कार्यालय प्रधान मुख्य वन संरक्षक (कक्ष–भू प्रबंध), सतपुड़ा भवन, मध्यप्रदेश, भोपाल

क्रमांक / एफ–3 / 53 / 2018 / 10–11 / 15 / 3106 भोपाल, दिनांक 12/09/2022

प्रति,

वन महानिरीक्षक (एफ.सी.)
भारत सरकार, पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय,
इंदिरा पर्यावरण भवन, अलीगंज,
जोरबाग रोड़, नई दिल्ली–110003

विषयः–जिला शिवपुरी के अंतर्गत सरकुला मीडियम लिफ्ट सिंचाई परियोजना के निर्माण हेतु 126.42 हेक्टेयर वनभूमि जल संसाधन विभाग को उपयोग पर देने बाबत्।

संदर्भः–भारत सरकार, पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय, इंदिरा पर्यावरण भवन, अलीगंज, जोरबाग रोड़, नई दिल्ली का पत्र क्र. क्र. 8-31/2021-FC दि. 02.06.2022

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महोदय,

विषयांतर्गत प्रकरण में भारत सरकार के उक्त संदर्भित पत्र द्वारा जारी की गयी सैद्वांतिक स्वीकृति में अधिरोपित शर्तों का पालन प्रतिवेदन प्राप्त किया जाकर निम्नानुसार संलग्न प्रेषित है :–

S.No	Conditions	Compliance
A. - Conditions required to be complied prior to handing over of forest land by the State Forest Department and compliance to be submitted prior to Stage-II approval:		
i	DSS analysis of the area and the IRO's report have revealed construction of certain structures like check dams and approach road in the area proposed for diversion. The State Government shall verify these constructions to ascertain whether the said constructions actually can be construed as violation of Forest (Conservations) Act, 1980 and action, as appropriate may accordingly be initiated under intimation to MoEE&CC.	वनमण्डलाधिकारी, शिवपुरी ने अवगत कराया है, कि उक्त संरचनाओं एवं पहुचमार्ग के निर्माण संबंधी कोई अभिलेख वनमण्डल कार्यालय में नहीं है, उक्त संरचना नदी के बीच में बनी होने से आसपास के वन्यप्राणीयों की पेयजल व्यवस्था बनी हुई है। परियोजना निर्माण से वनक्षेत्र पर कोई विपरीत प्रभाव नहीं पड़ेगा।
ii	The muck disposal plan shall be submitted.	मक डिस्पोजल प्लान की प्रति परिशिष्ट–1 पर संलग्न है।
iii	The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation at the prevailing wage 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 consultation with State Forest Department in the account of CAMPA of the concerned State through online portal. The CA will be maintained for 10 years. The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years;	आवेदक विभाग द्वारा क्षतिपूर्ति वनीकरण हेतु राशि रूपये 6,84,19,725/– आनलाईन ई–पोर्टल के माध्यम से एड हॉक कैम्पा मद मे जमा की गई है।

iv	The user Agency shall transfer online, the Net Present Value (NPV) of the forest land (126.42 ha) being diverted under this proposal, as per the orders of the Hon'ble Supreme Court of India dated 28-03-2008, 24-04-2008 and 09-05-2008 in Writ petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 53/2007-FC dated 05.02.2009. The requisite funds shall be transferred through online portal into CAMPA account of the state concerned;	आवेदक विभाग द्वारा नेट प्रजेंट वैल्यू की राशि रू. 12,10,82,548 ऑनलाईन ई–पोर्टल के माध्यम से एड–हॉक कैम्पा मद मे जमा की गई है।
v	The Copy of approved Catchment Area Treatment (CAT) Plan shall be submitted and the commensurate cost of CAT plan shall be deposited in the CAMPA account through online portal;	प्रस्ताव में जल ग्रहण उपचार क्षेत्र योजना मय तकनीकी स्वीकृति सहित परिशिष्ट–2 पर संलग्न है। जल ग्रहण उपचार योजना के लिये राशि रू. 71,44,770/– ई–पोर्टल के माध्यम से एड–हॉक कैम्पा मद में जमा की गई है।
vi	The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;	मध्यप्रदेश राज्य शासन के आदेश दिनांक 22.04.2016 से शासकीय विभागों को विदोहन व्यय में छूट दी गयी है। यह कार्य विभागीय मद से बजट उपलब्ध करवाकर सम्पादित किया जावेगा।
vii	The identified non-forest land for raising compensatory afforestation shall be transferred and mutated in the name of forest department and notified as Reserved Forest/Protected Forest prior to stage-II approval. A copy of the original notification declaring the non-forest land under section 4 or section 29 of the Indian Forest Act, 1927, or under the relevant section of the State Forest Act as the case may be, will be submitted by the State Government prior to State-II approval;	परियोजना में प्राप्त गैर वनभूमि को वनभूमि घोषित करने संबंधी कार्यवाही प्रचलित है।
viii	The complete compliance of the FRA, 2006 shall be ensured by way of prescribed certificate from the concerned District Collector;	FRA प्रमाण पत्र परिशिष्ट–3 पर संलग्न है।
ix	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 handing over forest land to the user agency;	जानकारी e-Green watch पोर्टल पर अपलोड की गई है। जिसकी आई.डी. क्रमांक 50164 है।
x	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:	आवेदक विभाग द्वारा क्षतिपूर्ति वनीकरण, नेट प्रजेंट वैल्यू एवं जल ग्रहण उपचार क्षेत्र योजना की राशि एड–हॉक कैम्पा में ई–पोर्टल के माध्यम से जमा की गई है।
xi	The Compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).	आवेदक विभाग द्वारा शर्तों का पालन प्रतिवेदन आनलाईन पोर्टल पर अपलोड किया गया है।

B. - Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking is to be submitted prior to Stage-II approval:		
i	Legal status of the diverted forest land shall remain unchanged;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
ii	Forest land will be handed over only after required non-forest land in the project in obtained by the user agency;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
iii	At the time of payment of the Net Present Value (NPV) at the then prevailing 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;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
iv	The felling of trees shall be restricted to FRL-4 meter only. Number of Trees to be removed shall be kept at barest minimum during the exection of the project;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
v	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 satate Government/Regional Office of MoEE&CC along with indicators for monitoring and expected observable milestones;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
vi	The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
vii	The User Agency shall undertake afforestation along the periphery of the reservoir;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
viii	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;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
ix	The boundary of the diverted forest land, be demarcated on ground at the project cost, be erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
x	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;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xi	No damage to the flora and fauna of the adjoining area shall be caused;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xii	Sufficient Firewood, preferably the alternate fuel, shall be provided by the user agency to the labourer after purchasing the same from the state Forest Department or the forest Development Corporation or any other legal source of alternate fuel;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।

xiii	The layout plan of the proposal shall not be changed without the prior approval of the Central Government;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xiv	No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xv	The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xvi	The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project, Bird's nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xvii	The concerned Divisional Forest Officer, will monitor and take necessary mitigative measures to ensure that there is no adverse impact on the forests in the surrounding area;	वनमण्डलाधिकारी, शिवपुरी ने अवगत कराया है, कि परियोजना निर्माण से आसपास के वनक्षेत्र में विपरीत प्रभाव नहीं पड़ेगा।
xviii	The user agency shall restrict the felling of Trees to minimum numbers in the diverted forest land and trees shall be felled under strict supervision of the state forest Department;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xix	The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the state forest Department;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xx	The User Agency shall submit the annual self-compliance report in respect of the above stated conditions to the state Government, concerned Integrated Regional Office and to this Ministry by the end of March every year regularly;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xxi	The user agency shall comply all the provisions of the all acts, Rules, Regulations, Guidelines, Hon'ble Court Order (8) and NGT order (s) pertaining to this project, if any, for the time being in force, as applicable to the project.	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।
xxii	Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEE&CC Guideline F.No. 11-42/2017-FC dated 29-01-2018;	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।

xxiii	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.	आवेदक विभाग सहमत है। वचन पत्र संलग्न है।

अतः प्रकरण में अनुरोध है कि भारत सरकार से औपचारिक स्वीकृति प्राप्त कर अवगत कराने का कष्ट करें।

संलग्नः–उपरोक्तानुसार।

12/9/2022

(सुनील अग्रवाल)
प्रधान मुख्य वन संरक्षक (भू–प्रबंध)
मध्यप्रदेश, भोपाल

पृ. क्रमांक/एफ–3/53/2018/10–11/15/3107 भोपाल, दिनांक 12/09/2022

प्रतिलिपिः–

1. मुख्य वन संरक्षक, (क्षेत्रीय) शिवपुरी वृत्त शिवपुरी, मध्यप्रदेश।
2. वनमंडलाधिकारी, (सा0) वनमंडल शिवपुरी, मध्यप्रदेश।
3. कार्यपालन यंत्री, जल संसाधन संभाग शिवपुरी, जिला शिवपुरी, मध्यप्रदेश।

की ओर सूचनार्थ अग्रेषित।

12/9/2022

प्रधान मुख्य वन संरक्षक (भू–प्रबंध)
मध्यप्रदेश, भोपाल

कार्यालय वनमण्डलाधिकारी, सामान्य वनमण्डल शिवपुरी (म0प्र0)

दूरभाष एवं फैक्स नं 07492-221012 ई मेल dfotshivp@mp.gov.in मोबाइल : 9424794737

क्रमांक/डी.एम./2022/4355 शिवपुरी, दिनांक/ 8/9/22

प्रति,

प्रधान मुख्य वन संरक्षक
(भू प्रबन्ध)
म.प्र. भोपाल

विषय :– जिला शिवपुरी के अंतर्गत सरकुला मीडियम लिफ्ट सिंचाई परियोजना के निर्माण हेतु 126.42 हैक्टेयर वन भूमि जल संसाधन विभाग को उपयोग पर देने बाबत्।

संदर्भ:– आपका पत्र क्रमांक / एफ–3/53/2018/10–11/15/1980 दिनांक 03.06.2022

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विषयांकित के संबंध में एवं संदर्भित पत्र के पालन में निवेदन है कि जिला शिवपुरी के अंतर्गत सरकुला मीडियम लिफ्ट सिंचाई परियोजना से संबंधित भारत सरकार वन एवं जलवायु परिवर्तन मंत्रालय एवं पर्यावरण एवं वन मंत्रालय दिल्ली से प्राप्त सैद्वांतिक स्वीकृति दिनांक 02.06.2022 की शर्तो का पालन प्रतिवेदन मे इस कार्यालय से संबधित जानकारी निम्नानुसार है :–

A(i) DSS analysis of the area and the IRO's report have revealed construction of certain structures like check dams and approch road in the area proposed for diversion. the state Government shall verify these construed as violation of forest (Conservation) Act, 1980 and action , as appropriate may accordingly be initiated under intimation to MoEF&CC.	शर्त क्रमांक I के पालन में निवेदन है कि उक्त संरचनाओं एवं पहुचमार्ग के निर्माण संबंधी अभिलेख इस कार्यालय में उपलब्ध नहीं है , परन्तु परियोजना निर्माण से विपरीति प्रभाव नही पडेगा । उक्त संरचना निर्माण से वन्यप्राणी पेयजल की व्यवस्था हो रही है ।
A (vii) The identified non forest land for raising compensatory afforestation shall be transferred and mutated in the name of forest department and notified as Reserved Forest/ Protected forest prior to Stage II approval , A copy of the original notification declaring the non -forest land under Section 4 or Section 29 of the Indian Forest Act, 1927 or under the relevant section of the State Forest Act	शर्त क्रमांक VII के पालन में निवेदन है कि सरकुला मध्यम सिंचाई परियोजना में प्रभावित वन भूमि के बदले गैर वन भूमि (राजस्व भूमि) शिवपुरी जिले के ग्राम टोंका में 126.50 हैक्टेयर हस्तांतरण एवं नामांतरण की कार्यवाही कलेक्टर जिला शिवपुरी द्वारा की गई है, जिसका अधिसूचना प्रारूप तैयार कर इस कार्यालय के पत्र क्रमांक 4311 दिनांक 07.09.2022 से कलेक्टर जिला शिवपुरी के हस्ताक्षर हेतु प्रस्तुत किये गये है । हस्ताक्षर उपरांत वरिष्ठ को प्रेषित किये जावेगे ।

