



OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION

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Memo No. 2673 /6F-Mining-77/2017

Dated, Keonjhar the 21-04 /2018

To

The Regional Chief Conservator Forests,
Rourkela Circle, Rourkela

Sub:

Diversion of 232.438 ha (originally proposed 539.4047 ha) of forest land in Gandhamardan Block-B for 1st renewal of mining lease for iron mining in favour of M/s Orissa Mining Corporation Limited in Keonjhar District, Odisha.

X-Sub:

Submission of scheme for Bio-diversity Conservation Measures in the impact zone of Gandhamardan Block- A & B Iron Ore Mines of M/s OMC Ltd.

Ref:

F. No. 5-ORA014/2005-BHU dated 18.10.2007 of ERO, MoEF, Govt. of India, Bhubaneswar, memo No. 5411/F&E dated 08.03.2018 of Special Secretary to Govt. F&E Department and memo No. 6092 dated 22.03.2018 of Addl. Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the PCCF, Odisha, Bhubaneswar.

With reference to the above cited letters on the captioned subject, the scheme for Bio-diversity Conservation Measures in the impact zone of Gandhamardan Block- A & B Iron Ore Mines of M/s OMC Ltd at the present wage rate of Rs. 213.50 per MD with a financial outlay of **Rs. 834.63 lakh (Rupees eight crores thirty-four lakh and sixty-three thousand) only** is sent herewith in compliance with the additional condition No. 14 of the Stage-II approval dated 18.10.2007 of Eastern Regional Office, MoEF, Govt. of India, Bhubaneswar for favour of kind information and necessary approval.

Encl:- Scheme in Five sets

Sd/-
**Divisional Forest Officer,
Keonjhar Division**

Memo No. 2674 /Dated 21-04-2018

Copy submitted to the Addl. Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the PCCF, Odisha, Bhubaneswar for favour of kind information and necessary action with reference to his memo No. 6091 dated 22.03.2018.

Sd/-
**Divisional Forest Officer,
Keonjhar Division**

FINANCIAL OUTLAY

TOWARDS IMPLEMENTATION OF MITIGATIVE MEASURES

PRESCRIBED IN THE

BIO-DIVERSITY CONSERVATION PLAN

PREPARED BY NIT, ROURKELA

IN THE IMPACT ZONE

OF

GANDHAMARDAN BLOCK- A & B IRON ORE MINES

OF

M/S OMC LTD

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1.0 INTRODUCTION

MoEF, Govt. of India vide letter F. No. 8-81/2005-FC dt. 17.08.2007 granted Stage-II Forest Clearance over 232.438 ha pertaining to Gandhamardan-B Iron Ore Mines of OMC subject to compliance of 12 conditions stipulated therein. Eastern Regional Office (ERO), MoEF, Govt. of India, Bhubaneswar vide letter no. 5-ORA014/2005-BHU dt. 18.10.2007 imposed additional three conditions. The condition no. 14, imposed by ERO, Bhubaneswar states that "An undertaking from the User Agency shall also be obtained to the effect that the required funds or proportionate contributions for Biodiversity Conservation Plan of the district/Zone shall be provided by the project authority to the Forest Department as per the requirement and as may be asked by the Forest Department."

In order to comply the above condition, the following steps were initiated:

