capacity, which can lead to surface runoff and increased erosion. Plant roots struggle to penetrate compacted soil, reducing vegetation growth. Additionally, the reduced aeration in compacted soil leads to lower oxygen availability for soil organisms, such as earthworms and microbes, which are essential for maintaining soil health.

3.2.3. Loss of Soil Fertility

Open cast mining often removes large quantities of soil, especially the nutrient-rich topsoil. This topsoil contains vital minerals and organic matter that support plant growth and soil biodiversity. Once the topsoil is removed, it is difficult to restore, and the underlying layers of soil may be far less fertile.

Even when mining companies attempt to rehabilitate the land after extraction, they may fail to replace the removed topsoil, or the replacement soil may not have the same nutrient profile. Without the proper nutrients, reclaimed land struggles to support vegetation, which further exacerbates the land degradation.

In addition, mining operations may alter the natural pH of the soil. For example, when minerals like sulphur are exposed during mining, they can combine with water to form sulfuric acid, leading to Acid Mine Drainage (AMD). Acidic soils are inhospitable for many plants, further reducing the fertility of the land.

3.2.4. Soil Contamination

Open cast mining can introduce a range of toxic substances into the soil, including heavy metals, toxic chemicals, and other pollutants. This contamination occurs through several processes:

- **Heavy Metals**: Mining often exposes rocks that contain heavy metals such as mercury, arsenic, and lead. When these metals come into contact with the soil, they can be absorbed by plants or leached into groundwater, contaminating the environment. These metals are persistent in the soil and can remain for decades or even centuries, long after mining activities have ceased. The contamination can enter the food chain, posing risks to both human and animal health.
- **Acid Mine Drainage (AMD)**: One of the most significant concerns in open cast mining is the generation of acid mine drainage. When sulphide minerals are exposed to air and water during mining, they oxidize and form sulfuric acid. This acid can leach into surrounding soil and water systems, significantly altering soil pH and harming plant life. Acidic soils inhibit the growth of many crops and reduce the overall quality of the land.
- **Toxic Chemicals**: Chemicals used in the mining process can leach into the soil and pose long-term environmental risks. These chemicals can also contaminate nearby water sources, further harming ecosystems.

3.2.5. Disruption of Soil Structure

Open cast mining also disrupts the natural soil structure by displacing soil layers. In undisturbed land, soil forms distinct layers based on particle size, texture, and organic content. These layers play an important role in water retention, nutrient distribution, and root penetration.

When mining occurs, soil layers are often mixed or removed entirely, resulting in a loss of structure. The absence of a well-defined soil profile can make it difficult for plants to establish deep root systems, which are essential for accessing nutrients and water.

Furthermore, some mined areas may not be properly reclaimed, leaving behind barren land that is difficult to rehabilitate. This disruption of soil structure not only affects agriculture but also reduces the ability of the land to support wildlife and natural vegetation.

3.2.6. Long Term Ecological Consequences

The environmental damage caused by open cast mining extends far beyond the immediate mining site. Once soil has been degraded, the ecological balance of the area is often disrupted for years, if not decades. Reclaimed lands may not support the same type of vegetation that existed prior to mining. Even with restoration efforts, the soil may not return to its original fertility or structure.

In some cases, invasive plant species may take root in disturbed soils, altering the local ecosystem and further preventing native species from re-establishing. The long-term effects of soil degradation include:

- **Loss of Biodiversity**: Degraded soils, along with the destruction of habitats, can lead to the displacement of native plant and animal species. Loss of vegetation means that herbivores may not find sufficient food, and predators may lose their prey. The entire food chain can be disrupted.
- **Reduced Carbon Sequestration**: Soil plays a critical role in storing carbon, which helps regulate the climate. The degradation of soil through mining activities reduces the soil's capacity to sequester carbon, contributing to higher levels of carbon dioxide in the atmosphere.
- **Water Quality Issues**: Soil degradation due to mining often leads to water pollution through runoff and the leaching of contaminants. This can affect both surface water and groundwater, impacting both human populations and aquatic life.

3.3. IMPACT OF THE PROJECT ON WATER REGIME OF THE LANDSCAPE

The excavation process generates substantial amounts of waste rock and tailings – materials left over after the extraction of desired minerals. Often, these materials contain hazardous substances that can leach into local water supplies, resulting in water pollution that affects both wildlife and human populations. The negative consequences of open cast mining on water regime of the landscape may be enumerated as follows.

3.3.1. Disruption of Surface Water Hydrology

Open cast mining typically involves the removal of large quantities of soil, rock, and vegetation. This drastic alteration of the land surface can disrupt natural drainage patterns, change the flow of surface water, and increase the risk of flooding or drought.

- **Alteration of Drainage Systems**: During open cast mining, the natural topography is often levelled or reshaped to facilitate the extraction of minerals. Streams, rivers, and lakes may be rerouted, diverted, or even destroyed during the process. This can drastically alter the natural flow of surface water, causing changes in the local hydrological cycle. The disruption can lead to the creation of artificial basins or pits that collect water, affecting the surrounding area's drainage.
- **Increased Runoff**: The removal of vegetation, which normally absorbs and slows down rainfall, and the exposure of bare soil make the landscape more prone to surface runoff.

Without plant cover to act as a buffer, rainwater flows more quickly across the land, leading to faster and higher runoff rates. This increases the risk of flooding, particularly in areas downstream of the mining site. Moreover, the increased runoff can lead to soil erosion, further altering the water regime by introducing more sediment into rivers and streams.

- **Sedimentation of Water Bodies**: The disturbance of soil and rock during mining activities leads to the release of large amounts of sediment into nearby rivers and ponds. This sediment can significantly reduce the clarity of water bodies, making it difficult for aquatic organisms to thrive.

3.3.2. Groundwater Depletion and Contamination

Groundwater is a crucial component of the water regime, particularly in areas that rely on wells and aquifers for drinking water, irrigation, and industrial use. Open cast mining can have a profound impact on groundwater levels and quality through dewatering, contamination, and the alteration of natural groundwater flows.

- **Dewatering of Aquifers**: In many open cast mining operations, water must be pumped out from the mine pit to allow for safe extraction of minerals. This process, known as dewatering, can lead to a significant drop in the local groundwater table. The removal of water from aquifers can cause wells in the surrounding areas to dry up, reducing the availability of groundwater for agricultural, industrial, and domestic purposes.
- **Contamination of Groundwater**: The mining process often exposes toxic substances, such as heavy metals, chemicals, and acidic compounds, that can leach into the surrounding soil and groundwater. One of the primary concerns is acid mine drainage (AMD), which occurs when sulphide minerals are exposed to air and water during mining activities. This leads to the formation of sulfuric acid, which can seep into the groundwater, significantly lowering the pH of the water and making it highly acidic. This acid can dissolve harmful metals, such as arsenic, mercury, and cadmium, contaminating both surface water and groundwater.
- **Chemical Leaching**: In some mining operations, chemicals are used. These toxic substances can easily leach into the surrounding environment, especially during heavy rains or if proper containment systems are not in place. Contaminants can migrate into groundwater reserves, making the water undrinkable and harming local ecosystems. Once contaminated, groundwater is difficult and expensive to clean, and the contamination can persist for decades or longer.

3.3.3. Water Quality Degradation

The quality of both surface water and groundwater can be severely compromised by open cast mining. Water bodies in mining regions often become contaminated with a range of pollutants, leading to significant health and environmental risks. Mining often exposes large quantities of nitrogen and phosphorus from fertilizers, waste, and mining byproducts. These nutrients can enter water systems, causing eutrophication, which leads to excessive algal blooms, oxygen depletion, and the death of aquatic organisms. Eutrophication disrupts the natural balance of aquatic ecosystems and can render water bodies toxic and unfit for use.

3.3.4. Impact on Aquatic Ecosystems

Open cast mining projects can have devastating impacts on local aquatic ecosystems, including rivers, streams, wetlands, and lakes. The changes in water quality and hydrology can lead to the destruction of habitats for aquatic species, affecting biodiversity and ecosystem stability.

- **Loss of Habitat**: The destruction or alteration of natural water bodies and riparian ecosystems can result in the loss of critical habitats for fish, amphibians, and other aquatic organisms. Streams, ponds, and wetlands are often dammed, diverted, or filled in during mining operations, which can disrupt the migration routes and breeding grounds of local species. This leads to a decline in biodiversity and disrupts the balance of the entire aquatic ecosystem.
- **Fish and Wildlife Impacts**: Water quality degradation from contaminants such as heavy metals, acid mine drainage, and sediments can be fatal to fish and other aquatic animals. Species that are sensitive to changes in water pH, oxygen levels, or temperature may suffer from stunted growth, disease, or death. Additionally, the presence of toxic substances in the water can accumulate in the food chain, affecting not only aquatic organisms but also terrestrial predators, including birds and mammals.
- **Disruption of Ecological Cycles**: Changes to the water regime in mining-impacted areas can disrupt the natural ecological cycles of water flow, nutrient cycling, and species migration. Over time, this disruption can lead to a collapse in the ecosystem's resilience and its ability to recover from disturbances.

3.4. IMPACT OF THE PROJECT ON AIR ENVIRONMENT

Open-cast mining comes with significant environmental consequences, particularly with regard to the air environment. The process of extracting minerals exposes large areas of soil and rock, disturbs the natural landscape, and introduces various pollutants into the atmosphere, contributing

to air pollution. These pollutants can have harmful effects on both local ecosystems and human health, particularly the respiratory health. The various impacts are being described in detail in the following paras.

3.4.1. Dust Emissions

One of the primary environmental impacts of open-cast mining on air quality is the generation of dust. Dust is produced from various activities during the mining process, including drilling, blasting, transportation, and the movement of heavy machinery over exposed surfaces. The dust particles can vary in size, with some being fine enough to remain suspended in the air for extended periods, traveling over long distances. Dust emissions primarily consist of:

- **Particulate Matter (PM10 and PM2.5)**: These fine particles, less than 10 microns in diameter, can penetrate deep into the human respiratory system and are associated with various health problems, including respiratory diseases, heart disease, and even cancer.
- **Coal Dust**: In coal mining, a significant amount of coal dust is generated, which not only impacts air quality but also poses an explosion risk in some mining environments.

The dispersion of dust can have detrimental effects on surrounding communities, wildlife, and vegetation. Dust can coat plant leaves, reducing their ability to photosynthesize and impairing growth. Furthermore, dust deposition can contaminate water sources and reduce visibility, posing dangers for road traffic and aviation etc.

3.4.2. Greenhouse Gas Emissions

Open-cast mining is energy-intensive, requiring significant amounts of fuel for equipment operation, transportation, and processing of minerals. The combustion of fossil fuels, such as diesel and coal, results in the release of greenhouse gases (GHGs), including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These GHGs contribute to global climate change by enhancing the greenhouse effect.

The extraction and processing of fossil fuels, such as coal, also release large amounts of carbon dioxide into the atmosphere. In coal mining regions, these emissions can significantly increase local carbon footprints. Additionally, methane is often released during coal mining activities, which is a potent greenhouse gas with a much higher warming potential than carbon dioxide in the short term.

3.4.3. Emission of Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) are organic chemicals that easily evaporate into the atmosphere. These compounds are emitted during the extraction and processing of minerals, as well as from the use of diesel and other petroleum-based products in mining machinery. VOCs, such as benzene, toluene, and xylene, can contribute to the formation of ground-level ozone, a key component of smog, and can also lead to the creation of particulate matter (PM).

The emission of VOCs is a concern for both air quality and public health. These compounds are associated with respiratory issues, eye irritation, and, in some cases, carcinogenic effects. Long-term exposure to VOCs can also damage the nervous system and liver.

3.4.4. Blasting Operations and Air Pollution

Blasting is a common technique used in open-cast mining to break rock and expose mineral deposits. The detonation of explosives causes a release of dust, gases, and particulate matter into the air. These gases include nitrogen oxides (NOx) and sulphur dioxide (SO_2), both of which contribute to air pollution and can have harmful effects on human health and the environment.

Nitrogen oxides contribute to the formation of ground-level ozone and smog, both of which can aggravate respiratory conditions such as asthma and bronchitis. Sulphur dioxide, on the other hand, can lead to the formation of acid rain, which has a detrimental impact on soil, water bodies, and vegetation. The presence of acid rain can further exacerbate the environmental degradation caused by mining.

3.4.5. Fugitive Emissions from Mining Operations

Fugitive emissions refer to the unintentional release of gases or particulate matter into the atmosphere from various mining activities. These emissions occur during the handling, storage, and transportation of materials such as coal, ore, and waste rock. For instance, when coal is stockpiled, it can emit methane and dust, both of which degrade air quality.

Similarly, during transportation, especially by trucks, significant amounts of dust are generated, especially on unpaved roads or in areas where the haulage roads are not properly controlled for dust suppression. In addition to particulate matter, exhaust fumes from diesel-powered vehicles and machinery contribute to the release of nitrogen oxides, carbon monoxide, and other harmful gases into the atmosphere.

3.4.6. Health Impacts on Local Communities

The emission of pollutants into the air as a result of open-cast mining activities poses significant health risks to local communities. Exposure to particulate matter, gases, and volatile organic compounds can cause a range of respiratory issues, including chronic obstructive pulmonary disease (COPD), asthma, and lung cancer. The elderly, children, and those with pre-existing health conditions are particularly vulnerable to these air quality impacts.

In addition to respiratory illnesses, exposure to air pollutants can also result in cardiovascular diseases, as well as neurological and reproductive problems. Studies have shown that people living near mining areas tend to experience higher rates of respiratory diseases and other health complications, which places an immense burden on public health systems.

3.4.7. Environmental Degradation and Ecosystem Disturbance

The emissions from open-cast mining operations not only impact human health but also have far-reaching effects on the environment. The introduction of large quantities of dust and particulate matter can cause the degradation of local ecosystems. For example, dust can settle on water bodies, reducing water quality and affecting aquatic life. The accumulation of dust on soil can also disrupt soil fertility, impairing agriculture and reducing biodiversity in the region.

The air pollutants produced by open-cast mining can also lead to the acidification of surrounding areas, which can have long-lasting effects on local ecosystems. This can result in the destruction of vegetation, reduced agricultural productivity, and loss of biodiversity. Furthermore, the introduction of pollutants into the air can affect nearby forests, wetlands, and agricultural land, leading to a loss of habitat for wildlife and the disruption of ecological balances.

3.5. IMPACT OF THE PROJECT ON NOISE ENVIRONMENT

Noise pollution in open-cast coal mining operations has a profound impact on both the environment and the health and well-being of people and wildlife in surrounding areas. Various sources of noise pollution and their impacts on environment are being discussed in the following paras.

3.5.1. Sources of Noise in Open-Cast Coal Mining

Open-cast coal mining operations generate noise at various stages, from exploration to extraction, transportation, and processing. The key sources of noise in open-cast mining operations include:

- **Drilling and Blasting**: Blasting is commonly used to break rock and expose coal seams. The sound produced by explosions can reach levels as high as 150 decibels (dB) in close

proximity. This intense noise is not only a significant disturbance to the environment but also contributes to ground vibrations, which can cause additional structural damage to nearby buildings.

- **Heavy Machinery**: Open-cast coal mining operations require large-scale equipment, including excavators, draglines, bulldozers, dump trucks, and haul trucks. These machines are often powered by diesel engines and can produce high noise levels, ranging from 85 to 110 dB depending on their size and operation. The constant operation of these machines, particularly in large mines, results in prolonged exposure to high noise levels, affecting both the workers on-site and communities in surrounding areas.
- **Transport of Coal and Waste Material**: Coal and waste material are transported via haul roads or conveyor belts. The movement of trucks and heavy vehicles on unpaved roads generates significant noise. In addition, the movement of materials on conveyor systems can also produce low-frequency noise, contributing to the overall noise pollution in the mining area.
- **Processing and Crushing**: After coal is extracted, it undergoes crushing, sorting, and processing before being transported to market. The operation of crushers, screens, and other processing equipment generates additional noise, often in the range of 90 to 100 dB. This noise, coupled with the noise from material handling and stockpiling, further exacerbates the overall noise environment in and around the mining site.
- **Wind and Environmental Factors**: Strong winds and natural environmental factors can sometimes amplify the noise generated by mining operations. For instance, wind can carry noise further than it would travel under normal circumstances, increasing the affected area. Also, the topography of the landscape—such as hills or valleys—can either reflect or absorb noise, making it more pronounced in certain areas.

3.5.2. Human Health Impacts of Noise Pollution

Noise pollution from open-cast coal mining can have serious health implications for nearby communities, workers, and others exposed to high levels of noise over extended periods. Long-term exposure to noise levels above 85 dB, particularly in mining environments, can lead to:

- **Hearing Impairment**: Prolonged exposure to loud noise can cause permanent hearing loss or partial hearing impairment, particularly in workers who are constantly exposed to high decibel levels without adequate ear protection.

- **Stress and Anxiety**: Chronic exposure to high noise levels is linked to increased stress, anxiety, and irritability. The constant bombardment of noise can disrupt sleep patterns, increase heart rates, and exacerbate mental health issues, such as depression and fatigue.
- **Cardiovascular Issues**: Studies have shown that long-term exposure to elevated noise levels can increase the risk of hypertension, heart disease, and stroke due to the stress it places on the cardiovascular system. The constant stress response triggered by noise exposure can lead to chronic health problems.
- **Sleep Disturbances**: Noise pollution can significantly disturb sleep, particularly for those living near mining sites. Sleep deprivation caused by constant noise exposure leads to reduced cognitive function, poor decision-making, and a weakened immune system.

3.5.3. Impacts of Noise Pollution on Wildlife

In addition to human health impacts, noise pollution also has significant effects on wildlife. Many species rely on sound for communication, navigation, and hunting. Persistent noise from mining operations can interfere with these vital behaviours, causing stress, displacement, and changes in reproductive success.

- **Disruption of Communication**: Many animals, including birds, mammals etc. use vocalizations to communicate with one another. Noise from open-cast mining can mask these sounds, disrupting social structures, mating behaviours, and territorial defense.
- **Habitat Displacement**: Noise can lead animals to abandon their natural habitats, which can affect their survival and reproduction. Species that are sensitive to noise, such as those living in forests or wetlands near mining areas, are particularly vulnerable.
- **Disturbance of Feeding and Hunting**: Many predators rely on their acute sense of hearing to locate prey. Excessive noise from mining operations can interfere with their ability to hunt, leading to reduced food availability and negative impacts on their populations.

3.5.4. Impact of Noise Pollution on Local Communities

The noise generated by open-cast coal mining can significantly reduce the quality of life for people living near mining areas. Persistent noise pollution affects people's ability to enjoy outdoor spaces, engage in recreational activities, and interact with their neighbours. Noise can also disrupt social and community cohesion, as constant disturbances make it difficult for individuals to communicate and engage in daily activities.

Communities affected by mining-related noise pollution may also experience economic setbacks. The disturbance caused by mining activities can lead to reduced property values, as potential buyers may be discouraged by the constant noise and the associated health risks. Additionally, noise pollution may negatively impact local tourism if the area was once a destination for visitors seeking peace and quiet.

Children and the elderly are particularly vulnerable to the effects of noise pollution. For children, exposure to excessive noise can interfere with their learning and development, leading to poor academic performance, difficulty concentrating, and behavioural problems. The elderly may suffer from sleep disturbances, increased stress, and a higher risk of cardiovascular diseases due to long-term exposure to high noise levels.

3.6. QUANTUM OF POLLUTANTS THAT MAY BE PRODUCED BY THE PROJECT

As regards the estimation of quantum of pollutants consequent upon the project activities, it would be relevant to mention here that a detailed Environmental Impact Study (EIA) Study has been carried out by the Project Proponent through a NABET certified agency. This report is being referred to here in this para.

3.6.1. Air Quality

According to EIA Study Report, Ambient Air Quality monitoring was carried out at a frequency of two consecutive days per week at each location representing the study area. The duration of sampling of Particulate Matter (PM2.5 & PM10), SO2, NOx and CO was carried out continuously for twenty four hours (6am to 6am of next day) per day. This was to allow a comparison with the present revised standards mentioned in the latest Gazette Notification of the Central Pollution Control Board (CPCB) (Nov. 18, 2009). Sampling was done in all the sampling locations at a height of 3 meter above the ground on a platform erected with outcrops at the base. The station represented approximately the highest ground level of the area and practically having no obstruction. 10 (ten) monitoring stations were set up in the study area. The values of Ozone (O3) and Ammonia (NH3) at all the sites are observed to be <10 µg/m3 and <20 µg/m3 respectively. Arsenic (As), Nickel (Ni), Benzene (C6H6), Benzo-a-pyrene (BaP) at all the sites were monitored once in a month i.e. at the end of each month. In the core zone the concentration of pollutants are less in comparison to other sampling locations because the mine has not yet started production. The higher concentration of pollutants were observed in the villages due to local phenomena viz. unpaved roads, heavy vehicular traffic on roads, agricultural activities leading to generation of dust, etc. The villages adjacent to main road have more dust pollution in comparison to those near forest patches.

Assessment of Impact on air quality has been carried out using AERMOD software. This model incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. This model is also recommended regulatory model for Ambient Air Quality (AAQ) impact modelling by United States Environmental Protection Agency (USEPA). Three Months baseline data, especially site specific micro meteorological data, has been used for dispersion modelling.

The modelling has been carried out for the production capacity of 9.0 MTPA of Pachhwara South Coal Block considering the various mining and ancillary activities as suggested in approved mining plan. Predicted Ground Level Concentrations were obtained for 24 hourly basis for ten locations, two within the mining lease area and eight at identified locations of villages within 10 km radius of the mining lease area. The average baseline value, incremental value and maximum value of pollutants are being tabulated hereunder.

Table 16: Predicted Average Ground Level Concentration (GLC) Values of Pollutants

PM_{10} ($\mu g/m^3$)			**$PM_{2.5}$ ($\mu g/m^3$)**			**SO_2 ($\mu g/m^3$)**			**NO_x ($\mu g/m^3$)**		
Baseline Value	Incremental Value	Max. GLC value	Baseline Value	Incremental Value	Max. GLC value	Baseline Value	Incremental Value	Max. GLC value	Baseline Value	Incremental Value	Max. GLC value
68.94	**10.84**	**79.78**	**36.40**	**5.87**	**42.27**	**13.77**	**3.96**	**17.73**	**17.03**	**4.82**	**21.91**

3.6.2. Noise Quality

According to the EIA Study Report, Baseline noise levels were monitored at different points within the study area using a Digital Sound Level Meter. 10 (Ten) noise monitoring stations were identified keeping in view the nature of the monitoring location i.e. residential areas in villages, schools, roads, etc for the assessment of the existing noise levels in four directions(Annexure XXVII). At all the ten stations, day and night time noise values were observed in the ranges from 39.8 dB(A) to 54.2 dB(A) and from 35.4 dB(A) to 42.2 dB(A), respectively. The average Steady Sound Pressure Value of day time ranges from 46.7dB(A) to 49.7 dB(A); whereas the night time ranges from 37.0 dB(A) to 39.3 dB(A). It is, therefore, concluded that the noise levels within the study area are well within the specified standards. However, the higher values of noise are observed in those villages, which are located adjacent to the road, primarily due to the vehicular traffic movement and other anthropogenic activities.

In the mechanised open-cast mine, mining operations such as drilling, blasting, excavation, loading and unloading, movement of dumpers, etc are expected to generate noise. In this particular mine, the operation will be limited to three shift of eighteen hours duration in a day. The various sources

of noise mentioned above shall only be periodical and are limited to a fixed period of operation only. In addition to this, the transportation of ores might cause a little effect on the noise level. Noise levels in the work zone shall vary from about 65 to 90 dB (A), except during blasting, which shall carried out at a specific time of the day. Personal exposure shall be less than 80 dB (A) because operators only remain very close to the machines and they sit in closed cabins. Noise level in work zone is expected to increase marginally in the open-cast mining area due to excavation, drilling & blasting, handling and transportation of overburden and coal. Measures towards mitigation is expected to reduce the noise level. Impact of noise level on the nearby villages has been predicted not to increase significantly.

3.6.3. Water Quality

Water is available in the form of surface water & ground water. Water quality parameters of 5 (five) Surface and 5 (five) Ground water resources within 10 km radius of the study area have been studied to assess the water environment and evaluate anticipated impact of the project. The surface water samples were collected on 19.01.2021 whereas the ground water samples were collected on 22.01.2021 for analysis in the MoEF&CC accredited laboratory. The analytical results of surface water samples at different location for various parameters reveal that all the parameters comply with "IS 2296:Class C" standards indicating their suitability for drinking and other purposes after conventional treatment followed by disinfection. The analytical results of groundwater samples showed all the parameters are within the prescribed limits as per IS: 10500 standards for drinking water.

3.6.4. Land Use & Topography

The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South-western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82m (above MSL) towards northeast to about 188m (above MSL) towards south central with general ground slope from south to north towards Bansloi river and which is also supported by the detailed topographical survey of the area. Highest elevation within the block area is 188.96m. Mining has not yet started within the lease area. By the end of the life of the mine, i.e. after 38 years, an area of 643.76 ha. shall be excavated out of which 523.62 ha area will be backfilled and the remaining 120.14 ha area will remain void which will be used as water reservoir.

3.6.5. Soil

According to the EIA Study Report conducted by the Project Proponent, soil samples were collected on 28th January, 2021 from six different sampling locations and were analyzed for the soil structure, texture, moisture content, nutrient level and other chemical parameters. From the results, it can be concluded that the soils of the study area have been developed mostly from massive granitic rocks and meta sedimentary formations of Precambrian age. These soils are brown colour, medium texture, containing gravels, quartz, sand and ferruginous concretions. Its physical and chemical characteristics markedly show a little variation in the area. The presence of organic carbon, N, P, K and moisture retaining capacity of the top soil indicates that the soils will support plant growth. The soil samples of nearby agricultural field are having good nitrogen, potassium and phosphorus percentage to support plant growth.

The aforesaid study assesses that during mining top soil will be scrapped and stored in the designated place over an area of 6.53 ha. Top Soil will be utilized in the embankment in the initial years, however, will be spread over the reclaimed area in later phases during the progressive and final closure of the mine. Although minimum storage time shall be attempted to avoid nutrient loss, but loss of some nutrients due to temporary storage and even after direct placement of soil to the reclaimed areas of the external waste dump, cannot be ruled out.

3.6.6. Vegetation

Out of 714.8553 ha of the said mining project about 455.1108 ha area is coming under forest land category, i.e. about 63.66% of the total project area. The remaining non-forest land has thin vegetation cover; mostly herbs & shrubs. The first and direct impact of mining operations in forested areas is the eviction of forests which alters the food availabilities and wildlife habitat.

The existing forests in the buffer zone will be subjected to human disturbances of various kinds like tree felling for fuel-wood requirement, expansion of agriculture into the forest area and diminished renewal of flora due to a polluted environment. Due to dusts from blasting and vehicle moments the surrounding are likely to be affected but water sprinkling and increase in vegetation cover are proposed to minimize the impact. The flora in the Buffer Zone is likely to be affected because of the mining activity and transportation of vehicles but this impact will be substantially reduced by plantation within and along the transportation road. Sal, Am, Tal, Jamun are the most dominant species in the forest of this region.

3.6.7. Wildlife

Presence of Reserve & Protected Forests within 10 km may result in interference of the human activities with the wild habitats. The mining activity and other ancillary activities such as blasting, dumping of waste and over burden, movement of vehicles, etc. shall threaten the wild animals and interfere in their life cycle. The most possible impacts on wild life:

- Dust pollution due to mining activities.
- Noise pollution due to movement of vehicles and mining machineries.
- Increase in human interference into the forest shall result in alterations in breeding and nesting of animals.
- Dumping of garbage and resulting water & air pollution due to mining and allied activities shall interfere with their living.

However, the forests in the buffer zone support faunal species which have become habituated to prevailing conditions. Similarly, the fauna in the core zone in the vicinity of the mine is restricted to few common small species. But after the mine is closed and the plantations developed on the abandoned mine, area will attract back at least some of the animals displaced/scared away by the project.

3.7. NATURE OF THREATS TO FLORA & FAUNA ON ACCOUNT OF PROJECT IMPLEMENTATION AND INCREASED HUMAN PRESENCE

The project may disrupt the delicate ecological balance in several ways. Following are the primary threats to flora and fauna due to open-cast mining activities in core and buffer zones.

3.7.1. Habitat Destruction and Fragmentation

Open-cast mining is a highly disruptive activity that directly leads to the destruction and fragmentation of habitats. This occurs both within the mining site itself and in surrounding areas due to the secondary impacts of mining operations. Habitat destruction and fragmentation are significant threats to biodiversity, as they disrupt ecosystems and wildlife populations. A detailed exploration of how open-cast mining causes habitat destruction and fragmentation, and the resulting consequences for wildlife and ecosystems, is as follows.

3.7.1.1. Physical Destruction of Habitats

- **Removal of Vegetation**: Open-cast mining involves clearing large areas of vegetation, including forests, grasslands, wetlands, and other ecosystems, to expose underlying minerals. This results in the immediate loss of the plant life that supports a variety of

species, from microorganisms to large mammals. Forests are particularly vulnerable, as they often support highly diverse ecosystems.

- **Soil Removal and Displacement**: The mining process often requires the removal of the topsoil, which is crucial for plant growth. Without this fertile soil, the area becomes unsuitable for many species of plants and, by extension, herbivores and other wildlife that depend on these plants for food and shelter.
- **Change in Topography**: Open-cast mining can alter the natural landscape by creating large pits or depressions and removing hills, mountains, or other landforms. These changes in topography can have lasting impacts on the natural flow of water, drainage patterns, and local climate conditions, further exacerbating habitat loss.

3.7.1.2. Fragmentation of Habitat

- **Disruption of Continuous Ecosystems**: Habitat fragmentation occurs when large, continuous habitats are broken up into smaller, isolated patches due to human activities such as mining. When ecosystems are fragmented, wildlife populations may become isolated in these smaller patches, reducing gene flow between populations and making them more vulnerable to inbreeding and genetic decline.
- **Barriers to Animal Movement**: Mining operations often create physical barriers (e.g., mining pits, roads, fences, and settlements) that prevent animals from moving freely across their natural range. For species that require large territories or seasonal migrations, these barriers can lead to overcrowding, resource shortages, and increased mortality. Species that are sensitive to disturbance may avoid these fragmented habitats altogether, further reducing biodiversity.
- **Loss of Connectivity**: Wildlife corridors – key areas that allow species to move between larger, connected habitats – can be severed by mining activities. This disrupts migratory routes, access to breeding grounds, and the ability to find food or mates. Without connectivity, populations of certain species may be unable to survive in the long term.

3.7.1.3. Reduction of Ecosystem Services

- **Water Regulation and Quality**: Healthy ecosystems, particularly wetlands and forests, play an essential role in regulating water cycles, filtering pollutants, and preventing soil erosion. Open-cast mining, by destroying these habitats, compromises these ecosystem services. For example, deforestation leads to a reduction in water absorption and purification, while mining-induced soil erosion can increase sedimentation in nearby water bodies, degrading water quality and further impacting aquatic habitats.

- **Carbon Sequestration**: Forests and wetlands sequester significant amounts of carbon, helping mitigate climate change. Mining operations that destroy these habitats release the carbon stored in vegetation and soil, contributing to increased atmospheric CO_2 levels.

3.7.1.4. Displacement of Wildlife

- **Loss of Shelter and Food Sources**: As vegetation is cleared and habitats are destroyed, animals are forced to abandon their homes. For species that rely on specific habitats, this can lead to their displacement into less suitable areas, where food and shelter may be scarce.
- **Population Decline and Extinction Risk**: The destruction of habitats through mining can lead to local extinctions, especially for species that are highly specialized or have small populations. For example, species that rely on undisturbed environments—such as certain birds, amphibians, or large mammals—may face an elevated risk of extinction if they cannot adapt to the changing landscape.

3.7.1.5. Increased Edge Effects

Habitat fragmentation creates "edges" where ecosystems meet human-modified landscapes, such as roads, mining pits, and settlements. These edges are often ecologically different from the interior of natural habitats, experiencing higher levels of sunlight, wind, and temperature fluctuations. The "edge effect" can make these areas more vulnerable to invasive species, which may thrive in disturbed environments, outcompeting native plants and animals. Moreover, some species that depend on interior habitats (e.g., forest-dependent species) may be less able to survive in these fragmented, edge-dominated environments.

3.7.1.6. Alteration of Ecological Processes

- **Disruption of Food Chains**: The destruction of habitats disrupts local food webs, as plants, herbivores, predators, and decomposers are all interconnected. The loss of plant life affects herbivores, which in turn affects carnivores. Decreasing plant diversity can reduce the availability of food for pollinators and herbivores, which in turn impacts species higher up the food chain.
- **Disruption of Breeding and Nesting Sites**: Many species rely on specific habitat features for breeding and nesting. For example, birds may depend on mature trees or cliffs, amphibians on wetlands, and mammals on dense undergrowth. The destruction of these features through mining operations leads to the disruption of reproductive cycles, reducing population sizes over time.

3.7.1.7. Secondary Impacts from Mining Infrastructure

- **Roads and Transportation Networks**: Roads and other infrastructure associated with mining can further fragment habitats and increase human-wildlife conflict. Roads can cause wildlife mortality through vehicle collisions, prevent animals from accessing key habitats, and facilitate the spread of invasive species.
- **Settlements and Urbanization**: Mining operations often attract workers and lead to the development of nearby settlements. These developments expand the human footprint in previously remote areas, further fragmenting habitats and putting additional pressure on local wildlife through hunting, logging, and agricultural expansion.