A (ix) 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 handing over forest land to the user agecy.	शर्त क्रमांक IX के पालन में निवेदन है कि कार्यवाही नोडल अधिकारी भोपाल स्तर से की जाना है ।
B (xvii) The Concerned Divisional Forest Officer, will monitor and take necessary mitigative measures to ensure that there is no adverse impact on the forests in the surrounding area;	शर्त क्रमांक B (xvii) के पालन में निवेदन है कि शर्त अनुसार पालन किया जावेगा एवं सुनिश्चित किया जाएगा कि आसपास के वन क्षेत्र में विपरीत प्रभाव नहीं पड़ेगा ।

इस कार्यालय से संबंधित शर्तो का पालन प्रतिवेदन पत्र के संलग्न सम्प्रेषित है । शेष शर्त क्रमांक A (ii), A (iii),A (iv), A (v), A (vi), A (viii), , A (x), A (xi), B (i), B (ii), B (iii), B (iv), B (v),B (vi), B (vii), B (viii), B (ix), B (x), B (xi), B (xii), B (xiii), B (xiv), B (xv), B (xvi), B (xviii), B (xix), B (xx), B (xxi), B (xxii), B (xxiii) का पालन प्रतिवेदन कार्य पालन यंत्री जल संसाधन संभाग शिवपुरी से प्राप्त हुआ है , जो पत्र के संलग्न आवयश्क कार्यवाही हेतु सम्प्रेषित है ।

संलग्न :– पालन प्रतिवेदन की छायाप्रति ।

Meena

(मीना कुमारी मिश्रा)
भा.व.से.
वनमण्डलाधिकारी
वनमण्डल शिवपुरी (म.प्र)

पृष्ठांकन क्रमांक/डी.एम./2022/ 4356 शिवपुरी, दिनांक/8/9/22

प्रतिलिपि :–

1- मुख्य वन संरक्षक शिवपुरी वृत्त शिवपुरी की ओर सूचनार्थ सम्प्रेषित ।
2. कार्य पालन यंत्री जल संसाधन संभाग शिवपुरी की ओर सूचनार्थ ।

Meena

वनमण्डलाधिकारी
वनमण्डल शिवपुरी (म.प्र)

कार्यालय वनमण्डलाधिकारी, सामान्य वनमण्डल शिवपुरी (म0प्र0)

दूरभाष एवं फैक्स नं 07492-221012 ई मेल dfotshivp@mp.gov.in मोबाइल : 9424794737

क्रमांक/डी.एम./2022/ 4311 शिवपुरी, दिनांक/ 07-09-22

प्रति,

कलेक्टर

जिला शिवपुरी (म.प्र.)

विषय :- सरकुला मध्यम सिंचाई परियोजना हेतु आवंटित राजस्व भूमि की भारतीय वन अधिनियम 1927 की धारा 29 के तहत अधिसूचना के प्रस्ताव भेजने बाबत् ।

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विषयांकित के संबंध में निवेदन है कि सरकुला मध्यम सिंचाई परियोजना प्रोजेक्ट में प्रभावित 126.42 हैक्टर वन भूमि के बदले प्राप्त राजस्व भूमि खसरा नम्बर 1699 रकबा 126.50 हैक्टेयर ग्राम टोका तहसील शिवपुरी में राजस्व भूमि आपके आदेश क्रमांक 21/2019–20/अ –20(3) नजूल आदेश दिनांक 24.04.2021 से हस्तांतरित एवं नामांतरित किये जाने के कारण उक्त भूमि की अधिसूचना भारतीय वन अधिनियम 1927 की धारा 29 के अंतर्गत कराया जाना है ।

उक्त भूमि की अधिसूचना हेतु आवश्यक प्रमाण पत्र अनुविभागीय अधिकारी (राजस्व) शिवपुरी द्वारा तैयार कर प्रस्तुत किये गये है , जिनकी छायाप्रति संलग्न है ।

अतः अधिसूचना की मूल प्रतियॉ आपके हस्ताक्षर हेतु सम्प्रेषित है , जिसकी मूल प्रतियॉ हस्ताक्षर उपरांत वापिस इस कार्यालय में भेजने का कष्ट करे ।

संलग्न :– उपरोक्तानुसार प्रस्ताव मय चैकलिस्ट ।

Meena

(मीना कुमारी मिश्रा)
भा.व.से.
वनमण्डलाधिकारी
वनमण्डल शिवपुरी (म.प्र)

पृ0क्रमांक/डी.एम./2022/ 4312 शिवपुरी, दिनांक/ 07-09-2022

प्रतिलिपि :-

मुख्य वन संरक्षक शिवपुरी वृत्त शिवपुरी की ओर सूचनार्थ सम्प्रेषित ।

Meena

वनमण्डलाधिकारी
वनमण्डल शिवपुरी (म.प्र)

O/C

कार्यालय कार्यपालन यंत्री जलसंसाधन संभाग, शिवपुरी (म.प्र.)

पत्र क्र. 1041 /कार्य /सरकुला / 2022-23 शिवपुरी दिनांक 23/8/2022

प्रति,

वनमंडलाधिकारी

सामान्य वनमंडल, शिवपुरी

विषय: सरकुला मध्यम सिंचाई परियोजना के निर्माण हेतु वन विभाग से द्वितीय स्टेज की स्वीकृति हेतु कंप्लायंस पूर्ण करने बावत।

सन्दर्भ ; कार्यालय प्रधान मुख्य वन संरक्षक (कक्ष -भू प्रबंध),सतपुड़ा भवन ,मध्यप्रदेश,भोपाल का पत्र क्र./एफ -3/53/2018/10-11/15/1980 भोपाल दिनांक 03.06.2022

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उपरोक्त विषयान्तर्गत लेख है कि सरकुला मध्यम सिंचाई परियोजना के निर्माण हेतु वन विभाग से स्वीकृति बावत प्रकरण प्रक्रियाधीन है जिसमें FIRST STAGE की स्वीकृति प्राप्त हो चुकी है एवं SECOND STAGE की स्वीकृति हेतु संदर्भित पत्रानुसार कंप्लायंस कर प्रकरण अग्रिम कार्यवाही हेतु आपकी और प्रेषित है।

संलग्न :(1)कंप्लायंस रिपोर्ट पृष्ठ क्र.1से 3 की मूल प्रति-1 नग

(2) शर्त क्र I से XXIII तक शपथ पत्र की मूल प्रति-1 नग

(3) मक डिस्पोजल प्लान की मूल प्रति-1 नग

(4) अधिसूचना प्रारूप की मूल प्रति-9 नग

(5) कब्जा रसीद की मूल प्रति -1 नग

कार्यपालन यंत्री

जलसंसाधन संभाग ,शिवपुरी (म.प्र.)

शिवपुरी दिनांक

पृ.क्र.. /कार्य /सरकुला / 2022-23

प्रतिलिपि: अनुविभागीय अधिकारी जलसंसाधन उपसंभाग क्र.2,शिवपुरी (म.प्र.)की ओर सूचनार्थ प्रेषित।

कार्यपालन यंत्री

जलसंसाधन संभाग ,शिवपुरी

Office of the Executive Engineer Water Resource Division, Shivpuri (M.P.)
Compliance Report for Sanction of Stage-II for Land Coming Under Submergence of Sarkula Medium Irrigation Project

S.No.	Conditions	Compliance
A- Conditions required to be complied prior to handing over of forest land by the State Forest Department and compliance to be submitted prior to Stage-II approval:		
i	DSS analysis of the area and the IRO's report have revealed construction of certain structures like check dams and approach road in the area proposed for diversion. The State Government shall verify these constructions to ascertain whether the said constructions actually can be construed as violation of Forest (Conservations) Act, 1980 and action, as appropriate may accordingly be initiated under intimation to MoEE&CC.	यह कार्य आवेदक संस्था द्वारा नहीं किया गया है। इस संबंध में टीप वन विभाग द्वारा ही दी जा सकती है।
ii	The muck disposal plan shall be submitted.	मक डिस्पोजल प्लान तैयार कर लिया गया है, जो परिशिष्ट–1 में संलग्न है।
iii	The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation at the prevailing wage 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 consultation with State Forest Department in the account of CAMPA of the concerned State through online portal. The CA will be maintained for 10 years. The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years;	क्षतिपूर्ति वनीकरण की राशि रू. 6,84,19,725 ऑनलाईन परिवेश पोर्टल के माध्यम से जमा की गई है।
iv	A(iv) The user Agency shall transfer online, the Net Present Value (NPV) of the forest land (126.42 ha) being diverted under this proposal, as per the orders of the Hon'ble Supreme Court of India dated 28-03-2008, 24-04-2008 and 09-05-2008 in Writ petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 53/2007-FC dated 05.02.2009. The requisite funds shall be transferred through online portal into CAMPA account of the state concerned;	नेट प्रजेंट वैल्यू की राशि रू. 12,10,82,548 ऑनलाईन परिवेश पोर्टल के माध्यम से जमा की गई है।
v	The Copy of approved Catchment Area Treatment (CAT) Plan shall be submitted and the commensurate cost of CAT plan shall be deposited in the CAMPA account through online portal;	CAT प्लान की प्रति परिशिष्ट–2 में संलग्न है। CAT प्लान की राशि रू. 71,44,770 ऑनलाईन परिवेश पोर्टल के माध्यम से जमा की गई है।
vi	The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;	मध्यप्रदेश शासन द्वारा शासकीय विभागों की परियोजनाओं में विदोहन कार्य की राशि से छूट दी गई है।
vii	The identified non-forest land for raising compensatory afforestation shall be transferred and mutated in the name of forest department and notified as Reserved Forest/Protected Forest prior to stage-II approval. A copy of the original notification declaring the non-forest land under section 4 or section 29 of the Indian Forest Act, 1927, or under the relevant section of the State Forest Act as the case may be, will be submitted by the State Government prior to State-II approval;	वन विभाग से संबंधित है।

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viii	The complete compliance of the FRA, 2006 shall be ensured by way of prescribed certificate from the concerned District Collector;	यह प्रमाण पत्र परिशिष्ट–3 में संलग्न है।
ix	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 handing over forest land to the user agency;	वन विभाग से संबंधित है।
x	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:	सभी भुगतान ऑनलाईन परिवेश पोर्टल के माध्यम से किये गये हैं।
xi	The Compliance report shall be uploaded on e-portal (https://parivesh.nic.in/).	पालन प्रतिवेदन परिवेश पोर्टल पर अपलोड किया जा रहा है।
B- Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking is to be submitted prior to Stage-II approval:		
i	Legal status of the diverted forest land shall remain unchanged;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–4 में संलग्न है।
ii	Forest land will be handed over only after required non-forest land in the project in obtained by the user agency;	क्षतिपूर्ति वनीकरण हेतु गैर वनभूमि वन विभाग को हस्तांतरित कर दी गई है। कब्जा रसीद की प्रति परिशिष्ट–5 में संलग्न है।
iii	At the time of payment of the Net Present Value (NPV) at the then prevailing 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;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–6 में संलग्न है।
iv	The felling of trees shall be restricted to FRL-4 meter only. Number of Trees to be removed shall be kept at barest minimum during the exection of the project;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–7 में संलग्न है।
v	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 satate Government/Regional Office of MoEE&CC along with indicators for monitoring and expected observable milestones;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–8 में संलग्न है।
vi	The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–9 में संलग्न है।
vii	The User Agency shall undertake afforestation along the periphery of the reservoir;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–10 में संलग्न है।
viii	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;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–11 में संलग्न है।

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ix	The boundary of the diverted forest land, be demarcated on ground at the project cost, be erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–12 में संलग्न है।
x	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;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–13 में संलग्न है।
xi	No damage to the flora and fauna of the adjoining area shall be caused;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–14 में संलग्न है।
xii	Sufficient Firewood, preferably the alternate fuel, shall be provided by the user agency to the labourer after purchasing the same from the state Forest Department or the forest Development Corporation or any other legal source of alternate fuel;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–15 में संलग्न है।
xiii	The layout plan of the proposal shall not be changed without the prior approval of the Central Government;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–16 में संलग्न है।
xiv	No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–17 में संलग्न है।
xv	The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–18 में संलग्न है।
xvi	The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project, Bird's nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–19 में संलग्न है।
xvii	The concerned Divisional Forest Officer, will monitor and take necessary mitigative measures to ensure that there is no adverse impact on the forests in the surrounding area;	वन विभाग से संबंधित है।
xviii	The user agency shall restrict the felling of Trees to minimum numbers in the diverted forest land and trees shall be felled under strict supervision of the state forest Department;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–20 में संलग्न है।
xix	The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the state forest Department;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–21 में संलग्न है।
xx	The User Agency shall submit the annual self-compliance report in respect of the above stated conditions to the state Government, concerned Integrated Regional Office and to this Ministry by the end of March every year regularly;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–22 में संलग्न है।

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xxi	The user agency shall comply all the provisions of the all acts, Rules, Regulations, Guidelines, Hon'ble Court Order (8) and NGT order (s) pertaining to this project, if any, for the time being in force, as applicable to the project.	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–23 में संलग्न है।
xxii	Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEE&CC Guideline F.No. 11-42/2017-FC dated 29-01-2018;	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–24 में संलग्न है।
xxiii	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.	आवेदक संस्था इस शर्त से सहमत है। इस संबंध में वचन पत्र परिशिष्ट–25 में संलग्न है।

(Vinod Kumar Sharma)
Executive Engineer
WR Division, Shivpuri (M.P.)