- OMC requested APCCF (N) on dt 19.12.2015 to approve engagement of NIT, Rourkela for preparation of the Biodiversity Conservation Plan for Gandhamardan- A & B Mines including its impact area in BJP (Bhuyan-Juang-Pirha) Range of Keonjhar Forest Division.
- APCCF (N) requested the State Govt. vide letter no.8714, dt03.05.2016 to approve the name of NIT, Rourkela.
- State Govt. approved the proposal of APCCF (N) to engage NIT, Rourkela vide letter no.8904, dt 11.05.2016 and advised to get consent from them with terms of reference and cost estimate.
- As per the advice of APCCF (N) vide letter no.11272, dt 4.06.2016, OMC requested NIT, Rourkela to furnish terms of reference for preparation of the Biodiversity Conservation Plan vide letter no.8858, dt 08.06.2016.
- OMC forwarded the reply by NIT, Rourkela dt 20.07.2016 to APCCF (N) vide letter memo no.10702, dt 20.07.2016 for approval.
- Special Secretary to Govt. F&E Dept. approved the proposal vide letter no.15018, dt12.08.2016 submitted by APCCF (N) vide letter memo no.14493 dt 28.07.2016.
- OMC vide letter no.12604, dt. 30.08.2016 deposited the cost of preparation of Bio Diversity Conservation Plan by NIT, Rourkela and requested to expedite the study.

- NIT, Rourkela conducted the study and submitted the final report to State Govt. vide letter dt. 05.02.2018.
- Special Secretary to Govt. requested DFO, Keonjhar vide letter no. 5411 dt. 08.03.2018 to prepare a financial estimate for implementing the mitigative measures suggested in the final report of Biodiversity study submitted by NIT, Rourkela.
- APCCF (N), vide letter No. 6091, dt 20.03.2018 requested DFO, Keonjhar to complete the work and submit the report for necessary approval.
- Hence the current financial report is furnished for approval.

2.0 ACTIVITIES PRESCRIBED IN THE BIO-DIVERSITY CONSERVATION PLAN BY NIT, ROURKELA

A. Mitigation measures for floral species

1. Revegetation/Regeneration:

Re-vegetation can play an important role in minimizing the impact of mining project on the floral diversity. It incorporates both landscaping and habitat rehabilitation. The objectives of these two forms are different and call for different techniques and plant selection.

Plant species used in landscaping will be mainly local native species but may also include various non-indigenous medicinal and ornamental species. However, no species which display characteristics of environmental weeds shall be used and preference shall be given to endemic natives in each case. The overall objective of habitat rehabilitation will be to restore or recreate vegetation the same as originally occurring in the project area.

An area over 300 ha has been proposed for ANR plantation with 200 no. plants/ha whereas an area over 150 ha has been proposed for bald hill block plantation over 150 ha in 13 forest blocks of Gandhamardan region.

2. Soil and Moisture Conservation Measures

Soil erosion on fragile steep hilly slope containing biodiversity may be alarming which may have siltation in surrounding nallas including in study area and streams which are tributary of river Baitarani. Therefore, soil conservation measures shall be taken up in the mining area to prevent siltation and thus restore the normal water flow.

Hence, intensive soil and moisture conservation measures in the degraded areas shall be taken up to prevent soil loss and to foster natural regeneration and improvement of existing growing stock for protection of bio-diversity and recharge of ground water table. This may be achieved through construction of check dams on seasonal nallas both by vegetative and masonry manner staggered trenching and contour bund on slope areas. Planting of Agave on the bank of the nala situated in the mining lease area shall also arrest soil from being washed away during torrential rain/surface runoff.

Staggered contour trench of 2mtr x 0.5 mtr x 0.5 mtr size of 20000 nos will be constructed in different part of the forest area. Loose boulder check dams of 1m, 2m and 3m will be constructed to arrest siltation.

B. Measures for faunal diversity.

3. Prevention of fall of wild animals into mining pit

- a. The mining site should be properly fenced to prevent any encroachment or crossing of both domestic and wild animals into the mining site. Proper demarcation of the mining area should be made which may be with solar fencing all around the mining area.
- b. Movement patterns of many wildlife species are often associated with drainage lines or can be modified with mesh fencing to encourage small vertebrate species and amphibians to cross through it.
- c. Mitigatory measures for the birds and other small reptiles may be adopted by building of nests in the electric posts and nearby bushes in core zone to provide alternative shelters to destitute avifauna. Nesting boxes can be installed in tall trees like *Artocarpus heterophyllus*, *Delonix regia*.
- d. General awareness programs should be conducted to create awareness among the local people on wild life and its conservation. The local must be motivated to participate in various awareness programmes on human-wildlife conflict. They must be advised not to explore the forests for collection of fuel-wood, bee hive, berry, bamboo, kendu leaves and other wild fruits.
- e. It is proposed that bird bath in sufficient number and with appropriate size to be created and maintained properly to avoid contamination to provide clean water. Water may be filled in the bath by a hand operated tube well, which should be installed adjunct to bird bath. Accordingly, the site should be selected where ground water is most likely to be available. The bird bath should be disinfected by addition of $KMnO_4$ solution soon after cleaning.