3.7.1.8. Cumulative Impacts over time

- **Long-term Habitat Loss**: As mining operations progress over time, they often expand into new areas, leading to the cumulative loss of habitats. The disturbance continues to spread beyond the immediate mining site, as mining-related activities, such as exploration, infrastructure expansion, and waste disposal, degrade surrounding ecosystems.
- **Recovery Challenges**: Once habitats are destroyed or fragmented, recovery can be slow and difficult, particularly in areas with poor soil quality, extreme climates, or limited species diversity. Even with active restoration efforts, it may take decades or centuries for ecosystems to return to their original state—if they are able to recover at all.

3.7.2. Soil Erosion and Loss of Fertility

3.7.2.1. Soil Erosion

Soil erosion is a major concern in open cast mining, where large areas of land are cleared for extraction of minerals. The ways in which soil erosion threatens flora and fauna:

- **Loss of Vegetation Cover**: Open cast mining removes vast amounts of vegetation, which naturally stabilizes the soil. The removal of plants and trees, which bind the soil together with their roots, makes the soil more vulnerable to erosion, especially when rain or wind occurs.
- **Increased Sedimentation**: Eroded soil particles can wash into nearby water bodies, such as rivers, lakes, or wetlands. The excess sedimentation can disrupt aquatic habitats, reduce water quality, and affect species that depend on these ecosystems for food and shelter.

- **Loss of Topsoil**: The topsoil layer, which is rich in organic material and essential nutrients for plant growth, is particularly prone to erosion. Once lost, it is difficult to restore, leading to long-term degradation of the land and reduced ability to support plant life.
- **Habitat Destruction**: The destruction of plant life due to erosion and the exposure of bare soil can lead to the loss of habitat for a wide range of wildlife, including insects, birds, and mammals that rely on the vegetation for food, shelter, and breeding sites.

3.7.2.2. Loss of Soil Fertility

The removal of soil and vegetation in open cast mining operations leads to a direct loss of soil fertility, which impacts both the local ecosystem and any agricultural land in the vicinity:

- **Nutrient Depletion**: Mining activities, especially when they involve stripping away large sections of the land, can deplete the soil of essential nutrients. The fertile topsoil, which is crucial for plant growth, is often removed, leaving behind poorer, less fertile soil or even barren land that cannot support plant life.
- **Chemical Contamination**: In many cases, mining can expose underlying layers of soil to toxic chemicals such as heavy metals or acids. These contaminants can spread to surrounding areas through runoff, making the soil toxic and unsuitable for both flora and fauna.
- **Disruption of the Nitrogen Cycle**: The disruption of soil structure and the removal of organic matter (such as decomposed plant material) can interfere with the nitrogen cycle, which is vital for soil fertility. Without proper nitrogen cycling, plants struggle to obtain the nutrients they need for growth.
- **Decline in Agriculture**: Fertile soil is essential for local agriculture, and mining activities that degrade the soil can render vast areas unfit for farming. This can result in food scarcity for both humans and animals that depend on these areas.

3.7.3. Pollution

Open cast mining poses significant threats to flora and fauna, particularly through various forms of pollution, which can degrade ecosystems, poison wildlife, and disrupt habitats. The pollution associated with open cast mining can come in several forms, including air, water, and soil pollution. How these types of pollution threaten plant and animal life, is being described as follows.

3.7.3.1. Air Pollution

Open cast mining releases various pollutants into the air, which can have severe effects on both flora and fauna.

- **Dust and Particulate Matter**: Mining activities, especially blasting and excavation, generate large amounts of dust. These fine particles can travel long distances and settle on plants, disrupting photosynthesis by blocking sunlight. For fauna, inhalation of dust can lead to respiratory issues, reduced mobility, and, in extreme cases, death.
- **Toxic Gases**: The combustion of fuels used in mining machinery and the extraction process can release toxic gases, including sulphur dioxide (SO_2), nitrogen oxides (NO_x), and carbon monoxide (CO). These gases contribute to air pollution, which can acidify rain and soil (acid rain), damaging plant life and affecting animal health. Acid rain harms plant roots, weakens trees, and reduces agricultural yields, while also disrupting freshwater ecosystems.
- **Heavy Metals in the Air**: Open cast mining can release heavy metals like mercury, arsenic, and lead into the air. These metals can settle on plants and soil, entering the food chain when consumed by herbivores or predators. Over time, this can lead to bioaccumulation, poisoning wildlife and potentially humans.

3.7.3.2. Water Pollution

As explained earlier, water contamination is one of the most significant environmental impacts of open cast mining, particularly in relation to aquatic ecosystems:

- **Acid Mine Drainage (AMD)**: One of the most damaging forms of water pollution caused by mining is acid mine drainage, which occurs when sulphide minerals in the rock are exposed to air and water during the mining process, producing sulfuric acid. This acid can leach into surrounding water bodies, lowering the pH and making the water toxic to most forms of life. Acidified water harms aquatic plants, disrupts fish reproductive cycles, and kills aquatic organisms by damaging their gills and altering their habitats.
- **Heavy Metals and Toxic Chemicals**: Mining processes often involve the use of toxic chemicals. These chemicals can leach into nearby rivers, lakes, or groundwater, poisoning aquatic species and disrupting ecosystems. For example, high concentrations of mercury in water can cause neurological damage to fish, amphibians, and other wildlife that depend on water sources.

- **Sedimentation and Siltation**: Open cast mining often involves the excavation of large amounts of soil and rock, which can result in sediment runoff into nearby water bodies. Excessive sediment can smother aquatic plants, disrupt the habitats of fish and invertebrates, and reduce the amount of oxygen in the water, making it difficult for many species to survive.
- **Altered Water Flow**: Mining can change the natural course of rivers and streams, affecting the water flow and altering aquatic ecosystems. For example, the creation of pits or dams to store wastewater can disrupt the migration paths of fish and other aquatic species. Changes in water flow can lead to habitat fragmentation, affecting biodiversity.

3.7.3.3. Soil Pollution

The pollution of soil from open cast mining can lead to long-term degradation of ecosystems in following ways:

- **Heavy Metal Contamination**: As with water pollution, heavy metals such as mercury, arsenic, and lead can contaminate the soil as a result of mining operations. These metals can remain in the soil for a long time and accumulate in plants, making the soil unsuitable for healthy vegetation growth. Herbivores that feed on contaminated plants can ingest these toxins, leading to poisoning and reduced reproductive success. Predators that consume contaminated herbivores can also be affected.
- **Chemical Spills and Leaks**: Mining activities can lead to the accidental release of chemicals. These chemicals can seep into the soil, further contaminating the environment and making it difficult for native plants to grow. Such contamination can also extend to surrounding agricultural areas, reducing crop yields and harming livestock.
- **Topsoil Degradation**: The stripping of vegetation and topsoil during open cast mining can leave the land barren and unable to support plant life. Even if the land is later rehabilitated, it may take years for the soil to recover in terms of nutrient content and structure.

3.7.3.4. Noise Pollution

Noise pollution is another consequence of open cast mining, which can disrupt local flora and fauna in following ways:

- **Disruption of Animal Behaviour**: Loud noises from blasting, machinery, and transport trucks can disturb wildlife, particularly species that rely on acoustic signals for

communication, mating, or navigation. Birds, amphibians, and mammals may abandon their habitats due to the constant noise, leading to displacement or stress-induced behaviours that reduce reproductive success.

- **Reduced Pollinator Activity**: Bees and other pollinators can be deterred by persistent noise pollution, which may affect their ability to find flowers and pollinate plants. This can disrupt plant reproduction and ultimately affect the entire food chain.

3.7.3.5. Light Pollution

In mining operations, artificial lighting can have a profound impact on surrounding ecosystems:

- **Disorientation of Nocturnal Animals**: Many species of birds, insects, and mammals are nocturnal and rely on natural light cycles for navigation, hunting, and mating. Artificial lights can disorient these animals, leading them away from their habitats or causing them to become easy prey for predators.
- **Impact on Plant Pollination**: Some plants rely on nocturnal pollinators like moths, bats, or certain species of insects. Excessive artificial lighting can interfere with these pollinators' natural patterns, disrupting plant pollination and reproduction.

3.7.4. Loss of Biodiversity

The loss of biodiversity due to open cast coal mining is a significant environmental concern, as these mining activities can have a profound impact on ecosystems, wildlife, and plant species in the surrounding areas. The modes in which the loss of biodiversity takes place can be summarized as under.

- Habitat destruction and fragmentation;
- Soil degradation and erosion;
- Water pollution and disruption of aquatic ecosystems;
- Air pollution and toxic contaminants;
- Disruption of ecological processes;
- Introduction of invasive species;
- Climate change impacts; and
- Endangerment of specific species.

3.7.5. Disruption of Ecosystem Services

Open cast coal mining has significant negative impacts on ecosystem services, which are the benefits that humans and other organisms derive from healthy ecosystems. These services include provisioning services (such as food, water, and raw materials), regulating services (such as climate regulation and flood control), cultural services (such as recreation and spiritual benefits), and supporting services (such as soil formation and nutrient cycling). Open cast coal mining disrupts many of these essential services, leading to far-reaching consequences for both the environment and human well-being.

3.7.6. Displacement of Wildlife

Displacement of wildlife due to open cast coal mining is a significant and often devastating consequence of this type of mining. It involves the large-scale removal of vegetation, soil, and rock to extract coal deposits, which can result in the direct destruction of natural habitats and lead to the displacement of wildlife species. This disruption can cause serious harm to biodiversity, ecosystem stability, and the survival of individual species. An in-depth look at how open cast coal mining leads to the displacement of wildlife and the resulting impacts is as follows.

3.7.6.1. Habitat Destruction and Fragmentation

Open cast coal mining involves the removal of large areas of land, including forests, grasslands, wetlands, and other critical habitats. This destruction is one of the primary drivers of wildlife displacement:

- **Loss of Primary Habitats**: The excavation of large pits for coal extraction directly destroys the habitats of a wide range of plant and animal species. For example, forests that provide shelter, food, and breeding grounds for mammals, birds, insects, and other species are cleared for mining operations. Species that rely on these ecosystems for their survival are forced to leave in search of new habitats, often with limited options.
- **Habitat Fragmentation**: Even if some areas of the landscape are left undisturbed, the creation of large mining operations often results in habitat fragmentation. This divides ecosystems into smaller, isolated patches, making it difficult for wildlife to move between habitats, find mates, or access essential resources such as food and water. Fragmentation can also hinder the genetic diversity of species by isolating populations.

3.7.6.2. Disruption of Migration and Movement

Many species, particularly migratory birds, large mammals, and amphibians, rely on seasonal or regular movement patterns to access feeding, breeding, or migration routes. Open cast coal mining can disrupt these vital movement corridors:

- **Barriers to Migration**: Open cast mining operations can obstruct natural migration routes for animals, especially in areas where large-scale excavation blocks rivers, forests, or mountain ranges. Migratory species such as birds, fish, and large mammals (e.g., elephants, tigers, or antelope) may be unable to cross mining areas, leading to population declines or the complete displacement of these species.
- **Increased Human-Wildlife Conflict**: As wildlife is displaced from their natural habitats, they are forced into human-dominated landscapes, such as agricultural areas, towns, or roads. This increases the likelihood of human-wildlife conflict, as animals search for food and shelter in areas where they may come into conflict with people, leading to the destruction of crops, livestock predation, or even death of the animals through poaching or vehicle strikes.

3.7.6.3. Pollution and Toxicity

Open cast coal mining can introduce a range of pollutants into the environment, including heavy metals, toxic chemicals, and sedimentation, which can displace wildlife in several ways:

- **Contamination of Water Sources**: Mining operations often contaminate nearby rivers, streams, and groundwater with pollutants such as heavy metals, chemicals used in processing coal (e.g., cyanide), and acid mine drainage. These pollutants can poison water sources that wildlife depend on for drinking, breeding, and feeding. Species such as fish, amphibians, and waterfowl may be displaced from polluted water bodies or die due to toxicity, and this contamination can extend to surrounding ecosystems as well.
- **Soil Contamination**: Mining activities can result in the contamination of soil with toxic chemicals, heavy metals, and other pollutants. This can harm plant life, which forms the basis of the food chain for many herbivores, and disrupt the entire ecosystem. Wildlife species that depend on these plants for food may be forced to move, further fragmenting their populations.
- **Air Pollution**: Dust, particulate matter, and gases (such as sulphur dioxide and nitrogen oxides) released during mining operations can degrade air quality and affect wildlife, especially species with sensitive respiratory systems. Pollutants can also settle on plants and

soil, further contaminating food sources and forcing animals to relocate to find cleaner habitats.

3.7.6.4. Loss of Food Sources

The destruction of plant life and the degradation of ecosystems caused by open cast coal mining result in a direct loss of food resources for many wildlife species:

- **Destruction of Vegetation**: Many herbivores and other species rely on specific plants for food. The removal of forests, grasslands, or wetlands during mining leaves these species without their primary food sources. Animals may be forced to migrate to new areas in search of food, often resulting in overcrowding or competition with other species.
- **Disruption of Food Chains**: Open cast coal mining can disrupt entire food chains by reducing the availability of plants (for herbivores) and prey species (for carnivores). For instance, the destruction of aquatic habitats can affect fish populations, which in turn affects bird species that rely on fish for food. In addition, the removal of vegetative cover can impact insects and smaller animals that are part of the food web.

3.7.6.5. Displacement Due to Noise and Disturbance

The noise and disruption caused by open cast coal mining can stress wildlife, displacing species that are sensitive to human activities:

- **Noise Pollution**: Open cast coal mining generates significant noise from activities such as blasting, excavation, and transport. Many species, particularly birds, mammals, and amphibians, rely on sound for communication, navigation, and mating. The loud noise produced by mining operations can disrupt these behaviours, causing species to abandon their habitats and move to quieter areas.
- **Human Activity**: The presence of mining workers, trucks, and machinery can make an area less hospitable for wildlife. Animals may flee to escape disturbance, or they may become stressed by the constant human presence, reducing their reproductive success or even leading to death from accidents or hunting. In some cases, wildlife may be directly displaced by the construction of mining infrastructure, such as roads or processing plants.

3.7.6.6. Increased Risk of Predation

Displacement due to mining activities can also increase wildlife vulnerability to predators:

- **Loss of Shelter**: When mining destroys forests or other dense habitats, animals lose cover from predators. Species that rely on dense vegetation or rocky areas for protection from predators may be forced into more open environments, where they are more vulnerable to predation.
- **Disrupted Predator-Prey Dynamics**: The disruption of ecosystems can alter predator-prey relationships. For example, if mining depletes prey species or alters the availability of food, predators may be forced to relocate, increasing competition among species and leading to further displacement or the decline of certain populations.

3.7.7. Changes to Local Climate and Microclimate

Changes to local and microclimates due to open cast coal mining are often significant and can have long-lasting environmental consequences. Open cast mining, by its nature, involves the large-scale disturbance of land, vegetation, and water systems, which can disrupt local weather patterns, temperature regimes, humidity levels, and even precipitation patterns. These changes can affect ecosystems, human communities, and wildlife in the mining region. Some of the aspects of how open cast coal mining can alter both local and microclimates are being described as under.

3.7.7.1. Temperature Changes

Open cast coal mining can lead to noticeable changes in local temperatures, particularly due to the removal of vegetation and soil, as well as the exposure of new surfaces:

- **Increased Surface Temperatures (Local Heat Island Effect)**: When vegetation (such as forests or grasslands) is removed to make way for mining, the land is often left barren or is replaced with barren, reflective surfaces (e.g., exposed rock, bare soil, or mining debris). These surfaces absorb and retain more heat than natural ecosystems, raising local temperatures. This phenomenon can contribute to a "local heat island effect," where the area around the mining site becomes significantly warmer than surrounding regions with intact vegetation.
- **Lack of Shade and Evapotranspiration**: Vegetation naturally provides shade and regulates temperature through evapotranspiration—the process by which plants release water vapor into the atmosphere, cooling the surrounding area. The removal of trees and plants for mining reduces this cooling effect, which can lead to higher temperatures in nearby areas. The reduced availability of vegetation also means less moisture is returned to the atmosphere, contributing to drier conditions.

- **Surface Reflectivity and Albedo Changes**: The exposed surfaces in mining areas (rock, sand, or bare soil) typically have a lower albedo, meaning they absorb more solar radiation rather than reflecting it. This leads to an increase in the local surface temperature. In some cases, large mining areas can significantly alter the heat balance of the region.

3.7.7.2. Disruption of Wind Patterns

The large-scale excavation and removal of land materials can also affect local wind patterns:

- **Wind Erosion and Dust Generation**: Open cast mining activities, such as excavation, transport, and blasting, create large amounts of dust and fine particulate matter that are carried by the wind. The presence of dust in the atmosphere can not only reduce visibility but also affect wind speed and direction. These changes can alter local weather patterns, creating micro-wind systems that can contribute to further desertification and soil erosion.
- **Altered Airflow**: The physical disturbance of land surfaces during mining can also change how air flows across the region. For example, the removal of vegetation and the flattening of terrain may lead to increased wind speeds in the mining area itself, while air turbulence could increase at the edges of mining sites. These disruptions can modify the local atmospheric conditions, affecting how heat, moisture, and pollutants are distributed in the region.

3.7.7.3. Changes in Precipitation Patterns

Open cast mining can influence precipitation patterns, particularly in areas with sensitive ecosystems:

- **Altered Rainfall Distribution**: The removal of vegetation and soil can influence the local hydrological cycle and alter precipitation patterns. Vegetation plays a crucial role in the water cycle, contributing to the regulation of rainwater absorption and evaporation. With mining activities disrupting these processes, it can lead to changes in the amount and timing of rainfall. For example, the absence of vegetation might reduce the rate of rainfall infiltration, causing more water to run off, leading to soil erosion and less moisture retention in the ecosystem.
- **Reduced Evapotranspiration**: As mentioned, the loss of vegetation due to mining reduces the process of evapotranspiration, which normally helps to release moisture into the atmosphere and form clouds. Without this process, the local air may become drier, reducing the overall humidity levels and potentially leading to a decrease in cloud formation

and rainfall. This could result in drier conditions in the area surrounding the mining site, especially in regions that are already prone to drought.

- **Changes in Microclimates Around Water Bodies**: Open cast mining often involves the alteration of riverbeds or the creation of artificial ponds, lakes, or tailing pools. These water bodies can affect local humidity and temperature levels. For instance, exposed bodies of water in hot climates may increase local humidity, potentially altering precipitation rates, while water bodies in cooler climates may lower humidity levels, affecting the local microclimate.

3.7.7.4. Reduced Local Humidity

Humidity levels in mining regions are often significantly reduced due to several factors:

- **Loss of Vegetation**: As forests, grasslands, or wetlands are cleared for mining, the moisture released by plants into the atmosphere via transpiration and evapotranspiration is significantly reduced. This leads to a decrease in local humidity, creating a drier microclimate.
- **Soil and Water Changes**: In many mining regions, the destruction of soil and water systems can make the environment drier. For example, the diversion of water courses, the contamination of groundwater, or the drying up of nearby wetlands can further reduce available moisture in the area, exacerbating drought conditions and affecting both plant and animal life.
- **Dust and Air Pollution**: The high levels of dust produced by open cast coal mining can further reduce humidity. Dust particles in the air can prevent moisture from condensing, leading to reduced cloud formation and precipitation. This creates a cycle where a drier climate makes the region more susceptible to further degradation.

3.7.7.5. Changes in Local Ecosystems and Biomes

The changes in temperature, humidity, and precipitation patterns due to open cast coal mining can also lead to broader shifts in local ecosystems and biomes:

- **Altered Vegetation Types**: The removal of native vegetation and the changes to local climate conditions can make it difficult for existing plant species to thrive. As a result, the types of plants in the area may change, often replacing native species with those that are more resilient to the new conditions (e.g., drought-tolerant or invasive species). This alters the entire ecosystem, affecting the animal species that depend on native plants for food and shelter.

- **Invasive Species**: Open cast mining can create conditions that favour the growth of invasive species. For example, the disruption of soil and climate conditions can weaken native plant communities, allowing non-native species to colonize the area. Invasive plants and animals often disrupt the local balance of ecosystems, reducing biodiversity and further altering the local microclimate.
- **Changes in Animal Behaviour and Distribution**: Many animals, especially those that are dependent on specific climatic conditions, may need to move from mining-affected areas to find more suitable habitats. These shifts in animal populations can lead to changes in the dynamics of predator-prey relationships, competition for resources, and overall biodiversity in the region.

3.7.7.6. Impacts on Human Communities and Agriculture

The local and microclimate changes caused by open cast coal mining can also have significant effects on human populations, particularly in rural or agricultural areas:

- **Impacts on Agriculture**: Alterations in local temperature and humidity can affect the growing seasons of crops, water availability, and the overall productivity of local agriculture. Changes in precipitation can lead to droughts or flooding, which may reduce crop yields, increase soil erosion, and make it difficult for farmers to maintain their livelihoods.
- **Human Health**: The increase in dust, pollutants, and the shift in temperature and humidity can affect the health of nearby communities. Dust and particulate matter in the air can contribute to respiratory diseases and cardiovascular problems. The altered climate conditions, such as increased temperatures, can also make the region more uncomfortable and difficult to live in, especially for vulnerable populations.
- **Water Shortages**: Reduced rainfall and the contamination of water sources can lead to water shortages for local communities. This can have direct consequences for drinking water availability, sanitation, and the health of residents.

3.7.8. Increased Human-Wildlife Conflict

Increased human-wildlife conflict due to open cast coal mining arises from the disruption of natural habitats, displacement of wildlife, and changes in local ecosystems caused by mining activities. As coal mining intensifies, wildlife is forced to move out of their natural habitats in search of food, shelter, and safety. This leads to an increase in interactions between humans and wildlife, often with negative consequences for both sides. These conflicts can result in economic

losses, threats to human safety, and harm to wildlife populations. A comprehensive description of how open cast coal mining contributes to human-wildlife conflict is as follows.

3.7.8.1. Habitat Destruction and Fragmentation

Open cast coal mining involves the large-scale removal of vegetation, soil, and rocks to access coal deposits. This disruption has several consequences:

- **Loss of Natural Habitat**: As forests, grasslands, wetlands, or other natural ecosystems are cleared for mining, animals lose their homes. Species that once thrived in these habitats may be forced to migrate to human-dominated landscapes in search of food, water, or shelter.
- **Fragmentation of Wildlife Corridors**: Even if some natural habitat remains after mining activities, it is often fragmented into smaller patches. These fragmented habitats make it harder for wildlife to migrate, find food, or find mates, often pushing them into urbanized or agricultural areas.

Thus habitat loss and fragmentation force wildlife to encroach on human settlements, resulting in increased human-wildlife conflict.

3.7.8.2. Displacement of Wildlife

Open cast coal mining directly displaces wildlife from their native habitats. This displacement can have the following effects:

- **Animals Moving to Human-Dominated Areas**: Many animals, particularly larger mammals may move into nearby human-populated areas. These species may venture into agricultural fields, towns, or even residential areas in search of food, water, or safe habitats.
- **Competition for Resources**: Displaced animals may face difficulty finding suitable food sources in human-dominated environments. As a result, they may raid crops, livestock, or garbage, leading to direct economic losses for farmers and ranchers. In some cases, they may even attack humans if they feel threatened or cornered.
- **Increased Vulnerability of Species**: Displacement often leads to increased vulnerability to predation, road accidents, and hunting. For example, large herbivores displaced by mining might end up in agricultural fields where they are at risk of being killed by farmers defending their crops. Similarly, smaller animals may fall prey to domestic predators like dogs or cats.

3.7.8.3. Altered Movement Patterns

The destruction of habitats and the creation of mining infrastructure (e.g., roads, railways, and processing plants) can disrupt wildlife movement and migration:

- **Barriers to Movement**: Mining areas can create physical barriers, such as roads and mining pits, that prevent wildlife from accessing their traditional migration routes or seasonal habitats. For species that rely on migration for food or reproduction (e.g., certain bird species, large herbivores, and amphibians), these barriers can lead to overcrowding in remaining habitats or force them into closer contact with human settlements.
- **Increased Human-Wildlife Interaction**: As animals are forced to cross roads, enter populated areas, or adapt to new environments, they are more likely to encounter humans. This may result in direct conflicts, including vehicle collisions, crop damage, or predation of livestock.

3.7.8.4. Increased Risk of Disease Transmission

Displaced wildlife may come into closer contact with human populations, livestock, and domestic animals, increasing the risk of disease transmission:

- **Zoonotic Diseases**: When wildlife are displaced from mining areas, they often come into contact with domestic animals, livestock, and human populations. This can facilitate the transmission of zoonotic diseases (diseases that can spread between animals and humans). This increases the public health risk in mining regions.
- **Spread of Disease to Wildlife**: Conversely, domestic animals (including pets and livestock) can also spread diseases to wildlife. The interaction between wildlife and humans can exacerbate the spread of disease, harming local wildlife populations, some of which may already be endangered.

3.7.8.5. Economic Losses Due to Crop Raiding and Livestock Predation

As wildlife is displaced by open cast coal mining, they are often forced into agricultural areas where they may damage crops or prey on livestock:

- **Crop Raiding**: Displaced herbivores such as elephants, wild boars etc. may raid crops, causing significant economic losses for farmers. In some cases, large animals like elephants, which are displaced by mining activities, may destroy entire fields of crops. This leads to frustration and anger among farmers, which may result in retaliatory killings of these animals.

- **Livestock Predation**: Carnivorous animals may prey on livestock when their natural food sources are disrupted by mining activities. This can result in financial losses for farmers and create tension between local communities and wildlife conservation efforts. In regions where livestock farming is a primary livelihood, these conflicts can escalate into deadly encounters between humans and animals.

3.7.8.6. Increased Risk to Human Safety

As displaced wildlife venture into human-populated areas, they may pose direct threats to human safety:

- **Animal Attacks**: Larger animals may attack humans if they feel threatened, cornered, or are hungry. In regions where open cast coal mining displaces these animals, human-wildlife encounters become more frequent and dangerous. Additionally, herbivores like elephants may cause harm when they feel threatened or are startled, especially when humans inadvertently get too close.
- **Vehicle Collisions**: Animals, especially large mammals such as wild boars and elephants, are often killed or injured in vehicle collisions when they move into or across roads near mining areas. Increased traffic in these areas, as a result of mining operations, heightens the risk of these collisions, leading to fatalities for both animals and humans.

3.7.8.7. Psychological and Emotional Stress

In addition to the physical and economic impacts of human-wildlife conflict, there are psychological and emotional stresses placed on communities that live near mining operations:

- **Fear and Anxiety**: Communities living near mining sites may experience fear and anxiety due to the increased presence of large or potentially dangerous wildlife in their neighbourhoods. The fear of animal attacks can create an atmosphere of tension and distrust, particularly if previous incidents of wildlife attacks have occurred.
- **Impact on Well-being**: The stress of dealing with crop loss, livestock predation, and the general fear of wildlife encounters can reduce the quality of life for those living in or near mining areas. The loss of traditional livelihoods (e.g., agriculture or pastoralism) due to wildlife interference may also contribute to economic hardship, further exacerbating social challenges.

3.8. PROBABLE INCREASE IN THE VEHICULAR TRAFFIC AND ITS IMPACT

According to EIA Study, coal from the Pachhwara South mines shall be transported through lease road & village road connecting to the NH-114A. The heavy vehicles like 35-40T capacity truck /tippers shall ply on the road for initial 5 years from commissioning of the mining activity, thereafter conveyor system shall be implemented for transportation of coal up to Railway siding.

The traffic count was monitored continuously for 24 hours from 7.00 AM of 16th Dec., 2020 to 7.00 AM of 17th Dec., 2020, once in the entire study period. The traffic survey was done for both way movement of vehicles categorized into heavy vehicles (truck, bus, trailer, Lorries/ multi axle etc.), Cars, Light Commercial Vehicles (LCVs) (four wheelers pick up vans, pickup trucks, mini trucks, matador, jeep etc.), three wheelers (auto, tempo, etc.) and two wheelers (motorcycle, scooter etc.). Cumulative impact for existing traffic density was studied and found within the limit as per the IRC standard. Traffic density after start of Pachhwara South Coal Mine Project is also estimated on assumption basis and found as 11,357.82 PCU (Passenger Car Equivalent or Passenger Car Unit) which is also within the prescribed standard for two lane NH. (two lane road which is supposed to take a maximum traffic load of 15,000 PCU per day as per as per IRC : SP:73-2007 standards).

It is to be noted that when all the three mines (Pacchwara S, Pachhwara N and Pachhwara Central) will operate with their peak rated capacity, the existing road may not be sufficient for traffic load. As planned by the project proponents of all three mines, coal will be despatched to Railway siding through conveyor system when mines will achieve peak rated their capacity. Thus, traffic density due to coal transportation will be remain unchanged or shall be lower than the estimated PCU.

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4. OBJECTIVES OF MANAGEMENT AND STRATEGIES TO ADDRESS THE WILDLIFE CONSERVATION ISSUES

In this chapter, the objectives of management and strategies to address the issue of wildlife conservation both within the Project/Lease Area and outside the Project Area but limited to the delineated Impact Area shall be discussed. The development of elephant migration path within and beyond the Impact Area, as mandated by the Ministry under Stage-I approval to the Project, shall be discussed in a separate Chapter.

4.1. OBJECTIVES OF MANAGEMENT AND STRATEGIES WITHIN THE PROJECT AREA

The following objectives of management are being identified under this Plan to address the wildlife conservation issues within the Project Area:

(a) Protection of wild animals within the Project Area.
(b) Implementation of mitigation measures as specified under the Environmental Management Plan (EMP) approved while granting Environmental Clearance to the Project (**Described in detail in Chapter 5**).
(c) Development of habitat in such a way that after mine closure the project area could again be brought back to a semblance of its present configuration.

4.2. OBJECTIVES OF MANAGEMENT WITHIN THE IMPACT AREA

The following objectives are being identified under this Plan to address the wildlife conservation issues within the Impact Area:

(a) To conserve and sustainably manage the biodiversity and ecosystem of the Project Impact Area
(b) To maintain and restore the natural, biological and physical attributes within the Impact Area.
(c) To restore and enhance the productivity of the depleted habitat so as to provide adequate food, water and cover to the wild animals.
(d) To provide suitable habitat for spillover population of wild animals from Project Area to Impact Area as well as from Impact Area to neighbouring forest areas outside.
(e) To provide a relatively stress-free habitat to wildlife in the Impact Area that would be capable of meeting the basic needs of resident/migrant wildlife.
(f) To augment the hydrological regime in the Impact Area through Drainage Line Treatment (DLT) and appropriate measures for soil and moisture conservation.
(g) To effectively control incidences of forest fire in the Impact Area and surrounding forests.

(h) To provide for participatory eco-development inputs to local stakeholders for reducing their resource dependency on forests and for eliciting their support towards conservation needs of the area.
(i) To minimize existing human-elephant conflict
(j) To provide for suitable measures towards protection of forests and wildlife from unsavoury elements.
(k) To enhance the level of awareness for biological conservation amongst the relevant stakeholders including younger generation and students.
(l) To improve managerial and technical capacity of the frontline forest staff through appropriate training programs with special emphasis on implementation of the Plan.
(m) To provide the frontline forest staff with required resources and infrastructure to help implement the Plan.

4.3. OBJECTIVES OF MANAGEMENT AND STRATEGIES OUTSIDE THE IMPACT AREA

This segment shall exclusively deal with the strengthening of such areas, which are generally taken as pathways by elephants during their migration, by planting suitable species so as to make available an amenable habitat for elephants. This is expected to go a long way in minimising the human elephant conflict. In this backdrop, following objectives of management are being laid down:

(d) To identify areas/migration paths which have historically been frequented by elephants.
(e) To identify the ways and means of habitat development over such areas.
(f) To develop the existing water bodies and creation of fresh water bodies in such areas.
(g) To put in place infrastructure in such areas so as to minimise human-elephant conflict.

4.4. MITIGATION STRATEGIES WITHIN THE IMPACT AREA

To facilitate smooth implementation of the Plan, the different activities have been divided into following broad heads as follows.

(A) Habitat Management;
(B) Enrichment of the Elephant Movement Path (dealt with separately under Chapter 6);
(C) Human-Elephant Conflict Management;
(D) Awareness Development Programmes;
(E) Capacity Building of the Frontline Forest Staff;
(F) Development of Alternative Livelihoods;
(G) Promotion of Renewable/Alternative Energy Consumption;
(H) Development and Implementation of Appropriate Monitoring and Evaluation System; and

(I) Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan

4.4.1. Habitat Management

Controlling or arresting wildlife habitat loss and fragmentation is critical for preserving biodiversity and ensuring that ecosystems remain functional. Habitat loss and fragmentation are major drivers of species decline and extinction, contributing to the loss of essential ecosystem services such as pollination, water purification, and climate regulation. The instant Plan proposes to implement following activities in order to mitigate wildlife habitat loss and fragmentation:

4.4.1.1. Strengthening of Forest/Wildlife Protection Network in active partnership with JFMCs

Joint Forest Management (JFM), a community-based approach to forest and wildlife conservation, is being practiced in the Impact Area. Under this model, local communities, particularly forest-dependent people, collaborate with the government and forest departments in the protection, management, and sustainable use of forest resources.