परिशिष्ट - 1

MUCK MANAGEMENT PLAN OF SARKULA MEDIUM IRRIGATION PROJECT

1. MUCK MANAGEMENT PLAN

1.1.1 IMPACT DUE TO MUCK GENERATION

For construction of different components of the project, surface excavation in earth mixed with boulders, hard soil and disintegrated rock and hard rock would be carried out. The excavation shall result in large quantity of excavated material i.e. muck which shall have to be evacuated, disposed of and roller compacted or laid on mild slopes paripassu with the excavation work, to such designated areas where the muck piles do not substantially interfere with either environment / ecology or the river flow regime and cause turbidity impairing the quality of water. The disposal of muck has to be scientifically planned keeping in view the maximum reutilization of muck in construction as this being earthen dam requiring substantial amount of excavated material in construction. Reutilization would reduce/eliminate the transportation, storage and other pollution load on environment due to substantial amount of muck excavated from foundation and laying of underground pipeline.

The construction of dam and water conductor system for conveyance of water up to farm level would generate substantial amount of muck, as calculated below :

a) Muck from Dam's Foundation

Muck from dam's foundation has been computed by the design wing of WRD, during the preparation of DPR. Quantities received from excavation are given at Table 1 below.

A detailed estimate has also been prepared for the material required in construction of the dam, along with the quantity received and

requirement of dumping of surplus material or net quantity deficit to be procured/quarried separately and same is given at Table 2 below.

Table 1: Quantities of Excavated Material

Sl No.	Particulars	QUANTITIES FROM EXCAVATION (M3)			Total
		Hard Soil	Disintegrated Rock	Hard Rock	
1	Benching	21060	-	-	21060
2	Over flow part	3450	4500	11887	19837
3	Approach Channel	65000	32000	113105	210105
4	Chute Fall	60853	29800	31063	121716
5	Stilling Basin	66000	23500	39020	128520
6	Spill Channel	72500	29400	84724	186624
7	Non over flow part	2200	-	2200	4400
Total Qty. in Cum.		**291063**	**119200**	**281999**	**692262**

Table 2: Total excavation and utilization

Particulars	Total Qty. in Cum.	% Usefull	Qty. Cum.
(a) Benching			
Hard soil	21060	80%	16848
(b)Embankment			
Hard soil	270003	80%	216002
(c)Boulder Toe & Pitching			
Hard Rock	281999	90%	253799
Total Qty. in cum.			**486649**

Surplus excavated material which includes remaining hard soil, disintegrated rocks and earthwork from embankment of the order of 205613 m3 , will be utilized during the construction of earthen dam. A

dam of total length 474 m (earthen dam length 390 m), height of 43 m and top width of 7 m. will require substantial amount of excavated material during construction. All the excavated material will be accommodated in the dam construction and no surplus muck will be left for permanent disposal.

b) Muck from Pipeline Route

The proposed system is a closed conduit system for conveyance of water up to farm level. To understand the impact of muck generation from laying of pipeline, quantification of this impact was carried out by calculating the muck volume which shall be generated from excavation of earth for laying of pipeline, adding a swell factor of 25% to the muck generated and subtracting the quantity of back filling. The resultant quantum is the muck generation requiring disposal.

As the top of the pipe will be laid at least 1.2 m below the surface, for calculation of the trench volume, depth is taken as 2.9 m for rising main.

Muck from rising mains:

There is only one 785 m rising main proposed with 1.2 m dia; bottom width is taken as 10 cm more than the pipe dia on each side and top width is taken as ½ of the trench depth in addition to the bottom width i.e. ¼ depth on each side.

Pipe dia=1.2 m Trench depth= 2.9 m

Bottom width of trench=1.2+0.20=1.6 m (10 cm on each side)

Top width of trench=1.6+2.9/2=3.05 m

Total quantity of muck excavated from RM = 5292.86 cum

(785*2.9*(1.6+3.05)/2

Total quantity of muck with swell factor of 25% = 6616.07 cum

Backfill quantity = 3905.09 cum

Muck requiring disposal from RM (a) = 2710.98 cum

MUCK MANAGEMENT

As discussed above, the excavated material from the dam foundation will be fully utilised in dam construction and therefore dumping need will not arise. Muck requiring disposal from laying pipeline network especially rising has been estimated as 2710.98 m3 . This quantity can also be utilized in dam construction.

Alternatively, this surplus soil will be utilized for refilling of the trenches and the approach road proposed to be constructed for carrying the pipes at site and preparation of platform for crane. During excavation, care will be taken that top fertile soil is kept aside and will be used for re-filling the top area after laying pipe line. This top soil will be spread on adjoining farming fields with consent of farmers or alternatively will be used for green belt development.

Balance muck will be managed by spreading along the route in the low lying areas. As the topography is undulating, such low lying areas are available along the route. Any further surplus muck, shall be laid in the community undulating area of the connected villages with the consent of concerning Gram-panchayat or Janpad Panchayat. The muck may also be used by nearby Gram Panchayats for construction of village roads etc.
A lump sum provision of capital expenditure of Rs. 100 lakh has been made for muck disposal.

Sub Engineer

Sub Divisional Officer
W. R. Sub Division No.2,Shivpuri

Executive Engineer
W. R. Division ,Shivpuri

परिशिष्ट–2

शर्त– A(v)

The Copy of approved Catchment Area Treatment (CAT) Plan shall be submitted and the commensurate cost of CAT plan shall be deposited in the CAMPA account through online portal;

CAT प्लान प्रस्ताव के भाग–1 में बिन्दु क्रमांक M (ii) a में अपलोड है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

कार्यालय प्रधान मुख्य वन संरक्षक (कक्ष–भू प्रबंध), सतपुड़ा भवन, मध्यप्रदेश, भोपाल

तकनीकी स्वीकृति आदेश

आदेश क्रं./एफ–3/53/2018/10–11/15/06 भोपाल, दिनांक 04/02/2022

भारत सरकार द्वारा वन (संरक्षण) अधिनियम, 1980 के तहत दिनांक 08.03.2019 से प्रभावशील गाईड लाईन के अनुसार प्रधान मुख्य वन संरक्षक एवं वन बल प्रमुख म0प्र0 भोपाल के आदेश क्रमांक/एफ–3/2019/10–11/03, दिनांक 31.05.2019 से प्रदत्त अधिकारों के अन्तर्गत गठित समिति की बैठक आयोजित की गयी। सरकुला मीडियम लिफ्ट सिंचाई परियोजना निर्माण में केचमेन्ट एरिया ट्रीटमेन्ट प्लान कार्य के परीक्षण उपरांत तकनीकी स्वीकृति निम्नानुसार प्रदान की जाती है :–

वनमण्डल का नाम	योजना का नाम	उपचार भूमि हेतु रकबा (हेक्टयर में)	राशि (रूपये लाख मे)
शिवपुरी	सरकुला मीडियम लिफ्ट सिंचाई परियोजना (126.42 हेक्ट.)	6500	71,44,770

(राशि रूपये इकहतर लाख चोंवालीस हजार सात सौ सत्तर)

उक्त तकनीकी स्वीकृति निम्नलिखित शर्तो के अधीन रहेंगी :–

1. कार्यपालन यंत्री, जल संसाधन संभाग शिवपुरी द्वारा प्रस्तुत प्राक्कलन के प्रस्तावों पर दी जाती है। यदि प्रस्तावों मे कोई परिवर्तन स्थानीय परिस्थितियों को दृष्टिगत रखते हुए आवश्यक हो तो अनुमोदन उपरांत कराएं।
2. वनमण्डलाधिकारी, शिवपुरी इस स्वीकृति के अधीन केचमेन्ट एरिया ट्रीटमेन्ट प्लान कार्य हेतु प्रशासकीय स्वीकृति प्राप्त होने पर प्राप्त राशि के अंतर्गत ही व्यय करेंगें, केवल तकनीकी स्वीकृति के आधार पर कार्य प्रारंभ न किया जावें। कैम्पा कक्ष द्वारा दिये आवंटन के अनुसार ही कार्य कराया जावें।
3. इस कार्य की उपयोगिता प्राक्कलन अनुसार कार्य के लिये है।
4. कार्य का संपादन तकनीकी स्वीकृति के साथ संलग्न प्राक्कलन एवं मानचित्र में दर्शित तकनीकी मापदण्डों के अनुसार कराया जावें। कार्य के दौरान स्थल की भौगोलिक स्थिति के अनुसार किसी प्रकार के परिवर्तन/संशोधन की आवश्यकता होने पर सक्षम अधिकारी से पूर्व अनुमति लेना अनिवार्य होगा।
5. केचमेन्ट एरिया ट्रीटमेन्ट प्लान अंतर्गत कार्य हेतु स्थल उपयुक्तता प्रमाण–पत्र प्राप्त कर ही कार्य किया जावें।
6. केचमेन्ट एरिया ट्रीटमेन्ट प्लान कार्य की गुणवत्ता पर सतत निगरानी रखी जावें।
7. कोई भी सामग्री क्रय करते समय भण्डार क्रय नियम का पालन करें।
8. कार्य प्रांरभ के पूर्व विस्तृत कार्यवार स्थल अनुरूप डी.पी.आर. तैयार कर कार्य प्रांरभ करावें।

(सुनील अग्रवाल)
प्रधान मुख्य वन संरक्षक (भू–प्रबंध)
मध्यप्रदेश, भोपाल

–2–

पृ. क्रं. / एफ–3 / 29 / 2011 / 10–11 / 4 / 460 भोपाल, दिनांक 04/02/2022

प्रतिलिपिः–

1. अपर प्रधान मुख्य वन संरक्षक (विकास), सतपुडा भवन, मध्यप्रदेश भोपाल।
2. अपर प्रधान मुख्य वन संरक्षक (कैम्पा), सतपुडा भवन, मध्यप्रदेश भोपाल।
3. मुख्य वन संरक्षक, (क्षेत्रीय) छिन्दवाड़ा व न होने , मध्यप्रदेश।
4. वनमंडलाधिकारी, सामान्य वनमंडल, शिवपुरी, मध्यप्रदेश।
5. कार्यपालन यंत्री, जल संसाधन संभाग शिवपुरी, मध्यप्रदेश।

की ओर सूचनार्थ प्रेषित।

प्रधान मुख्य वन संरक्षक (भू–प्रबंध)
मध्यप्रदेश, भोपाल

GOVERNMENT OF MADHYA PRADESH

WATER RESOURCES DEPARTMENT

CATCHMENT AREA TREATMENT PLAN

of

SARKULA MEDIUM LIFT IRRIGATION PROJECT

August, 2020

Prepared for:

Water Resources Division Shivpuri

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ANNEXURE

1 INTRODUCTION

1.1General

The Sarkula Medium Lift Irrigation Project is proposed to be developed on Sarkula River in Shivpuri district in the state of Madhya Pradesh.

The project proposes construction of a 41.00 m high dam across Sarkula River near Pohari village to irrigate a total 6,500 ha of Culturable Command Area (CCA) in Pohari tehsil of Shivpuri District. Total 25 villages of Shivpuri district are to be benefitted by the implementation of proposed project. The creation of reservoir due to construction of dam will lead to submergence of 190 ha of forest land. The project is envisaged to have a live storage capacity of 24.086 MCM. Provision for dead storage is 4.69 MCM. Hence, gross storage is 28.776 MCM.