4. FIRE MANAGEMENT

Fire affects seriously the ecological status of the wildlife habitats and biodiversity in general. It is anthropogenic in origin. Repeated forest fires burns the sub-surface flora, fauna, soil microbial population and sets in retrogradation and deprives wildlife of their

cover and food. Burning of sub-surface flora also sets in soil erosion of different order over a period of time. Management of fire, is therefore assumes important consideration for the conservation of both floral & faunal diversity. Forest fires, that impacts bio-diversity are normally caused by local people in the process of collection of NTFP and shifting cultivation practices.

- a. Creation of awareness: It is important that awareness about the adverse effects of fire should be created amongst the local people. It is also necessary to involve them in preventing and controlling fires.
- b. Incentive to local villagers: The local villagers may be involved in fire fighting, prevention of grazing, shifting cultivation, poaching etc. Local people involved for this purpose will be given incentive, may be in terms of cash award on annual basis as informed by OMC.
- c. Deployment of fire protection squad: As proposed by OMC, a fire protection squad consisting of local young and energetic youths shall be constituted. They shall be provided with a hired vehicle, search lights, fire-fighting tools etc. to extinguish incidental fire as when and where required following guideline prescribed by CWLW, Odisha under the supervision of local forest staff.
- d. Provision for vehicle fitted with water tanker, pipes and fire blowers: As Gandhamardan Block B even other surrounding forest areas are encircled by human habitations, there is every chance of incidental fires. Therefore it is required to provide a vehicle fitted with water tanker, fire blower etc. to the fire protection squad to extinguish the forest fire without causing any damage to the biodiversity of the zone.
- e. Deployment of biodiversity protection squad: Similar to fire protection squad, a biodiversity protection squad shall be formed to protect the biodiversity of the study and its surrounding areas to act against any illegal activities like illicit felling, collection of uncontrolled fruits, flowers, leaves, burring of forest floor and more over shifting cultivation, that occurs in the biodiversity area by the local people.

5. CAPACITY BUILDING PROGRAM

The company shall provide appropriate capacity building program to the local villagers who are forest dependant. Some of the program is suggested as - honeybee keeping, mushroom and vegetable cultivation, press khalli preparation, involvement of SHG in incense stick preparation and other cottage industry activities. These will also reduce forest dependence of the local villagers and thereby further degradation floral and

faunal diversity can be avoided. Some of the capacity building activities are narrated below:

a. Vegetable and Mushroom cultivation:

Since the villages in the mining site are in proximity of Keonjhar town and Joda-Barbil mining belt, the above products shall be always in demand. The product can be profitably grown, if proper seeds and training are given to the people. In this context, company has confirmed to collaborate with Horticulture Department.

b. Honey Bee keeping:

The villagers are mostly tribal. Bee keeping shall be very much profitable to them, if they adopt such business. The District Small Scale Industries Centres may be requested to provide them necessary accessories, technical guidance and marketing facilities under some poverty eradication programme.

c. Poultry

Generally, there is good demand for poultry meat and eggs in mining and industrial areas. Some house hold poultry, broilers and layer bird farm may be set up by the local village people. For this, necessary training and support shall be provided by the District Animal Husbandry Department.

d. Manufacture of sal and siali leaf plates.