Though the institutional framework is in place, yet a dire need is being felt to further strengthen the framework so as to enable even better outcomes. With the coal mining project becoming operational, it would further require strengthening of the JFMCs in order to get desired level of conservation goals.

The challenges and issues involved would largely veer around the following:

- **Conflict of Interests**: Balancing the needs of local communities with those of conservation can be difficult. Communities might rely heavily on forests for their livelihoods, while conservation requires limiting certain activities like felling of trees or grazing.
- **Capacity Building**: Communities generally lack the necessary technical knowledge to manage forests sustainably. This can be addressed through training programs, but such capacity-building efforts need to be sustained over time.
- **Market Forces and External Pressures**: Commercial pressures such as logging, mining, and agricultural expansion can undermine the efforts of JFMCs. External actors may exploit resources in ways that undermine the local conservation efforts or create conflicts within the community.

In order to meet these challenges, seed money may be provided to the JFMCs and proper training may be scheduled from time to time. Also, necessary infrastructure should be created. Further, the Committees must be allowed to benefit from forest resources in a sustainable manner. This can include non-timber forest products (NTFPs) like fruits, nuts, mushrooms, or honey, as well as ecotourism and employment opportunities from forest management and protection. Creation of alternative livelihoods, being dealt with separately under this plan, also has a tremendous potential towards meeting conservation needs of the area.

4.4.1.2. Anti-Depredation-cum-Patrolling Squad

One of the objectives of the Plan is to provide suitable habitat for spillover population of wild animals from Project Area to Impact Area as well as from Impact Area to neighbouring forest areas outside. Since the forest located in the impact area is vulnerable to illegal activities it requires constant patrolling and monitoring. Notably, the forest divisions are acutely deficient in manpower infrastructure. Hence, the Plan proposes to deploy patrolling staff on daily-wage basis. Also, to strengthen the existing infrastructure for patrolling, it is being proposed to purchase patrolling kits like water-proof back pack, camouflage raincoat, binoculars etc., mobile sets and patrolling vehicles.

4.4.1.3. Forest Fire Control and Management

Forest fires in the Impact Area have been a recurring problem, especially during the dry season. Since the area is dominated by forest cover, the forest fires pose a significant threat to both the environment and the people living in and around forest. While some fires are natural, many are human-induced and exacerbated by seasonal conditions. Effective management of these fires requires a combination of proactive measures, including better community awareness, forest management practices, technological intervention, and government support. The response and management of such incidents has the following dimensions:

(a) Forest Fire Prevention and Control:

- **Firebreaks and controlled burns**: Firebreaks are strips of land cleared of vegetation to prevent the spread of fires. In some cases, controlled or prescribed burns are used to reduce the amount of fuel in forests and prevent large-scale wildfires.
- **Fire lines and watchtowers**: Fire lines (cleared paths) and fire watchtowers are erected in vulnerable forest areas to monitor and control the fires as soon as they start.

- **Deployment of fire-fighting teams**: In areas with high fire risk, fire-fighting teams are trained and equipped to respond quickly when a fire breaks out. The Forest Department and local authorities are sometimes assisted by local communities in fire control efforts.

(b) Community Involvement:

- Involving local communities in fire management is essential. Awareness programs educating people about fire risks and the importance of controlled burns and responsible farming practices can reduce the occurrence of accidental fires.
- Joint Forest Management (JFM) committees, which include local villagers and forest officials, have been successful in mitigating forest fires by fostering cooperation and better management of forest resources.

(c) Technological Intervention:

- The use of satellite imagery and drones to monitor fire-prone areas can provide early warnings and help in rapid response. Real-time data can assist in coordinating firefighting efforts and managing resources effectively.
- Mobile apps and helplines for reporting fires may also be implemented in some areas to help community members quickly alert authorities to fire outbreaks.

4.4.1.4. Enhancement of Soil and Moisture Regime

Soil and moisture are fundamental components of healthy ecosystems, and they directly influence the survival, growth, and reproduction of plant and animal species. The loss and fragmentation of wildlife habitats are two of the most significant threats to biodiversity. A degraded soil and moisture regime often exacerbates these issues, making ecosystems more vulnerable to climate change, human activities, and invasive species. Therefore, enhancing the soil and moisture regime is a critical strategy for curbing habitat loss and fragmentation, and promoting biodiversity conservation.

Healthy soils and adequate moisture are fundamental to maintaining vegetation, which in turn supports diverse wildlife populations. By implementing practices such as ecosystem restoration, sustainable agriculture, efficient water management, and invasive species control, it is possible to reverse the trends of habitat degradation and fragmentation. These actions not only support biodiversity but also improve ecosystem services like water regulation, carbon storage, and soil fertility—contributing to more resilient ecosystems in the face of climate change.

As regards the instant Wildlife Conservation Plan, it may be noted that in compliance of one of the conditions laid by MoEF&CC towards Forest Clearance to Pachhwara South Coal Mining Project, a dedicated Soil and Moisture Conservation Plan has been prepared for the same Impact Area. Therefore, measures towards soil and moisture conservation within the Impact Area is not being included in the instant Plan.

4.4.1.5. Removal of Invasive Species

The removal of invasive species is a crucial aspect of biodiversity conservation and ecosystem management. While the process can be resource-intensive and challenging, the benefits of protecting native ecosystems, reducing economic losses, and enhancing resilience to climate change makes it an essential strategy in environmental management.

There are various methods for removing invasive species, each with its own advantages and limitations. These methods can be broadly categorized into manual/mechanical, chemical, and biological approaches. However, the Impact Area can be better handled by adopting the manual/mechanical method which is being described as follows:

- **Hand Pulling**: For small-scale infestations or herbaceous plants, manually pulling the species from the soil (with the root system intact) is an effective method. This works well for invasive weeds and young plants.
- **Cutting or Mowing**: Invasive plants can be cut down or mowed before they have a chance to flower and set seed. This method may require repeated efforts, especially for perennial species, to weaken the plants and reduce their reproductive capacity.
- **Digging and Excavation**: For more persistent or larger species, excavation or digging up the roots can be effective, particularly for non-woody plants or invasive shrubs. However, this can be labour-intensive.
- **Mechanical Removal**: In large-scale infestations, machinery like bulldozers, backhoes, or specialized equipment like weed harvesters may be used to remove invasive species.

4.4.1.6. Grassland Development

Grasslands are vital ecosystems that support a diverse array of wildlife, and their development or conservation plays a crucial role in maintaining biodiversity. Grasslands host a wide range of species, many of which are specially adapted to these habitats. Many species of wildlife including various bird species rely on grasslands for food, shelter, and breeding grounds. Development and management of grassland ecosystems help protect both common and endangered species that depend on these landscapes.

Some degraded areas within the Impact Area are fit to be developed as grasslands. However, it would not be possible to find large stretches in the Impact Area which could be considered for grassland development. Therefore, small areas in scattered manner would be identified for this activity. In fact, many such areas have been degraded by agricultural activities or invasive species. Restoring grasslands can bring back habitats for wildlife. For example, the re-establishment of native grasses can provide food and nesting sites for birds, small mammals, and pollinators.

4.4.1.7. River/Stream-side Plantation

Plantation along streams/rivers in the area which are generally subject to heavy erosion along their banks could be one of the methods to stabilize the stream banks. Further, such plantation around the newly created/renovated (desilted) ponds/percolation tanks/check dams can serve the purpose of arresting the erosion around the water structures. Such plantation would also serve the aesthetic/cultural/religious purpose too.

4.4.2. Human-Elephant Conflict Management

Human-Elephant Conflict (HEC) is a significant issue in Jharkhand and the Impact Area is no exception. The state is home to a sizable population of wild elephants, primarily in its forests and hilly regions, which frequently overlap with agricultural land, settlements, and infrastructure. As human settlements expand and agricultural practices intensify, conflicts between humans and elephants have become more frequent, leading to significant loss of life and property on both sides, as well as severe impacts on elephant populations.

Effectively managing HEC requires a multi-pronged approach involving better planning, community engagement, preventive measures, and habitat restoration.

Apart from initiatives already in place by the State Forest Department, some of the management strategies which require further to be strengthened in order to effectively mitigate HEC are being enumerated as follows.

4.4.2.1. Early Warning Systems and Rapid Response Teams

Early warning systems can help alert villagers to the presence of elephants near their settlements. This can be done through community-based monitoring, using trained elephants, drones, or camera traps to track elephant movement. This may be more effectively done in coordination with the neighbouring areas at intra-division as well as inter-division levels.

Rapid response teams should be trained and equipped to quickly intervene when conflicts arise. These teams can guide elephants back to forests or use non-lethal methods (e.g., noise makers, firecrackers) to deter elephants from entering human settlements.

4.4.2.2. Crop Protection Measures

Farmers can be provided with crop protection tools such as flashlights, firecrackers, or noise-making devices to scare elephants away from their fields.

Scarecrow methods, like placing reflective materials or loud sound generators in fields, can also be effective in preventing elephants from raiding crops.

4.4.2.3. Community Engagement

Raising awareness about human-elephant conflict and promoting coexistence is essential for long-term success. Communities should be educated on how to prevent conflicts, recognize elephant behaviour, and respond appropriately in a safe manner.

Training local communities in sustainable farming practices that do not attract elephants, such as avoiding certain crops that are particularly attractive to elephants, can reduce the likelihood of crop raiding.

4.4.3. Awareness Development Programmes

Awareness amongst villagers and other stakeholders towards the importance of wildlife conservation issues is one of the most important aspects of the success of any plan intended to arrest degradation of forest & wildlife ecosystem of any area. However, the traditional knowledge of the villagers towards these issues cannot be ignored. The senior citizens of the villages generally have tremendous understanding of the importance of conservation of forest and wildlife. But the younger generation more specifically needs to be sensitized towards the perils of not paying adequate attention to conservation needs.

Some of the activities identified to meet the abovesaid objectives are:

- Organising regular educational and sensitisation meetings to enhance community awareness on forest and wildlife conservation in general;
- Organising meetings/workshops to raise awareness amongst villagers about elephant behaviour and possible steps that could be taken by them to minimize the damage of life and property due to elephants;

- Organising outreach programmes in village schools so as to enhance awareness amongst children.
- Helping schools to organize nature camps, field trips to some wildlife sanctuary.
- Organising interactive activities like tree planting, wildlife documentary shows in schools, poster competitions etc.
- Establishing Eco Clubs in schools.
- Strengthening the capacities of communities, corporates and other stakeholders in the conservation and management of forest and wildlife;
- Involving JFMCs in awareness campaigns.
- Organising marches with the help of community leadership etc.

4.4.4. Capacity Building Programmes for Frontline Forest Staff

Implementation of Conservation initiatives under this Plan has to be carried out by the frontline forest staff under the overall supervision of the forest officials of Dumka/Godda Forest Division. Though the frontline forest staff is trained for implementation of similar programmes, yet the need of further specialised training is being felt. Needless to mention here that capacity building is also important for maintenance of common goods created during the implementation of the Plan.

The Impact Area constitutes a part of Kathikund & Hizla West ranges of Dumka Forest Division and Godda and Sundarpahari Ranges of Godda Forest Division. However, to ensure efficient and effective implementation of wildlife conservation programmes in other areas of the forest division in future, it would be more appropriate to involve all the frontline forest staff of the two divisions in capacity building initiatives under this Plan.

With the aforesaid objectives in mind, training and workshops with hands-on field exercises are being proposed to be taken up under this Plan. The workshops shall be organised at division level as well as at the range level. The divisional forest administration shall have the liberty of selection of individual trainers and institutions/organizations to be roped in capacity building programmes. The structure of the programmes may be decided in active participation of all the stakeholders.

The activities/areas proposed for capacity building of the forest frontline staff may include the following:

- Workshops at division and range levels;
- Structured training on various activities proposed under the Plan;

- Demonstration of various technological aspects such as Remote Sensing and GIS tools to the staff. The remote sensing products such as land use/land cover maps, NDVI maps for baseline, mid-term and end of the project period shall help in understanding the impact of the project;
- Exposure Visit of the staff to the areas successfully treated;
- Publication and use of mass media to build awareness over larger community and wider areas.
- Recent trends in wildlife management
- Protocols to be followed while handling wildlife crimes viz. search, seizure, investigation etc.
- Techniques of Forest Fire Control
- Recent Plantation techniques
- Principles and practices related to biodiversity conservation
- Camera-trapping
- Sign-surveys
- Animal tracking
- Animal/reptile capture and release
- Conflict mitigation
- Wildlife behaviour
- Use of GPS and mobile applications in wildlife monitoring

4.4.5. Development of Alternative Livelihoods

Both Dumka and Godda districts are largely characterised as rural districts as most of the population resides in villages. Agriculture is the predominant activity in the districts and is the means for livelihood for about 80% of the population. The pattern of agriculture practices in the district is mono crop because of rain fed farming. The dependency on rainfall for agriculture purposes is evident from the fact that almost all area is dependent on rain for agriculture purpose.

Alternative livelihoods can be defined as livelihood activities that supplement people's basic income. These activities usually depend on people's spare time, their skills, resources and art. A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Issues such as capacity building, transfer of appropriate management practices, and strengthening community-based organizations come to mind. In our

case JFMCs are the most crucial entities which could play a pivotal role in development of sustainable alternative livelihood options.

During field survey exercise conducted during the formulation of the instant Plan, some of the livelihood options identified are being enlisted as under:

- Sal Plate making;
- Bee keeping;
- Mushroom cultivation;
- Orchard creation;
- Distribution of vegetable seeds kits;
- Establishment of Village Nurseries;
- Vermicomposting;
- Poultry farming;
- Development of fisheries;
- Distribution of Sewing machines and training;
- Training in Computers etc.
- Training in vehicle driving etc.

These activities have been identified in active consultation and participation of the local villagers. The infrastructure as well as training etc. required to build on such infrastructure shall be provided by the Forest Department so as to make the system sustainable. However, it may be noted here that the activities may not be limited to the aforesaid categories. It could be further diversified to include other activities as well in consultation with the stakeholders.

4.4.6. Promotion of Alternative Energy Consumption

Provision of solar powered street lights in villages and distribution of solar lanterns shall be taken up to enhance the living standards of villagers.

Wood, agricultural residues and cattle-dung cakes are the primary energy sources for cooking in rural areas. Traditional chulhas, commonly in use in rural areas, however, are inefficient and environmentally undesirable. In contrast, improved chulhas are scientifically designed for optimal regulation of heat flow and better fuel utilization. Improved chulhas have heat transfer efficiency of 20-35% as compared to 8-10% in case of traditional chulhas. Therefore, supply of Improved Chulhas (Cook Stoves) amongst villagers is being considered as appropriate intervention in order

to conserve available bio-resources of the area. It would be pertinent to mention here that providing LPG connection to villagers has not proved to be a sustainable approach as the villagers generally are not in a position to afford the high prices of cooking gas cylinders.

4.4.7. Development of Appropriate Monitoring and Evaluation System and Implementation thereof

Monitoring is a process of continuous assessment of plan/project activities in the context of implementing schedules. It takes care of day-to-day progress and management of the project. It is the regular observation and recording of activities taking place in the project and also a process of routinely gathering information or data on all aspects of the project. It involves checking on how the project activities are progressing. The gathered data are used in making decisions for improving project performance.

Evaluation gathers information from the observed data on monitoring and these are presented in a form which is easy to understand. Evaluation may require some additional studies to obtain data which are available for monitoring.

Numerous monitoring tools may be considered to determine the values of indicators over time. Some of the commonly used tools are as follows:

- Community workshops arranged to evaluate the extent of performance and achievement.
- Community may evaluate some appropriate technical indicators.
- Geographical information system (GIS)
- Observation and measurements of field indicators like species composition, forest cover, wildlife census, poaching data etc.
- Remote sensing satellite imaginaries and aerial photographs of the treated area taken before the implementation of the Plan and thereafter periodically.
- Video monitoring

Evaluation of the Plan is a multi-dimensional task which is generally performed at different times during the implementation of the Plan. Typically, quantitative evaluations reflect a simplistic view that reality takes a single form that can be perceived and measured objectively. On the other hand, qualitative evaluations reflect a more constructive view, implying that reality can have multiple versions. It has been found better to mix both the qualitative and quantitative methods of evaluation. This comes from the fact that purely quantitative and purely qualitative approaches to

the program evaluation, both have limitations. The strengths of each evaluation often compensate for the weaknesses of the other evaluation.

The quantitative evaluation attempts to attribute changes in various outcome variables to the treatment and determine whether such effects are statistically significant. An experimental approach is often considered as an acceptable standard for quantitative evaluation of conservation programs. Yet, in many cases the results of such a study may not extrapolate beyond the project examined.

There are many situations wherein an experimental approach to quantitative program evaluation may not be possible. In such situations, various approaches have been used, each with their own strengths and limitations.

The first approach is called a "before/after" study. The evaluator measures the levels of outcome indicators in the area before and after the treatment. This is a fairly weak but feasible approach that involves an unlikely assumption that there have been no other significant changes during the study period. A second approach consisting of a "with/without" study, is useful when no baseline data are available.

Thus, there are clearly multiple challenges associated with using quantitative evaluation methods for evaluation of a project involving catchment area treatment. Most challenges are introduced by the fact that wildlife conservation projects are not amenable to the same controlled conditions as in the experiments which provide the data for a simplistic analysis.

In contrast to quantitative evaluation, qualitative evaluators typically place less emphasis on measurement and more on context and on understanding the subtle manifestations. In general, a qualitative approach tends to be flexibly structured and uses open-ended questions in an inductive fashion. The objective is not to obtain a numerical estimate of some phenomenon, but to develop an in-depth understanding of an issue by probing, clarifying, and listening to stakeholders talk about a topic in their own words. The in-depth nature of the qualitative approach means that a study's scale is usually smaller than that found in quantitative research.

As with quantitative evaluation, sampling issues in qualitative evaluation also raise questions about biases in data. While quantitative researchers use random sampling whenever possible, qualitative researchers use several strategies to increase the internal validity of their findings. In qualitative evaluation, data collection and analysis become inseparable; as such evaluators collect much of the data themselves, rather than relegating this task to field assistants.

As for the stages of plan evaluation, commonly four stages are prescribed in standard project evaluation methods:

(a) Baseline Evaluation: This is evaluation at the initial stage. The data on the indicators are used as benchmark for evaluation. A reliable baseline data on different selected parameters is provided for this evaluation.
(b) Mid-term Evaluation: This evaluation is proposed to be done in the middle of the plan implementation. The purpose of such mid-term evaluation is to check the effectiveness of each individual activity. This evaluation quantifies the short and mid-term benefits of the project.
(c) Terminal Evaluation: This evaluation shall be done at the end of the plan period. It indicates the efficiency of project implementation, accuracy of the project estimates, etc.
(d) Post-Terminal Evaluation: This evaluation may be carried out after 5 to 15 years of the end of the plan period. Long-term effects and impacts become visible in this post-terminal evaluation. However, as far as the instant plan is concerned, this evaluation may not be possible and even if it is taken up, the results would not reflect the reality for the reason that the Impact area may be subject to similar other interventions through different schemes of the Forest Department.

4.4.8. Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan

Under this head following are being proposed under the Plan:

- Purchase of Drone System and other equipment like GPS, Mobile phones, instruments meant for monitoring wildlife, Fire control gear etc. and equipment used in wildlife capture viz. cages, snake catching gear etc. as per requirement.
- Purchase software, hardware; development of mobile applications etc.
- Engagement of IT/GIS professionals at the division level.
- Other infrastructural development activities etc.

The detailed Plan under this head shall be chalked out by the concerned DFO as per need assessment and the sub-components of this head shall not be restricted to the abovementioned subjects only.

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5. MANAGEMENT INTERVENTIONS TO BE CARRIED OUT BY THE PROJECT PROPONENT WITHIN THE PROJECT AREA

This chapter shall exclusively deal with the interventions mandated to be carried out by the Project Proponent/User Agency within the Lease area in order to mitigate the environmental impacts of mining activities with respect to forests and wildlife. In this connection it would be pertinent to mention that the project falls under Category 'A' and therefore, in pursuance of procuring Environmental Clearance for the project, EIA/EMP Report has been prepared by M/s Centre for Envotech & Management Consultancy Pvt. Ltd., Bhubaneshwar in accordance with guidelines laid down under EIA Notification, 2006. The objects of the said EIA Report includes, amongst other things, the following:

- To identify and quantify the impacts of activities at the mine on various Environmental attributes.
- To evaluate the anticipated pollution and prepare Environmental Management Plan (EMP) by describing various control measures to be adopted for mitigation of adverse impacts.

5.1. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to evaluate various environmental impacts likely to be caused due to opencast mining activities for excavation of Coal over an ML area of 714.8553 ha in Pachwara South Coal Mine project, the EIA Study has been carried out to assess the existing environmental scenario through generation of different baseline data on various environmental attributes. Chapter 3 of the EIA Report outlines the present environmental setting of the project site and its surroundings.

Chapter 4 of the Report attempts to scientifically evaluate various impacts that are likely to influence the present environment on different environmental parameters viz. topography and drainage, land, water, noise, air, ecological and socio-economic conditions. Also, the mitigation measures have been worked out with a view to bring down the levels of impacts within limits. In each of the areas of impact, measures have been proposed to mitigate adverse impacts and where these are beneficial in nature such impacts are proposed to be enhanced/augmented so that the overall adverse impacts are reduced to substantial extent.

5.1.1. Air Pollution Mitigation

The preventive measures proposed to be undertaken by the mining company during various mining related activities are being detailed in the following paras.

5.1.1.1. Drilling Operation

Dust emanated during drilling operation could be reduced by:

- Providing drills with dust arrester or collector.
- Proper maintenance of drill bits.
- Sprinkling of water before and after drilling in dry seasons.
- Dust generation would also be reduced by using sharp drill bits for drilling holes and drills with water flushing system.
- Drill operators will be provided with dust mask, if necessary, to minimize the impact of air pollution on the workers.

5.1.1.2. Blasting Operation

Generation of dust during blasting would be minimized by taking the following measures;

- Proper burden and spacing of blast hole.
- Proper charge per delay.
- Water shall be sprayed at Quarry Faces before and after blasting.

5.1.1.3. Loading and Transportation

To minimize the adverse impact on air quality due to loading/unloading and transportation the following measure are proposed:

- The un-metalled service roads are proposed to be metalled or adequately compacted before being put into use.
- Overloading of vehicles will be avoided as spillage generates dust.
- Trucks carrying coal will be covered with tarpaulin sheets to prevent fugitive dust generation.
- Continuous cleaning of haul roads & regularly filling of pot holes.
- Water sprinkling during loading, unloading and transportation in the haul roads.
- All the fossil fuel consuming vehicles & equipment shall be properly maintained as per the guideline of the manufacturer to keep the SO_2 & NOx level within the limit.
- Vehicles having 'Pollution Under Control (PUC) Certificate' will be engaged in the mines.

5.1.1.4. Dumping Area

Once the overburden dump has reached its designed size, Coir matting will be adopted. Jute mat/coir netting of about 25 mm X 25 mm mesh size shall be laid on slopes and anchored by pins on levelled surfaces to prevent displacement and to have intimate contact. The mat/net shall be covered with 80 mm thick good agricultural soil mixed with fertilizer, pesticides and saw dust/hay as base for vegetation along with seeds of Grass-Legume mixture.

Grasses like Stilohamata and Cynodon with Baugenvillia are quick growing to provide biomass, have the ability to survive on toxic waste material and tolerant to adverse pH, extremely low nutrient conditions and toxic metals. Extensive root system of these species holds loose soil particles and prevents soil erosion while enhancing productivity to a sustainable level. On the other hand, legumes are drought tolerant, perennial, fast growing and enrich nitrogen in derelict sites. Some common species like, Stylosanthes humilis, Stylosanthes hamata, Sesbania sesban, Crotalaria sp., Desmodium sp. etc. are proven to be excellent nitrogen fixing legumes. At the end of growing season, grasses eventually dry to form mulches which conserve moisture. Moreover, dry mulch decomposes to form humus & organic matter which initiate nutrient cycling on the derelict sites. Legumes, being perennial, also conserve moisture, accrete organic matter & create a nitrogen rich substrate for the soil by decomposition of their subterranean parts. This not only stops erosion of soil by wind or rain and help to maintain uniform moisture content of the soil underneath but also helps in growth of shrubs & trees species.

5.1.1.5. Haul Road

Haul roads are major sources of fugitive dust in a mine. To reduce the problem of dust generation from haul roads, the following actions will be taken up:

- The prevailing practice of construction of haul roads with the layers of hard stones overlaid by laterite fines and subsequently compacted by road rollers in surrounding areas will be continued.
- The haul roads will be compacted and water spraying will be done in a number of runs using only a small quantity of water each time just sufficient to wet the surface.
- Ensuring transport equipment to be leak proof.
- Over loading of the transport vehicles will be prevented in order to avoid spillage.
- Regular water sprinkling especially before transportation.

5.1.1.6. Coal Stock Yard

Water sprinkling will be carried out daily in coal stack yard. Peripheral plantation around the stack yard will also be taken up to arrest the air borne dust, if any.

5.1.1.7. Emissions during Material Handling

In the material handling section, various handling devices like feeders, belt conveyors, bucket elevators and screw conveyors are used to transport excavated coal from one point to another. In Pachwara South Coal Block only dumpers and belt conveyors will be used for material handling. Particulates are emitted from any of the material handling operations. Most of the emissions occur at transfer points. Since transport of material on the conveyor causes little disturbance of air, emissions that occur due to the wind may be minimized. The transfer points include transfers from a conveyor on to another, into a hopper and finally on to a storage pile. The amount of uncontrolled emissions depends on the size distribution of the material handled, the belt speed and the free fall distance.

5.1.2. Water Pollution Mitigation

In the core zone i.e. the ML area, which is gently undulating in nature, there is Bansloi river, the main surface run-off, which is flowing in the central part of the area from west to east along with a few ephemeral streamlets descending from the catchment area of the Bansloi River. Initially water will be drawn from the Bansloi River after taking the necessary permissions from the state Government; afterwards the generated mine water will be used.

The storm water discharge coming out of quarries and dump through a network of garland drains is expected to contain solid particles. These solid particles shall be removed by settling in the settling pond before being used for dust suppression and plantation. Hence, there shall be no change in drainage system due to this mining project in buffer zone.

Water management and water pollution mitigation measures to be undertaken by the Project Proponent are being detailed in following paras.

5.1.2.1. Surface Water Pollution Control

The objective is to regulate the surface water of the mining area in such a manner so as to cause minimum contamination and alteration of drainage system. The major source of water in the buffer area is Bansloi River (flowing adjacent to the northern boundary from west to east along with a few ephemeral streamlets). Water management (including storm water drainage) scheme (by a network of garland drains/diversion ditches and catch-pits) has been planned. Attempts shall be

made to minimise the discharge of surface run off during monsoon. Domestic waste shall be treated in STP and shall be used for green belt development purpose. The salient features of the scheme are as follows:

- Retaining walls will be built all-around the external dumps which will have weep holes for passage of storm water to join garland drains.
- Garland drains shall be constructed as much as possible around quarries and external dumps (depending on contours). The garland drains shall be routed through settling pits and settling tanks to settle down suspended solids in the storm water.
- Settling pits and drains shall be cleaned periodically, especially before and after rainy season.
- Small grasses & bushes in garland drains will hold back solid particles from draining away.
- Small stone barriers shall be constructed across the drain to check water current & arrest solid particles.
- No overburden or loose sediments will be kept in the working benches particularly during monsoon months.
- No mine water will be discharged into the river which is flowing within the leasehold.
- Monitoring of river shall be done at regular intervals & records shall be maintained.
- Effluents from the rest of the areas will be diverted through drains to the guard pond after proper treatment for use in vehicle wash system, workshop and green belt development.
- Sanitary sewage generated in office area shall be treated in 100 KLD Sewage Treatment Plant & treated water to be used in watering of saplings.
- Problems due to inundation and flood will not arise as the mine is in upland and at a higher altitude than the normal surface level. The clarified water from the settling pond will be used in dust suppression and plantation.

Bansloi River is flowing through the central part of the study area from west to east along with a few ephemeral streamlets. Following steps will be taken to maintain the flow of water in the river throughout the year:

- A safety zone of 60 meter has been considered along the northern boundary against Bansloi River from the southern bank of the river; thus depending upon the proximity of the river bank to Block boundary, a variable safety zone has been considered all along the northern boundary. No dumping or mining will be done in this zone.

- An embankment has been planned to construct all along the safety zone against the Bansloi River. Height of the embankment shall be maintained more than 3 meter of the HFL of Bansloi River. HFL (Highest Flood Level) of Bansloi River in this part is 97 meter AMSL (Above Mean Sea Level) as per information obtained from the local public works department.
- Top of the embankment will have more than 30 meter width and shall be utilized for dedicated Coal Corridor, village road diversion, service road and garland drain.
- The Embankment slope walls will be stone pitched in the outer surface and grass turfing will be done in the inner surface. Slopes in the outer surface will be maintained to 1:1 while inner surface slope will be maintained to 1:2. Periodical monitoring will be done to identify any damages of this embankment.
- Plantation in 60m safety zones will be carried out along the river.
- No waste materials or mines water will be allowed to mix in the river; its water quality will be regularly monitored.

5.1.2.2. Sewage Treatment Plant

Sewage Treatment Plant (STP) of 100 KLD capacity (considering 60 to 70 liters water to be used by approximately 1300 no. of employees) will be set up within the lease area. The treated water will be low in BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), TSS (Total Suspended Solids), etc. and will meet the standards consistently as per guidelines.

The sewage treatment plant is based on Moving Bed Biofilm Reactor (MBBR) technology. This process improves reliability, simplify operation, and require less space than traditional wastewater treatment systems. The biological treatment system will consist of an aeration tank with submerged air diffuser. The treatment scheme will consist of Screening, Equalization, Biological Treatment, Clarification, Sludge Re-circulation, Filter Press/centrifuge, Filtration and Disinfection. The sewage treatment plant will include the following treatment components:-

- Preliminary Treatment or Screening Process - Collection of the sewage in the collection tank
- Biological Treatment - Transfer of Raw sewage via Transfer pumps to the Aeration tank
- Tertiary Treatment - Storage & Chlorination of Clarified water in the Clarified water storage tank.

MBBR technology employs thousands of polyethylene biofilm carriers operating in mixed motion within an aerated wastewater treatment basin. Each individual biocarrier increases productivity through providing protected surface area to support the growth of heterotrophic and autotrophic bacteria within its cells. It is this high density population of bacteria that achieves high-rate biodegradation within the system, while also offering process reliability and ease of operation.

5.1.2.3. Ground Water Pollution Control

The ground water table of the region varies from 2.25m to 11mbgl whereas the pit limit by the end of the lease period will be at 320m below from the average surface level. Thus, the quarry depth during the lease period will intersect the ground water table.

During rainy season the accumulated rain water in the quarry pit shall be pumped out. The rain water will be passed through the garland drain into the settling tank to arrest suspended solids, if any. Two Settling ponds of 100m length, 100m width and 4m depth shall be constructed between pit boundary and 60m wide safety zone along the Bansloi River to collect rain water from pit. One of the tanks will have High Density Polythene coating to hold the water throughout the year. One more settling pond shall be constructed near the dump connecting to garland drains. The settled water shall be used in water sprinkling & Plantation.

Mining is a physical process where water is mainly used for dust suppression and washing of heavy earth moving machines. Since no chemical transformation takes place and the ore is naturally occurring, there is no possibility of any chemical contamination in this waste water except an increase in suspended solids comprising ore particles, clay, etc in surface run off during monsoon. During oil changes in equipment & other machinery, there are chances of spillage of oil and generation of waste water containing oil & grease.

A sanitary sewage treatment plant has been proposed as almost 1288 manpower will be deployed in Pachhwara South Coal Block mining project.

The core zone, being at a higher elevation allows substantial quantity of precipitated water to flow down as run off to the streams/nalas in close vicinity. In operational period the runoff is expected to carry substantial amount of solids from mining zone.

5.1.2.4. Rain Water Harvesting

For the operation of the mining units the extraction of natural resources is unavoidable but effective steps shall be taken towards replenishing the natural resource conservation. In order to

keep pace with the dwindling availability of the natural resources & resource utilization it has been proposed to take steps for organizing resource conservation initiatives.

Water is a scarce natural resource in most regions of India. Water from perennial sources/ground water sources is piped to utilization centres. Collection, storage & efficient use of rainwater can reduce the cost of water collection & supply. To cater to the needs of daily water requirement now-a-days mines are coming up with implementing the techniques of Rain Water Harvesting (RWH) over the roofs of offices, rest sheds and by making percolation tanks.

Broadly there are two ways of harvesting rain water:

- Surface runoff harvesting
- Roof top rainwater harvesting

In mining area rainwater flows away as surface runoff. This runoff could be caught and used for recharging aquifers by adopting appropriate methods. In the present context of open cast mining, rainwater flows away as surface runoff and hence, Rain Water Harvesting from land surface (paved and unpaved areas) is proposed.