Scope of the present study is to prepare Catchment Area Treatment Plan for the catchment area of Sarkula Medium Lift Irrigation Project. Hence, the catchment area has been delineated from the source of Sarkula river to the dam site of Sarkula Medium Lift Irrigation Project. The project location map is enclosed as **Figure 1**.

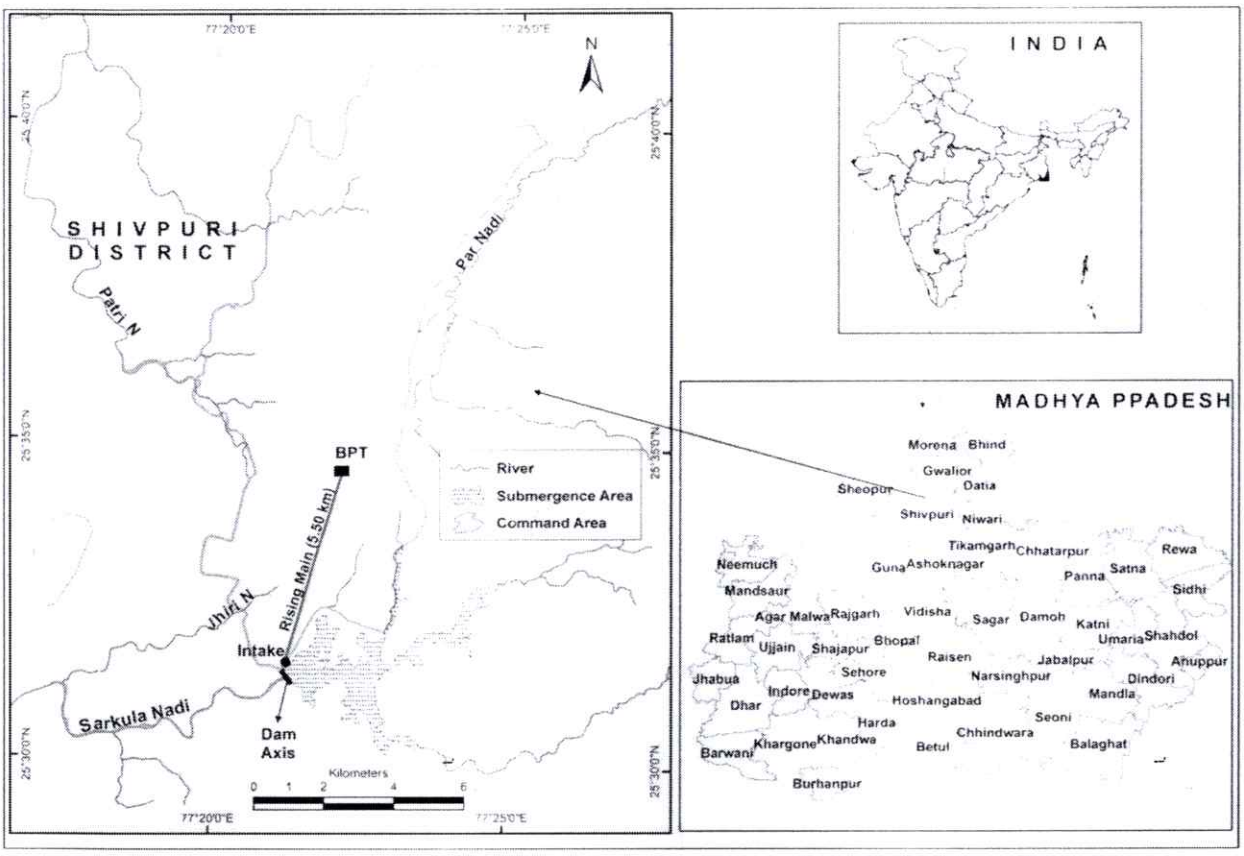

Figure 1: Location Map of Sarkula Medium Lift Irrigation Project

1.2Salient Features

The salient features of the proposed Sarkula Medium Lift Irrigation Project are given in **Table 1**. An Index map of the project is given at **Figure 2**.

Table 1: Salient Features of Sarkula Medium Lift Irrigation Project

1	**GENERAL DATA:-**			
	a.	District	:-	Shivpuri
	b.	Tehsil	:-	Pohari
	c.	River or River/ Nalla	:-	Sarkula
	d.	Location of Dam	:-	Near Village Pohari
	e.	Name of River/Basin	:-	Chambal Basin
	f.	Situation		
		Toposheet No.	:-	54 G/6
		Longitude	:-	77°21'22"
		Latitude		25°31'32"
2	**HYDROLOGICAL DATA:-**			
	a.	Name of the rainfall station	:-	Pohari
	b.	Average Monsoon rainfall	:-	767 mm
	c.	Monsoon Rainfall 75% dependable	:-	619.50 mm
	d.	Mean run-off	:-	35.46 mcum
	e.	75% dependable yield	:-	24.31 mcum
	f.	Flood	:-	3029 cumec
	g.	Moderated SPF Calculated	:-	2479 cumec
3	**RESERVOIR DATA:-**			
	a.	Catchment area	:-	131.25 sq km
	b.	Gross storage capacity	:-	28.776 MCM
	c.	Dead storage capacity	:-	4.69 MCM
	d.	Live Storage capacity	:-	24.086 MCM
	e.	Full Tank levels F.T.L.	:-	419.80 m
	f.	Max. water levels M.W.L.	:-	420.10 m
	g.	Top of bank level	:-	422.40 m
	h.	NZE	:-	387.55 m
	i.	NBL	:-	381.40 m
4	**DAM DATA:-**			
	a.	**Length of Dam**	:-	300 m
	b.	Masonry/Concrete Spill	:-	166 m
	c.	**Maximum height Of Dam**		
		Earthen / Masonry/Concrete	:-	28.50 M. / 41 m
	d.	**Top Width of Dam**		
		Earthen / Masonry/Concrete	:-	7.5 M./7.5 m
	e.	Type of waste weir	:-	Central Spillway
	f.	Maximum discharge of west weir	:-	2478 Cumec
4	**CANAL:-**			
	a.	Length of rising main		5.5 km
	b.	Village Benefited		25
	c.	Total Area in command		6500 ha
	d.	Power Required		2.41 MW
5		**COST:-**		
	a.	**Unit I - Head Works**		**Rs. 142.18 Cr.**
	b.	**Unit II - Canals**		**Rs. 84.44 Cr.**
		Total		**Rs. 226.62 Cr.**
		Cost per Ha.		**Rs. 3.49 Lakhs**
		B.C. Ratio		**1.96**

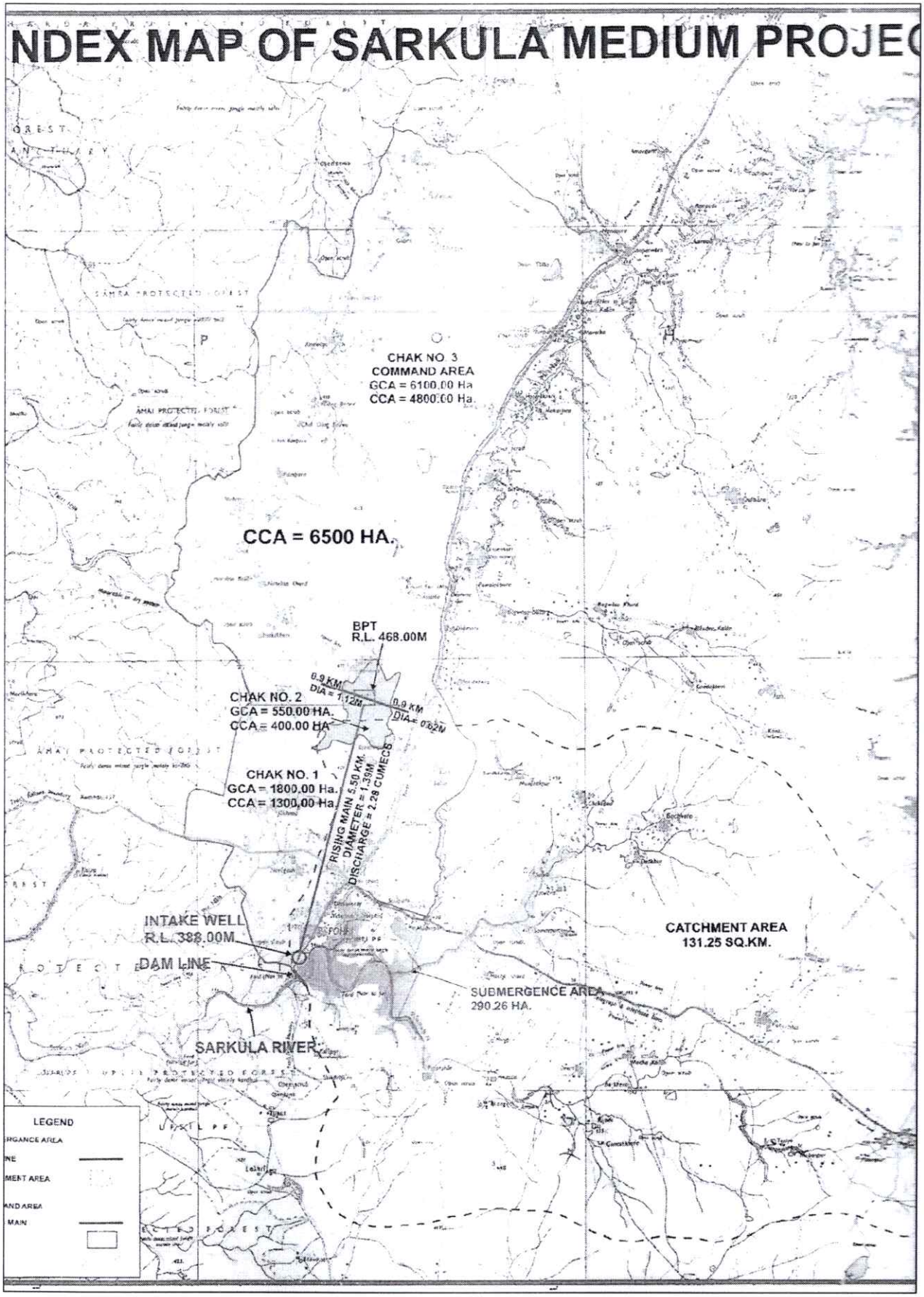

Figure 2: Index Map of Sarkula Medium Lift Irrigation Project

1.3Catchment Area

The catchment area of the project up to the proposed dam site is 131.25 km^2. The elevation of the catchment varies from about El. 380.0m to about El. 480.0m. Length of Sarkula river up to the proposed dam site is around 20.0 km. The catchment area map is shown in **Figure 3**.