This small scale industry is very much popular among the poor tribal by collecting leaves from the forests. Therefore, if financial and technical supports are provided to them under the guidance of Small Scale Industries Department, the local people will be benefited from this industry.

e. Self Help Group

Women Self Help Groups are being encouraged in the State of Odisha in a big way to make them self-reliant. Some SHG groups are functioning in BJP range, located in Gandhamardan region. They are engaged in vegetable cultivation, Poultry, Goatery, Fishery, Tamarind business etc. So the above activities and marketing of products shall be taken up through such groups. This will not reduce the forest dependence of the villagers but also uplift their economic status.

f. Farm Forestry and Institutional Planting:

Indigenous plants can be planted on the farm bunds, village community land, avenues and different institutions existing in the proposed mining site. The species shall be fruit bearing like mango, panas, medicinal plants like Anla, Harida, Bahada, fodder species like Badachakunda, Sirisa, Barakoli, Babul etc. and small timber species like Acassia, Eucalyptus, Sunder kania bamboos etc. so that villagers in addition to improving the environment they can also meet their need of forest materials. This shall be encouraged with funds available with DRDA and funds from Orissa Forestry Sector development programme or from CAMPA as suggested by OMC.

g. Vaccination of cattle:

As the cattle of the area graze in the forest by tradition and come in contact with wild herbivores, any cattle born epidemic may affect wild animals. Hence, the cattle population should be immunized at regular intervals with the help of local veterinary Department. This will not only prevent spread of cattle borne diseases to wild animals but also raise the milk yielding capacity of the domestic cows.

h. Live-stock grazing Control:

Awareness program shall be organized time to time to refrain from grazing of live-stock in the forest areas such practice. This will be done through the members of VSS (Van Sanrankshyan Samities) as informed by company (OMC).

i. Monitoring, Evaluation Mechanism and Training:

A monitoring cell is to be created at the Division Hqrs. headed by one of the Assistant Conservator of Forests working in the Division office. He will be assisted by one computer data operator.

3.0 FINANCIAL OUTLAY

Sl. No.	Activities	Financial break up (In Lakhs)	Remarks
1	Regeneration/Revegetation: Plantation will be taken up in suitable area.	Bald Hill plantation over 150 ha = Rs. 381.78 lakh [Annexure- I] (Cost Norms with 10 years maintenance)	Rs 136.90 lakhs have already been deposited for 204 ha against Gandhamardan-A and 250 ha against Gandhamardan-B towards plantation in ANR mode as per the approved SSWLCP within zone of influence. Accordingly, ANR plantation is not suggested in this plan.
2	Soil & Moisture conservation measures	SCM with check dams, gully plugging, contour bund, staggered trench, planting agave over 100 ha @ Rs.50000/- per ha = Rs.50 lakh Staggered contour trench in slope areas: 2 mtr x 0.5 mtr x 0.5 mtr size 20000 nos @ Rs. 56.20 each.= Rs. 11.24 lakh Loose Boulder Check Dams 1000 running mtrs @ Rs 2561.10 (Annexure- II) = Rs. 25.61 lakh Total = Rs. 86.85 lakh	Rs.58.90 lakh has been deposited towards Soil & Moisture Conservation Measures in the approved SSWLCP for Gandhamardan-A.
3	Measures for faunal diversity.		
a.	Prevention of fall of wild animals into mining pit Mining site should be fenced with solar fencing	-	Rs. 10 lakh has been deposited by OMC as per the approved SSWCP towards solar powered fencing at Gandhamardan B.
b.	Mess fencing across drainage line so that small vertebrate and amphibians can pass through it.		
c.	Mitigatory measures for birds and other small reptiles by keeping artificial nests	Rs.10.0 lakh	-