Rain Water Harvesting from Land Surface: Rainwater harvesting using land surface is less complex way of collecting rainwater and can be done in the mining areas. It involves improving runoff capacity of the land surface through various techniques including collection of runoff with drain pipes and storage of collected water. Ground catchment techniques provide more opportunity for collecting water from a larger surface area. By retaining the flows of small creeks and streams in small storage reservoirs created by low cost earthen dams, this technology can meet water demands during dry periods. There is a possibility of high rates of water loss due to infiltration into the ground, and, because of the often marginal quality of the water collected, this technique is mainly suitable for storing water for plantation and other purpose.

Rain Water Harvesting through Contour Bunds: Contour Bunds are effective methods to conserve soil moisture in watershed for long duration. These are suitable in low rain fall areas where monsoon run off can be impounded by constructing bunds on the sloping ground all along the contour of equal elevation. Flowing water is intercepted before it attains the erosive velocity by keeping suitable spacing between bunds. Spacing between two contour bunds depends on the slope of the area as the permeability of the soil. Lesser the permeability of soil, the close should be spacing of bunds. Contour bunding is suitable on lands with moderate slopes without involving terracing.

The annual rainfall of the project area has been taken from the nearest IMD station located at Dumka (1316.8 mm) and the runoff coefficient factors have been taken as per guidelines of Manual on Norms and Standards for Environmental Clearances by MoEF&CC, Govt. of India. The Total Runoff from the Project Area has been calculated as follows:

Total Annual Runoff = Rainfall × Catchment Area × Runoff Coefficient = 6,75,344.50 m^3

By taking into account the loss of 20% due to evaporation, spillage and wastage, the effective runoff that may be harvested inside the project area is 5,40,275.60 m^3.

Annual Water Requirement of the Project Area has been calculated to be 4,68,000 m^3

The surface runoff being generated from the project area will be channelized to rain water harvesting ponds through network of drainage systems. The bottom of the ponds is naked and natural seepage from the bottom will recharge the ground water regime. Hence the storage ponds will act as recharging structure. Even though rain water will be sufficient to fulfil the daily requirement of water but in the initial years of mining, when the mining pit is smaller in size or in an year with deficit rainfall surface water will be collected with due permission.

Runoff Generation from Quarry Pit, Dump, Ore Storage etc.: In order to contain such runoff the Project Proponent shall construct the 1st settling tank of 100m X 125m X 5m size within the 1st year of mining activity, which shall be connected to garland drains. This tank will be in use to collect the water through garland drains and allow to settle the water. Further, one more settling tank is proposed to be constructed in the 2nd year of mining, which shall be connected to garland drains. This tank will be in use to collect the water through garland drains and allow to settle the water.

The daily water requirement for the project for sprinkling and plantation purpose, etc has been calculated to be 1560 KLD. Thus the settling tanks will play a vital role in supplying daily water requirement for sprinkling and plantation purpose for about a month.

5.1.3. Noise Pollution Mitigation

The sources of noise in this particular project are drilling, blasting, movement of vehicles, loading & unloading of materials. However, Noise level shall be maintained below 75 dB (A) in work zone (for 8 hours exposure). The mitigation measures for noise pollution are of following types:

- Prevention at source

- Attenuation in transmission path and
- Protective measures on work environment.

The following measures are proposed to be taken to reduce noise levels:

- Diesel powered machineries which are major source of noise in open cast environment will be properly maintained as per maintenance schedule to prevent undesirable noise.
- Attention shall be paid towards rigorous maintenance of silencers of diesel engines.
- Static diesel engines shall be housed as far as possible (not made of sheet metals or surrounded by baffles). If possible they will be placed on vibration isolators.
- Green belt will be developed around office building and mine to reduce noise level.

5.1.3.1. Control of Vibration, Noise and Fly Rock Generation due to Blasting

For any possibility of objectionable ground vibration the broad blasting parameters may be implemented as per the field condition along with the use of delay detonator. The blasting parameters should be suitably set to minimise ground vibration within safety limit. Measures to be taken while blasting in opencast mines are as follows:

- Blasting shall be carried out only during daytime, at a particular time as per schedule.
- Blasting will not be done in stormy condition or during morning & evening hours.
- Maximum permissible charge per delay would depend on the distance of structure to be protected from the blasting.
- Detonation cords, cord relays, mili-second delay detonators will continue to be used for connection and initiation of holes.
- Suggested number of rows in a blast should not be more than four to reduce fly rock and ground vibrations.
- Length of blast will depend on the total number of holes which can be blasted in a round while observing the above guidelines/restrictions. However, it should be as large as design would permit. Attempts should be made to have one large blast with less frequency than to have several small blasts.
- All the holes are proposed to be blasted by safety fuse firing system to control the throw and vibration.
- Provisions will be kept for conducting trial blast by any competent agency/organisation and the suggestions will be made in use to reduce the ground vibration.

5.1.4. Impact on Soil

5.1.4.1. Management of Top Soil

Where possible, topdressing material will be re-spread directly from stripped areas onto areas being rehabilitated. Where this is not possible, topdressing material will be stored in stockpiles. Stock piles will be dumped at places where they would not be disturbed by future mining. Sediment fences or other barriers can be used where necessary to retain sediment. When stock piling of top soil is done, the mound should not be higher than 1.20m (without amendments) and 3.0m (with amendments). The overall topography for the graded surface should be designed to minimize the uncontrolled flow of runoff. Dispersed sheet flow should be broken up by terraces or benches along the slope that also follow topographic contours. On a fine scale the ground surface can be roughened by the tracks of a bulldozer perpendicular to the slope. Construction of stockpiles with a "rough" surface condition will reduce erosion hazard, improve drainage and promote re-vegetation.

5.1.4.2. Preservation of Top Soil

Stockpiling topsoil may result in disruption & loss of beneficial soil microorganisms and nutritional values, hence needs preservation. Re-vegetation of the stockpile should be done to protect the soil from erosion, discourage weeds and maintain active populations of beneficial soil microbes. Temporary Seeding shall be carried out as soon as possible within 30 days after the formation of the stockpile. If stockpiles will not be used within 12 months they will be stabilized with permanent vegetation to control erosion and weeds. Native grass species should be selected for re- vegetating top soil stock piles. Topsoil can be mixed with organic material or manufactured soil amendments to improve the growing capability. To the extent practicable, above ground vegetation, including tree litter should be mixed or otherwise incorporated into the topsoil. Stockpiled topsoil needs significant fertilizer application for the establishment and maintenance of vegetation. Soil amendments should be applied before seeding or planting. Common soil amendments used are biosolids, compost, manure, lime and coal combustion byproducts.

5.1.5. Impact on Vegetation within the Project Area

Out of 714.8553 ha of the said mining project about 455.1108 ha area is coming under forest land category, i.e. about 63.66% of the total project area. The remaining non-forest land has thin vegetation cover; mostly herbs & shrubs. The first and direct impact of mining operations in forested areas is the eviction of forests which alters the food availabilities and wildlife habitat.

The existing forests in the buffer zone will be subjected to human disturbances of various kinds like tree felling for fuel-wood requirement, expansion of agriculture into the forest area and diminished renewal of flora due to a polluted environment. Due to dusts from blasting and vehicle moments the surrounding are likely to be affected but water sprinkling and increase in vegetation cover are proposed to minimize the impact.

The flora in the Buffer Zone is likely to be affected because of the mining activity and transportation of vehicles but this impact will be substantially reduced by plantation within and along the transportation road. Sal, Am, Tal, Jamun are the most dominant species in the forest of this region.

No medicinal plants reported to be under Threatened or Near Threatened category are observed in the study area. All reported medicinal plants like Azadirachta india, Terminalia chebula, Asparagus racemosus, Woodfordia fruticosa, Holarrhenaan pubescence, Nyctanthes arbor-tristis, Pongamia pinnata, etc are abundantly available in the locality.

5.1.5.1. Proposed Mitigation Measures

In order to mitigate and minimize the environmental impacts, arising due to mine project especially from air pollution, noise pollution, soil erosion etc. the Greenbelt Development around the project sites can provides the best mitigation option. The green canopy not only absorbs some of these pollutants but also improves the aesthetic environment. Therefore, a "Green Belt Development Plan" has been proposed around the mine lease area and along the conveyor corridor. The green belt shall serve the following purposes:

- To compensate the damage to vegetation due to setting up & operation of the mine.
- To prevent the spread of fugitive dust generated due to mining and allied activities.
- To attenuate noise generated by the mine.
- To reduce soil erosion.
- To help stabilize the slope of over-burden dumps.
- To increase green cover and improve aesthetics.
- To attract animals to re-colonise the area when the mine is abandoned.

A safety zone of 60 meter has been considered along the northern boundary against Bansloi River from the southern bank of the river; thus depending upon the proximity of the river bank to Block boundary, a variable safety zone has been considered all along the northern boundary. Safety zone all along the southern and eastern boundary has been considered as 15 meter to accommodate the

garland drain. Safety zone of 7.5 meter is reflected along the part of the western boundary. The green belt is proposed to be developed in safety zone covering 10.84 ha and also along with the haul roads as transportation corridor. The strategy worked out for development of green belt consists of following:

- Broad leaf trees growing above 10m in height should be planted along the roads, offices and infrastructure facilities.
- Plantation of trees should be undertaken in appropriate encircling rows.
- Generally local/indigenous fast growing trees & shrubs should be planted.
- The trees should be protected by plantation of non-palatable shrub species to avoid browsing by animals.
- Placement of tree guards to be provided to save the plants.

The identified plantation sites should be free from over-head telephone lines, electric poles and other industrial emergency installations so that there will be no obstacle in the plant growth. In the project area, plantation shall be developed in the following areas:

- Along the transportation roads inside and outside the ML area
- Along the ML area boundary
- On the bank of Bansloi river
- Around office, rest shed & parking places
- Around waste dump areas as well as in the dump slope
- Over the vacant and non-mineralized area within the lease area
- On backfilled areas and on mining upper benches/slope (where overburden material is not available for backfilling) of mine pits after closure of the mine pit.

5.1.6. Impact on Wildlife within the Project Area

Presence of Reserve & Protected Forests within 10 km may results in interference of the human activities with the wild habitats. The mining activity and other ancillary activities such as blasting, dumping of waste and over burden, movement of vehicles, etc. shall threaten the wild animals and interfere in their life cycle. The most possible impacts on wild life are being illustrated below:

- Dust pollution due to mining activities.
- Noise pollution due to movement of vehicles and mining machineries.

- Increase in human interference into the forest shall result in alterations in breeding and nesting of animals.
- Dumping of garbage and resulting water & air pollution due to mining and allied activities shall interfere with their living.

5.1.6.1. Proposed Mitigation Measures

The Project Proponent shall adopt the following measures within the Project Area to reduce impact on wildlife.

Best Mining Practices

- **Tree plantation**: Tree plantation is an effective means for reducing disturbance to wild animals. Noise attenuates much more rapidly in areas with tree cover in comparison to those areas without vegetation. Tree plantation can help prevent multiple impacts ranging from dust pollution, noise pollution and providing safe cover to the wild animals. Tree plantation is, therefore, recommended in form of greenbelt as an effective means of preventing disturbance to wild animals in the mining lease area. It is recommended to create a 3m wide greenbelt along the roads, a 5m wide greenbelt around colony and infrastructure and a plantation at density of 2500 plants per ha on intervening land. The trees planted should be of native species with thick leaf cover to be effective as greenbelt.
- **Minimizing Coal Fire**: There should be a well-designed and maintained firefighting system in the mine to deal with possibilities of fire. Water sprinklers should be provided at appropriate places to deal with spontaneous combustion of coal. Fire hydrants of adequate specification should be kept ready at strategic locations in case of any emergency.
- **Fire Protection**: Fire occurrence may go up around the lease area due to rise in anthropogenic pressure created due to increase in population. Suitable fire protection measures like fire lines and fire watching shall be ensured in the forest patches in cooperation with the forest dept. during dry seasons. These should be maintained throughout the plan period. Two local youth can be engaged for five months every year during fire season and equipped with simple fire-fighting tools.
- **Environmental Education and Awareness among Work Force**: Presence of increased work force including truck drivers and attendants may lead to increase in firewood collection and poaching. The problem may get aggravated due to the presence of contract labour. There should be mandatory checking of vehicles leaving the mines by security staff to prevent such activities. A regular education, training and awareness program should be

conducted for the work force and local people to sensitize them to wildlife conservation and animal welfare through various communication modes involving NGOs having capability and expertise in the field.

- **Awareness Programmes in Villages**: Improvement of rural economy for minimizing their dependence for on forest growth (Eco-development) can be done by educating and assisting people to choose the alternative livelihood such as poultry farm, growing vegetables and Mushroom, small scale business, raising nurseries for forest and horticulture species, cultivation of medicinal plants, minor technical jobs, small mechanical works like cycle repairs, electrical repairing and wiring, welding and fabrication work etc.
- **Noise Pollution Control**: Noise from vehicle movements, mining activities like drilling & blasting is detrimental to the wild animals. The vehicles shall be checked at regular intervals and maintained properly besides using right types of muffling mechanism so that noise level remains within 70 dB. The blasting operations will be restricted to day time only and particularly between 12 noon to 2pm, so as to cause minimum disturbance to animals when they are out for their requirements during late evening and night.
- **Dust Pollution Control**: The road surfaces and active benches shall be sprayed with water twice a day except on rainy days in order to prevent the fugitive dust emission from mining operation, movement of vehicles. The ore should be made free from dust by spraying water on it before transportation and covering the trucks with tarpaulin during movement. Overloading of trucks /tipper shall be strictly prohibited. Thick vegetation should be maintained around the mining pit to absorb dust and to minimize noise.
- **Soil and Moisture Conservation**: Wherever necessary, staggered contour trenches 5 m in length and 0.5 m in depth may be dug around the ML area to check soil loss and to conserve water in order to improve sub-soil water. This will also help to reduce fire incidents. The contour trenches may be planted up with suitable indigenous species preferably those which have fodder value.
- **Landscape Planning**: It is desirable that the overburden dumps should be natural in appearance and suitable for re-vegetation. The dumps should be properly constructed keeping in view slope profile, run-off control and topographical features of the area. Some important features of the landscape are as follows:
  (a) The landscape should have hillocks with gentle slopes and waterways in a natural and aesthetic manner.
  (b) The landscape should merge with the existing landscape in the surrounding area.

(c) The slopes of overburden dumps should be gentle as per the guidelines issued by Director General Mining Safety (DGMS).
(d) There should be no unwanted low-lying areas that can cause water collection and water logging, except the designated water bodies.
(e) Planning should be done for the direction in which water will flow. Waterways should be created and linked to existing waterways on the upstream and downstream side.
(f) The landscaping should be done aesthetically so that the appearance of the restored mine is very natural and appealing including meandering streams.

Standard Mining Practices

Several standard good mining practices have been in use in the mining sector. Some of the standard practices recommended for the proposed project are:

- Dust suppression by sprinkling water on the haul roads;
- Appropriate chutes/hoods at coal transfer points to prevent fugitive dust;
- Covering the haul trucks with tarpaulin to prevent dust emission;
- Controlled blasting only during day time;
- Matting, grass seeding and vegetation for stabilizing surface of the dump;
- Peripheral greenbelt and plantation along roads, around colony and CHP;
- Regular maintenance of vehicles;
- Water leaving the mine will meet the standards prescribed by the regulatory authorities;
- Check dams and gabion structures to prevent soil erosion from dumps;
- Proper garland drains equipped with baffles to prevent wash offs; and
- Sumps should have adequate capacity.

These measures in combination with the other best practices will help in minimizing the identified impacts.

5.2. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Chapter 10 of the EIA Report contains Environmental Management Plan (EMP) for the Project. Keeping in view the mitigation of the adverse environmental impacts due to mining, the EMP has been worked out with the following objectives:

- Reclamation of the mined-out area wherever and whenever possible.

- Restoration of landscape as near to its original form as far as possible, consistent with the economy of mining operations, keeping in view the drainage pattern, geological stability, vegetation etc.
- Minimization, mitigation and wherever possible elimination of degradation of land and deterioration of quality of air as well as water.
- Making least disturbance to the water regime and water quality.
- Least disruption to the existing basic ecological status in the mining area during mining, which will be conserved and protected.
- Improvement of the overall flora scenario of the area.
- Establishment of an environment, in which the activities presently being carried out may change for the better without disruption or disturbance to the socio-economic condition.

Anticipated potential impacts and suggested mitigation measures have been summarized as mentioned in the following paras.

5.2.1. Air Pollution Control

Anticipated Potential Impacts: The mining activities involve various processes such as, loading & unloading, mining extraction, transportation, drilling, blasting, sizing of coal etc. which are likely to contribute towards air pollution in the area. The effect will be localized and is mostly due to fugitive emission of dust particles.

Suggested Mitigation Measures:

- Installation & maintenance of automatic sprinklers along the haul road.
- Purchase & maintenance of water tanker & machineries for water sprinkling.
- AAQ monitoring.
- Construction &maintenance of mines haul road.
- Surface miner will be deployed for sizing of coal.
- Regular checking & maintenance of vehicles & machineries will be carried out

5.2.2. Water Pollution Control

Anticipated Potential Impacts: Field investigation in the mine area indicates that the ground water zone is encountered around 3.2m bgl whereas the proposed mining activities shall be carried out up to a depth of 320m from average ground level & the RL of the lowermost bench of the mines by the end of the conceptual period shall remain at around 200m. Therefore, the seepage of

groundwater shall occur as and when water table is intersected. Ion leaching from overburden material due to weathering causes increase of dissolved particles into the infiltrated water to aquifer.

Suggested Mitigation Measures:

- Construction of garland drain around the dump.
- Construction & maintenance of garland drain around mining pit.
- Construction of 2 settling ponds & their collecting drains.
- Masonry Construction of catch pits to arrest the clay mixed water from the ROM Stack yard.
- Construction of toilets with septic tank & soak pits.
- Water Treatment Plant for domestic use of mine pit water.

5.2.3. Noise Pollution Control

Anticipated Potential Impacts: In the mechanised open-cast mine, mining operations such as drilling, blasting, excavation, loading and unloading, movement of dumpers, etc are expected to generate noise.

Suggested Mitigation Measures:

- Mining machineries fitted with upgraded silencer and noise pollution control facilities.
- Suitable PPE (Personal Protective Equipment) will be provided to the exposed workers.

5.2.4. Water Conservation Measures

Anticipated Potential Impacts: Mining of coal from the Coal Mine shall intersect Ground Water.

Suggested Mitigation Measures:

- Rainwater harvesting using land surface is less complex way of collecting rainwater and can be done in the mining areas.
- For water conservation, contour bund, recharge pit, settling pond, coco filtration etc. can be done.
- Pond shall be the post mining use of land in the ML area. It shall fulfil the water need of the area for agriculture and will also be used for pisciculture.

5.2.5. Land Management – Top Soil Reclamation etc.

Anticipated Potential Impacts: During the course of Mining top soil, overburden will be disturbed. Top soil will be scrapped and stored in the designated place. The overburden generated in the initial 6 years shall be dumped in the eastern part of the block. Concurrent backfilling will commence from the 7th year of production commencement. Though the agricultural production of the villages decreases due to diversion of agricultural land to mining it will benefit the people by providing alternate source of earning, facility of transportation, etc. Some of the civil construction shall remain after cessation of active mining. These infrastructure facilities shall benefit the site.

Suggested Mitigation Measures:

- Top Soil will be utilized in the Embankment in the initial years, however, it will be spread over the reclaimed area in later phases during the progressive and final closure of the mine.
- Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement. The material will be used in concurrent backfilling.

5.2.6. Biodiversity

Anticipated Potential Impacts: Out of 714.8553 Ha. of Block area, around 455.1108 ha. area comes under forest land. Necessary forest clearance as per statute will be obtained before commissioning of the mining activity

Suggested Mitigation Measures:

- The massive afforestation on abandoned mining benches, overburden dumps and other areas shall match well with the forests in the study area to the maximum possible extent, to provide a uniform land use befitting to the location. Afforestation has been planned in a manner, which will actually increase the bio-diversity of the local ecosystem. Conditions and guideline of the Forest clearance will be duly complied.

5.2.7. Greenbelt

Greenbelts generally serve the following functions:

- To compensate the damage to vegetation due to setting up and operation of the mine.
- To prevent the spread of fugitive dust generated due to mining and allied activities.
- To attenuate noise generated by the mine.
- To reduce soil erosion.

- To help stabilize the slope of over-burden dumps.
- To increase green cover and improve aesthetics.
- To attract animals to recolonise the area when the mine is abandoned.

Suggested Mitigation Measures:

- Broad leaf trees growing above 10m in height should be planted along the roads, offices and infrastructure facilities.
- Plantation of trees should be undertaken in appropriate encircling rows.
- Generally local/indigenous fast growing trees & shrubs should be planted.
- The trees should be protected by plantation of non-palatable shrub species to avoid browsing by animals.
- Placement of tree guards to be provided to save the plants.

5.2.8. Occupational Safety and Health

Anticipated Potential Impacts: The mining processes may result in accident like rock fall, fire, explosion, fall from height, mobile equipment accidents, entrapment and electrocution. All these activities involve operators who are susceptible to accidents if proper safety precautions are not taken and the equipment are not maintained properly. The working personnel in the mine area are also exposed to occupational health hazard conditions which emanate due to dust emissions, ergonomic problems, exposure to sun, stagnant water in mine pits, etc.

Suggested Mitigation Measures:

- Provision of safety shoes, dust mask, safety goggles, ear plugs, safety helmets, etc to workers.
- Construction of Rest Shelters & First Aid Centre.
- Annual health check-up of workers & health camp.
- Ambulance for workers and villagers.
- Training to Staff.

5.3. COST STIPULATED UNDER ENVIRONMENTAL MANAGEMENT PLAN

Para 3.xxxiv. of the order issued by the MoEF&CC towards Environmental Clearance to the project stipulates the Budget for EMP as follows.

Table 17: Estimated Cost of Environmental Management Plan

Activities	Capital Cost (Rs. in lakhs)	Recurring Cost per annum (Rs. in lakhs)	Total Recurring Cost in the Lease Period (Rs. in lakhs)
Air Pollution Control			
Installation & maintenance of Automatic Sprinklers along the haul road.	350	4.5	171
Purchase & maintenance of water tanker & machineries for water sprinkling	65	7.5	285
Online AQ monitoring system	35	2.5	95
Construction & Maintenance of mines haul road	90	8.5	323
Sub Total	**540**	**23**	**874**
Water Pollution Control			
Construction of garland drain around the dump	150	4	152
Construction & maintenance of garland drain around mining pit	225	8	304
Construction of 2 settling ponds & it's collecting drains	175	2.5	95
Masonry Construction of Catch pits to arrest the clay mixed water from the ROM Stack yard.	22	1.25	47.5
Construction of toilets with septic tank & soak pits (5 Nos.)	77.5	1	38
Water Treatment Plant for domestic use of Mine Pit water.	50	2.5	95
Effluent Treatment Plant (ETP)	1050	31.5	1197
Sub Total	**1749.5**	**50.75**	**1928.5**
Noise Pollution Control			
Mining machineries fitted with upgraded silencer. noise pollution control facilities	55	2.5	95
Sub Total	**55**	**2.5**	**95**
Environmental Monitoring & Management			
Electronic display board near the main gate	22.5	0.5	19
Installation & maintenance of round the clock Weather Monitoring Station on the office	8.5	1.25	47.5
Monitoring & reporting cost of registered laboratory	-	5.5	209
Sub Total	**31**	**7.25**	**275.5**
Occupational Safety			
Provision of safety shoes, dust mask, safety goggles, ear plugs, safety helmets, etc to workers.	25.76	25.76	978.88
Construction of Rest Shelters & First Aid Centre	25	0.5	19
Annual health checkup of workers & health camp	64.4	12.88	489.44
Ambulance for workers and villagers - 1 No. (Replacement considered in 11th year)	15	4	152
Training to Staff	2.6	2.6	98.8
Sub Total	**132.76**	**45.74**	**1738.12**

Plantation & Green Belt Development			
Plantation and Green Belt Development for the entire lease period	1642.5	102	3876
Sub Total	**1642.5**	**102**	**3876**
Grand Total	**4150.76**	**231.24**	**8787.12**

Capital Cost of EMP = **Rs. 4150.76 lakh**

Recurring Cost of EMP = **Rs. 8787.12 lakh** for project period of 38 years.

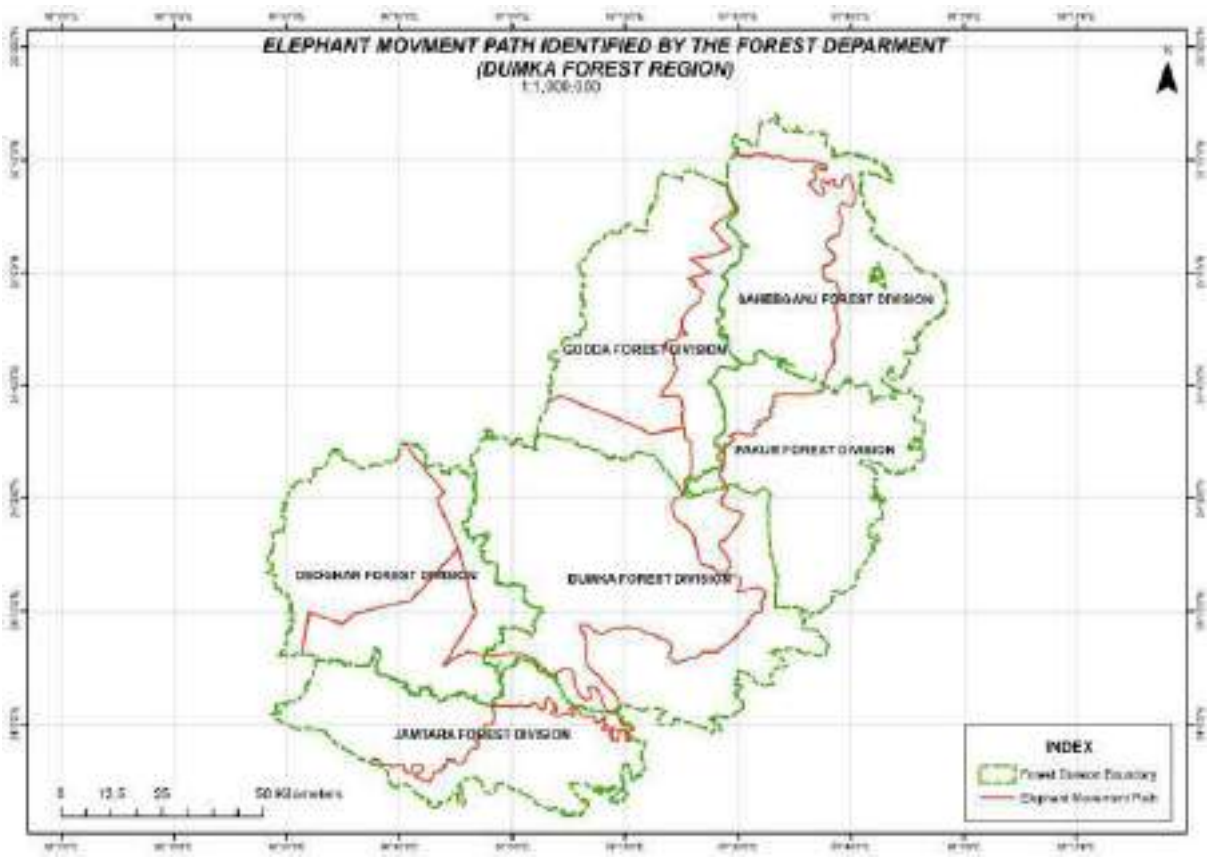
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6. ELEPHANT MOVEMENT PATHS IN DUMKA AND GODDA FOREST DIVISIONS

6.1. DELINEATION OF ELEPHANT MOVEMENT PATHS

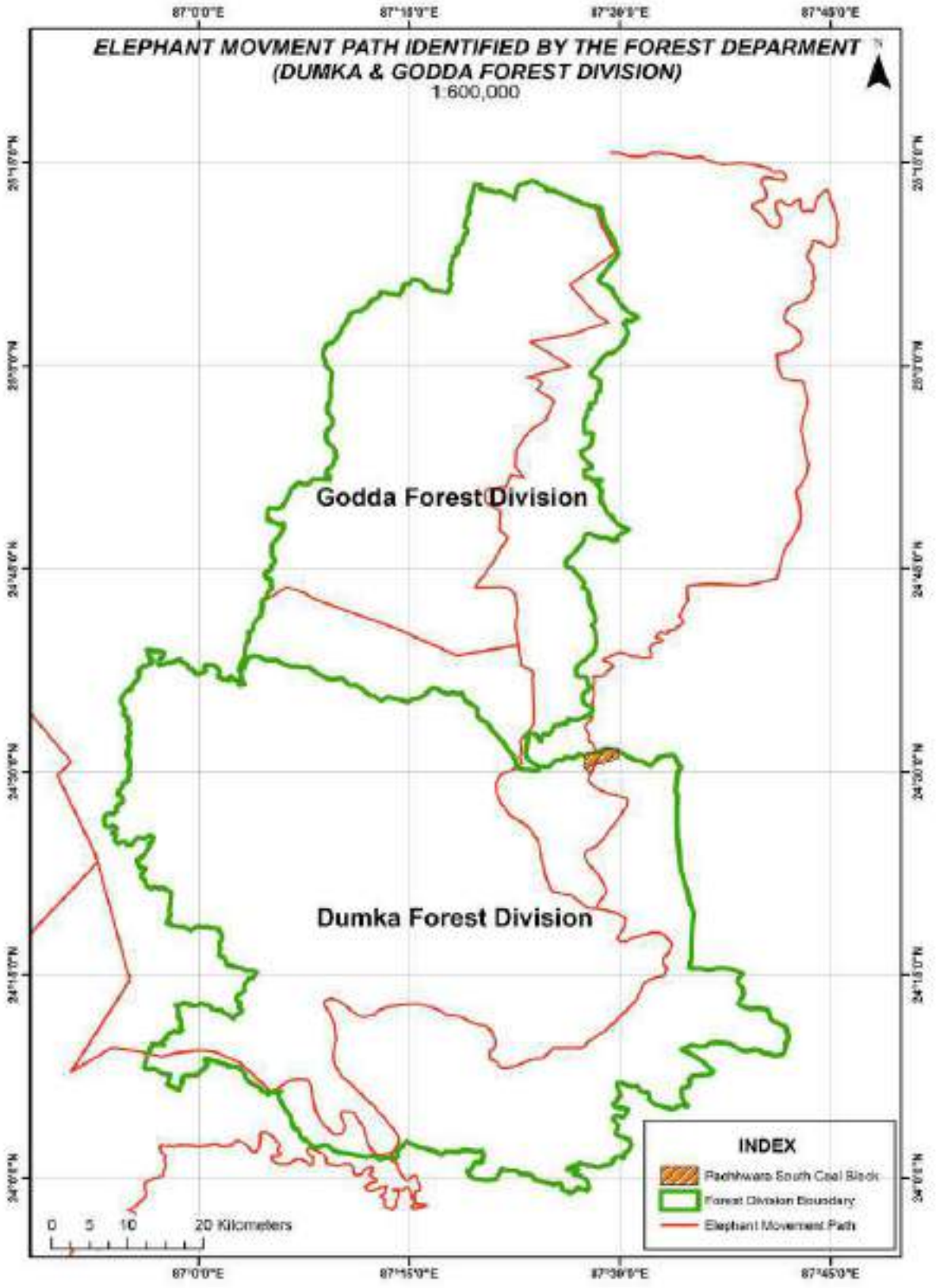
Elephants are highly intelligent and mobile animals, and their movement paths are shaped by a variety of factors such as the availability of food, water, suitable habitats, social needs, and the need to avoid human settlements. Understanding and delineating these paths is crucial for ensuring the protection and conservation of elephant populations, especially in regions where human-wildlife conflict is a concern. This becomes all the more difficult when the Study Area does not have any established elephant corridor. However, the Dumka Forest Region in general and the two forest divisions under consideration in particular, are frequented by elephants quite regularly. This is manifested by a large number of depredation events recorded by the Forest Department. The Department maintains the record of spatial and temporal parameters with respect to the human-elephant conflict incidents caused by elephants. Based on this data the department has delineated the movement paths of elephants. The identified movement path of elephants in the Dumka Region is being shown in the following map.

Map 21: Elephant Movement Paths in Dumka Forest Region



For better appreciation of our area of concern, the elephant movement paths in Dumka and Godda divisions is being shown in the following map.

Map 22: Elephant Movement Paths in Dumka and Godda Forest Divisions



6.2. SELECTION OF AREAS FOR PLANTATION ENRICHMENT ALONG THE ELEPHANT MOVEMENT PATHS IN DUMKA AND GODDA DIVISIONS

It is being proposed under this Plan to enrich the areas falling within one km of distance, on both sides of the elephant movement path, with plantation of species which are preferred by elephants. Towards this end, identification of villages involved in the pathways of elephants would be pertinent. The map showing village boundaries in Dumka Forest Division, falling within the boundary of one km of the movement path is as under.