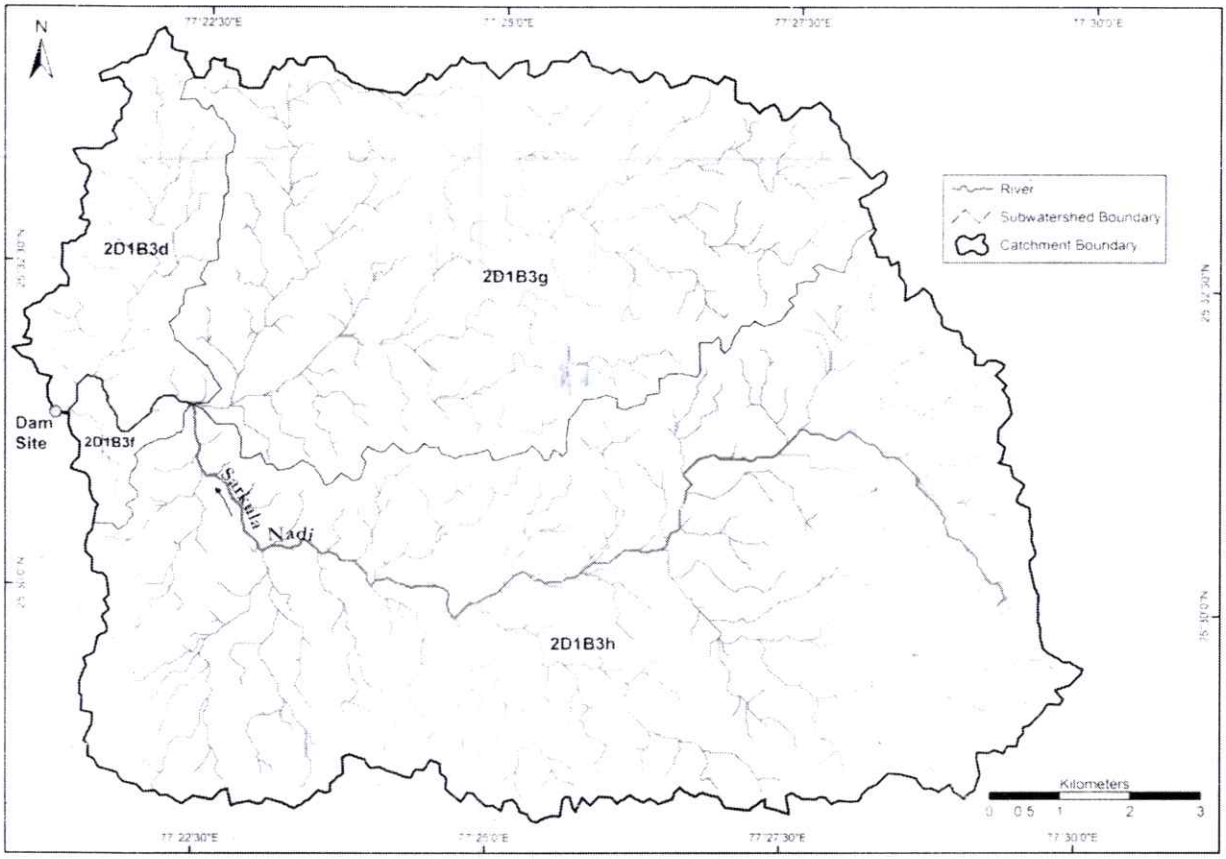

Figure 3: Drainage Map of Catchment Area showing Subwatersheds

2 NEED FOR CATCHMENT AREA TREATMENT

It is a well-established fact that reservoirs formed by dams on rivers are subjected to sedimentation. The process of sedimentation embodies the sequential processes of erosion, entrainment, transportation, deposition and compaction of sediment. The steady erosion and sediment in reservoir reduce its capacity, and thus affecting the water availability for the designated use. The eroded sediment from catchment when deposited on streambeds and banks causes braiding of river reach. The removal of top fertile soil from catchment adversely affects the land productivity in the area. Thus, a well- designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above mentioned adverse effects of soil erosion. Soil erosion can be defined as detachment, transportation and deposition of soil particles from one place to other by means of transporting agent like air, water or animals. Soil erosion is mainly affected by rainfall intensity and runoff, slope gradient and length,

soil erodibility and vegetation cover (landuse pattern). Therefore, study of erosion and sediment yield from catchments are of great importance. Soil erosion leads to:

- loss in production potential
- reduction in infiltration rates
- reduction in water-holding capacity
- loss of nutrients
- increase in tillage operation costs
- reduction in water supply

To control the rate of soil erosion in the catchment, Catchment Area Treatment (CAT) is an ineluctable part. The CAT plan pertains to preparation of a management plan for treatment of erosion prone areas through adequate preventive measures. An effective CAT plan is a key factor to make the project eco-friendly and sustainable. Thus, a well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above mentioned adverse process of soil erosion. CAT plan essentially consists of following steps.

1. Calculation of soil erosion using Revised Universal Soil Loss Equation (RUSLE), combined with Remote Sensing (RS) and Geographic Information System (GIS) technologies.
2. Prioritizing the areas for treatment using Silt Yield Index (SYI).
3. Planning of suitable erosion control measures.
4. Cost estimation for CAT plan.

3 METHODOLOGY ADOPTED FOR THE STUDY

The various steps, covered in the study, are as follows:

- Defining study area
- Defining data requirement
- Data acquisition and preparation
- Output presentation

The above mentioned steps are briefly described in the following paragraphs:

3.1Defining Study Area

As stated above, purpose of the study is preparation of CAT plan for the catchment of Sarkula Medium Lift Irrigation Project. Hence, study area is defined as catchment area of Sarkula Medium Lift Irrigation Project. In order to plan watershed management and to formulate action plans it requires subwatershed delineation, therefore, catchment area was further delineated

into subwatersheds. For the delineation of subwatershed, Watershed Atlas of India prepared by Soil and Land Use Survey of India (SLUSI) has been referred. Soil and Land Use Survey of India (SLUSI) has Watershed Atlas of India under digital environment using GIS and produced a Digital Watershed Atlas (DWA) where the delineation and codification of watersheds in the country has been undertaken in GIS environment. The delineation for DWS has been done in seven stages starting with Water Resource Regions and their subsequent division and subdivisions into Basins, Catchments, Sub-catchments, Watershed, Sub watershed and Micro-watersheds in decreasing size of the delineated hydrologic unit.

As per Watershed Atlas of India, the catchment area of Sarkula Medium Lift Irrigation Project falls in four subwatersheds. Of these four subwatersheds, two subwatersheds i.e. 2D1B3d and 2D1B3f falls partially while the other two
i.e. 2D1B3g and 2D1B3h falls completely within the catchment area. The detail of subwatersheds delineated for the catchment area is given below (refer **Table 2 and Figure 3**).

Table 2: Names and codes of Subwatersheds delineated for the Catchment Area

S. No.	Water Resource Region	Basin	Catchment	Sub-catchment	Watershed	Sub-watershed Code	Sub-watershed Area (ha)	Sub-watershed Area (%)
1.	2	2D	2D1	2D1B	2D1B3	2D1B3d	965.17	7.35
2.						2D1B3f	169.89	1.29
3.						2D1B3g	4381.80	33.39
4.						2D1B3h	7608.15	57.97
TOTAL							**13125.00**	**100**

3.2Defining Data Requirement

Soil loss has been calculated through RUSLE (Revised Universal Soil Loss Equation) model which is computed by the following equation:

Soil Loss (A) = R*K*LS*C*P

Wherein;

A = Soil loss (Tons/ha/year)

R is Rainfall & Runoff Erosivity Factor (MJ mm/ha^{-1}/h^{-1}/year^{-1}), which depends upon the annual average rainfall in mm. Data required for R factor is rainfall intensity.

K is Soil Erodibility Factor (Tons/ha/h/ha^{-1}/MJ^{-1}/mm^{-1}), which depends on the organic matter, texture permeability and profile structure of the soil. Also, it is a constant value for each soil type. Data required for K factor is soil type.

LS is Topographic Factor (dimensionless) which depends upon flow accumulation and steepness and length of slope in the area. Data required for LS factor is slope length and slope gradient.

C = Vegetation Cover and Crop Management Factor (dimensionless), which is the ratio of bare soil to vegetation and non- photosynthetic material. It is a constant value for each land use category. Data required for C factor is landuse/ landcover.

P is Conservation Supporting Practice Factor (dimensionless), which takes into account specific erosion control practices like contour bunding, bench terracing etc.

3.3Data Acquisition and Preparation

The base map of study area as already discussed was prepared from Survey of India Toposheets at 1:50000 scale. The data on various aspects was collected from different sources. The rainfall data in the Study area was sourced from the study 'Observed Rainfall Variability and Changes Over Madhya Pradesh State' carried out by India Meteorological Department. Soil map of the study area was prepared from soil map of Madhya Pradesh procured from Regional Centre of National Bureau of Soil Survey & Land Use Planning (NBSS&LUP), New Delhi.

For the preparation of DEM and preparation of Slope map, Shuttle Radar Topography Mission (SRTM) 3 Arc-Second Global Digital Terrain Elevation Data (DTED) data have been used. For the preparation of landuse/ landcover map, land use/landcover maps prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space with Remote Sensing Applications Centre, MP Council of Science & Technology has been used.

3.3.1 Rainfall Erosivity (R) Factor

R factor is a function of the falling raindrop and rainfall intensity and is estimated as the product of the kinetic energy (E) of the raindrop and the maximum intensity of rainfall (I_{30}) over duration of 30 min in a storm. The erosivity of rain is calculated for each storm, and these values are summed up for each year.

In this study, the storm wise rainfall data were not available for the computation of rainfall erosivity factor (R); therefore, the relationship between seasonal value of R and average rainfall has been used. The rainfall erosivity factor has been defined as $R = 81.5 + 0.38X$, where, R is the average seasonal erosivity factor (MJ $mm/ha^{-1}/h^{-1}/year^{-1}$), and X is the annual average rainfall (mm).

For the estimation of rainfall erosivity in the catchment area, average rainfall of 30 years has been taken from the India Meteorological Department data. In the absence of site specific periodic data, India Meteorological Department data from the year 1989 to 2018 for Shivpuri district has been used for the calculation of R factor. As per the data, average annual rainfall in Shivpuri district ranges between 814-936 mm. The R factors thus arrived is 414.

3.3.2 Soil Erodibility (K) Factor

The K factor is an expression of the inherent erodibility of the soil or surface material at a particular site under standard experimental conditions. It is a function of the particle-size distribution, organic-matter content, structure, and permeability of the soil or surface material. Prior to deciding the K values, soil map for the area is prerequisite. Soil map procured from NBSS&LUP, Nagpur was digitized. Majority of the catchment area is covered by soil unit
468 (48.75%), which is characterised by deep, moderately well drained, calcareous, clayey soils on gently sloping plateau with moderate erosion. Soil map has been shown in **Figure 4**. The legend for soil unit classes is given in **Table 3**.

Table 3: Description of Soil Units in the Catchment Area

Soil Unit	Main Group	Sub Group	Area (ha)	Area (%)
452	**Fine-loamy, kaolinitic, hyperthermic, Typic Ustochrepts** Slightly deep, well drained, loamy soils on moderately sloping undulating plateau (slightly dissected) with severe erosion and moderately stony, *associated with:*	**Loamy, kaolinitic, hyperthermic, Lithic Ustorthents** Very shallow, somewhat excessively drained, loamy soils on gently sloping with severe erosion and moderately stony.	3206.51	24.43
463	**Fine, mixed, (Cal.), hyperthermic, Chromic Haplustrets** Deep, moderately well drained, calcareous, clayey soils on gentiy sloping intervening basin with severe erosion, *associated with:*	**Fine, mixed, hyperthermic, Vertic Ustochrepts** Slightly deep, moderately well drained, clayey soils on very gently sloping with moderate erosion.	3520.63	26.82
468	**Fine, mixed, (Cal.), hyperthermic, Typic Ustochrepts** Deep, moderately well drained, calcareous, clayey soils on gently sloping plateau with moderate erosion, *associated with:*	**Fine, mixed, (Cal.), hyperthermic, Vertic Ustochrepts** Deep, moderately well drained, calcareous, clayey soils on moderately sloping with moderate erosion.	6397.86	48.75
TOTAL			**13125.00**	**100**