d.	Programme to create awareness among local people for wildlife conservation.	Rs. 2.0 lakh	Rs 27.50 lakh has been deposited for Gandhamardan-A including training, awareness and management of interface between man and elephants.
e.	Construction of Bird Bath for protection of faunal species in summer	Rs. 10.0 lakh	-
4	Fire management		
a	Creation of awareness among local people	-	Provision for awareness activity is earmarked in SSWLCP.
b	Incentive to local villagers	-	Rs 3.60 lakhs has been deposited against Gandhamardan A.
c	For hired vehicle for fire-fighting squad	Rs.16.0 lakh for 10 years for four months in a year @Rs. 40,000/month, @Rs. 1,60,000/year (Cost including fuel and driver)	-
d	Deployment of Fire-fighting squad	-	Rs.228.40 Lakhs has been deposited towards engagement of persons for protection as per approved SSWLCP for Gandhamardan-A&B.
e	Fire-fighting equipment	Rs.5.0 lakh	Rs. 3.60 Lakhs has been deposited for procurement of firefighting equipment as per approved SSWLCP for Gandhamardan A.
d	Fire blower with maintenance	Rs.6.0 lakh	-
f	Vehicle with water tanker to prevent forest fire	Rs. 24.0 lakh	-
g	Biodiversity protection squad to prevent illicit felling, prevent uncontrolled collection of fruits, flower, leaves etc, and prevent shifting cultivation.	Rs 145.0 (Including a vehicle with fuel and driver, skilled and un-skilled manpower for 10 years)@14.5 lakhs	-

5 Alternative livelihood/ Eco-system development initiative		
a	Honey bee keeping: District Small Scale Industries Centre may be requested to provide necessary accessories, technical guidance and marketing facilities under some poverty eradication programme.	(i) Rs 110000/- (Training to 20 members + subsidize equipment) per village for 30 villages = Rs.33.0 lakh (ii) Refreshers training for bee keeping = Rs.0.5 lakh per year for 10 years= Rs. 5.0 lakh (iii) Building at Suakati for processing, packaging & branding honey = Rs.30.0 lakh (iv) Recurring expenses, unforeseen expenses = Rs 15.0 lakh Total=Rs 83.0 lakh
b	Vegetable and mushroom cultivation in collaboration with Horticulture Department.	Rs 5.0 lakhs
c	Press khali preparation: Financial and technical support to be provided to them under the guidance of Small Scale Industries Department.	Rs 23.0 lakhs (10 lakhs cluster godown, 5.0 lakhs for electrification and 8.0 lakhs for machineries) x 2 locations= Rs. 46.00 lakhs
d	Poultry: Necessary training and support to be provided by Animal Husbandry Department Incense stick preparation etc	Rs 2.0 lakhs Rs 2.0 lakhs
e	Vaccination of cattle	Rs.5.0 lakh
		Rs 2.0 lakhs was deposited for 13240 cattle population as per SSWLCP of Gandhamardan-B.
6	Monitoring & Evaluation	Rs.5.0 lakh
	Total	Rs. 834.63 lakh