Map 23: Villages falling within one km distance from the elephant movement path (Dumka Forest Division)

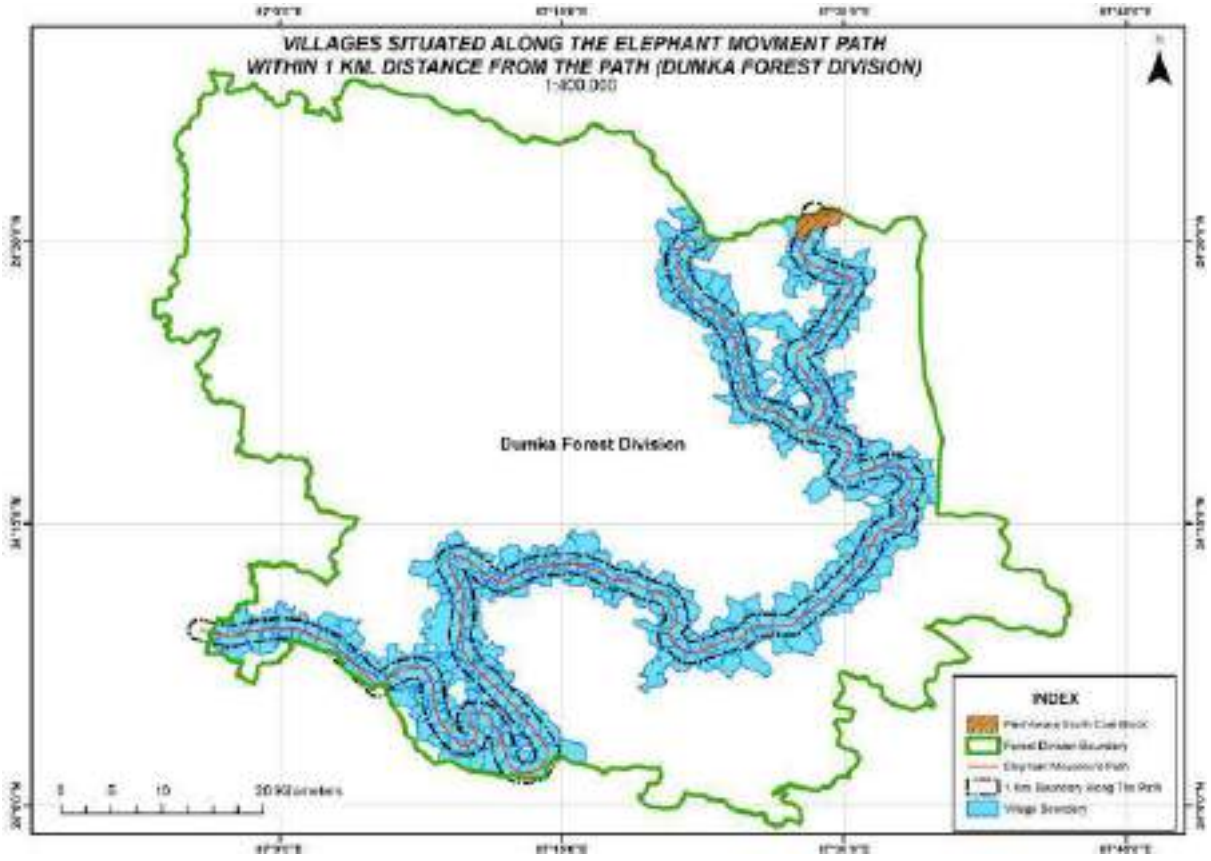


Table 18: Description of Villages falling within one km distance from the elephant movement path (Dumka Forest Division)

Forest Range	Beat	Sub-Beat	Village	Notified Forest Land (Yes/No)
Kathikund	Kathikund	Kathikund East	**Amtala**	Yes
			Balia	Yes
			Bandubera	Yes
			Chhota Bhalki	No
			Dalahi	Yes
			Datunkati Pahar	No
			Dhumnahi	Yes
			Jamni	Yes

			Kusumba	Yes
			Lakraphela Pahar	No
			Manjhdiha	Yes
			Mohanpur	Yes
			Nijhor	Yes
			Nijhor Pahar	Yes
			Talpahar	No
			Tilatanr	No
			Ukhrapahari	Yes
Kathikund	Kathikund	Kathikund West	**Asanpahari**	Yes
			Bartalla	Yes
			Bathanpahari	No
			Bichhipahari	Yes
			Chandarpara	Yes
			Chaudhar	Yes
			Chhota Tetulmath	No
			Chhota Kathikund	Yes
			Dhaniyapahari	Yes
			Dhankutta	Yes
			Dhawadangal	No
			Dhawatanr	Yes
			Dubaidih	Yes
			Dudhia	Yes
			Gadrap	Yes
			Haripur	Yes
			Kadarmara	Yes
			Kairasol	Yes
			Kalajhar	Yes
			Kangrapahari	Yes
			Kathikund	No
			Lakraphela	Yes
			Mahuadangal	Yes
			Murbhanga	Yes
			Nayadih	Yes
			Rampur	Yes
			Ratanpur	Yes
			R. F.	Yes
			Saharjori	Yes
			Sibatala	Yes
Kathikund	Kathikund	Jhilimili	**Chandpani**	Yes
			Rangamatia	Yes
Kathikund	Kathikund	Masnia	**Jaluaduba**	Yes
			Jamchua	Yes
			Kendpahari	Yes
			Kumirkata	Yes
			Kusumghati	Yes
			Mahulpahari	Yes
			Masnia	Yes
			Musabil	Yes
			Ranipahari	Yes
			Sugapahari	Yes
			Tinrsalla	Yes
Kathikund	Kathikund	Saldaha	**Asanbani**	Yes
			Bara Bhalki	Yes

			Bara Tetulmath	Yes
			Bilakandar	Yes
			Butbaria	Yes
			Chhota Bhalki	Yes
			Chhota Tetulmath	Yes
			Chichro	Yes
			Dhaniapahari Chhota	Yes
			Domanpur	Yes
			Gamra Pahari	Yes
			Ghasipur	Yes
			Jhikra	Yes
			Joram	Yes
			Kanaidih	Yes
			Pelendaha	Yes
			Saldaha	Yes
			Sarasbad	Yes
			Tesparta	Yes
Kathikund	Gopikandar	Gopikandar East	**Balia**	Yes
			Dharampur	Yes
			Jitpur	Yes
			Talberia	Yes
Kathikund	Gopikandar	Gopikandar West	**Babupur**	Yes
			Bhagabandh	Yes
			Burichapar	No
			Chanramali	Yes
			Chhatarchua	Yes
			Dubrajpur	Yes
			Gamria	No
			Gariapani	Yes
			Gopikandar	Yes
			Jolo	Yes
			Kherbari	Yes
			Khijurdangal	No
			Kolha	No
			Kumarbandh	Yes
			Kurumba	Yes
			Muskidangal	Yes
			Nicha Pujadih	No
			Palasbani	No
			Sarkhi	No
			Talkhora	No
Kathikund	Gopikandar	Korcho	**Koilo**	Yes
			Sahara	Yes
			Tesaphuli	Yes
Kathikund	Chirudih	Chirudih	**Kundapahari**	Yes
Kathikund	Chirudih	Durgapur West	**Jorasimal**	Yes
			Kulaipura	Yes
Kathikund	Chirudih	Silangi	**Kharikasol**	Yes
			Mahuldabar	Yes
Kathikund	Narganj	Baskia	**Balidih**	Yes
			Bagjhopa	Yes
			Baskia	Yes
			Bokwa	Yes
			Chhota Narganj	Yes

			Dimudi	Yes
			Kuriadih	No
			Lakrapahari	Yes
			Mahuapathar	Yes
			Majurnach	Yes
			Pindari	Yes
			Simra	Yes
Kathikund	Narganj	Borapahari	**Kurcho**	Yes
			Murguja	Yes
			Upar Pujadih	Yes
Kathikund	Narganj	Lakhanpur	**Bajrisol**	Yes
			Balijor	Yes
			Charakpathar	Yes
			Sahritola	Yes
			Tilatanr	Yes
Kathikund	Narganj	Narganj	**Amgachi**	Yes
			Bara Chaparia	Yes
			Bara Bhuibhanga	Yes
			Bara Sarwapani	Yes
			Chhota Bhuibhanga	Yes
			Kulkant	Yes
			Sarwan	Yes
			Sarwan Pahari	No
Hizla West	Masalia	Ranga Masaliya	**Amgachhi Pahar**	Yes
			Amgachhi	Yes
			Bartali	Yes
			Bhadudih	Yes
			Burikurya	Yes
			Dalathal	Yes
			Gulamibathan	Yes
			Jhilua	Yes
			Jhujko	Yes
			Katadumar	Yes
			Kusbedia	Yes
			Masaliya	Yes
			Nagrapathar	Yes
			Namimahal	Yes
			Nijhor	Yes
			Pathargora	Yes
			Rahara	Yes
			Rainkhari	Yes
			Ranga	Yes
			Sarmundih	Yes
			Sikarpur	Yes
			Simaldi	Yes
			Taldangol	Yes
			Thekaha	Yes
			Tilabad	Yes
Hizla West	Masalia	Tasaria	**Ajmeri**	Yes
			Bankati	Yes
			Bara Chapariya	Yes
			Bediachak	Yes
			Belgania	Yes
			Bhangaphir	Yes

			Bheladaha	Yes
			Charkapathar	Yes
			Chhota Chaparia	Yes
			Ghusru	No
			Jamjuri	Yes
			Kalidih	Yes
			Mahulbana	Yes
			Makhatar	Yes
			Mohtodih	Yes
			Paharudih	Yes
			Pialghara	Yes
			Pipra	Yes
			Pokharia	Yes
			Puratan Tasaria	Yes
			Thari	Yes
Hizla West	Masalia	Gormala	**Asansol**	Yes
			Astajor	Yes
			Beliajor	Yes
			Bhul	Yes
			Chapuria	No
			Datiyarpur	Yes
			Dewcha	Yes
			Dudhani	Yes
			Dukhiyadil	Yes
			Dumdumi	Yes
			Garduara	Yes
			Golpur	Yes
			Gormala	Yes
			Hetiapathar	Yes
			Hunja	Yes
			Ismala	No
			Keuwadhap	Yes
			Kharna	Yes
			Kusumghata	Yes
			Maysamugar	Yes
			Mohanpur	Yes
			Murgathal	Yes
			Paharpur	Yes
			Phutbasia	Yes
			Rampur	Yes
			Sadipur	Yes
			Sundarmohan	Yes
Hizla West	Masalia	Gumro	**Astajor**	Yes
			Barmasia	Yes
			Bhoktadih	Yes
			Bichkora	Yes
			Garapathar	Yes
			Ghasimarani	Yes
			Ghormundani	Yes
			Golbazar	Yes
			Gumro	Yes
			Gutidih	No
			Kalabagan	No
			Kapseo	Yes

			Karmatanr	Yes
			Kherbana	No
			Khirkanali	Yes
			Mahulidih	Yes
			Masanjor	Yes
			Naujara	Yes
			Parbad	No
			Shimla	Yes
Hizla West	Masalia	Choto	**Baghkol**	Yes
			Barmasia	Yes
			Bajarmara	Yes
			Beludabar	Yes
			Chaklatipur	Yes
			Chhatapahari	Yes
			Chholpathar	Yes
			Chigalpahari	Yes
			Chiharbani	Yes
			Ganeshdih	Yes
			Ghaghra	No
			Hathbari	Yes
			Himatpur	Yes
			Jarkahi	Yes
			Jirkahi	No
			Jirulia	Yes
			Jiruliyagadi	No
			Kathanara	Yes
			Kolharia	Yes
			Kurua	Yes
			Mahadebraydih	Yes
			Mahuatanr	No
			Mankapahari	Yes
			Nawadih	Yes
			Nischintpur	Yes
			Nuni	Yes
			Sakrigali	Yes
			Sugapahari	Yes
			Teliyapahari	Yes
			Thekaha	Yes
			Uparbahal	Yes
Hizla West	Masalia	Sapchala	**Banbad**	Yes
			Bariyabad	Yes
			Burhadangal	Yes
			Chapuria	No
			Chitarsini	No
			Chuadaba	Yes
			Daladali	Yes
			Dhobna	Yes
			Ganuadih	Yes
			Goyasol	Yes
			Hiraljuri	Yes
			Jambad	Yes
			Kalipathar	Yes
			Karmatanr	Yes
			Kendghata	Yes

			Lakshibad	Yes
			Latabar	Yes
			Madhuvan	Yes
			Mahulbana	Yes
			Manikachak	Yes
			Nipania	Yes
			Patharia	Yes
			Phulsahari	Yes
			Pichli	Yes
			Sapchala	Yes
			Shyampur	Yes
			Sugapahari	Yes
Hizla West	Masalia	Singro	**Dhanbasa**	Yes
			Dhobana Harinbahal	Yes
			Dhunabasa	Yes
			Dundiya	Yes
			Golbandha	Yes
			Sibakel	Yes
Hizla West	Khasmahal	Khejuria	Asansol	No
			Bagjuri	No
			Baglajuri	Yes
			Bankati	No
			Chorkata	No
			Dakri	No
			Darbarpur	No
			Kenbad	No
			Kenpani	No
			Khejuria	Yes
			Larua	No
			Motipur	No
			Murabahal	No
			Nawadih	No
			Palma	No
			Patbari	No
			Sabalpur	No
			Saharghati	Yes
			Solukduba	No
			Suripalan	No
Hizla West	Nonihat	Amdiha	Bakua	No
			Baliakhara	No
			Bansduma	No
			Barhnia Chhota	No
			Burhnia	Yes
			Danro	Yes
			Duarpahari	No
			Heth Barachapar	No
			Kendua	Yes
			Kubriam	No
			Kulapathar	No
			Kuramba	Yes
			Mahuadangal	No
			Parasbad	Yes
			Pardaniduma	Yes
			Raidih	Yes

			Rajamar	Yes
			Sapdahar	No
			Siltha	No
			Simalpahari	No
Hizla West	Basukinath	Belkupi	Bhorabad	No
			Shampur	No
Hizla East	Shikaripara	Shikaripara	**Amarpani**	Yes
			Bhoktadih	Yes
			Gandharvapur	Yes
			Ghylapathar	Yes
			Jagatpur	Yes
			Jhilidabar	Yes
			Naupahar	Yes
			Panchbahini	Yes
			Saraipani	Yes
Hizla East	Shikaripara	Simanior	**Amradaba**	Yes
			Durgapur	No
			Harinsingha	Yes
			Hatpara	Yes
			Karigarh	Yes
			Karmachuan	Yes
			Khajuria	Yes
			Mahulbana	Yes
			Patharkata	Yes
			Ramgarh	Yes
			Ranai	Yes
			Saharpur	Yes
Hizla East	Shikaripara	Rajbandh	**Banskandari**	Yes
			Chhatupura	Yes
			Dharampur	Yes
			Karkata	Yes
			Kiranpur	Yes
			Kolaybari	No
			Latbedha	Yes
			Parbatpur	No
			Rajabandh	No
			Sonadhap	No
			Sugnibasa	Yes
			Sulanga	Yes
Hizla East	Asanbani	Asanbani	**Amjhari**	Yes
			Charkapathar	Yes
			Dhanghara	Yes
			Digalpahari	Yes
			Dumki	Yes
			Karikadar	Yes
			Kuarsila	Yes
			Latulia	Yes
			Leya	Yes
			Mohanpur	Yes
			Paharpur	Yes
			Pokharia	Yes
			Resama	Yes
			Sarpahari	Yes
			Sulunga	Yes

			Taldangal	Yes
			Taradaha	Yes
Hizla East	Asanbani	Gando	Chakalata	No
			Gandhrakpur	No
			Goradangal	No
			Kalapani	No
			Sitasal	No
Hizla East	Asanbani	Dhanbasa	**Dhanbasa**	Yes
			Jamkandar	No
			Kairabani	Yes
			Mahulbana	Yes
			Siulibona	Yes
			Thopam	Yes
Hizla East	Ranibahal	Bagnal	**Bagnal**	Yes
			Basmata	Yes
			Chitadih	No
			Damri	Yes
			Jagudih	No
			Karmatanr	Yes
			Paharudih	No
			Parsimla	No
			Rampur	Yes
			Saltala	Yes
Hizla East	Ranibahal	Banskuli	**Tongra**	Yes
Hizla East	Ranibahal	Ranibahal	**Chirudih**	Yes
			Kuldiha	Yes
			Murgathali	Yes
			Panjanpahari	Yes

The map showing village boundaries in Godda Forest Division, falling within the boundary of one km of the elephant movement path is as under.

Map 24: Villages falling within one km distance from the elephant movement path (Godda Forest Division)

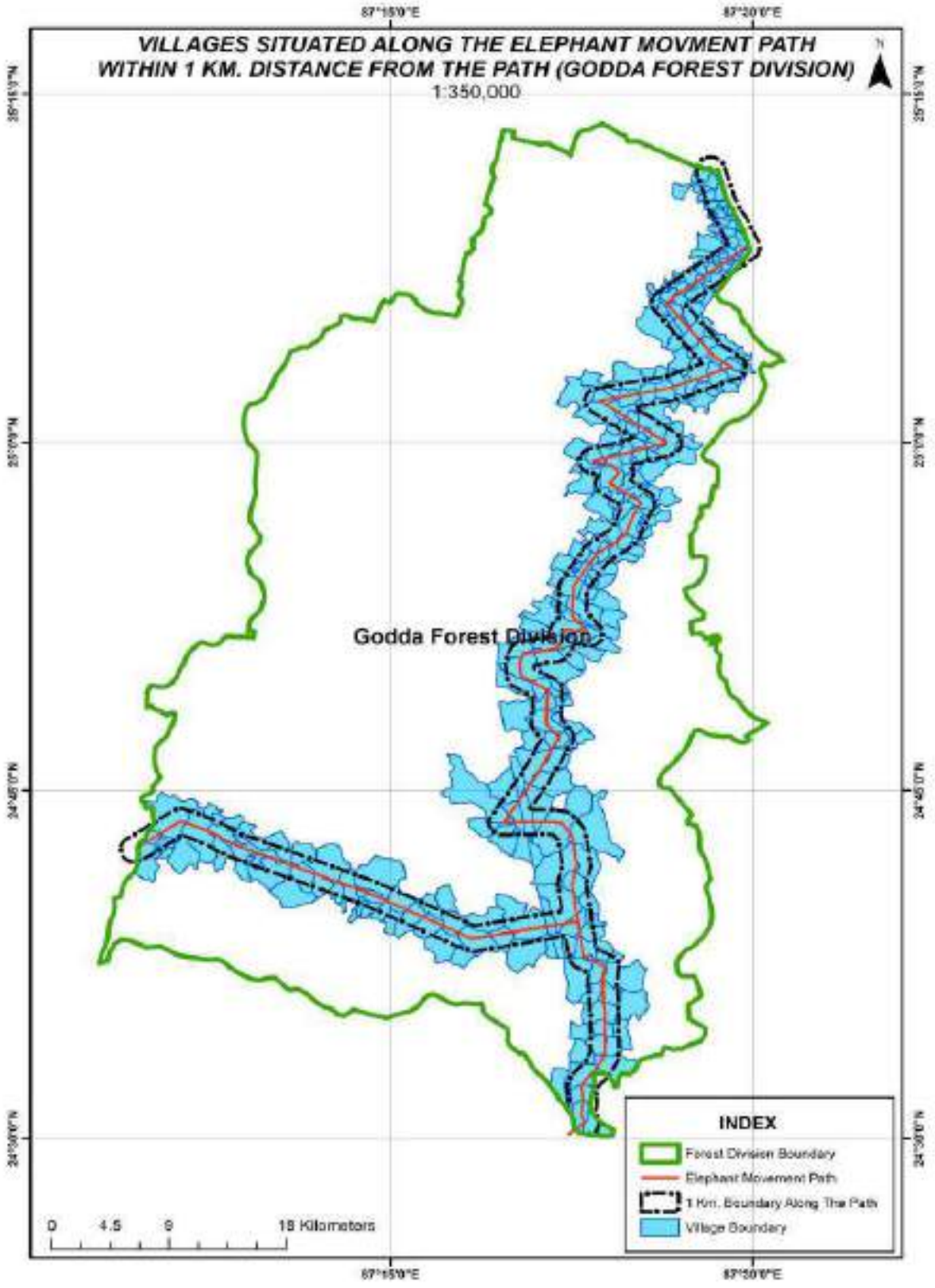


Table 19: Description of Villages falling within one km distance from the elephant movement path (Godda Forest Division)

Forest Range	Beat	Sub-Beat	Village	Whether Notified Forest Land Exists?
Godda	Godda	Raghunathpur	Agiyabandh	No
			Baghmunda	No
			Bandhaghat	Yes
			Beltupa	Yes
			Dhenukata	No
			Panchratan	No
Godda	Godda	Sunamara	**Baristanr**	Yes
			Kalhajorkalan	Yes
			Sunamara	Yes
Godda	Godda	Belbathan	Burhikura	No
			Danga	No
			Devdanr Uttartola	No
			Haripur	No
			Jamkudar	No
			Jhagrahi	Yes
			Lalpur	Yes
			Malmala	No
			Shyampur	Yes
			Siyarkatia	No
Godda	Poreyahat	Banjhi	Amduma	No
			Baghmara	No
			Chorbad	No
			Dulidih	No
			Gauripur	No
			Gunghasa	No
			Harla	No
			Kayrakura	No
			Kanchanrai Tola	No
			Kundapani	No
			Pitarpahari	No
			Pokhariya	No
			Poreya	No
			Rajdaha	No
			Sagunibad	No
			Satpahari	Yes
Godda	Poreyahat	Maheshkurto	Amjora	No
			Bargaon	No
			Dakhinbahiar	No
			Danidih	No
			Dumariya	No
			Garhi	No
			Joguwadih	No
			Machkhar	No
			Pasai	No
			Shivpur	No
			Taratikar	No
			Tarkhuta	No

			Tilona	No
Godda	Poreyahat	Poreyahat	Amuar	No
			Amuar (Santhali)	No
			Barachapar	No
			Barkabaiso	No
			Draupad	No
			Gwaridih	No
			Harlatikar	No
			Maythani	No
			Sugathan	No
			Surapurba	No
			Tarpokhara	No
Godda	Poreyahat	Pindrahat	Baghmara Purabtola	No
			Chhota Sabaikundi	No
			Devdanr	No
			Pairgadih	No
Godda	Poreyahat	Thakuranhan	**Salaiya**	Yes
			Sijua	Yes
Godda	Karmatanr	Bansjori	Barnadijagir	No
			Bisunpur	Yes
			Chatra	Yes
			Jamdiha	No
			Jilbari	No
			Kajuri	Yes
			Kamramarai	No
			Paharpur	Yes
			Rakso	Yes
			Sabalpur	No
			Simaldhab	Yes
Godda	Karmatanr	Khelari	Bilmaka (Bhuski)	No
			Dighibathan	No
			Jamuntanr	No
			Kairbari	Yes
			R.F.	Yes
			Mahutanr	Yes
			Paharpur Jagir	No
			Sabalpur Jagir	No
			Simaldhab	No
			Tasria	Yes
Godda	Karmatanr	Karmatanr	**Dighibathan**	Yes
			Lawadih	Yes
			Paharpur Jagir	No
			Samlapur	Yes
			Sudarmor	Yes
			Suju	Yes
Sundarpahari	Sundarpahari	Sundarpahari	**Amjora**	Yes
			Baijalphar	Yes
			Churi	No
			Domdih	Yes
			Kalhajor	Yes
			Kusumghati	Yes
			Mohanpur	Yes
			Palam (Dumar)	No
			Salpatra	Yes

			Sundarpahari	Yes
			Tesubathan	Yes
			Tilabad	Yes
Sundarpahari	Sundarpahari	Chandna	**Angbali**	Yes
			Bansiori	No
			Bara Haripur	Yes
			Bara Sindri	Yes
			Borwa	Yes
			Chandna	Yes
			Kadampur	Yes
			Karamtola	No
			Langodih	Yes
			Sabalpur	No
			Sagar	Yes
			Saharpur	Yes
Sundarpahari	Sundarpahari	Jiyajori	Bedotok	No
Sundarpahari	Damru	Susni	**Babupur**	Yes
			Bargo	Yes
			Belpahari	Yes
			Bengni	Yes
			Jamropani	Yes
			Jogimarna	Yes
			Kumupahari	Yes
			Paharpur	Yes
			Susni	Yes
			Sundrijola	Yes
Sundarpahari	Damru	Bokrabandh	**Bajrijogosami**	Yes
			Bokrabandh	Yes
			Haldisol	Yes
			Pipra	Yes
			Potomdih	Yes
			Tilaypara	Yes
Sundarpahari	Damru	Damruhat	**Bariyarpur**	Yes
			Chandradih	Yes
			Chhota Haripur	Yes
			Damruhat	Yes
			Dumki	No
			Ghatiari	No
			Goradih	Yes
			Kairabani	No
			Khepadih	Yes
			Kusmuha	Yes
			Paharpur	No
Bowarijor	Simra	Simra	**Dabra**	Yes
			Gopali	Yes
			Jadudighi	No
			Jolapahari	Yes
			Magdi Goda	Yes
			Rohari Narayanpur	No
			Telodhuni	Yes
Bowarijor	Simra	Telo	**Adro**	Yes
			Agoia	No
			Balajhor	No
			Bara Amarpur	No

			Bara Darma	No
			Bara Gogra	Yes
			Bara Telo	Yes
			Barari	No
			Chetan Pahar	Yes
			Chhota Amra	No
			Dumaria	No
			Elkar Pahar	No
			Kaldigra	No
			Khejuria	No
			Kojribhita	No
			Moterpahar	No
			Pairgora	No
			Phatehpur	No
			Puriabazar	No
			Seharo Chak	No
			Tulsipur	Yes
Bowarijor	Simra	Haripur	Bara Barma	No
			Barabarma Pahar	No
			Bedaur	No
			Chandsar	No
			Haripur	Yes
			Jagora	No
			Karmatanr	No
			Pakria	No
			Surla	No
			Taratikur	No
			Titardiha	No
			Urkusia	No
Bowarijor	Simra	Garial	Ambadiha	No
			Chandna	No
			R. F.	Yes
			Mahuabathan	Yes
			Tamalia	No
			Tetaria	No
Bowarijor	Simra	Lilatari	Bara Bhorai	No
			Hura	Yes
			Kesgaria	Yes
			Phulbaria	Yes
			Taljhari	No
Bowarijor	Simra	Malbhita	Amdanda	No
			Bara Chatampur	Yes
			Bara Malbhitha	Yes
			Baridih	No
			Bhagwanpur	Yes
			Chetma Pahar	Yes
			Chhota Bowarijor	No
			Chhota Chatampur	Yes
			Chhota Gogra	No
			Chhota Ithari Pahar	No
			Chhota Malbhita	Yes
			Itahari	No
			Jonjatola	No
			Kaldigra	No

			Lilabhita	No
			Malbhita	Yes
			Pairgora	No
			Ratanpur	No
			Rohra	No
			Sijua	No
Bowarijor	Bowarijor	Shripur	Asakhapar	No
			Baniadih	No
			Bariasirsa	No
			Basta	No
			Bhiganda	No
			Chamuakol	No
			Darbe Chak	No
			Dogachhi	No
			Durga Chak	No
			Gaiyas Chak	No
			Gauri Chak	No
			Gobindi Chak	No
			Jaborampur	No
			Kadma	No
			Kanipathari	No
			Khanjri Chak	No
			Lainbrar Barakhar	No
			Lensirsa	No
			Mirikchak	No
			Mukerichak	No
			Raghunikita	No
			Srikanta Chak	No
Bowarijor	Bowarijor	Babupur	**Babupur**	Yes
			Bharenda	No
Bowarijor	Bowarijor	Chhota Saharpur	Baghakol	No
			Bahoriabagaicha	No
			Bara Maniankalan	No
			Baraiya Chak	No
			Belatikar	No
			Bhagaiya	No
			Bhalawa	No
			Bhuska	No
			Bhuslia	No
			Birnath Chak	No
			Bishunpur	No
			Bodhrai khutahari	No
			Budhua Chak	No
			Darji kita	No
			Dhaknesar	No
			Dhaniabandh	No
			Dharampur	No
			Harikol	No
			Hira Khutahari	No
			Indar Chak	No
			Itwa milik	No
			Jhurakusia	No
			Jiban Khutahari	No
			Kajrail	No

			Kantola	No
			Kari Khutahari	No
			Karma	No
			Karmail	No
			Khandhar	Yes
			Kokankita	No
			Lalsing Khutahari	No
			Manikpur	No
			Maromal	No
			Mophari	No
			Mordiha	No
			Nehalchandkita	No
			Pipra	No
			Purnia	No
			Ramdas khutahari	No
			Rangai Chak	No
			Rangila	No
			Saharbari	No
			Tetariamal	No
Bowarijor	Bowarijor	Bowarijor	**Baghmara**	Yes
			Balajhor	Yes
			Bangama	Yes
			Bansbhita	No
			Bara Bowarijor	No
			Bara Gogra	Yes
			Bara Kaira	No
			Bara Saraiya	Yes
			Barakota	Yes
			Behra Chak	No
			Bishunpur	No
			Chandsar	No
			Chhota Barma	No
			Chhota Bowarijor	Yes
			Chhota Dharma	No
			Chhota Sariya	No
			Chhota Talbaria	No
			Dabra	No
			Daharlangi	No
			Dalang	No
			Dhodri	No
			Jamujharna	No
			Kaldigra	No
			Karamtola	Yes
			Karmatanr	No
			Khijuria	No
			Kolwa	No
			Lakrakol	Yes
			Mahuakol	Yes
			Mahulia	No
			Malbhita	No
			Mangra	No
			Manikpur	No
			Marpa	No
			Meghi	No

			Nawadih	No
			Pajradih	No
			Parsia	Yes
			Pokharia	Yes
			Raidih	No
			Ratiachak	No
			Sakrikitta	No
			Talbaria	Yes
			Talbaria	No
Bowarijor	Meharma	Thakurgangti	Baheradih	No
			Bansbhita	No
			Bharsing parbara	No
			Bhatkhoria	No
			Chhota Manian	No
			Jadu Chak	No
			Karantola	No
			Kumarchak	No
			Laghrachak	No
			Majhkola	No
			Mishragangti	No
			Runji	No

6.3. STRATEGY RECOMMENDED FOR PLANTATION ENRICHMENT ALONG IDENTIFIED ELEPHANT MOVEMENT PATH

Strengthening elephant movement paths through plantation enrichment is a key strategy for enhancing the habitat and ensuring that elephants have sufficient food, water, and shelter along their migratory routes. These movement paths often face challenges due to habitat fragmentation, reduced availability of food, and increased human-wildlife conflict. Plantation enrichment can play a vital role in restoring and expanding the ecological value of these corridors, making them more sustainable for elephant populations. Some of the key components of the strategy are being described in the following paras.

6.3.1. Selection of Native and Elephant-friendly Plant Species

Focus should be on planting native vegetation that elephants are accustomed to and that form part of their natural diet. These include a mix of trees, shrubs, and grasses that elephants rely on for food and shelter. A diverse range of species ensures that elephants have access to different types of food and shelter year-round. However, the Asian elephant distinguishes itself from its African counterpart because of its dependency more on arboreal forests as opposed to grasslands. Due to the variation in habitat and climatic conditions prevalent across the two continents, the elephant population in Asia and more specifically India, depends on its tropical trees—consuming twigs, branches, stems, root, flowers, fruits etc.

It is important to note here that ensuring diversity in selection of species is essential not only because a mixture of evergreen, deciduous, and fruit-bearing trees supports different seasons of elephant activity, but also from the standpoint of ecological and environmental perspective. Some of the elephant-friendly plant species are being discussed in the following paras.

6.3.1.1. Bamboo Species

Bamboo plays a crucial role in providing food and habitat for elephants. Bamboo groves are especially important in forested landscapes as they provide a dense and nutritious food source for elephants, particularly during the dry season when other food sources may be scarce. Additionally, bamboo groves offer shelter, play a role in maintaining soil stability, and help connect fragmented habitats, making them a critical component of elephant corridors.

6.3.1.2. Woody Plants

Elephants feed on a variety of trees and shrubs for their leaves, fruits, and bark. These species are important in maintaining food availability for elephants, especially during dry seasons. Some of the most common species which could be easily raised in the study area are as follows.

- Ficus spp. (Fig trees): Figs are a favourite food source for elephants. Many species of figs (like *Ficus benghalensis*, *Ficus religiosa* & *Ficus racemosa*) produce abundant fruits that elephants enjoy.
- Acacia spp.: Acacias are a critical food source, especially for elephants in arid regions. Species like *Acacia nilotica* (gum arabic tree) and *Acacia senegal* are useful.
- Terminalia spp.: *Terminalia tomentosa* and *Terminalia arjuna* provide both fruits and leaves that elephants feed on.
- Mango (Mangifera indica): Elephants are attracted to the mango fruits.
- Moringa (Moringa oleifera): Also called the "drumstick tree", moringa's leaves and seeds provide significant nutrition for elephants.
- Ziziphus spp.: *Ziziphus mauritiana* and other species of the genus are thorny but also produce edible fruit.
- Bauhinia spp. (Orchid Trees): The leaves and flowers of Bauhinia species (such as *Bauhinia variegata*) are consumed by elephants.

6.3.1.3. Grasses

Elephants are primarily grazers and consume a wide variety of grasses. Grasses are in fact the primary food for elephants during certain times of the year, especially when other vegetation may be scarce. Some of the common grass species that be undertaken for planting in the appropriate parts of the study area are as follows.