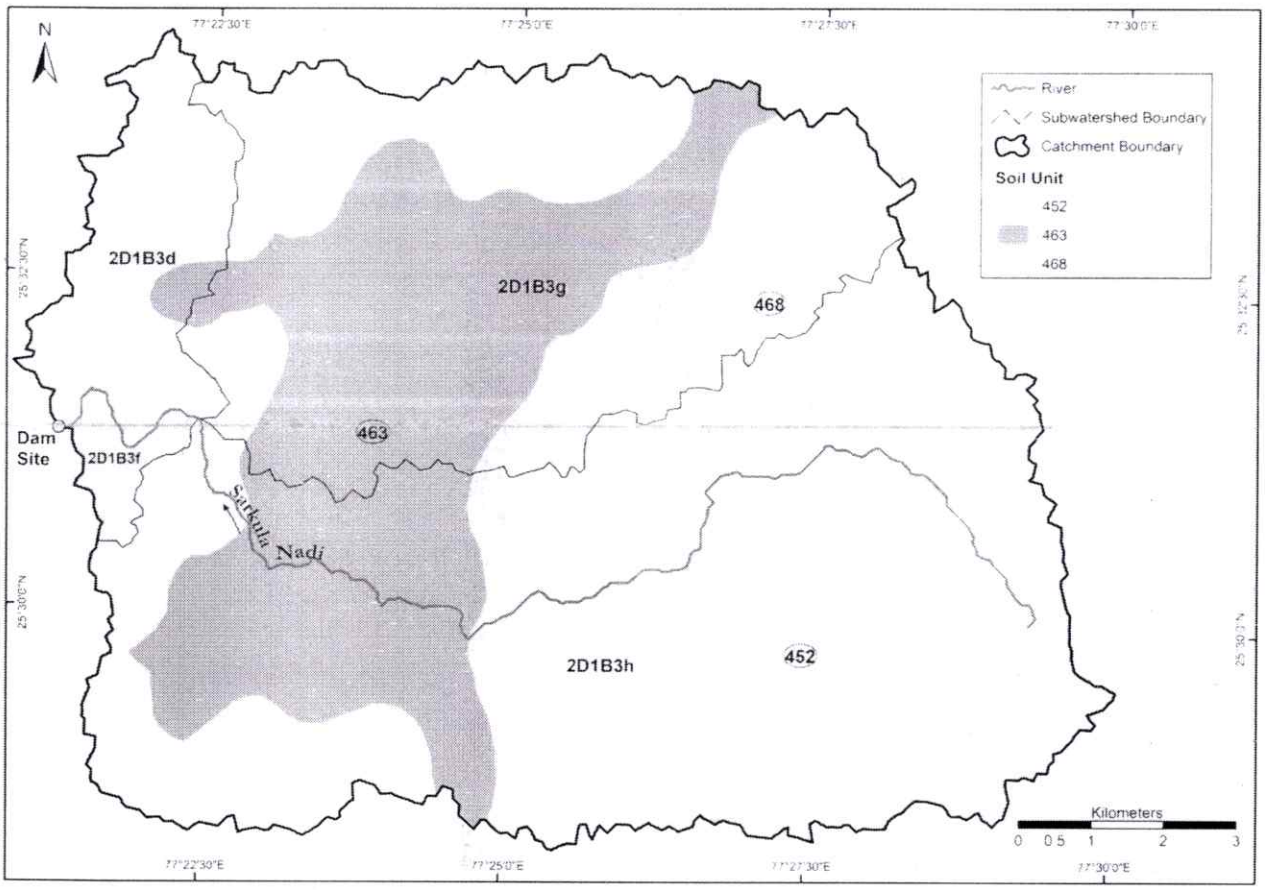

Figure 4: Soil Map of Catchment Area (For details of Soil Unit legend refer Table 3)

As per the soil map of the catchment area, the soil can be classified in two major categories. Deep with moderate erosion have low K values i.e. 0.25 because of high infiltration resulting in low runoff even though these particles are easily detached. Deep to slightly deep with severe erosion have high K value i.e. 0.35. Various classes of soil and the values of K are shown in **Figure 5** and given in **Table 4.**

Table 4: Soil Erodibility Factor for different soil types in the Catchment Area

S. No.	Soil Unit	Soil Type	Erosion Intensity	K Value
1	468	Deep	Moderate erosion	0.25
2	452, 463	Slightly deep to deep	Severe erosion	0.350

3.3.3 Topographic (LS) Factor

The LS factor is an expression of the effect of topography, specifically hill slope length and steepness, on rates of soil loss at a particular site. The value of 'LS' increases as hill slope length and steepness increase, under the assumption that runoff accumulates and accelerates in the down-slope direction. Digital Elevation Model (DEM) and Slope of a particular area is prerequisite for LS factor. As already discussed, SRTM data has been used for DEM and the sae DEM has been used for the preparation of slope map. The

slope map in degrees prepared for the catchment area is given at **Figure 6**. As can be seen from the figure, in the catchment area, the slope ranges from 0° to around 24°. The LS factor prepared for the catchment area is given at **Figure 7**.

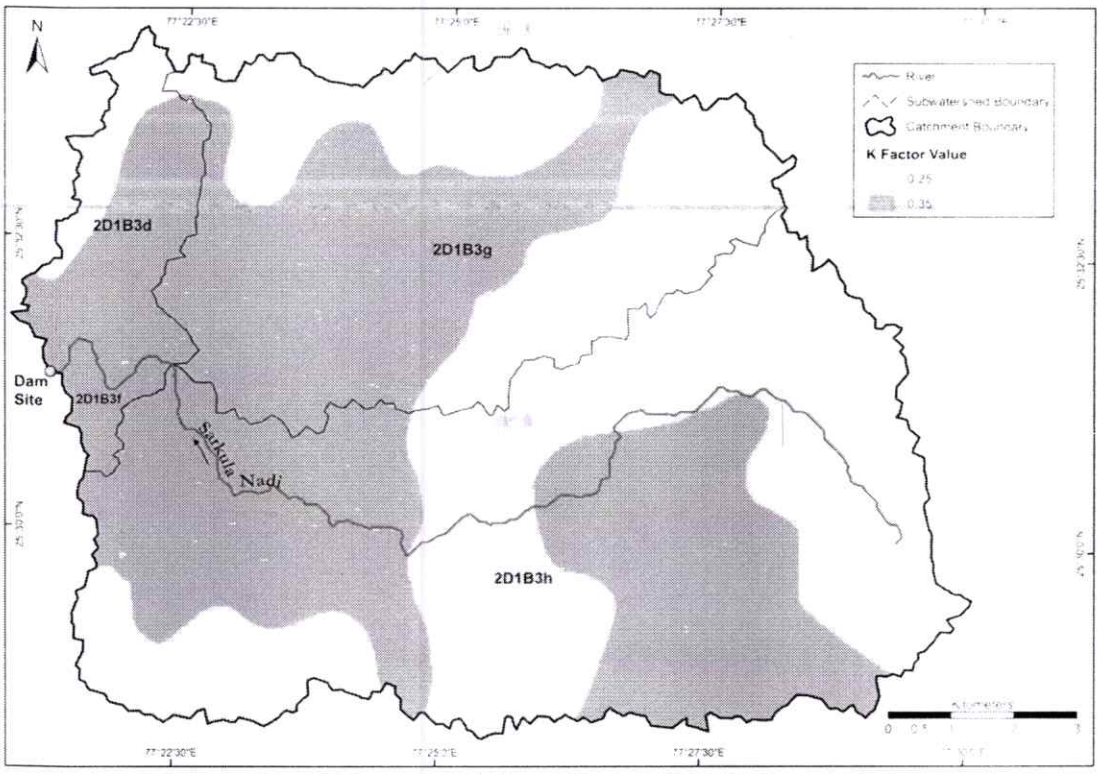

Figure 5: K Factor Value Map of Catchment Area

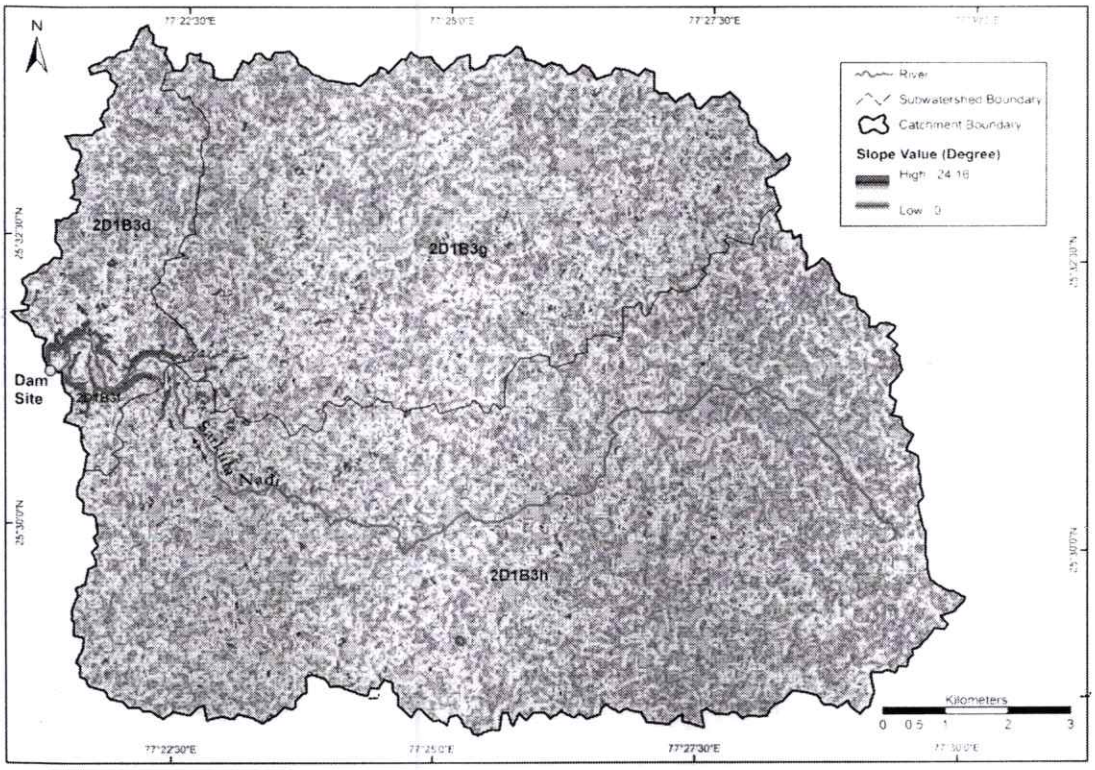

Figure 6: Slope Map of Catchment Area

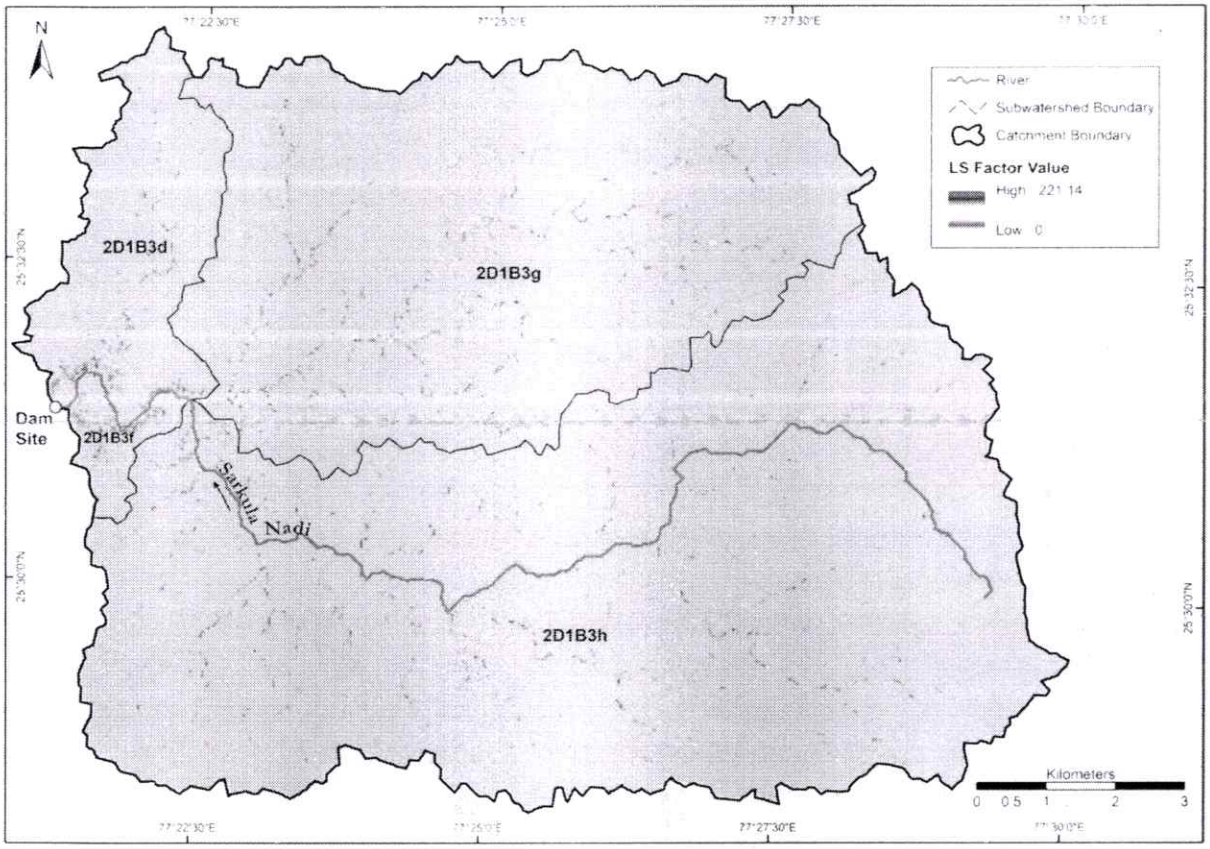

Figure 7: LS Factor Map of Catchment Area

3.3.4 Crop Management (C) Factor

The C factor is an expression of the effect of surface cover and roughness, soil biomass, and soil-disturbing activities on rates of soil loss at a particular site. The value of C decreases as surface cover and soil biomass increase, thus protecting the soil from rain splash and runoff. In the present study, the land use/land cover map prepared from Landsat Data has been used in the allocation of C factor for different land use classes.