(Rupees eight crores thirty-four lakh and sixty-three thousand) only


Divisional Forest Officer
Keonjhar Division

COST NORM FOR BALD HILL PLANTATION @ 1600 PLANTS PER HECTARE						
Labour cost @ Rs 213.50 per manday						
Sl No	Item of work	Preferable period of execution	Manday	Labour cost @ Rs 213.50 per day	Material cost per hectare in Rs	Total cost per hectare in Rs.
Preparatory operation (0th Year)						
1.	Survey and demarcation	June	2	427.00	0	427.00
2.	Pitting (1600 pits per ha.)- each pit 45cm ³	Nov-Dec	128	27328.00	0	27328.00
3.	Soil and water conservation measures (a) Staggered trench along the contour @ 300 per ha (2.5mx0.5mx0.5m), digging of percolation pits @ 600 per ha in lieu of staggered trenches, gully plugging and Drainage line treatment, half moon trench on the uphill side of each planting pit (100 MD for staggered trench/ percolation pits and 30 MD for gully plugging, drainage line treatment and half moon trench)	Sept-Nov	130	27755.00	0	27755.00
	(b) Site clearance-8 MD. Alignment and staking of contour lines on ground, planting pits, contour trenches/ percolation pits and check dam sites etc.-2 MD	July-Aug	10	2135.00	0	2135.00
4	Raising of seedlings in poly bags (minimum 60 cm high) @ Rs 9.45 per seedling (Rs 6.67 in 0 th year) Part (1760 saplings to be raised for one hectare from January-March @ Rs 11739/-	October-March	44	9394.00	2939.00	12333.00
Total 0th year			314	67039.00	2939.00	69978.00
Planting Operation (1st Year)						
1	Cost of sapling (balance) from April-June/July @ Rs 2.78 per seedling for 1760 seedlings = Rs.4893/-	April-July	21.5	4590.25	593.00	5183.25
2	Freshening of pits-64 MD, filling with fertile soil and farm yard manure (FYM)-24 MD, application of insecticide and planting of 60 cm tall saplings including carriage of plants-21MD	June-July	109	23271.50	0	23271.50
3	Cost of fertile soil 0.25 cft @ Rs 6 per cft/ FYM 0.25 cft @ Rs 15 per cft per pit		0	0	9200.00	9200.00

4	Sowing of seeds on dug out earth of trench	June	6	1281.00	200.00	1481.00
5	Carriage-6 MD. Planting including casualty replacement-6 MD, fertilizer application-5 MD, 1 st weeding-7 MD, 2 nd weeding-5 MD, soil working-7 MD.	July-August	36	7686.00	0	7686.00
6	Cost of fertilizer and insecticide (Granular insecticide @ 5gms/plant @Rs 80/- per kg = Rs 640.00, NPK 100 gms/plant in two doses @ Rs 24 per kg = Rs 3840.00)		0	0	4480.00	4480.00
7	Maintenance of Soil and Moisture Conservation measures (20% of cost)	October-December	26	5551.00	0	5551.00
8	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	30	6405.00	0	6405.00
9	Fire tracing and control, display board construction, painting/writing, other miscellaneous cost	Jan-Feb	10	2135.00	360.00	2495.00
Total (1st year)			238.5	50919.75	14833.00	65752.75
Maintenance Operation (2nd Year)						
1	Casualty replacement-6 MD including seedling cost @ Rs 9.45 per seedling and its transportation	June-July	10	2135.00	1512.00	3647.00
2	Soil working-7 MD, 1 st weeding-6 MD, 2 nd weeding-6 MD and fertilizer application-4 MD	August-October	23	4910.50	0	4910.50
3	Cost of fertilizer @ 50 gms NPK per plant @ Rs 24/- per kg for 1600 plants = Rs 1920.00. Insecticide @ 5 gm per plant for 160 nos of plants @ Rs 80 per kg = Rs 64.00		0	0	1984.00	1984.00
4	Maintenance of Soil and Moisture Conservation measures (20% of cost)	August-October	26	5551.00	0	5551.00
5	Fire tracing and control, and other miscellaneous cost	Feb-March	10	2135.00	0	2135.00
6	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	30	6405.00	0	9405.00
Total 2nd Year			99	21136.50	3496.00	24632.50
Maintenance Operation (3rd Year)						
1.	S.M.C measures (Renovation)--	April-March	26	5551.00	0	5551.00
2	Maintenance of plantation	Apr-Mar	14	2989.00	0	2989.00
3	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	30	6405.00	0	6405.00
Total 3rd Year			70	14945.00	0	14945.00

Maintenance Operation (4 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 4th Year			53	11315.50	0	11315.50
Maintenance Operation (5 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 5th Year			53	11315.50	0	11315.50
Maintenance Operation (6 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 6th Year			53	11315.50	0	11315.50
Maintenance Operation (7 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 7th Year			53	11315.50	0	11315.50
Maintenance Operation (8 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 8th Year			53	11315.50	0	11315.50
Maintenance Operation (9 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 9th Year			53	11315.50	0	11315.50
Maintenance Operation (10 th Year)						
1	S.M.C measures- 21MD, and maintenance of plantation – 14 MD	April-March	35	7472.50	0	7472.50
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	3843.00	0	3843.00
Total 10th Year			53	11315.50	0	11315.50