- *Pennisetum purpureum* (Elephant grass): This tall, robust grass is a primary food source for elephants. It is named for its association with elephant diets in Africa and Asia.
- *Cynodon dactylon* (Bermuda grass): This grass is common in both African and Asian grasslands and is a preferred food for elephants.
- *Panicum maximum* (Guinea grass): An abundant grass in tropical regions, elephants are known to feed on this species.
- *Sorghum* spp.: Some species of sorghum are known to be eaten by elephants.
- *Setaria* spp. (Foxtail grasses): Found in tropical grasslands, these grasses are often grazed by elephants.

6.3.2. Common Characteristics of the Elephant Migratory Route and the Way Forward

The delineated migratory path criss-crosses many villages of Dumka and Godda Forest divisions. As stated earlier, the villages falling within one km of distance from the path have been selected for treatment towards the end of plantation enrichment. These villages have been tabulated in Table 18 and Table 19 with respect to Dumka and Godda forest divisions respectively. In order to facilitate prioritization and selection of plantation sites by the field officials, the administrative units of the Forest Department viz. name of the Range, Beat and Sub-beat corresponding to a particular village have been provided in the aforesaid tables. The way forward is being proposed as under.

- In order to provide an elephant-friendly pathway all along the identified migratory route, the whole delineated area should be planted with suitable species. As the first charge, it is being proposed to saturate such forest land which have canopy density less than 0.4, with plantation of bamboo/tree species preferred by elephants.
- Majority of the villages in Dumka Division do have forest land within. On the contrary, majority of the villages in Godda Division do not have forest land. To ensure the integrity of the migratory pathway, the target should be to somehow ensure the availability of food for elephants all along the pathway. Hence, the villages which do not have forest land,

must be carefully surveyed for identification of non-forest land suitable for plantation. This would be a great challenge and the field officials need to liaison closely with the district administration. Village common lands and Govt. lands under Jungle-Jhari category may be the best option. As the second charge, such lands may be taken up for plantation activity with suitable species.

- Community participation in selection of plantation sites as well as implementation of plantation programmes is a must. The efforts should essentially be locally supported, culturally appropriate, and sustainable in the long term. By integrating the community into every phase of the project – from planning and implementation to monitoring and evaluation – these efforts have a higher chance of success. Additionally, when local communities see tangible benefits, such as improved livelihoods and reduced human-wildlife conflict, they are more likely to take ownership of the project and contribute to its sustainability.
- To ensure community participation, engagement of VFMPCs in villages having forest land within, and panchayats in rest of the villages may be necessary. Workshops and outreach programmes may be arranged by field officials from time to time so as to make the engagement fruitful towards turning the migratory route friendly to elephants.

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7. PROPOSED INTERVENTIONS TO BE CARRIED OUT BY THE FOREST DEPARTMENT UNDER THE PLAN

In Chapter 4 of the Plan, the objectives of management and strategies to address the issue of wildlife conservation both within the Project/Lease Area and outside the Project Area but limited to the delineated Impact Area were discussed. Chapter 6 deals with delineation of elephant movement path and the strategy recommended for plantation enrichment along identified elephant movement path.

In consonance of the objectives of management and strategies set out herein, this Chapter tries to summarize the proposed interventions by the Forest Department within the Impact Area as well as outside the Impact Area. The zone of consideration for plantation enrichment has been restricted to areas falling within one km distance from the delineated elephant movement path, both in Dumka and Godda divisions. As stated in Chapter 4 of this Plan, the interventions to be carried out by the Forest Department have been categorized under following broad heads:

(A) Habitat Management
(B) Enrichment of the Elephant Movement Path
(C) Human-Elephant Conflict Management
(D) Awareness Development Programmes
(E) Capacity Building of the Frontline Forest Staff
(F) Development of Alternative Livelihoods
(G) Promotion of Renewable/Alternative Energy Consumption
(H) Development and Implementation of Appropriate Monitoring and Evaluation System
(I) Infrastructural Strengthening towards Implementation as well as Monitoring and Evaluation of the Plan

It may be noted here that the delineated elephant movement path, as described under Chapter 6, also passes through the Impact Area. Though the activities under the above heads shall be restricted to the Impact Area, the enrichment activities along the elephant movement path are planned to extend beyond the Impact Area too.

7.1. HABITAT MANAGEMENT

This issue has been deliberated upon in detail in Para 4.4.1. Budget provisions under different activity heads are being discussed in the following paras.

7.1.1. Strengthening of Forest/Wildlife Protection Network in active partnership with JFMCs

Seed Money to Joint Forest Management Committees (JFMCs) refers to an initial financial allocation provided to JFMCs to support their activities in forest management, conservation, and sustainable development. Joint Forest Management (JFM) is a collaborative approach to forest management where local communities and government agencies share responsibilities for the protection, conservation, and sustainable use of forest resources.

72 villages out of a total of 133 in Dumka Forest Division and 26 villages out of a total of 36 in Godda Forest Division have forest land within, and as such Joint Forest Management Committees have duly been constituted in those villages having forest land. It is being proposed to provide a seed money of Rs. 5.00 lakh each to 36 JFMCs in Dumka Forest Division and 13 JFMCs in Godda Forest Division under this Plan. Seed money to rest of the JFMCs has been proposed under the SMC Plan.

7.1.2. Anti-Depredation-cum-Patrolling Squad

Since the Impact Area is prone to human-wildlife conflict, particularly in relation to elephants, anti-depredation squads are being proposed under the Plan. These squads shall also be utilised towards normal patrolling activities and HEC management with the objective of forest crime control as well as monitoring other activities proposed under the Plan. It is being proposed to constitute squad (s) consisting of ten persons for Dumka and Godda Forest divisions on daily wage basis. Also, a sum of Rs. 2.50 lakh each in Year-1 and Year-6 of the Plan for the two divisions is being provisioned for purchase of patrolling kits comprising of water-proof back pack, camouflage raincoat, cap, binoculars, water bottles, first-aid kits etc. to equip the squad in a better way to meet the challenges.

7.1.3. Forest Fire Control and Management

Though fire-watchers are engaged by the Forest Department under departmental schemes, the number of fire-watchers is grossly insufficient to meet the demand as the area is extremely prone to forest fire. The Impact Area is spread over the jurisdictions of four ranges – two in Dumka Division (Kathikund and Hizla East) and two in Godda Division (Godda and Sundarpahari). Hence, engagement of ten fire-watchers each in four forest ranges is being proposed under the Plan in order to supplement the existing manpower. However, this engagement would be limited to 5 months only in the fire season. Apart from this, appropriate sum is being provisioned under the Plan to each of the forest divisions to purchase various equipment like safety goggles, fire-

resistant gloves, fire-resistant suit, fire-resistant shoes, chest guard, water bottle, First Aid Kit, Fire beating equipment, Leaf blowers, Brush cutters etc.

7.1.4. Removal of Invasive Species

The forests are infested with lantana and other invasive weeds. The notified forest land in Dumka and Godda forest divisions within the Impact Area are 2384.70 ha and 1839.20 ha respectively in extent. The Plan proposes to take up 300 ha and 150 ha of forest land within the Impact Area for removal of invasive species in Dumka and Godda divisions respectively.

7.1.5. Grassland Development

It is being proposed to develop a total of 50 ha of forest land in Dumka Forest Division and 25 ha in Godda Forest Division as grassland after weed removal..

7.1.6. River/Stream-side Plantation

It is being proposed to take up 2 km of suitable river/stream side in Dumka division and 1 km in Godda Division for plantation.

7.1.7. Plantation Enrichment of Elephant Movement Path

Chapter 6 of the Plan mentions in detail the villages involved under the elephant movement path. This Plan proposes to cover a total of 500 ha of land within the identified villages along the migratory route of elephants with suitable species of plants, preferably bamboo – 400 ha in Dumka Forest Division and 100 ha in Godda Forest Division. Apart from this, silvicultural operations over 500 ha of forest area, 400 ha in Dumka and 100 ha in Godda, are being proposed. The two divisions have large tracts of bamboo forests. Hence, a total of 1200 ha of bamboo forest area, 900 ha in Dumka and 300 ha in Godda, is being proposed to be decongested.

7.2. HUMAN-ELEPHANT CONFLICT MANAGEMENT

In Para 7.1.2., six persons are proposed to be engaged for constituting Anti-Depredation-cum-patrolling squad. These persons shall also be trained to manage conflict situations during elephant movement near villages.

Apart from the Rapid Response Team as stated above, the Plan proposes to provide budget for purchase and installation of Early Warning Systems like drones etc. as also for crop protection measures like solar-operated standalone blinking LED lights, flashlights etc. A sum of Rs.70.00 lakh for Dumka Division and Rs. 35.00 lakh for Godda Division is being provisioned for this purpose.

Budget provision for measures towards community engagement and raising awareness amongst villagers about elephant behaviour and possible steps that could be taken by them so as to minimize the damage of life and property due to elephants, has been made under the head "Awareness Development Programmes".

7.3. AWARENESS DEVELOPMENT PROGRAMMES

Para 4.4.3. contains the activities that could be undertaken by the Forest department to meet the objective of sensitising the villagers and other stakeholders towards wildlife conservation issues. However, one of the critical aspects in this regard is the aim to minimise the damage done by the elephants. These measures, amongst other objectives, shall also be aimed towards mitigating the impact of elephant depredation on the villagers. However, the importance of education and awareness amongst villagers cannot be compromised in any way.

7.4. CAPACITY BUILDING PROGRAMMES FOR FRONTLINE FOREST STAFF

The indicative areas of focus towards capacity building of frontline forest officials have been listed in Para 4.4.4. of the Plan. It is relevant to mention here that budget provisions have also been made towards this end under the Soil & Moisture Conservation Plan (SMC Plan) and Catchment Area Treatment Plan (CAT Plan) prepared in compliance of conditions laid towards Stage-I Forest Clearance to the Project. Therefore, it would be prudent to utilize the funds allocated herein primarily for wildlife related issues.

7.5. DEVELOPMENT OF ALTERNATIVE LIVELIHOODS

The importance of development of alternative livelihoods and some of the representative livelihood options have been discussed under Para 4.4.5. of the Plan. It may further be noted that the Impact Area of SMC Plan and the instant Plan is common. Therefore, budget provided herein should be so utilized that a significant impact could be discernible in the livelihood status of the villagers residing in the Impact Area.

7.6. PROMOTION OF ALTERNATIVE ENERGY CONSUMPTION

Para 4.4.6. details the need and the context of promotion of alternative energy consumption in the Impact Area villages by way of installing solar street lights in Impact Area villages and distribution of solar lanterns and improved chulhas amongst the villagers. The budget provision under this head shall be treated as complemental to the budget provided under this head in the SMC Plan. The objective should be to maximise the coverage of Impact Area villages using budget under the two plans.

7.7. DEVELOPMENT AND IMPLEMENTATION OF APPROPRIATE MONITORING AND EVALUATION SYSTEM

Para 4.4.7. discusses possible monitoring tools and different approaches towards evaluation of the Plan. Sufficient funds are being allocated to meet this end.

7.8. INFRASTRUCTURAL STRENGTHENING TOWARDS IMPLEMENTATION AS WELL AS MONITORING AND EVALUATION OF THE PLAN

Para 4.4.8 of the Plan contains the tentative list of equipment/services to be procured under the Plan. It is expected that budget provisions made under this Plan and the SMC Plan together would suffice to cater to the needs of the Forest establishments towards an effective and efficient implementation of the Plan.

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8. FINANCIAL FORECAST AGAINST THE INTERVENTIONS TO BE UNDERTAKEN BY THE FOREST DEPARTMENT

8.1. FINANCIAL FORECAST – DUMKA FOREST DIVISION

Table 20: Year-wise Financial Forecast – Dumka Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in lakh)
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	
A.	**Habitat Management (Refer Para 4.4.1. & 7.1.)**											
A.1.	Strengthening of Forest/Wildlife Protection Network (Seed Money to 36 JFMCs*) @ Rs. 5.00 Lakh/JFMC – 6 JFMCs/year	30.00	30.00	30.00	30.00	30.00	30.00	-	-	-	-	180.00
A.2.	(i) Anti-Depredation-cum-Patrolling Squad (10 persons on daily wages, all the year round)	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	146.40
	(ii) Patrolling Kits viz. water-proof back pack, camouflage raincoat, binoculars etc.	2.50	-	-	-	-	2.50	-	-	-	-	5.00
	(iii)Purchase of patrolling vehicle (4-wheeler)	20.00	-	-	-	-	-	-	-	-	-	20.00
	(iv) Wages for Driver of patrolling vehicle	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	(v) Fuel cost/Maintenance etc.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
A.3.	(i) Forest Fire Control & Management (10 fire watchers for five months; 5 each in two forest ranges – Kathikund & Hizla East)	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	60.20
	(ii) Fire Fighting Equipment viz. Leaf Blower, Brush cutter, Chain Saw & maintenance; Fire Beater, Fire resistant shoes/gloves/suit, safety googles etc.	15.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	42.00
	(iii) Vehicle for fire-fighting operations – hire charges for 5 months	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	35.00
A.4.	Removal of Invasive species @100 md/ha (Total Area: 300 ha; 50 ha/year)	20.05	20.05	20.05	20.05	20.05	20.05	-	-	-	-	120.30
A.5.	Grassland Development (50 ha); 12.5 ha Advance Work/year	9.55	16.23	18.11	20.00	10.45	3.77	1.89	-	-	-	80.00

A.6.	Riverside Plantation (2 km); Advance Work initiated in Year 1.	23.05	4.53	3.51	3.18	1.39	0.84	0.84	-	-	-	37.34
A.7.	Creation of Watch Tower -1 & its maintenance	20.00	-	-	2.00	-	-	2.00	-	-	2.00	26.00
A.8.											**Total (Habitat Management)**	**802.24**
B.	**Enrichment of the Elephant Movement Path (Refer Chapter 6)**											
B.1.	Plantation Enrichment (Bamboo); Elephant Movement Path (400 ha); 100 ha Advance Work initiated in Year-1, 2, 3, 4 & 5.	101.41	141.90	158.73	172.74	71.33	30.83	14.01	-	-	-	690.95
B.2.	Silvicultural operations (400 ha); 100 ha/year; Advance Work initiated in Year-1, 2, 3 & 4.	69.89	83.34	88.64	93.94	24.05	10.60	5.30	-	-	-	375.76
B.3.	Bamboo decongestion (900 ha); 150 ha/year; Advance Work initiated in Year-1,2,3,4,5 & 6	53.59	61.24	61.24	61.24	61.24	61.24	7.65	-	-	-	367.44
B.4.	Creation of Stop Dams (10 nos.) @ Rs. 20 lakh/unit; outside the Impact Area identified for SMC & CAT Plan i.e., beyond 15 km periphery of the lease area.	60.00	60.00	40.00	40.00	-	-	-	-	-	-	200.00
B.5.											**Total (Enrichment of the Elephant Movement Path)**	**1634.15**
C.	**Human-Elephant Conflict Management (Refer Para 4.4.2. & 7.2.)**											
C.1.	Installation of Early Warning Systems; Engagement of trained persons for driving elephants away from human settlements.	10.00	10.00	10.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00	70.00
D.	**Awareness Development Programmes (Refer Para 4.4.3. & 7.3.)**											
D.1.	Workshops, outreach programmes, Eco Clubs, Nature camps, awareness marches etc.	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
E.	**Capacity Development Programmes for Frontline Forest Staff (Refer Para 4.4.4. & 7.4.)**											
E.1.	Emphasis on wildlife management and forest conservation – animal capture, conflict mitigation, monitoring of animal movement, use of remote sensing/GIS/mobile applications etc.	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00

F.	**Development of Alternative Livelihoods (Refer Para 4.4.5. & 7.5.)**											
F.1.	Livelihood Improvement Programmes	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	200.00
G.	**Promotion of Alternative Energy Consumption (Refer Para 4.4.6. & 7.6.)**											
G.1.	Distribution of Solar lanterns, improved cook stoves; Installation of Solar Street lights etc.	10.00	10.00	10.00	10.00	10.00	-	-	-	-	-	50.00
H.	**Development and Implementation of appropriate Monitoring & Evaluation System (Refer Paras 4.4.7. & 7.7.)**											
H.1.	Monitoring & Evaluation of the Plan	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	18.00
I.	**Infrastructural Strengthening (Refer Paras 4.4.8. & 7.8.)**											
I.1.	Purchase of equipment/software/drones etc; Development of appropriate mobile applications; Engagement of IT/GIS professionals; Infrastructural Strengthening etc.	15.00	15.00	15.00	15.00	15.00	10.00	10.00	10.00	10.00	10.00	125.00
J.	**Miscellaneous & Administrative Expenses**											
J.1.	Unforeseen Miscellaneous expenditure	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
K.	**Total**	524.20	521.45	524.44	547.31	317.67	243.99	115.85	84.16	84.16	86.16	3049.39
L.	**Cost Escalation Provision @20%**	104.84	104.29	104.89	109.46	63.53	48.80	23.18	16.83	16.83	17.23	609.88
M.	**Total (K. + L.)**	629.04	625.74	629.33	656.77	381.20	292.79	139.02	100.99	100.99	103.39	**3659.27**
N.	**Grand Total (Dumka Forest Division)**											**3659.27**

*A total of 72 JFMCs are registered in the Impact Area. 36 JFMCs are proposed to be funded with Seed money under the instant plan. Rest of 36 JFMCs are being proposed to be funded through the SMC Plan.

8.2. FINANCIAL FORECAST – GODDA FOREST DIVISION

Table 21: Year-wise Financial Forecast – Godda Forest Division

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)										Total (Rs. in lakh)
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	
A.	**Habitat Management (Refer Para 4.4.1. & 7.1.)**											
A.1.	Strengthening of Forest/Wildlife Protection Network (Seed Money to 13 JFMCs*) @ Rs. 5.00 Lakh/JFMC.	25.00	20.00	20.00	-	-	-	-	-	-	-	65.00
A.2.	(i) Anti-Depredation-cum-Patrolling Squad (10 persons on daily wages, all the year round)	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	146.40
	(ii) Patrolling Kits viz. water-proof back pack, camouflage raincoat, binoculars etc.	2.50	-	-	-	-	2.50	-	-	-	-	5.00
	(iii) Purchase of patrolling vehicle (4-wheeler)	20.00	-	-	-	-	-	-	-	-	-	20.00
	(iv)Wages for Driver of patrolling vehicle	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	(v) Fuel cost/Maintenance etc.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
A.3.	(i) Forest Fire Control & Management (10 fire watchers for five months; 5 each in two forest ranges – Godda & Sundarpahari)	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	60.20
	(ii) Fire Fighting Equipment viz. Leaf Blower, Brush cutter, Chain Saw & maintenance; Fire Beater, Fire resistant shoes/gloves/suit, safety googles etc.	7.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	21.00
	(iii) Vehicle for fire-fighting operations – hire charges for 5 months	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	35.00
A.4.	Removal of Invasive species @100 md/ha (Total Area: 150 ha; 30 ha/year)	12.03	12.03	12.03	12.03	12.03	-	-	-	-	-	60.15
A.5.	Grassland Development (25 ha); 12.5 ha Advance Work/year	9.55	16.23	8.56	3.77	1.89	-	-	-	-	-	40.00
A.6.	Riverside Plantation (1 km); Advance Work initiated in Year 1.	11.53	2.26	1.76	1.59	0.69	0.42	0.42	-	-	-	18.67

A.7.	Creation of Watch Tower – 1 & its maintenance	20.00	-	-	2.00	-	-	2.00	-	-	2.00	26.00
A.8.	**Total (Habitat Management)**											**547.42**
B.	**Enrichment of the Elephant Movement Path (Refer Chapter 6)**											
B.1.	Plantation Enrichment (Bamboo); Elephant Movement Path (100 ha); 100 ha Advance Work initiated in Year 1.	101.41	40.50	16.83	14.01	-	-	-	-	-	-	172.75
B.2.	Silvicultural operation (100 ha); Initiated in Year 1.	69.89	13.45	5.30	5.30	-	-	-	-	-	-	93.94
B.3.	Bamboo decongestion (300 ha); 150 ha initiated in each year; Year 1 & 2.	53.59	61.24	7.65	-	-	-	-	-	-	-	122.48
B.4.	Creation of Stop Dams (3 nos.) @ Rs. 20 lakh/unit; outside the Impact Area identified for SMC & CAT Plan i.e., beyond 15 km periphery of the lease area.	40.00	20.00	-	-	-	-	-	-	-	-	60.00
B.5.	**Total (Enrichment of the Elephant Movement Path)**											**449.17**
C.	**Human-Elephant Conflict Management (Refer Para 4.4.2. & 7.2.)**											
C.1.	Installation of Early Warning Systems; Engagement of trained persons for driving of elephants away from human settlements.	5.00	5.00	5.00	5.00	2.50	2.50	2.50	2.50	2.50	2.50	35.00
D.	**Awareness Development Programmes (Refer Para 4.4.3. & 7.3.)**											
D.1.	Workshops, outreach programmes, Eco Clubs, Nature camps, awareness marches etc.	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	25.00
E.	**Capacity Development Programmes for Frontline Forest Staff (Refer Para 4.4.4. & 7.4.)**											
E.1.	Emphasis on wildlife management and forest conservation – animal capture, conflict mitigation, monitoring of animal movements, use of remote sensing/GIS/mobile applications etc.	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	25.00
F.	**Development of Alternative Livelihoods (Refer Para 4.4.5. & 7.5.)**											
F.1.	Livelihood Improvement Programmes	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	100.00
G.	**Promotion of Alternative Energy Consumption (Refer Para 4.4.6. & 7.6.)**											

G.1.	Distribution of Solar lanterns, improved cook stoves; Installation of Solar Street lights etc.	5.00	5.00	5.00	5.00	5.00	-	-	-	-	-	25.00
H.	**Development and Implementation of appropriate Monitoring & Evaluation System (Refer Paras 4.4.7. & 7.7.)**											
H.1.	Monitoring & Evaluation of the Plan	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9.00
I.	**Infrastructural Strengthening (Refer Paras 4.4.8. & 7.8.)**											
I.1.	Purchase of equipment/software/drones etc; Development of mobile applications; Engagement of IT/GIS professionals; Infrastructural Strengthening etc.	7.50	7.50	7.50	7.50	7.50	5.00	5.00	5.00	5.00	5.00	62.50
J.	**Miscellaneous & Administrative Expenses**											
J.1.	Unforeseen Miscellaneous expenditure	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
K.	**Total**	436.66	251.87	138.29	104.86	78.27	59.08	58.58	56.16	56.16	58.16	1298.09
L.	**Cost Escalation Provision @20%**	87.33	50.37	27.67	20.97	15.65	11.82	11.72	11.23	11.23	11.63	259.62
M.	**Total (K. + L.)**	523.99	302.24	165.95	125.83	93.92	70.90	70.30	67.39	67.39	69.79	**1557.71**
N.	**Grand Total (Godda Forest Division)**											**1557.71**

*A total of 26 JFMCs are registered in the Impact Area. 13 JFMCs are proposed to be funded with Seed Money under the instant plan. Rest of 13 JFMCs are being proposed to be funded through the SMC Plan.

8.3. ABSTRACT OF EXPENDITURES UNDER THE PLAN

Table 22: Abstract of Expenditures under Various Heads

Sl. No.	Activity Head	Financial Forecast (Rs. in Lakh)		Total (Rs. in Lakh)
		Dumka Forest Division	Godda Forest Division	
A.	Habitat Management (Refer Para 4.4.1. & 7.1.)	802.24	547.42	1349.66
B.	Enrichment of the Elephant Movement Path (Refer Chapter 6)	1634.15	449.17	2083.32
C.	Human-Elephant Conflict Management (Refer Para 4.4.2. & 7.2.)	70.00	35.00	105.00
D.	Awareness Development Programmes (Refer Para 4.4.3. & 7.3.)	50.00	25.00	75.00
E.	Capacity Development Programmes for Frontline Forest Staff (Refer Para 4.4.4. & 7.4.)	50.00	25.00	75.00
F.	Development of Alternative Livelihoods (Refer Para 4.4.5. & 7.5.)	200.00	100.00	300.00
G.	Promotion of Alternative Energy Consumption (Refer Para 4.4.6. & 7.6.)	50.00	25.00	75.00
H.	Development and Implementation of appropriate Monitoring & Evaluation System (Refer Paras 4.4.7. & 7.7.)	18.00	9.00	27.00
I.	Infrastructural Strengthening (Refer Paras 4.4.8. & 7.8.)	125.00	62.50	187.50
J.	Miscellaneous & Administrative Expenses	50.00	20.00	70.00
K.	Total	3049.39	1298.09	4347.48
L.	Cost Escalation Provision @20%	609.88	259.62	869.50
M.	Grand Total	3659.27	1557.71	5216.98

Cost to the User Agency towards implementation of the Wildlife Management Plan = Rs. 5216.98 Lakh

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8.4. NOTABLE POINTS REGARDING IMPLEMENTATION OF THE PLAN

Following points are worth noting while implementing the Plan:

- The Plan may be revised every three years depending upon the feedback of the implementing agency and taking into consideration the properly assessed gap between the expected outcome and the actual results. Though it is somewhat difficult to assess the gaps in an objective manner, the experience of the field staff and villagers' views may come in handy at times. As for the cost of revision of the SMC Plan, the User Agency shall submit an undertaking to the respective DFOs to the effect that the cost of revision of the Plan shall be borne by them.
- Though provision of a flat rate of 20% has been made towards cost escalation in the Plan viz. increase in wage rate/material cost etc., yet the User Agency shall submit an undertaking to the respective DFOs to the effect that they will deposit extra cost of the Plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.
- The Plan has been formulated taking into consideration the available Schedule of Rates, copies of which are being annexed with the Plan. Since the Plan is expected to begin its journey not any time before the next financial year i.e., 2026-27 when it is expected to be included in the State APO (CAMPA), cost escalation of 20% has been provided for even against the estimates for Year-1.
- The Plan should not be taken as the last word. The DFOs may be given sufficient amplitude to change the locations, specifications etc. The Divisional Forest administration may devise a framework in consultation with superior authorities so as to facilitate the implementation of the Plan considering all the site-specific technical as well as community demands.
- While estimating the cost of various activities under the Plan, departmental schedule of rates has been followed. However, these are based on some broad assumptions. The implementing agency is expected to prepare site-specific estimates considering the rates approved by the Department against specific items required for a specific activity.
- For successful implementation of the Plan, it would be desirable that a comprehensive APO is prepared after the funds are received. It is a common practice that the amount estimated in the instant Plan for a specific year is not received by the implementing agency

in full. Therefore, prioritisation of works would be an exercise which may call for due care and diligence in the interest of meeting the objectives under the Plan.

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ANNEXURES

Annexure 1: Stage-I Forest Clearance Order issued in favour of Pachhwara South Coal Block Project

8-37/2022-FC

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand State (Online No. FP/JH/MIN/59823/2020) –regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter No. Van Bhumi-19/2022-3464 V.P. dated 29.11.2022 on the above subject seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government & on the basis of the recommendations of the Advisory Committee and with due approval of the competent authority, the Central Government hereby accords **"In-principle/Stage-I"** approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 455.1108 ha of forest land for Pachwara South Coal Block project in favour of M/s Neyveli Uttar Pradsh Power Ltd. (NUPPL), District Dumka, Jharkhand subject to fulfilment of the following conditions:

i. Legal status of the diverted forest land shall remain unchanged;

ii. **Compensatory Afforestation**:

a. *Details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion including the area for safety zone/green belt shall be submitted by the State Government along with the compliance report of the Stage-I approval.*
b. *The non-forest land to be identified shall be transferred and mutated in favour*

of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval.

c. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

iii. **Net Present Value:**

a. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC's guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

b. At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

iv. *Trees should be felled in a phased manner and when become absolutely necessary and under strict supervision of State Forest Department and wherever feasible suitable species should be transplanted.*

v. *The State Govt. shall prepare and implement Wildlife Conservation plan duly approved by CWLW, Jharkhand to mitigate the impact of mining on elephant and other wildlife in and around the proposed area at project cost.*

vi. *As the Bansloi river is flowing in the Northern boundary of the proposed mining lease, no excavated material and mine waste water shall be discharged into the river. Embankment all along the river bank should be constructed to ensure that the no mining waste water is drained to the river. Catchment area treatment plan for river Bansloi shall be prepared and implemented at project cost.*

vii. *Safety Zone of 100 meter along the river bank shall be maintained and inside the safety zone, plantation should be done at the project cost.*

viii. *A site specific wildlife management plan of a radius of 10 km from the proposed lease area at the project cost will be prepared. Besides this, migration path for elephant's passage if present beyond 10 km then such migration route shall be developed with plantation of suitable species at the project cost.*

ix. *User agency shall prepare a Digital Elevation Model of 10 Km radius using LIDAR technology before commencement of mining operation and shall be*

repeated on 3rd, 5th, 10th, 15th, 20th, 25th and 30th year in consultation with the PCCF. On the basis of DEM user agency shall prepare a CAT and SMC plan of 10 km radius including Chatua nala and other nearby nalas. These plans will be approved by the PCCF (HoFF) and will be implemented by the Forest Department at the project cost. A team, to be finalized by the PCCF, comprising of officials of user agency, Forest Department subject matter specialist shall be constituted to study and monitor the soil erosion, water conservation, ecological restoration activities during the implementation of the project.

x. *As recommended by the State, the Water security plan prepared by the group of experts shall be adhered to.*

xi. The State Government shall upload the KML files of the area under diversion and the accepted area for raising compensatory afforestation in the e-Green watch portal of FSI, before handling over forest land to the user agency;

xii. All the funds received from the user agency under the project shall be transferred/deposited in CAMPA account only through **e-portal** (https://parivesh.nic.in/); Amount deposited through other mode will not be accepted as compliance of the Stage-I clearance;

xiii. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent Reclamation Plan as per the approved Mining Plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

xiv. The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

xv. The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

xvi. Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:

a. User agency shall ensure demarcation of safety zone (7.5 meter strip all

along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department;

b. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
c. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department; and
d. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

xvii. Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department:

a. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;
b. Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved Plan/scheme;
c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;
d. Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and
e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

xviii. The validity of approval granted under the Adhiniyam shall be for a period co-terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

xix. The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'In-principle' approval;

xx. The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

xxi. The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;

xxii. Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

xxiii. The user agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

xxiv. The User agency will undertake comprehensive soil conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted to the Regional Office along with the 'in-principle' approval; and

xxv. Under no circumstances, approval granted for the use of forest land for underground mining, shall subsequently be converted to opencast mining operations.

xxvi. The R&R Plan shall be implemented as per the R&R Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones;

xxvii. The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled;

xxviii. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

xxix. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

xxx. No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

xxxi. The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;

xxxii. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

xxxiii. No damage to the flora and fauna of the adjoining area shall be caused;

xxxiv. The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project;

xxxv. The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

xxxvi. Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency; and

xxxvii. Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 as issued by this Ministry's letter dated 29.12.2023;

xxxviii. The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).

After receipt of compliance report on fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Signed by
Dheeraj Mittal
Date: 18-09-2024 14:10:45

Yours sincerely,

(Dr. Dheeraj Mittal)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi for uploading on PARIVESH portal.

Annexure 2: Environmental Clearance issued in favour of Pachhwara South Coal Block Project

ENVIRONMENTAL CLEARANCE

PARIVESH

(Pro-Active and Responsive Facilitation by Interactive, and Virtuous Environment Single-Window Hub)

Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

To,

The CEO
NEYVELI UTTAR PRADESH POWER LIMITED
6/42, VIPUL KHAND, GOMTI NAGAR, Lucknow Uttar Pradesh-226010

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the Ministry vide proposal number IA/JH/CMIN/168045/2020 dated 10-Oct-2022. The particulars of the environmental clearance granted to the project are as below:

1.	**EC Identification No.**	**EC24A042JH120508**
2.	**File No.**	IA-J-11015/18/2020-IA-II(M)
3.	**Project Type**	New
4.	**Category**	A
5.	**Project/Activity including Schedule No.**	1(a) Mining of minerals
6.	**Name of Project**	Pachwara South Coal Mine Project
7.	**Name of Company/Organization**	NEYVELI UTTAR PRADESH POWER LIMITED
8.	**Location of Project**	Jharkhand
9.	**TOR Date**	05 Nov 2020

The project details along with terms and conditions are appended herewith from page no 2 onwards.

Date: 23/09/2024

(e-signed)
Sundar Ramanathan
Scientist F
IA - (Coal Mining sector)

Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH.Please quote identification number in all future correspondence.

This is a computer generated cover page.

File No. J-11015/18/2020-IA. II (M)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)
*****

Indira ParyavaranBhawan,
Jorbagh Road, N Delhi – 3
Email: r.sundar@nic.in
Tel: 011-20819378

Dated: 23rd September, 2024

To,

The Chief Executive Officer,
M/s Neyveli Uttar Pradesh Power Limited,
At Village. Chirudih, Tehsil Gopikandar,
District Dumka - 814101 (Jharkhand)
Email: pachwara.south@nlcindia.in

Sub: Pachwara South Opencast Coal Mine of 9 MTPA (Normative & Peak) in mine lease area of 714.8553 ha by M/s Neyveli Uttar Pradesh Power Limited located at Rajmahal Coalfield, District Dumka (Jharkhand) – Environmental Clearance –reg.