For the present study, land use/landcover maps prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space with Remote Sensing Applications Centre, MP Council of Science & Technology as partner; Google Earth has been used for the preparation of land use/ land cover maps.

The classified land use/ land cover map of the catchment area is shown as **Figure 8**. The land use/ land cover pattern of the catchment area as well as of subwatershed has been given in **Table 5**. As can be seen from the map and table, the land use/ land cover pattern can be classified into six classes, out of these six classes, agricultural land covers the maximum area i.e. around 81%. followed by scrub land i.e. around 14%. Deciduous forest, scrub forest, settlement and waterbody cover the rest 5% of the area.

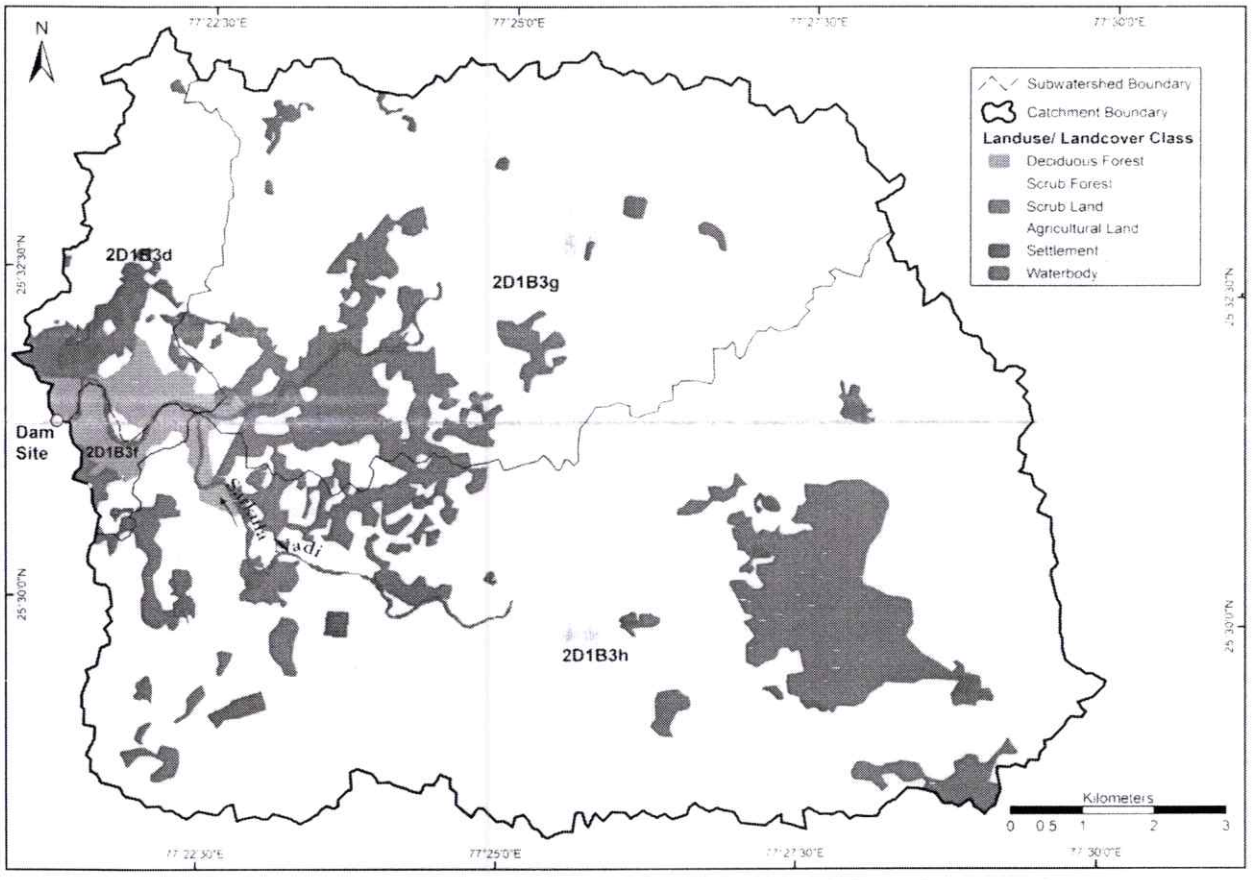

Figure 8: Landuse/ Landcover Map of Catchment Area

Table 5: Catchment Area falling under different Landuse/ Landcover Classes

S. No.	Landuse/ Landcover Class	Area (ha)	Area (%)
1	Deciduous Forest	254.01	1.94
2	Scrub Forest	75.25	0.57
3	Scrub Land	1803.30	13.74
4	Agricultural Land	10633.80	81.02
5	Settlement	200.68	1.53
6	Waterbody	157.96	1.20
	TOTAL	**13125.00**	**100**

Table 6 describes the cover management factors used in the model under different land use/land cover categories and the same is shown in the map of cover management factors given at **Figure 9**.

Table 6: Crop Management Factor used for the Catchment Area

S. No.	Land use/ Land cover Type	C Value
1	Deciduous Forest	0.05
2	Scrub Forest & Scrub Land	0.10
3	Agricultural Land	0.01
4	Settlement & Waterbody	0.00

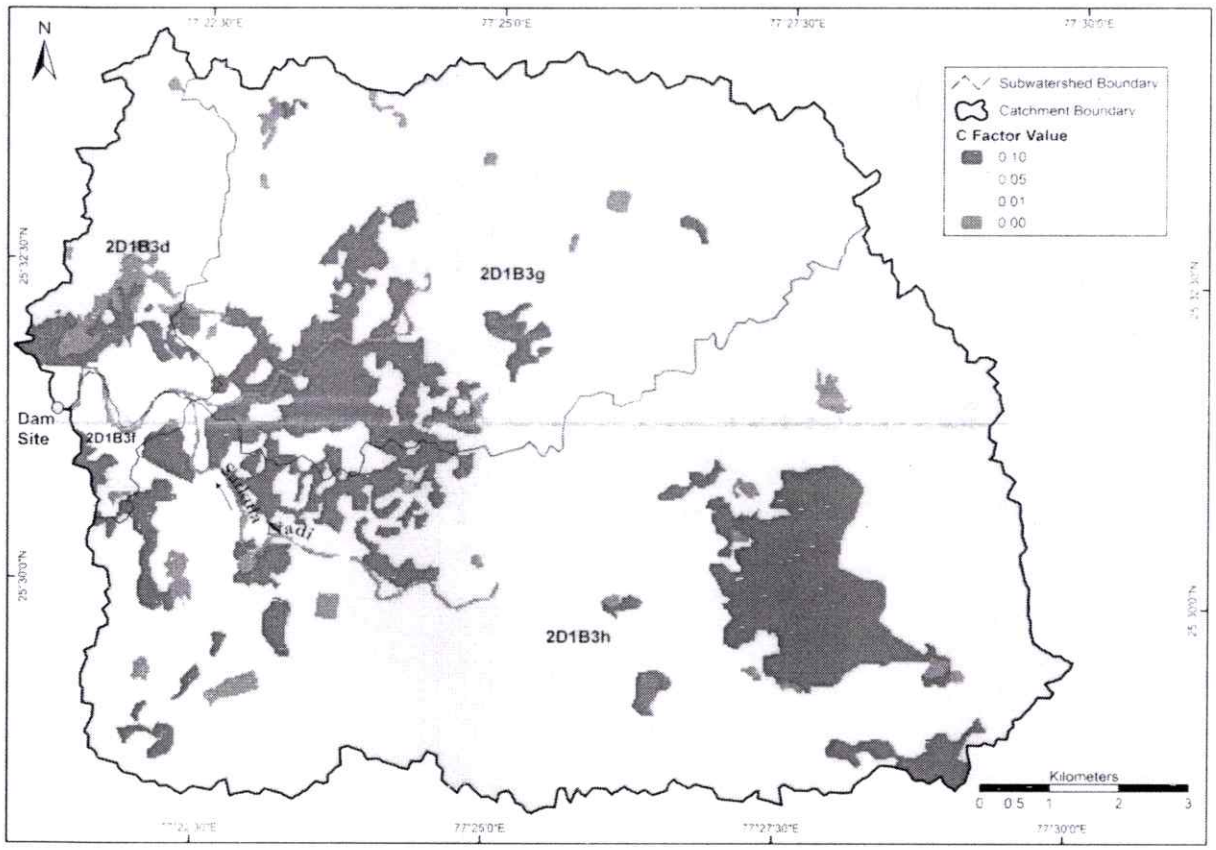

Figure 9: C Factor Value Map of Catchment Area

3.3.5 Conservation Support Practice (P) Factor

The P factor is an expression of the effects of supporting conservation practices, such as contouring, buffer strips of vegetation, and terracing, on soil loss at a particular site. It is the ratio of soil loss with specific support practice to the corresponding loss with up- or down-slope cultivation. In the present study, the P factor has been considered as 1.

3.4Output Presentation

A thematic map for soil loss of the catchment area has been prepared using RUSLE model mentioned in the above section. The catchment area was then demarcated into different soil erosion intensity mapping units or classes based upon the extent of soil loss (see **Table 7 & Figure 10**). The catchment area under different Erosion Intensity categories is given in **Table 7**. As can be seen from the figure and table, around 82% of the catchment area is prone to less than 1 tons/ha/annum soil erosion, i.e. under negligible erosion intensity category. Only 0.69% of its area is prone to Severe and Very Severe soil erosion.

Table 7: Area falling under different Erosion Intensity Categories

S. No.	Soil loss in tons/hectare/annum	Erosion Intensity Category	EIMU Code	Area (ha)	Area (%)
1	<1	Negligible	6	10734.81	81.79
2	1-5	Slight	6	1447.23	11.03
3	5-10	Very Low	5	351.54	2.68
4	10-20	Low	4	339.18	2.58
5	20-40	Moderate	3	161.87	1.23
6	40-80	Severe	2	61.04	0.47
7	>80	Very Severe	1	29.32	0.22
	Total			**13125.00**	**100**