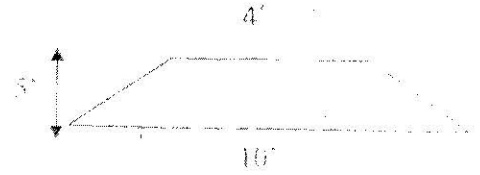
ABSTRACT

Sl	Year	Mandays	Labour cost (Rs.)	Material cost (Rs.)	Total (Rs.)
1	0 th year	314	67039.00	2939.00	69978.00
2	1 st year	238.5	50919.75	14833.00	65752.75
3	2 nd year	99	21136.50	3496.00	24632.50
4	3 rd year	70	14945.00	0	14945.00
5	4 th year	53	11315.50	0	11315.50
6	5 th year	53	11315.50	0	11315.50
7	6 th year	53	11315.50	0	11315.50
8	7 th year	53	11315.50	0	11315.50
9	8 th year	53	11315.50	0	11315.50
10	9 th year	53	11315.50	0	11315.50
11	10 th year	53	11315.50	0	11315.50
Grand Total		1092.5	233248.75	21268.00	254516.75


Divisional Forest Officer
Keonjhar Division

Annexure-II

LOOSE BOULDER CHECK DAM



(A) Size - 10' x 10' x 5'

(i) Requirement of boulder (Procured from quarry)

$$\frac{1}{2} (10' + 4') \times 10' \times 5' = 350 \text{ cu ft or } 9.90 \text{ cum}$$

Cost of Boulder @ Rs. 199/- per cum for 9.9 cum = Rs. 1,970.00/-

(ii) Labour for construction of LBCD for 1 cum

Mulla 1.04 No x 213.50 = 222.04

Mason special 0.17 No. x 273.50 = 46.49

Stone packer - 0.35 No. x 233.50 = 81.72

Total 350.25

For 9.90 cum 9.90 x 350.25

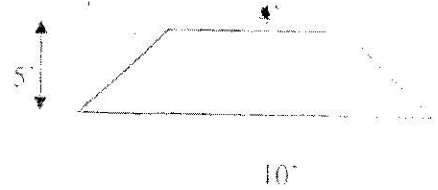
Rs. 3467.47/-

Rs. 5437.47/-

(Rounded to Rs 5438/-)

Rate for 1 cum Rs. 549.25 per cum or Rs. 550 per cum

LOOSE BOULDER CHECK DAM



(A) Size-10' x 10' x 5'

(i) Requirement of boulder (Picked up and broken)

$$\frac{1}{2} (10' + 4') \times 10' \times 5' = 350 \text{ cu ft or } 9.90 \text{ cum}$$

@ Rs.185/- per cum

Rs. 1,831.50/-

(ii) Labour for construction of LBCD for 1 cum

Mulla 1.04 No x 213.50 = 222.04

Mason special 0.17 No. x 273.50 = 46.49

Stone packer - 0.35 No. x 233.50 = 81.72

Total 350.25

For 9.90 cum 9.90 x 350.25 =

Rs. 3467.47/-

Rs. 5298.97/-

(Rounded to Rs 5300/-)

For 1 cum Rs.535.25/ cum or Rs. 535/- per Cum

N.B. The cost of transportation with a lead of 5 Kms- Rs.156.40/cum.

ABSTRACT

SL NO.	ITEM	REMARKS
1	Loose Boulder Check Dam(LBCD) Constructed from the boulder procured from the quarry	Rs. 550/Cum
2	In- situ collected, broken and utilized for construction of LBCD	Rs 535/Cum
3*	Cost of transportation within a lead of 5 Kms	Rs. 156.40/ Cum

* Rate will be proportionately enhanced for lead more than 5 km in specific cases.

[Handwritten Signature]