Sir,

This has reference to your online proposal No. IA/JH/CMIN/168045/2020 dated 10th October, 2022 and your subsequent letter dated 19th September 2024 (submission of Stage – I FC for diversion of 455.1108 Ha) for grant of Environmental Clearance to the above project.

2. The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of Environmental Clearance to the project Pachwara South Opencast Coal Mine of 9 MTPA (Normative & Peak) in mine lease area of 714.8553 ha by M/s Neyveli Uttar Pradesh Power Limited located at Rajmahal Coalfield, District Dumka (Jharkhand). The project/activity is covered under category "A" of item1(a) 'Mining of Minerals" the Schedule to the EIA Notification, 2006

3. The proposal was considered by the sectoral Expert Appraisal Committee (EAC) in its 36th meeting held during 20-21 October, 2022, 41st meeting held during 13-14 March, 2023 and 47th meeting on 21-22 July, 2023 through Video Conferencing. The details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meetings, are given as under:

i. The project area is covered under Survey of India Topo Sheet No G45V6 & G45V7 and is bounded by the geographical coordinates ranging from Latitude 24°29'57.404"N to. - 24°31'46.956"N and Longitude 87°27'22.010"E to 87°29'S6.150"E.

ii. Coal Mined from this project will be utilized in Ghatampur Thermal Power Plant (Neyvelli Uttar Pradesh Power Limited), a Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh.

iii. Joint venture cartel has been formed on 09.11.2012.

iv. Project does not fall in the Critically Polluted Area (CPA), as per MoEF &CC's OM dated 13th January, 2010.

v. Employment generation. Direct-1288 and indirect employment generation shall be more than 3000.

vi. The project is reported to be beneficial in terms of employment to local people directly and indirectly. Indirect employment will be in the form of service provides, shopkeepers, mechanic, drivers, transporters etc. The lessee will be responsible for providing better social infrastructure benefits such as drinking water, health care measures, educational facilities, promotion of culture and religious activities in surroundings as part of their CER activities. The proposed mine will bring economic benefits to the state by the way of Royalty and other statutory payments. The linked power plant of 1980 MW will produce of 14743.08 MU of power which will help the state of Uttar Pradesh state to meet out the shortfall in power requirements.

vii. Terms of Reference granted on 5th November 2020 for a production capacity of 9 MTPA (Normative) and 13.50 MTPA (Peak rated) by Vide letter no. IA-J-1 1015/18/2020-IA-II(M) dated 5th November, 2020.

viii. Total mining lease area as per block allotment is 715 ha. Mining Plan (Including Progressive Mine Closure Plan) has been approved by the Ministry of Coal (MoC) on 11th Nov'2020, vide letter no. 3401 1/2/2020-MPS.

ix. The land usage pattern of the project is as follows:

Pre-mining land use details (Area in Ha)

S. No.	Land Use	Within ML Area	Outside ML Area	Total
1	Agricultural Land	136.40	-	136.40
2	Forest Land	397.39	-	397.39
3	Wasteland	-	-	-
4	Grazing land	12.20	-	12.20
5	Surface water bodies	10.32	-	10.32
6	Settlements	139.13	-	139.13
7	Others (Specify)	12.2653	-	12.2653
8	Old Excavation Area (East)	-	-	-
9	Old Excavation Area (West)	-	-	-
10	Old OB Dumps			
11	Roads & Mine Infrastructure	7.15	-	7.15
12	R & R Colony	-	-	-
13	Staff Colony	-	-	-
14	Green Belt	-	-	-
15	Balance Area	-	-	-
	Total Project Area =	**714.8553**		**714.8553**

Post Mining (Area in Ha)

S. No.	Land Use	Land use (ha)				
		Plantation	Water Body	Public Use	Undisturbed	Total
1	External OB Dump					
2	Top Soil Dump					6.53
3	Excavation					643.76
4	Roads					18.47
5	Built-up Area					
6	Green Belt					3.06
7	Undisturbed area					3.2653
8	Safety Zone / Rationalization Area					10.84
9	Diversion / Below River / Nala / Canal			3.31		3.31
10	Water Body					
11	Staff Colony					
12	Others					25.62
	Total Area =					**714.8553**

x. Total gross geological reserve reported in the mine lease area is 415.02 MT with 269.58 MT mineable reserve. Out of total mineable reserve of 269.58 MT, 262.84 MT are available for extraction Percent of extraction is 70.37%.

xi. 31 seams (including splits) with thickness ranging from 0.5 m 19.43 m are workable. Grade of coal is G10 (GCV 4300 to 4600), stripping ratio 3.25, while gradient is 1:19.

xii. Method of mining operations envisages by Mechanized opencast mining method.

xiii. Life of mine is 38 years including two years of pre mining activity.

xiv. The project has one external OB dump initially in an area of 197.79 ha. with 60 m height with 80.63 MCum of OB. One internal dump in an area of 523.62 ha. with 853.27 MCum of OB is envisaged in the project. The re-handling of entire surface dump (80.63 MCum) will commence from 7th year of production commencement and completed by 19th year from production commencement and there would not be any external dump.

xv. Proposed quarry area is 643.76 ha out of which backfilling will be done in 523.62ha while final mine void will be created in an area of 120.14 ha with a depth of 320m. Backfilled quarry area of 122.29ha shall be reclaimed with plantation. Final mine void of 120.14 ha will be converted into water body.

xvi. Transportation of coal has been proposed by front head loader dumper combination in mine pit head (however, as the mine goes to depth, a steep angle conveyor system will be installed from mine face to temporary coal stock yard at later stage), from surface to siding coal will be transported through conveyor system. However, in the initial few years, till the conveyor laying is completed, coal will be transported through road. At sidings RLS and Bunkers will be installed for coal loading onto wagons.

xvii. Out of 715 ha. of project area, an area of 643.76 ha. will be excavated. Out of total 643.76 ha. of excavated area, an area of about 523.62 ha. will be backfilled and 120.14 ha of land will remain as a mined-out void which will be converted as water body.

xviii. 397.39 ha of forest land has been reported to be involved in the project. Approval under the Forest (Conservation) Act, 1980 for diversion of 397.39ha of forest land for non-forestry purposes will be obtained.

xix. No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones fall within 10 km boundary of the project.

- Wildlife conservation plan for schedule – I have been submitted to the Principal & Chief Conservator of Forest, Doranda, Ranchi, Jharkhand on 6th October, 2022. List of Flora and Fauna has been authenticated by DFO, Pakur for buffer zone vide letter no. 127 on dated 18th January, 2022. List of Flora and Fauna has been authenticated by DFO, Dumka for core zone vide letter no. 572 on dated 07.03. 2022.

xx. Clarification from Divisional Forest Officer, Dumka is obtained vide letter no- 2509 dated 07.12.2020 that the mine does not fall under corridors of any National Park and Wildlife Sanctuary. Since, the Buffer Zone is also covering part of Pakur District, clarification from Divisional Forest Officer, Pakur is also obtained vide letter no- 227 dated 02.01.2021 that the buffer zone doesn't form a part of any National Park and Wildlife Sanctuary.

xxi. The ground water level has been reported to be varying between 4.5 m to 11.0 m during pre-monsoon and between 2.25 m to 9.1 m during post-monsoon.

xxii. Total water requirement for the project is 1660KLD including domestic and industrial.

xxiii. Application for obtaining the approval from Central Ground Water Authority has been submitted and a provisional No Objection Certificate for Groundwater Abstraction has been granted by vide letter no-CGWA/NOC/MIN/ORIG/2022/14905 dated 25.03.2022.

xxiv. Public hearing for the project of production capacity of 9 MTPA (Normative) and 13.50 MTPA (Peak rated) in an area of 715 ha was conducted on 28th of December, 2021 at 11.30am in village Rangamison on Dumka-Pakur main road under the Chairmanship of Additional Collector. Major issues raised in the public hearing include social-developmental activities, pollution control due to mining. Appropriate action to address the issues raised in the Public Hearing have already been taken/proposed.

xxv. During the public hearing, major issues raised were related to social-developmental activities, Pollution control during mining activity, construction of R& R colony with all basic amenities and adequate compensation for the "Van Patta" and other land, construction of schools for children, employment to the villagers, filling the mined out land and to be made flat, irrigation well and distribution network shall be installed, occurrence of seepage of ground water and leaching from overburden material.

xxvi. Consent to Operate will be obtained from the concerned authority as per prevailing norms.

xxvii. No perennial river is passing through the block and diversion of such Streams/ Nala's are thus not envisaged.

xxviii. Regular monitoring of Ambient Air quality will be carried out as per the guideline of MOEF & CC. Monitoring report will be submitted along with half yearly EC compliance report.

xxix. No court cases, violation cases are pending against the project of the PP.

xxx. Base line study for Environmental Impact Assessment has been carried out during December, 2020 to February, 2021.

xxxi. The project does not involve violation of the EIA notification 2006, coal production will be started after obtaining necessary statutory approval from concern authorities.

xxxii. The project involves 541 project affected families. R&R of the PAPs will be done as per the statute. At present, detailed SIA study is ongoing on under the guidance of District Administration. More precise numbers of PAF's and PAP's along with estimated R&R cost will be informed after completion of the SIA study.

xxxiii. Total cost of the project is Rs. 1795.01 crores. Cost of production is Rs. 1071 per tonne, estimated CER cost for Pachwara South Coal block is coming around Rs.8.97 cores. Environment Management cost: Capital Investment - Rs 185 lakh. Recurring Cost-118 lakh.

xxxiv. Revised Environmental Budget:

Activities	Capital Cost (in Rs. Lakhs)	Recurring Cost per Annum (in Rs. Lakhs)	Total Recurring Cost in the lease period (in Rs. Lakhs)
Air Pollution Control			
Installation & maintenance of Automatic Sprinklers along the haul road.	350	4.5	171
Purchase & maintenance of water tanker & machineries for water sprinkling	65	7.5	285
Online AQ monitoring system	35	2.5	95
Construction & Maintenance of mines haul road	90	8.5	323
Total	**540**	**23**	**874**
Water Pollution Control			
Construction of garland drain around the dump	150	4	152
Construction & maintenance of garland drain around mining pit	225	8	304
Construction of 2 settling ponds & it's collecting drains	175	2.5	95
Masonary Construction of Catch pits to arrest the clay mixed water from the ROM Stack yard.	22	1.25	47.5
Construction of toilets with septic tank & soak pits (5 Nos.)	77.5	1	38
Water Treatment Plant for domestic use of Mine Pit water.	50	2.5	95
Effluent Treatment Plant (ETP)	1050	31.5	1197
Sub-Total –	**1749.5**	**50.75**	**1928.5**
Noise Pollution Control			
Mining machineries fitted with upgraded silencer, noise pollution control facilities	3500	250	9500

Activities	Capital Cost (in Rs. Lakhs)	Recurring Cost per Annum (in Rs. Lakhs)	Total Recurring Cost in the lease period (in Rs. Lakhs)
Sub-Total =	**55**	**2.5**	**95**
Environmental Monitoring & Management			
Electronic display board near the main gate	22.5	0.5	19
Installation & maintenance of round the clock Weather Monitoring Station on the office	8.5	1.25	47.5
Monitoring & reporting cost of registered laboratory		5.5	209
Sub-Total =	**31**	**7.25**	**275.5**
Occupational Safety			
Provision of safety shoes, dust mask, safety goggles, ear plugs, safety helmets, etc to workers.	25.76	25.76	978.88
Construction of Rest Shelters & First Aid Centre	25	0.5	19
Annual health checkup of workers & health camp	64.4	12.88	489.44
Ambulance for workers and villagers - 1 No. (Replacement considered in 11th year)	15	4	152
Training to Staff	2.6	2.6	98.8
Total	**132.76**	**45.74**	**1738.12**
Plantation & Green Belt Development			
Plantation and Green Belt Development for the entire lease period	1642.5	102	3876
Sub-Total =	**1642.5**	**102**	**3876**
Grand Total =	**4150.76**	**231.24**	**8787.12**

xxxv. EMP capital cost of Rs. 4150.76 Lakhs and recurring cost to be spent as Rs. 8787.12 Lakhs on environment.

xxxvi. PP will spent total of Rs. 144.27000 to address the issues raised during Public Hearing mentioned below:

Activity	Budget in Rs.
School Bus Provisions per Year	20,00000
Hand Pump & Pump Sets	15,00000
Construction of School in R & R Colony	89,27000
Provision for Anganwadi	20,00000
Total =	**144,27000**

4. The Expert Appraisal Committee in its 47th EAC Meeting on 21 - 22 July, 2023 through Video Conferencing has recommended the project for grant of Environment Clearance (EC). Based on recommendations of the EAC, Ministry of Environment, Forest and Climate Change hereby accords approval for Environment Clearance(EC) to **Pachwara South Opencast Coal Mine of 9 MTPA (Normative & Peak) in mine lease area of 714.8553 ha by M/s Neyveli Uttar Pradesh Power Limited located at Rajmahal Coalfield, District Dumka (Jharkhand),** under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto subject to the compliance of the following terms & conditions / specific conditions in addition to the standard environmental conditions notified by the Ministry as under :-

i. PP should not construct any infrastructure and no dumping of overburden allowed on forestland, (if required Mine Plan shall be revised).

ii. PP shall mine 9 MTPA (as peak capacity) as per the calendar plan submitted in the Mining plan and accordingly CTO from State Pollution Control Board shall be obtained for 9 MTPA.

iii. PP shall restrict the mining activity at least 100m away from the HFL of the Bansloi River in order to protect the natural flow of river. Accordingly, embankment with stone pitching on both side (towards and outwards of river) shall be developed. Dense plantation shall be developed with Sal Trees on this embankment.

iv. PP shall construct the railway siding towards other side of riverbank so that all available coalmines can access for the use of transportation purpose.

v. The construction of railway siding shall be in commensurate with inpit belt conveyor system along with silo loading system and the same shall be completed within 30 months i.e. on or before February 2026, accordingly, SPCB may grant CTO.

vi. PP has to resolve suggestions/objections raised during the public hearing along with implement activities-wise proposed budget of Rs. 144.27000 (as Public Hearing Budget), Capital cost of Rs. 4150.76 Lakhs and recurring cost of Rs. 8787.12 Lakhs (as EMP cost) in time bound manner as per para 47.5.2 (ii) & (iii) of MoM. The details of annual expenditure shall be part of report submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored through dedicated online monitoring mechanism. The maintenance of all activities shall be covered through recurring cost of Public Hearing, which will be part of CSR budget.

vii. The truck size of 40 tonne (payload) for the transportation of coal through road till commissioning of SILO with rapid loading system i.e. on or before February 2026 accordingly SPCB may issue the CTO. No coal transportation shall be done from village road and near to any sensitive locations such as schools, hospitals etc.

viii. PP must develop adequate drainage pattern all around the Mine lease area and treat it through ETP. No acidic/untreated water from mine should be allowed to discharge from mine lease area into the water bodies including river.

ix. PP shall explore the sand-segregation plant for recovering sand from Overburden.

x. PP shall install fixed type sprinkling system (near to haul road, stockyard, transportation route etc.) across the mine lease area in order to arrest the dust coming out from the mining activities.

xi. The status of mine closure activities must be included in every six months compliance report

submitted to the state pollution control board and IRO.

xii. PP shall conduct third party audit of compliance of EC condition at an interval six months and its report shall be submitted to IRO, MoEF&CC.

xiii. PP to maintain the topped haul road properly to minimized the dust emission. PP to also develop pucca roads by seeking consent from the panchayat with widening of roads especially roads inter linking the villages within the study area of 10 km radius buffer zone. Also PP shall install Mist Cannon Dust Suppression Systems (80-100 mtrs.) at Coal Stock Yard to suppress the dust particles (at least 10 numbers).

xiv. Garland drains (2mX3m) of adequate size shall be provided at the toe of the benches to arrest discharge and runoff with silt and sediments surging into areas adjoining the periphery of Overburden dump, which will be regularly cleaned before the onset of monsoon every year.

xv. PP shall construct 5 water harvesting pond (of at least 5 ha) separately to recharging the ground water and usage of project affected families within 10-15 km of project area within 2 years of commencement of mine operation.

xvi. PP shall make alternate arrangement of grazing land of at least 10 ha for usage of project affected families within 10-15 km of project area within 2 years of commencement of mine operation.

xvii. PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year.

xviii. PP shall make use of advanced computer simulation techniques for design and execution of blasting operation in the mine. PP shall make use of Electronic Delay Detonators for optimal blasting in coal and OB rock to minimize the environmental impacts of blasting such as ground vibration, fly rocks and excessive dust generation.

xix. PP shall deploy atleast 20% of overall fleet of dumpers/trucks as electrical or CNG/LNG based dumpers/trucks for transportation of coal/OB etc and deploy e-vehicles for workers/staff in the mine.

xx. PP to provide bio toilets to the villages located within the study areas within 1 year from the grant of this EC.

xxi. Persons of nearby villages shall be given training on livelihood and skill development to make them employable with its proper records.

xxii. PP shall establish a school for local people and Project affected families as per the new Education policy, 2020 along with the school bus facility with minimum fees.

xxiii. PP shall create a "Public Grievance Redressal and Monitoring System" for resolving any issues related to the pollution of mines and complaint has to resolve as soon as possible not beyond 30 days. In this regard, adequate awareness to be spread among the public to address their grievance to company with simple and easy manner and for which company needs to devise the mechanism. The same shall be reported to IRO within 3 months. A logbook to be maintained by PP on "Public Grievance Redressal and Monitoring System.

xxiv. PP shall ensure distribution of water from the artificial reservoir within and outside Mine lease area in consultation with gram panchayat. The water treatment plant to meet the requirement with the start of production.

xxv. PP shall install fixed fog cannon (mist spayer) and fixed sprinkler all along the haul road/

CHP, and OB dump till Railway siding is completed. The sufficient number of fog cannons (not less than 10 nos.) with 40 mts jet length shall be installed within 6 months. It should be ensured that air pollution level confirm to the standards prescribed by the MOEFCC/CPCB.

xxvi. PP shall deposit the approved amount as proposed for wildlife conservation plan to the Govt. of Jharkhand, Forest & Environment Dept. shall do regular follow up with for expenditure of Wildlife Conservation Plan and the details expenditure shall be submitted with six monthly EC compliance report to Ministry's IRO. Also, PP shall engage with State Biodiversity Authority and local biodiversity committee under its CSR activity to develop the local market.

xxvii. PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority.

xxviii. PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021

xxix. Continuous air quality monitoring station (CAAQMS) should be installed within six months of commencement of mine and the real time data so generated to be uploaded on company website. In addition, data should also be displayed digitally at entry and exist gate of mine lease area for public display.

xxx. PP to plant 100,000 nos. of Sal trees only and develop nursery of 10 ha sal trees for free distribution in nearby areas.

xxxi. PP shall obtain prior approval of CGWA for use of groundwater for mining operations

xxxii. PP shall conduct catchment area study of the nallah/streams present and may impact river before any diversion. These catchment study shall be submitted to EAC prior to any diversion of streams for appropriate mitigation measures.

4.1 The grant of environmental clearance is further subject to compliance of the Standard EC conditions as under:

(a) Statutory compliance

i. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.

ii. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.

iii. The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan/Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of Schedule-I species in the study area).

iv. The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee.

v. The project proponent shall obtain the necessary permission from the Central Ground Water Authority.

vi. Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.

(b) Air quality monitoring and preservation

i. Continuous ambient air quality monitoring stations as prescribed in the statue be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM_{10}, $PM_{2.5}$, SO_2 and NO_x. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc to be carried out at least once in six months.

ii. The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.

iii. Transportation of coal, to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun etc shall be carried out in critical areas prone to air pollution (with higher values of $PM_{10}/PM_{2.5}$) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.

iv. The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed so that the impact of sound, dust and accidents could be appropriately mitigated.

v. Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.

vi. Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.

vii. Coal handling plant shall be operated with effective control measures w.r.t. various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.

(c) Water quality monitoring and preservation

i. The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.

ii. The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.

iii. Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/RO.

iv. Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.

v. Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.

vi. Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly consolidated/ compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drains/ ponds so constructed shall be regularly de-silted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development and other industrial use. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/habitation/water bodies.

vii. Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).

viii. Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under Water Act 1974 and Environment (Protection) Act, 1986 and the Rules made there under, and as amended from time to time. Adequate ETP/STP needs to be provided.

ix. The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.

x. The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.

xi. The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5 km. A rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.

(d) Noise and Vibration monitoring and prevention

i. Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.

ii. Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.

iii. The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.

(e) Mining Plan

i. Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.

ii. Mining shall be carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).

iii. No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.

iv. Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.

(f) Land reclamation

i. Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).

ii. The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and

alive top soil. Post-mining land be rendered usable for agricultural/forestry purposes and shall be diverted. Further action will be treated as specified in the guidelines for Preparation of Mine Closure Plan issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments.

iii. The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land-use pattern, which is an integral part of the approved Mining Plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-a-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.

iv. Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD), if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.

v. Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized. The top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.

vi. The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.

(g) Green Belt

i. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.

ii. Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all along the major approach/ coal transportation roads.

(h) Public hearing and Human health issues

i. Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six-monthly basis.

ii. The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records

accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.

iii. Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.

iv. Implementation of the action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.

v. The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.

(i) Corporate Environment Responsibility

i. Fund allocation for Corporate Environment Responsibility (CER) shall be made as per Ministry's O.M. No. 22-65/2017-IA.III dated 30th September 2020 and based on commitment made during public consultation process for incorporating in EIA-EMP for deliberation of EAC

ii. The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall have defined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions and/or shareholders/stake holders.

iii. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

iv. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

v. Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

(j) Miscellaneous

i. The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be

in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

ii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

iv. The project proponent shall monitor the criteria pollutants level namely; PM_{10}, SO_2, NOx (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.

vi. The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled "Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area".

vii. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

viii. The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

ix. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

x. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.

xi. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change.

xii. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xiii. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiv. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xv. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

xvi. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes

(Management and Trans-boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

5. The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.

6. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

7. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

8. The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.114/2014 in the matter of "Common Cause Vs Union of India & others.

9. The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining, if any, is paid by the project proponent through their respective Department of Mining & Geology, in strict compliance of the judgment of Hon'ble Supreme Court.

10. This environmental clearance shall not be operational till such time the project proponent complies with the above said judgment of Hon'ble Supreme Court, as applicable, and other statutory requirements.

This issues with the approval of the competent Authority.

(Sundar Ramanathan)
Scientist 'E'

Copy to:

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi
2. The Secretary, Department of Environment & Forests, Government of Jharkhand, Secretariat, Ranchi
3. The Additional Principal Chief Conservator of Forests, Regional office (ECZ), Ministry of Environment & Forests, Bungalow No. A-2, Shyamali Colony, Ranchi - 834002
4. The Chairman, Jharkhand State Pollution Control Board, TA Building, HEC Complex, PO Dhurwa, Ranchi

5. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
6. The Chairman, Central Ground Water Authority, Ministry of Jal Shakti, Jamnagar House, 18/11, Man Singh Road Area, New Delhi, Delhi 110001

7. The District Collector, Dumka, Government of Jharkhand.
8. Monitoring File/Guard File/Record File.
9. PARIVESH Portal

(Sundar Ramanathan)
Scientist 'E'

Signature valid
Digitally signed by: Sundar Ramanathan
Designation: Scientist F
Date and Time: 9/23/2024 6:02:23 PM

Annexure 3: Estimate – Bamboo Plantation

झारखण्ड राज्य अन्तर्गत वन भूमि पर बाँस वृक्षारोपण हेतु कार्य दर

योजना का नाम :– बाँस वृक्षारोपण (पाईलोट से) मजदूरी दर प्रति मानव दिवस : 406 रूपये
प्रति हे0 पौधों की संख्या : 1000 पौधे
पौधों की दूरी : 3मी0 x 3मी0

क्र0 सं0	कार्य की विवरणी	मानव दिवस	मजदूरी रू0	सामग्री रू0	कुल व्यय रू0 में	अनुमति
1	2	3	4	5	6	7
क	अग्रिम कार्य (प्रथम वर्ष)					
1	सर्वेक्षण एवं डिमार्केशन	3	1215.00	0.00	1215.00	
2	झाड़ी सफाई	7	2835.00	0.00	2835.00	
3	मशीन द्वारा ट्रेंच खुदाई ट्रेसिंग सहित (जल संसाधन विभाग की अनुसूचित दर सूची दिनांक 01.06.2021 से लागू का आईटम सं0 7.1.43.1 से 9.1 प्रतिशत संवेदक लाभ घटाकर दर) 18 प्रतिशत जीएसटी0 सहित।	12	4860.00	15942.90	20802.90	स्थल के आवश्यकतानुसार कटीले तार घेराव/ खेल लिक/पत्थर घेराव/झाड़ी घेराव किया जा सकता है।
4	गड्ढा एवं सरेखन कार्य (0.45 मी x 0.45 मी x 0.45 मी) – 1000 गड्ढा प्रति हे0	75	30375.00	0.00	30375.00	
5	बाँस 1200 साइजोम (10 रूपये प्रति साईजोम) का क्रय एवं परिवहन 20.0	0	0.00	14000.00	14000.00	
6	अंश पौधशाला का कार्य (दिसम्बर से मार्च) 6"x8" x 150 गेज मे पोलीथिन बैगी, रात्रि प्रहरी सहित	15	6075.00	0.00	6075.00	
7	सामग्री (पोलीथिन बैगी, उर्वरक, खाद रसायन, पौधशाला के लिये घेराव सामग्री छायांकन प्रस्तर आदि	0	0.00	6720.00	6720.00	
8	मृदा एवं जल संरक्षण कार्य जैसे कंटूर ट्रेंचिंग, गली प्लगिंग, ब्रायवरन बैनल, चेक डैम आदि	10	4050.00	0.00	4050.00	
9	इण्ट्री प्वाईट कार्य	10	4050.00	10500.00	14550.00	
10	विविध कार्य (छायांकन, साईनबोर्ड, प्रचार–प्रसार, मुद्रण एवं संकलन आदि)	0	0.00	250.00	250.00	
11	लेबर सेस मजदूरी का 1 प्रतिशत	0	0.00	534.60	534.60	
	योग :–	132	53460.00	47947.50	101407.50	
ख	संस्थापन कार्य (द्वितीय वर्ष)					
1	अंश पौधशाला कार्य (रात्रि प्रहरी सहित)	12	4860.00	0.00	4860.00	
2	वृक्षारोपण	45	18225.00	0.00	18225.00	
3	एक खोड़नी–निकौनी एवं एक निकौनी एवं मल्चिंग	25	10125.00	0.00	10125.00	
4	ट्रेंच के बर्म पर रोपण हेतु बीज रोपण	2	810.00	0.00	810.00	
5	सुरक्षा पर व्यय	9	3645.00	0.00	3645.00	
6	सामग्री, बीज, उर्वरक, खाद रसायन आदि 50 ग्राम प्रति पौधा एन0पी0के0 सहित	0	0.00	2205.00	2205.00	
7	विविध कार्य (छायांकन, साईनबोर्ड, प्रचार–प्रसार, मुद्रण एवं संकलन आदि)	0	0.00	250.00	250.00	
8	लेबर सेस मजदूरी का 1 प्रतिशत	0	0.00	376.65	376.65	
	योग :–	93	37665.00	2831.65	40496.65	

क्र0 सं0	कार्य की विवरणी	मानव दिवस	मजदूरी रू0	सामग्री रू0	कुल व्यय रू0 में	अभ्युक्ति
1	2	3	4	5	6	7
ग	**सम्पोषण कार्य (तृतीय वर्ष)**					
1	एक निकौनी एवं मृदा खनन	14	5670.00	0.00	5670.00	
2	उर्वरक (50 ग्राम/पौधा यूरिया सहित)		0.00	1099.00	1099.00	
3	गड्ढा घेरान की मरम्मति	5	2025.00	0.00	2025.00	
4	मृत पौधों का प्रतिस्थापन	4.4	1782.00	1000.00	2782.00	
5	पौधों की सुरक्षा पर व्यय	12	4860.00	0.00	4860.00	
6	विविध कार्य (छायांकन, साईनबोर्ड, प्रचार-प्रसार, मुद्रण एवं संकलन आदि)	0	0.00	250.00	250.00	
7	लेबर सेस मजदूरी का 1 प्रतिशत	0	0.00	143.37	143.37	
	योग :–	**35.4**	**14337.00**	**2492.37**	**16829.37**	
घ	**सम्पोषण कार्य (चतुर्थ वर्ष)**					
1	एक निकौनी एवं मृदा खनन	14	5670.00	0.00	5670.00	
2	उर्वरक (50 ग्राम/पौधा यूरिया सहित)	0	0.00	1419.86	1419.86	
3	मृत पौधों का प्रतिस्थापन	2.2	891.00	800.00	1691.00	
4	पौधों की सुरक्षा पर व्यय	12	4860.00	0.00	4860.00	
5	विविध कार्य (छायांकन, साईनबोर्ड, प्रचार-प्रसार, मुद्रण एवं संकलन आदि)	0	0.00	250.00	250.00	
6	लेबर सेस मजदूरी का 1 प्रतिशत	0	0.00	114.21	114.21	
	योग :–	**28.2**	**11421.00**	**2584.07**	**14005.07**	
	सकल योग :–	**288.6**	**116883.00**	**55855.59**	**172738.59**	

नोट :–

(1) स्थल विशिष्ट प्राक्कलन अनुसूचित दरों पर तैयार किये जायेंगे, जिसमें झाड़ी सफाई एवं घेरान कार्य पूर्णरूपेण आवश्यकतानुसार किया जाएगा।

(2) सुरक्षा कार्य में मजदूरों का नियोजन वन से सम्बन्धित ग्राम के स्थानीय मजदूरों को नियोजित कर किया जाएगा।

(3) जैविक खाद, शोध पौधशालाओं से एवं रासायनिक खाद का क्रय पैक्स एण्ड लैम्पस (PACS & LAMPS) से अथवा क्षेत्रीय मुख्य वन संरक्षक की अध्यक्षता में गठित क्रय समिति द्वारा निर्धारित प्रक्रिया से की जाएगी।

(4) पौधों का रोपण पूर्व से स्थापित वृक्षों के नीचे नहीं किया जाय।

Annexure 4: Estimate – Riverside Plantation

कार्यालय : अपर प्रधान मुख्य वन संरक्षक, विकास,
झारखण्ड, राँची।
वन भवन, डोरण्डा, राँची
e-mail : pccf-development@gov.in ☎ - 0651-2481813/ 9304727852

कार्यालय आदेश

संख्या–01 / यो0व0–30 / 2020– 11 दिनांक 26/04/2023

वन एवं पर्यावरण विभाग के अधिसूचना संख्या सं0सं0–4 / यो0बजट–42 / 2010–2371 व0प0, दिनांक 05.05.2015 द्वारा वृक्षारोपण एवं पौधशाला कार्य हेतु दर निर्धारण के लिए राज्य स्तर पर एक स्थायी समिति का गठन किया गया।

अपर प्रधान मुख्य वन संरक्षक, विकास, झारखण्ड, राँची के अध्यक्षता में राज्य स्तरीय दर निर्धारण समिति की बैठक दिनांक 15.09.2022 को आयोजित की गई।

समिति द्वारा समीक्षोपरान्त नदी तट पर वृक्षारोपण का अनुसूचित कार्यदर की अनुशंसा की गई। समिति की अनुशंसा पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है। यह दर तत्काल प्रभाव से वित्तीय वर्ष 2023–24 के लिए लागू होंगी एवं अगले पुनरीक्षण तक प्रभावी रहेगी।

नदी तट पर वृक्षारोपण का अनुसूचित दर तालिका

पौधों की संख्या प्रति यूनिट	300	
पौधो की दूरी	2mx3m	
1 यूनिट का परिमाप	2000 m2	100*20
1 यूनिट में घेरान की कुल लम्बाई	240m	
मजदूरी दर प्रति मानव दिवस	346.01	रुपये

क्र. सं.	कार्य का विवरणी	इकाई प्रति	मानव दिवस	मजदूरी (रू0 में)	सामग्री (रू0 में)	कुल
i	ii	iii	iv	v	vi	vii
A	अग्रिम कार्य (प्रथम वर्ष)					
1	सर्वेक्षण एवं सीमांकन	प्रति इकाई	0.6	207.61	25.00	232.61
2	घनी झाड़ी सफाई	प्रति इकाई	2	692.02		692.02
3	घेरान कार्य	प्रति इकाई	-			
3.1	आर0सी0सी0 पीलर 82 सं0 965.00 रू0 प्रति पीलर। पीलर का आकार 7' x 4" x 4" का निर्माण एवं 1' x 1' x 2' का गड्ढा में ढलाई कर लगाने का खर्च	प्रति इकाई		31652.00	47478.00	79130.00

क्र. सं.	कार्य का विवरणी	इकाई प्रति	मानव दिवस	मजदूरी (रू0 में)	सामग्री (रू0 में)	कुल
i	ii	iii	iv	v	vi	vii
3.2	कंटीला तार 4Point 2Ply 12swg, 15cm apart 64.90 (जी0एस0टी0 सहित Item No. 31/M215) रू0 प्रति कि0ग्रा0 की दर से 225 kg	प्रति इकाई	0.00	0.00	14602.25	14602.25
3.3	कंटीलातार को खींचने, सीधा करने, स्अेल इत्यादि लगाने का कार्य सहित।	प्रति इकाई	5.93	2051.84		2051.84
3.4	आर0सी0सी0 पीलर एवं कंटीलेतार की कार्य स्थल तक ढुलाई 15% of (3.1+3.2)	प्रति इकाई	27.51	9518.74	5763.38	15282.12
4	मृदा कार्य (0.3 मी. X 0.3 मी. X 0.3 मी.) 0.027 क्यू0 मी0 967 पीट प्रति हे0 (संरेखन एवं मृदा प्रोफाईल पिट सहित)	प्रति इकाई	6.60	2283.67	0.00	2283.67
5	मृदा एवं जल संरक्षण–गली प्लगिग/सिल्ट रिटेंशन डैम/कंटूर आदि (आवश्यकता अनुसार)	प्रति इकाई	1.20	415.21	0.00	415.21
6	अन्यान्य				100.00	100.00
7	लेबर सेस मजदूरी का 1 प्रतिशत				468.21	468.21
	कुलः–		**43.84**	**46821.08**	**68436.84**	**115257.92**
B	समापन कार्य (द्वितीय वर्ष)					
1	पौधों का क्रय ढुलाई सहित 360 पौधे (3'–5')	25 रू0 प्रति	0	0.00	9000.00	9000.00
2	वृक्षारोपण	प्रति इकाई	6.6	2283.67	0.00	2283.67
3	दो कोड़नी एवं निकौनी	प्रति इकाई	11.00	3806.11	0.00	3806.11
4	पौधों की सुरक्षा	प्रति इकाई	18.00	6228.18		6228.18
5	सामग्री (बीज, उर्वरक, कम्पोस्ट खाद, डी0ए0पी0/यूरिया, जैविक खाद, किटनासक आदि)	प्रति इकाई	0	0.00	590.16	590.16
6	विविध कार्य (छायांकन, प्रचार प्रसार, मुद्रण एवं संकलन आदि)	प्रति इकाई		0.00	600.00	600.00
7	लेबर सेस मजदूरी का 1 प्रतिशत				123.18	123.18
	कुलः–		**35.60**	**12317.96**	**10313.34**	**22631.30**
C	संपोषण कार्य (तृतीय वर्ष)					
1	एक कोड़नी–निकौनी	प्रति इकाई	4.2	1453.24	0.00	1453.24
2	सामग्री (बीज, उर्वरक, कम्पोस्ट खाद, डी0ए0पी0/उरिया, जैविक किटनासक आदि)	प्रति इकाई	0	0.00	826.75	826.75
3	पौधों की सुरक्षा	प्रति इकाई	24.00	8304.24	0.00	8304.24
4	घेरान की मरम्मत	प्रति इकाई	1.20	415.21	500.00	915.21
5	मृत पौधों का प्रतिस्थापन	प्रति इकाई	1.00	346.01	750.00	1096.01

क्र. सं.	कार्य का विवरणी	इकाई प्रति	मानव दिवस	मजदूरी (रू0 में)	सामग्री (रू0 में)	कुल
i	ii	iii	iv	v	vi	vii
6	पटवन (आवश्यकतानुसार)	प्रति इकाई	13.64	4719.58	0.00	4719.58
7	अन्यान्य				100.00	100.00
8	लेबर सेस मजदूरी का 1 प्रतिशत				152.38	152.38
	कुलः–		44.04	15238.28	2329.13	17567.41
D	संपोषण कार्य (चतुर्थ वर्ष)					
1	एक कोड़नी–निकौनी	प्रति इकाई	4.2	1453.24		1453.24
2	सामग्री (बीज, उर्वरक, कम्पोस्ट खाद, डी0ए0पी0/यूरिया, जैविक खाद, किटनाशक आदि)	प्रति इकाई	0	0.00	256.13	256.13
3	पौधों की सुरक्षा	प्रति इकाई	24.00	8304.24	0.00	8304.24
4	घेरान की मरम्मत (मृत पौधों की प्रतिस्थापन)	प्रति इकाई	1.2	415.21	500.00	915.21
5	पटवन (आवश्यकतानुसार)	प्रति इकाई	13.64	4719.58		4719.58
6	अन्यान्य				100.00	100.00
7	लेबर सेस मजदूरी का 1 प्रतिशत				148.92	148.92
	कुलः–		43.04	14892.27	1005.05	15897.32
E	संपोषण कार्य (पंचम वर्ष)					
1	एक कोड़नी–निकौनी	प्रति इकाई	4.2	1453.24		1453.24
2	सामग्री (बीज, उर्वरक, कम्पोस्ट खाद, डी0ए0पी0/यूरिया, जैविक खाद, किटनासक आदि)	प्रति इकाई	0	0.00	256.13	256.13
3	पौधों की सुरक्षा	प्रति इकाई	12.00	4152.12		4152.12
4	घेरान की मरम्मत	प्रति इकाई	1.20	415.21	500.00	915.21
5	अन्यान्य				100.00	100.00
6	लेबर सेस मजदूरी का 1 प्रतिशत				60.21	60.21
	कुलः–		17.4	6020.57	916.34	6936.91
F	संपोषण कार्य (षष्ठम वर्ष)					
1	पौधों की सुरक्षा	प्रति इकाई	12.00	4152.12		4152.12
2	लेबर सेस मजदूरी का 1 प्रतिशत				41.52	41.52
	कुलः–		12.00	4152.12	41.52	4193.64
G	संपोषण कार्य (सप्तम वर्ष)					
1	पौधों की सुरक्षा	प्रति इकाई	12.00	4152.12		4152.12
2	लेबर सेस मजदूरी का 1 प्रतिशत				41.52	41.52
	कुलः–		12.00	4152.12	41.52	4193.64
	सकल योगः–		207.920	103594.40	83083.74	186678.14

नोट (1) कंटीले तार का क्रय GeM द्वारा अथवा क्षेत्रीय मुख्य वन संरक्षक की समिति की अनुशंसित दर पर किया जाएगा (जो न्यूनतम हो)।

(2) प्रत्येक ब्लॉक के बीच सुगम आवगमन हेतु कुछ अंतर रखा जाए, ताकि आदमी एवं जानवर का आवागमण हो सके। व्यवहारिक रुप से 10 ब्लॉक को 1 कि0 मी0 माना जा सकता है।

(3) स्थल पर उपलब्ध भूमि के आकार एवम् लगाए जाने वाले पौधों की संख्या के अनुसार क्रमांक (A) से क्रमांक (E) तक कार्यों की दर को Pro-rata आधार पर स्थल – विशिष्ट प्राक्कलन पर सक्षम पदाधिकारी द्वारा अनुमोदन के पश्चात व्यय किया जाएगा।

(4) नदी तट पर मुख्य रूप से इमारति एवं फलदार प्रजाति के पौधों का ही रोपण किया जाएगा। जैसे:– सागवान, शीशम, कटहल, बरगद, पीपल, बीजू आम, महुआ, महुगनी, बडहर, जामुन आदि।

26/4/2023

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

ज्ञापांक–01 / यो0ब0–30 / 2020– 283 दिनांक– 26/04/2023

प्रतिलिपि :

1. सभी प्रधान मुख्य वन संरक्षक।
2. सभी अपर प्रधान मुख्य वन संरक्षक।
3. सभी क्षेत्रीय मुख्य वन संरक्षक।
4. सभी मुख्य वन संरक्षक।
5. सभी वन संरक्षक।
6. सभी उप वन संरक्षक।
7. सभी वन प्रमण्डल पदाधिकारी।

को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

26/4/2023

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

Annexure 5: Estimate – Grassland Development

लैंटाना (घनत्व 60%>) हटाकर घास मैदान के विकास हेतु कार्य दर तालिका (2024–25)

मजदूरी दर प्रति मानव दिवस रु0 405.00 *कार्य दर प्रति हे0*

क्रम सं0	कार्य विवरणी	मानव दिवस	कार्य दर (रुपये में)		
			मजदूरी	आपूर्ति एवं सामग्री	योग (4+5)
i	ii	iii	iv	v	vi
1	वित्तीय वर्ष 2024–25 में अग्रिम कार्य (प्रथम वर्ष)				
i	सर्वेक्षण एवं सीमांकन कार्य	3	1215.00	1500.00	2715.00
ii	Local palatable दे0 घा0 Herbivores एवं रेमण्ड के बीजों का संग्रहण	30	12150.00	1000.00	13150.00
iii	चयनित घास मैदान से गलवे एवं लैंटाना को जड़ सहित उखाड़कर 10 मीटर दूरी तक एकत्रित कर जलाने का कार्य :–				
क	पहली बार : माह सितम्बर – नवम्बर	60	24300.00	14500.00	38800.00
ख	दूसरी बार : दिसम्बर – फरवरी	40	16200.00		16200.00
iv	विविध व्यय / साइनेज आदि		0.00	5000.00	5000.00
v	लेबर सेस मजदूरी का 1 प्रतिशत			538.65	538.65
	योग :	133	**53865.00**	**22538.65**	**76403.65**
2	वित्तीय वर्ष 2025–26 में रोपाण कार्य (द्वितीय वर्ष)				
i	लकड़ी के खम्भे या लाल हरे रंग के कपड़े से रोपण कार्य	30	12150.00	10000.00	22150.00
ii	घास के बीजों का बालू एवं मिट्टी के मिश्रण के साथ रोपण	15	6075.00		6075.00
iii	लैंटाना तथा खर-पतवार को हटाने और रिक्त स्थानों पर स्थानीय घास के बीज बोने का दूसरा चक्र तथा पानी पटवन का कार्य :–				
क	पहली निकौनी, बीजारोपण : माह जुलाई – अगस्त	20	8100.00		8100.00
ख	दूसरी निकौनी एवं पटवन : माह सितम्बर – अक्टूबर	15	6075.00		6075.00
ग	तीसरी निकौनी एवं पटवन : माह नवम्बर – दिसम्बर	10	4050.00		4050.00
iv	Local palatable घास के बीजों का संग्रहण	10	4050.00	500.00	4550.00
v	विविध व्यय / साइनेज आदि		0.00	2000.00	2000.00
vi	लेबर सेस मजदूरी का 1 प्रतिशत		0.00	405.00	405.00
	योग :	100	**40500.00**	**12905.00**	**53405.00**
3	वित्तीय वर्ष 2026–27 में सम्पोषण कार्य (तृतीय वर्ष)				
i	लैंटाना तथा खर-पतवार को हटाने और रिक्त स्थानों पर स्थानीय घास के बीज बोने का तीसरा चक्र तथा पानी पटवन का कार्य :–				
क	पहली निकौनी, बीजारोपण : माह जुलाई – अगस्त	12	4860.00		4860.00
ख	दूसरी निकौनी एवं पटवन : माह सितम्बर – अक्टूबर	10	4050.00		4050.00
ग	तीसरी निकौनी एवं पटवन : माह नवम्बर – दिसम्बर	10	4050.00		4050.00
ii	विविध व्यय / साईनेज आदि		0.00	2000.00	2000.00
iii	लेबर सेस मजदूरी का 1 प्रतिशत		0.00	129.60	129.60
	योग :	32	**12960.00**	**2129.60**	**15089.60**
4	वित्तीय वर्ष 2027–28 में सम्पोषण कार्य (चतुर्थ वर्ष)				

क्रम सं०	कार्य विवरणी	मानव दिवस	कार्य दर (रूपये में)		
			मजदूरी	आपूर्ति एवं सामग्री	योग (4+5)
i	ii	iii	iv	v	vi
I	लैंटाना तथा खर-पतवार को हटाने और स्थित स्थानों पर स्थानीय घास के बीज बोने का चतुर्थ चक्र तथा पानी पटवन का कार्य :-				
क	पहली निकौनी, बीजारोपण : माह जुलाई – अगस्त	12	4860.00		4860.00
ख	दूसरी निकौनी एवं पटवन : माह सितम्बर – अक्टूबर	10	4050.00		4050.00
ग	तीसरी निकौनी एवं पटवन : माह नवम्बर – दिसम्बर	10	4050.00		4050.00
ii	विविध व्यय / साईनेज आदि		0.00	2000.00	2000.00
iii	लेबर सेस मजदूरी का 1 प्रतिशत		0.00	129.60	129.60
	योग :	32	**12960.00**	**2129.60**	**15089.60**
	कुल योग :	297	**120285.00**	**39702.85**	**159987.85**

सारांश

क्र० सं०	वर्ष	मजदूरी	आपूर्ति एवं सामग्री	कुल
1	वित्तीय वर्ष 2024-25 में अग्रिम कार्य (प्रथम वर्ष)	53865.00	22538.65	76403.65
2	वित्तीय वर्ष 2025-26 में समापन कार्य (द्वितीय वर्ष)	40500.00	12905.00	53405.00
3	वित्तीय वर्ष 2026-27 में सम्पोषण कार्य (तृतीय वर्ष)	12960.00	2129.60	15089.60
4	वित्तीय वर्ष 2027-28 में सम्पोषण कार्य (चतुर्थ वर्ष)	12960.00	2129.60	15089.60
	कुल योग :	**120285.00**	**39702.85**	**159987.85**

Annexure 6: Estimate – Silvicultural Operations

कार्यालय : अपर प्रधान मुख्य वन संरक्षक, विकास,
झारखण्ड, राँची।
वन भवन, कोरण्डा, राँची
e-mail : pccf-development@gov.in
0651-2481813/ 9304727852

कार्यालय आदेश

संख्या–01 / यो0व0–30 / 2020 10 दिनांक 26/04/2023

वन एवं पर्यावरण विभाग के ज्ञापसूचना संख्या सं0स0–4 / यो0व0स्ट–42 / 2010–2371 व0प0, दिनांक 05.06.2015 द्वारा वृक्षारोपण एवं पौधशाला कार्य हेतु दर निर्धारण के लिए राज्य स्तर पर एक स्थायी समिति का गठन किया गया।

अपर प्रधान मुख्य वन संरक्षक, विकास, झारखण्ड, राँची के अध्यक्षता में राज्य स्तरीय दर निर्धारण समिति की बैठक दिनांक 15.09.2022 को आयोजित की गई।

समिति द्वारा सामाजीकरण सिल्विकल्चरल ऑपरेशन योजना का अनुसूचित कार्यादर की अनुशंसा की गई। समिति की अनुशंसा पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है। यह दर तत्काल प्रभाव से वित्तीय वर्ष 2023–24 के लिए लागू होगी एवं अगले पुनरीक्षण तक प्रभावी रहेगी।

योजना का नाम : सिल्विकल्चरल ऑपरेशन योजना का दर निर्धारण

(औसतन 10%-25% वृक्ष / रूट स्टॉक विहीन खुले वन क्षेत्र हेतु)

मजदूरी वाले मानव दिवस (रू0 में) : 346.01 कार्य दर प्रति हे0

क्र0 सं0	कार्य का विवरणी	इकाई	मानव दिवस	मजदूरी (रू0 में)	सामग्री (रू0 में)	मूल व्यय (रू0 में)	अभियुक्ति
i	ii	iii	iv	v	vi	vii	viii
(A)	आवश्यक कार्य (प्रथम वर्ष)						
1	सर्वेक्षण एवं सीमांकन	हे0	3	1038.03	50.00	1088.03	
2	कटवेक / लोपिंग, झाड़झंखार कटिंग, स्टम्प ग्रेडिंग, along with debris removal आदि (All live stumps should be touched)	हे0	30	10380.30	0.00	10380.30	इन कार्यों को करने के क्रम में कथानि किसी भी पूंजी का पातन नहीं किया जायेगा। उपरोक्त कार्यों को करने के पूर्व एक कार्य संपादित करने के उपरान्त संपूर्ण व्यय की विभीषपाती / फोटोग्राफी अवश्य कराई जाय।

3	न्यूनतम आवश्यकता अनुसार स्वीकृत डिजाईन एवं वन संरक्षक के अनुमोदन से मशीन द्वारा ट्रेंच खोदन अथवा श्रमिक द्वारा खोदन किया जायेगा (i) ट्रेंच खोदन– ऊपर की चौड़ाई 1.03 मी., नीचे की चौड़ाई 1.22 मी., गहराई 1.22 मी., ढलान सहित (ii) पत्थर खोदन– ऊपर की चौड़ाई 0.30 मी., नीचे की चौड़ाई 1.25 मी. ऊँचाई 1.00 मी. (iii) कंक्रीट खोदन	घन	12	4152.12	15942.90	20095.02	यद्यपि 50 ट्रेंच खोदन की मेन का प्रावधान है किन्तु वास्तविक स्थल पर भूगठान पारम्परिक वर्षा संचयन के अनुसार निर्णय लिया जायेगा। उपर्युक्त ट्रेंच को पर स्थानीय प्रजाति के बीजों का रोपारोपण किया जायेगा, ताकि Live Hedge/Fence तैयार हो सके।
4	गड्ढा कार्य (0.45 मी. X 0.45 मी. X 0.45 मी.) 0.091 क्यूब मीटर अधिकतम 200 पीट प्रति हे० (खोदान एवं गड्ढा भराव सहित)	हे०	20	6920.20	0.00	6920.20	औसतन 200 पौधे प्रति हे० रोपण के लिए। अन्य प्रति क्षेत्रों में भूगर्भीय जल जीवी के पर्यावरण के विकास के अनुकूल प्रजाति हो।
5	गुला एवं जल संरक्षण कार्य – कंटूर ट्रेंच – 90, कंटूर बर्डिंग 5 मी. X 0.30 मी. X 0.30 मी. का छोटा खाला जिसके बीच की दूरी कम से कम 2 मीटर ढलान के कोण के अनुसार हो तथा इसकी मिट्टी का पौधे ढाल पर 0.15 मीटर ऊंट कर 0.30 मीटर की चौड़ाई में 0.45 मी. गहरा खोदाई कर रखा जाना।		45	15570.45	625.00	16195.45	आवश्यकतानुसार ढलान पर ही कंटूर ट्रेंच का निर्माण किया जायेगा। कंटूर ट्रेंच के मध्य पर स्थानीय प्रजाति के बीजों को भी बोया जायेगा।
6	गार्डी फेंसिंग	मी०	10	3460.10	0.00	3460.10	नोट शीट
7	सिंगल डिटेन्शन केटल गेज टेस्ट, रिटेनिंग एवं लेवल ब्लाक टेस्ट सहित, स्पर एवं टॉरेन्ट नियन्त्रक कार्य आदि	हे०	25	8650.25		8650.25	नोट शीट
8	स्थाई पौधशालाओं में उपलब्ध (10% अतिरिक्त) 80% Root-Shoot की 6"x12" आकार की ट्यूब में Pre-sprout अनुसार पौधा तैयार करना।		2	692.02	1200.00	1892.02	स्थानीय पौधशालाओं से क्रय किये गये Tube Plants/ Root-Shoot के क्रय के लिए रू 6.00 की दर से राशि जमा कराई जायेगी। स्थानीय एवं फलदार प्रजाति के बड़े पौधे को प्राथमिकता दी जायेगी
9	पशु की सुरक्षा		2.00	692.02	0.00	692.02	
10	लेबर लेस मजदूरी का 1 प्रतिशत				515.55	515.55	
	योग–		149.00	51555.49	18333.45	69888.94	

(B)	रोपण कार्य (द्वितीय वर्ष)						
1	Presprouted Root-Shoot एवं Poly Tube Seedling स्थायी पौधशाला (न्यूनतम 40 प्रतिशत)	220	5	1730.05	800.00	2530.05	स्थायी पौधशाला से क्रय किये गये Tube Plants/ Root-Shoot के क्रय के लिए रू 5.00 की दर से राशि जमा कराई जाएगी
2	गड्ढासंपन		6.40	2214.46	0.00	2214.46	
3	दो जोड़ती निराई	80	7	2422.07	0.00	2422.07	
4	सामग्री (उर्वरक, कल्चरस् एवं)	80	0	0.00	625.00	625.00	
5	सिंगलिंग कार्य		5	1730.05	0.00	1730.05	
6	पौधों की सुरक्षा (10 हे० क्षेत्र के लिए पशुरक्षक)		11.00	3806.11	0.00	3806.11	ट्रेन्च घेराव की प्रस्तावित
7	लेबर सेस मजदूरी का 1 प्रतिशत				119.03	119.03	
	योग–		34.40	11902.74	1544.03	13446.77	
(C)	संपोषण कार्य (तृतीय वर्ष)						
1	सुरक्षा एवं संपोषण		14.60	5051.75	200.00	5251.75	घेराव, क्षतिग्रस्त ट्रेंच की मरम्मति, मृत पौधों का प्रतिस्थापन, रोपित पौधे की निकौनी / कोपिस / कटवेक / सिंगलिंग
2	लेबर सेस मजदूरी का 1 प्रतिशत				50.52	50.52	
	योग–		14.60	5051.75	250.52	5302.26	
(D)	संपोषण कार्य (चतुर्थ वर्ष)						
1	सुरक्षा एवं संपोषण		14.60	5051.75	200.00	5251.75	घेराव, क्षतिग्रस्त ट्रेंच की मरम्मति, मृत पौधों का प्रतिस्थापन, रोपित पौधे की निकौनी / कोपिस / कटवेक / सिंगलिंग
2	लेबर सेस मजदूरी का 1 प्रतिशत				50.52	50.52	
	योग–		14.60	5051.75	250.52	5302.26	
	सकल योग –		212.60	73561.73	20378.52	93940.24	

नोट:–

1. प्रत्येक रोपणोत्तर वर्ष पर कार्य आवश्यकतानुसार प्रस्तावित कार्यों का प्राक्कलन तैयार कर सक्षम स्तर से तकनीकी स्वीकृति उपरान्त कार्य सम्पादित किए जायेंगे।

2. इन कार्यों को करते के क्रम में अवांछित किसी भी वृक्ष का पातन नहीं किया जाएगा।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

ज्ञापांक–01 / वो०स०–30 / 2020– 282 दिनांक– 26/04/2023

प्रतिलिपि :

1. सभी प्रधान मुख्य वन संरक्षक।
2. सभी अपर प्रधान मुख्य वन संरक्षक।
3. सभी क्षेत्रीय मुख्य वन संरक्षक।
4. सभी मुख्य वन संरक्षक।
5. सभी वन संरक्षक।
6. सभी उप वन संरक्षक।
7. सभी वन प्रमण्डल पदाधिकारी।

को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

Annexure 7: Estimate – Decongestion of Bamboo Clumps

कार्यालय : अपर प्रधान मुख्य वन संरक्षक, विकास,
झारखण्ड, राँची।
वन भवन, डोरण्डा, राँची
e-mail : pccf-development@gov.in ☎ - 0651-2481813/ 9304727852

कार्यालय आदेश

संख्या–01 / बो0ब0–30 / 2020– 08 दिनांक 26/04/2023

वन एवं पर्यावरण विभाग के अधिसूचना संख्या सं0स0–4 / बो0ब0ज0–42 / 2010–2371 6040, दिनांक 05.05.2015 द्वारा वृक्षारोपण एवं चीवाला कार्य हेतु दर निर्धारण के लिए राज्य स्तर पर एक स्थायी समिति का गठन किया गया।

अपर प्रधान मुख्य वन संरक्षक, विकास, झारखण्ड, राँची की अध्यक्षता में राज्य स्तरीय दर निर्धारण समिति की बैठक दिनांक 15.09.2022 को आयोजित की गई।

समिति द्वारा समीक्षोपरान्त बाँस वनों में कंजेशन (Congestion) हटाना एवं वन–वर्द्धन कार्यों का अनुसूचित कार्यदर की अनुशंसा की गई। समिति की अनुशंसा पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है। यह दर तत्काल प्रभाव से द्वितीय वर्ष 2023–24 के लिए लागू होगी एवं अगले पुनरीक्षण तक प्रभावी रहेगी।

बाँस वनों में कंजेशन (Congestion) हटाना एवं वन–वर्द्धन कार्यों हेतु कार्य दर
तालिका

मजदूरी दर – 346.01 रु0
प्रति 200 बांस गच्चर

(राशि रुपये में)

क्र0 सं0	कार्य का विवरण	मानव दिवस (प्रति डे0)	मजदूरी	आपूर्ति एवं खरीदी	कुल राशि	अनुदेश
i	ii	iii	iv	v	vi	vii
A	प्रथम वर्ष					
1	वनों एवं सीमांकन एवं बफर की मरम्मत	3	1038.03	50.00	1088.03	
2	बाँस बगानों (Clumps) की सफाई एवं Silviculturally available बाँसों के विरोहण (200 गच्चर प्रति)	40	13840.40	250.00	14090.40	एक मानव दिवस में 5 झाड़ियों में कार्य किया जायेगा। गच्चर के पहले का बिन्द में विसर्जन करना।
3	वनों में आंतरिक अग्नि रेखा की खुदाई, 5 मीटर चौड़ा (प्रत्येक 250 मीटर पर) एवं वर्षात से क्षतिग्रस्त किए गए बार्डर को ठीकना	10	3460.10	0.00	3460.10	

4	क्यारी के खरी और 1.5 फीट गोलाई में कोड़नी/निकोनी तथा गोबर खाद/वर्मी कम्पोस्ट इत्यादि डालना	20	6920.20	1875.00	8795.20	एक गाम्ब दिवस में 10 क्यारी में कार्य किया जायगा
5	राइजोम प्रिजरवेशन हेतु क्यारी में कोड़नी/निकोनी क्षेत्र के बाहर 1 फीट गोलाई से मिट्टी लेकर क्यारी पर चढ़ाना	20	6920.20	0.00	6920.20	एक कार्य दिवस में 10 क्यारी में कार्य किया जायगा
6	सुरक्षा (कटीला, घराई, अग्नि सुरक्षा)	3	1038.03	0.00	1038.03	
7	लेबर सेस मजदूरी का 1 प्रतिशत		0.00	332.17	332.17	
	कुल	96.00	33216.96	2507.17	35724.13	
B	द्वितीय वर्ष					
1	सुरक्षा (कटीला, घराई, अग्नि सुरक्षा)	14.6	5051.75	0.00	5051.75	अप्रील– मार्च वर्ष
2	लेबर सेस मजदूरी का 1 प्रतिशत			50.52	50.52	
	कुल	14.60	5051.75	50.52	5102.26	
	सकल योग –	110.60	38268.71	2557.69	40826.39	

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

ज्ञापांक–01/योजना-30/2020– 280 दिनांक– 26/4/2023

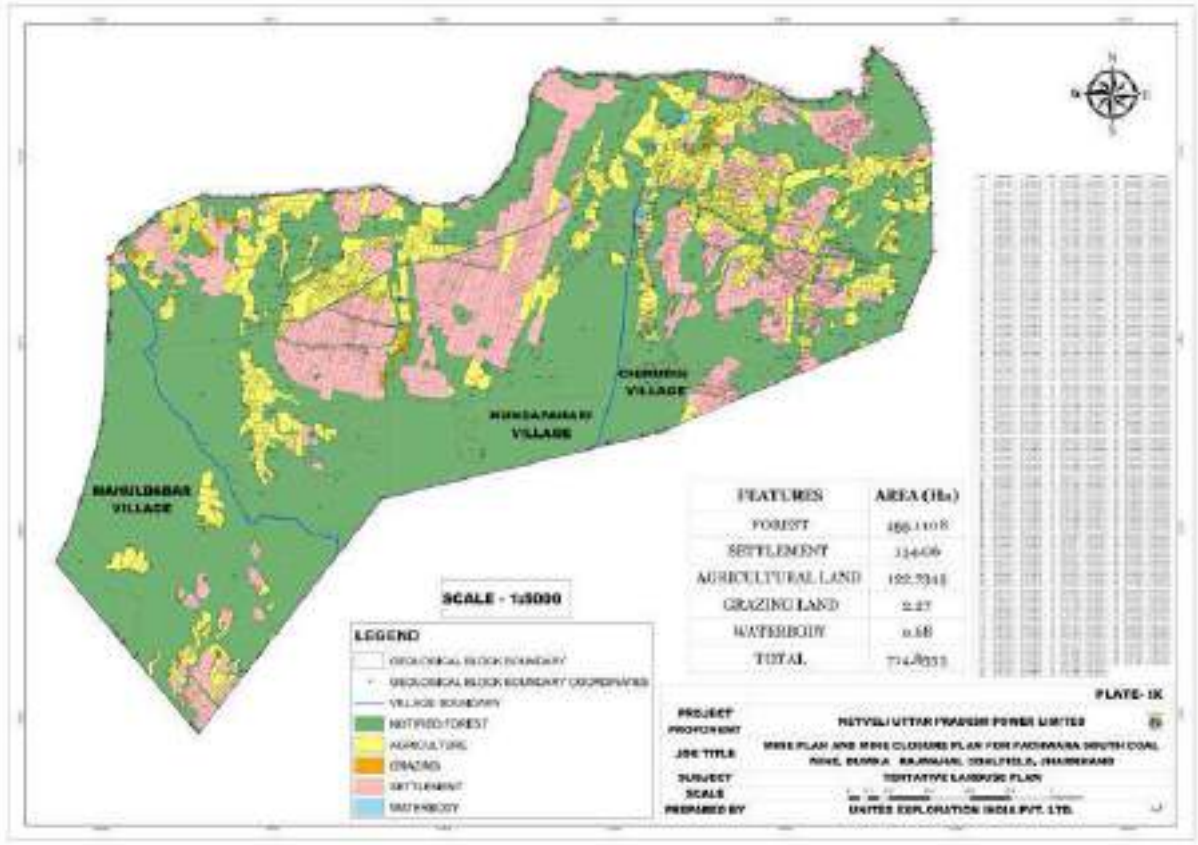
प्रतिलिपि :

1. सभी प्रधान मुख्य वन संरक्षक।
2. सभी अपर प्रधान मुख्य वन संरक्षक।
3. सभी क्षेत्रीय मुख्य वन संरक्षक।
4. सभी मुख्य वन संरक्षक।
5. सभी वन संरक्षक।
6. सभी उप वन संरक्षक।
7. सभी वन प्रमण्डल पदाधिकारी।

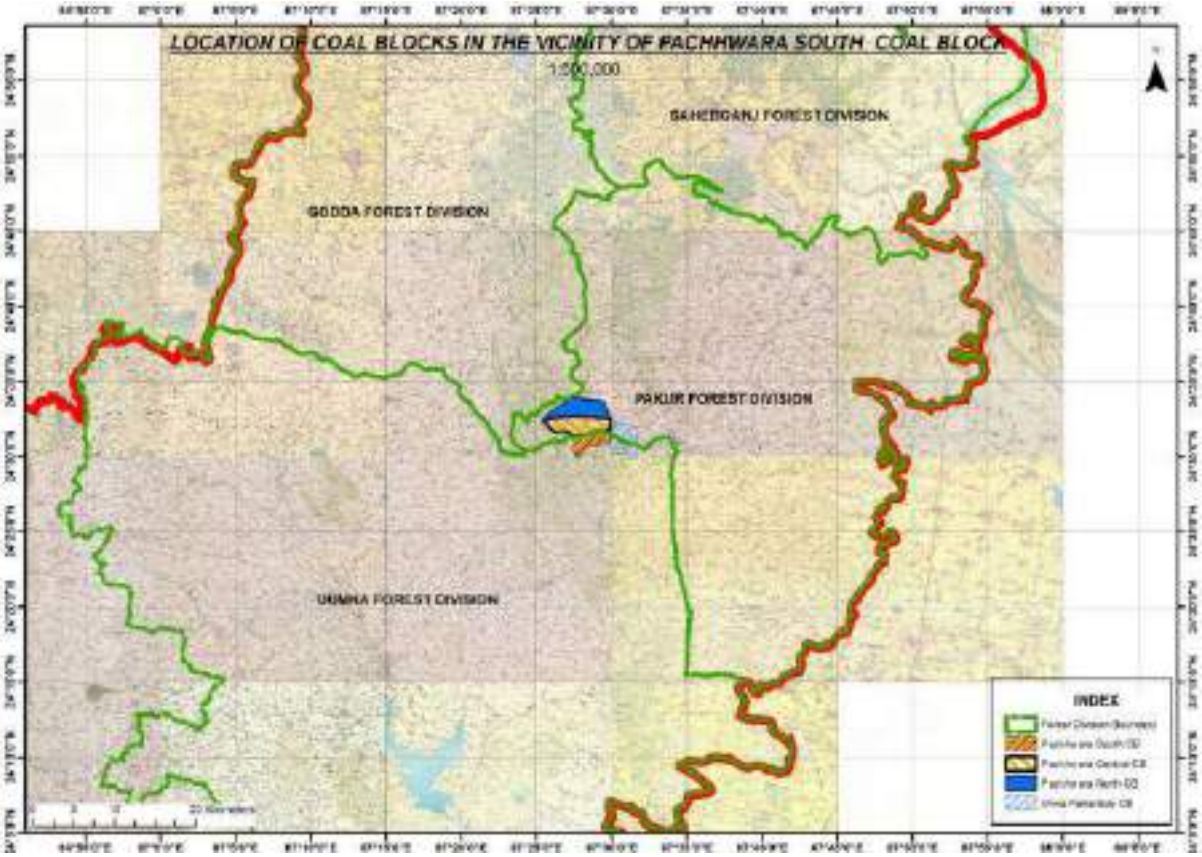
को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

Annexure 8: Land Use Plan of Pachhwara South Coal Mining Project



Annexure 9: Location Map of Coal Blocks in the Vicinity of Pachhwara South Coal Block (1:500,000 scale).



Annexure 10: Location Map of Elephant Depredation Sites (1:500,000 scale)