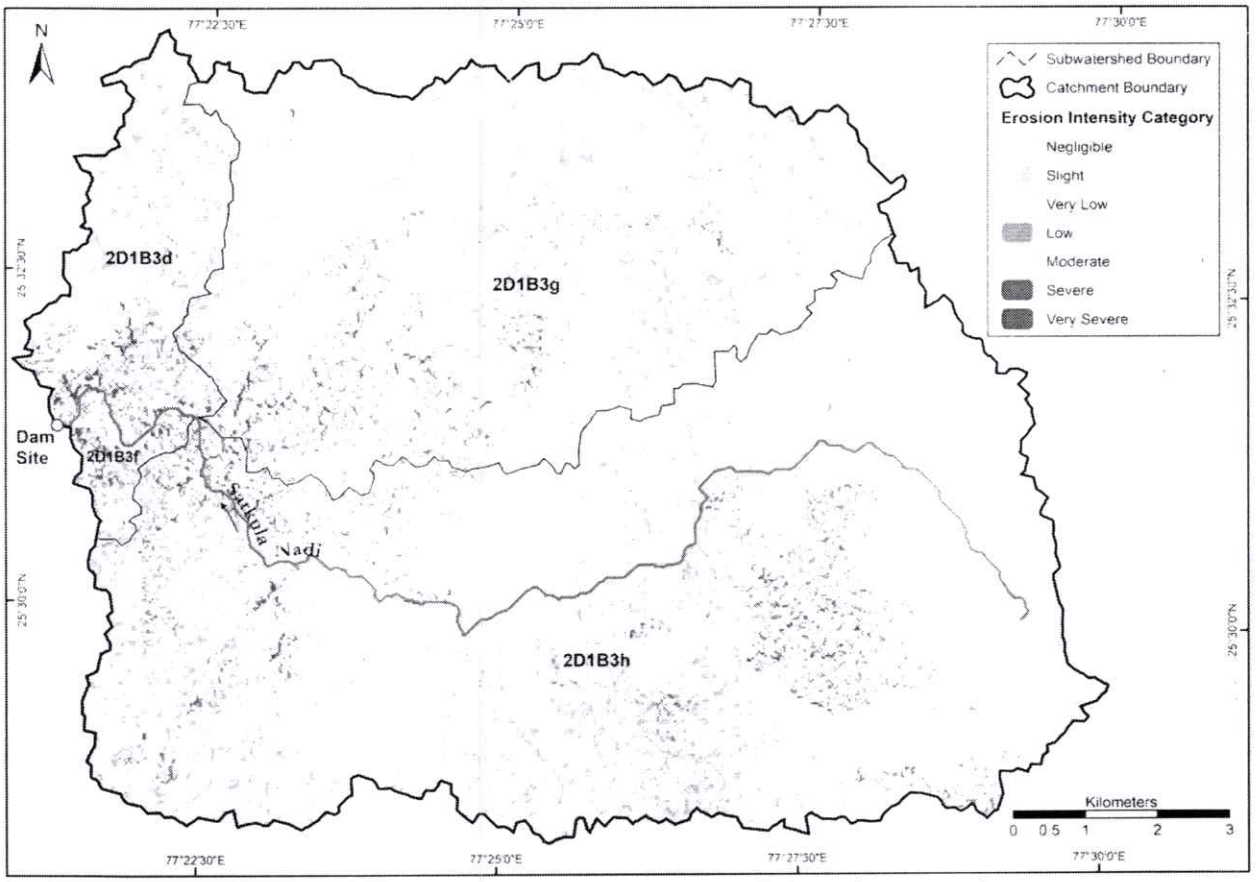

Figure 10: Erosion Intensity Map of Catchment Area

4 PRIORTIZATION OF SUBWATERSHEDS USING SILT YIELD INDEX (SYI)

METHOD

`Silt Yield Index' (SYI), method has been used for prioritization of subwatersheds in the catchment for treatment. The Silt Yield Index (SYI) is defined as the Yield per unit area and SYI value for hydrologic unit is obtained by taking the weighted arithmetic mean over the entire area of the hydrologic unit by using suitable empirical equation. The Silt Yield Index Model (SYI) considers sedimentation as product of erosivity, morphometry and delivery ratio of a particular subwatershed and was conceptualized by Soil and Land Use Survey of India (SLUSI) as early as 1969 and has been operational since

then to meet the requirements of prioritization of smaller hydrologic units within river valley project catchment areas. Silt yield index (SYI) was calculated using following empirical formula:

$$SYI = \Sigma (Ai * Wi) * Di * 100 \text{ ; where } i = 1 \text{ to } n$$
$$Aw$$

where,

Ai = Area of ith unit (EIMU)
Wi = Weightage value of ith mapping unit
n = No. of mapping units
Aw = Total area of subwatershed.
Di = Delivery ratio

4.1Erosion Intensity Mapping Unit

Erosion Intensity Mapping Units (EIMU) are demarcated and defined as per the soil erosion intensity map prepared above. Various EIMU categories, such as Very Severe, Severe, Moderate, Low, Very Low, and Negligible & Slight (clubbed together), were then used to calculate subwatershed-wise SYI. Erosion Intensity Mapping Units (EIMU) is a composite expression of physiography, land use, and conservation practices adopted. While computing soil erosion intensity in a catchment all the factors (physiography, land use, and conservation practices) are already taken into consideration. Therefore, EIMUs are assumed as per the soil erosion intensity in the subwatershed.

4.2Weightage Value

Each erosion intensity unit is assigned a weightage value. When considered collectively, the weightage value represents approximately the comparative erosion intensity. A basic factor of K = 10 was used in determining the weightage values. The value of 10 indicates a static condition of equilibrium between erosion and deposition. Any addition to the factor K (10+X) is suggestive of erosion in ascending order whereas subtraction, i.e. (10-X) is indicative of deposition possibilities. The weightage value assigned to erosion mapping unit in a subwatershed ranges from 11-20.

4.3Delivery Ratio

Delivery ratios were adjusted for each of the erosion intensity unit. The delivery ratio suggests the percentage of eroded material that finally finds entry into reservoir or river/ stream. Delivery ratios are assigned to all erosion intensity units depending upon their distance from the nearest stream. The criteria adopted for assigning the delivery ratio are as follows:

Nearest Stream	Delivery ratio
0 - 0.9 km	1.00

1.0 - 2.0 km	0.95
2.1 - 5.0 km	0.90
5.1 - 15.0 km	0.80
15.1 - 30.0 km	0.70

4.4Silt Yield Index

The area of each of the mapping units is computed and silt yield indices of individual subwatersheds are calculated using the equations mentioned above. The SYI values for classification of various categories of erosion intensity rates are given in **Table 8**.

Table 8: Calculation of SYI in Subwatersheds in Catchment Area

Sub-watershed	EIMU	EIMU Area (EA) in ha	Weightage Factor (WF)	Silt Yield (SY) = EA * WF	Delivery Ratio (DR)	SYI = (SY*DR*100)/SA
2D1B3d	1	4.71	20	94.17	0.9	1121
	2	9.77	20	195.49		
	3	20.91	18	376.42		
	4	34.36	16	549.74		
	5	32.56	14	455.83		
	6	862.85	12	10354.23		
Total		965.17		12025.87		**1121**
2D1B3f	1	2.58	20	51.57	0.9	1215
	2	6.63	20	132.61		
	3	13.21	18	237.69		
	4	18.29	16	292.72		
	5	14.62	14	204.66		
	6	114.56	12	1374.75		
Total		169.89		2293.99		**1215**
2D1B3g	1	9.41	20	188.14	0.8	981
	2	17.10	20	342.00		
	3	51.86	18	933.40		
	4	100.70	16	1611.27		
	5	100.82	14	1411.45		
	6	4101.91	12	49222.95		
Total		4381.80		53709.21		**981**
2D1B3h	1	12.63	20	252.57	0.85	1042
	2	27.54	20	550.75		
	3	75.90	18	1366.13		
	4	185.83	16	2973.21		
	5	203.55	14	2849.66		
	6	7102.71	12	85232.56		
Total		7608.15		93224.87		**1042**

4.5Prioritization of Subwatersheds

The subwatersheds are subsequently rated into various categories corresponding to their respective SYI values. The criteria followed for priority categorization of subwatersheds depending upon their SYI values is given

below and the priority classification of individual subwatershed is given in **Table 9** and **Figure 11**.

Priority categories	SYI Values
Very high	> 1300
High	1200-1299
Medium	1100-1199
Low	1000-1099
Very Low	<1000

Table 9: Priority Number as per SYI Classification in Catchment Area

Subwatershed	SYI Value	Priority	Priority Number
2D1B3d	1121	Medium	2
2D1B3f	1215	High	1
2D1B3g	981	Very Low	4
2D1B3h	1042	Low	3

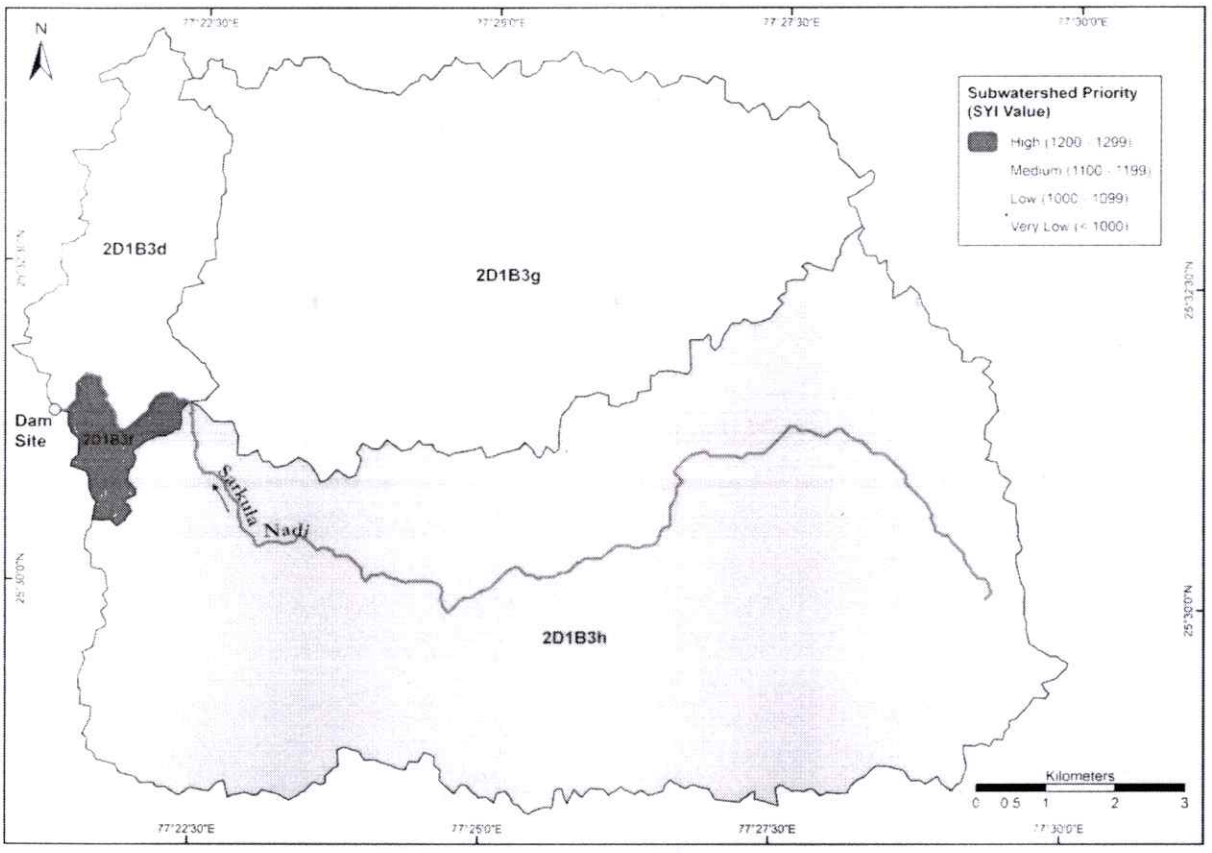

Figure 11: Subwatershed Priority Classification Map of Catchment Area

5 TREATMENT PLAN

5.1 Area to be taken up for treatment

Area under severe and very severe erosion intensity category in all the four subwatersheds will be taken up for treatment. To arrive at such an area, first of all area under severe and very severe erosion intensity category was

extracted for each subwatershed, which comes out to be **90.36 ha**. Thereafter, area under severe and very severe erosion intensity category falling inside proposed submergence area was excluded. The area under severe and very severe erosion intensity category falling outside proposed submergence area is
54.53 ha.

Lastly, area under severe and very severe erosion intensity category **(54.53)** falling under settlements, agricultural land and waterbody classes of land use/ land cover has been excluded as they are not being disturbed. The sub-watershed wise and land use/ land cover wise area thus arrived at and considered as treatable area is **49.88 ha** (or say **50 ha**) and is presented below in **Table 10**.

Table 10: Sub-Watershed wise treatable area under different Land use/ Land cover classes in Catchment Area

Subwatersheds	Sub-Watershed Wise Land use/ Land cover Classes Area (ha)			Total Area (ha)
	Deciduous Forest	Scrub Forest	Scrub Land	
2D1B3d	1.72	0.00	2.18	**3.90**
2D1B3f	0.45	0.00	0.65	**1.10**
2D1B3g	0.00	0.00	15.71	**15.71**
2D1B3h	0.14	0.87	28.17	**29.17**
Total	**2.31**	**0.87**	**46.71**	**49.88**

The period for implementing CAT plan interventions including maintenance has been taken as 8 years. It is proposed to prepare micro plans for sub-watersheds, establish administrative setup and implement other entry point activities in the first year itself. It is proposed to implement biological treatment measures in sub-watersheds falling under high and medium priority in the second year, followed by implementation of biological treatment measures in sub-watershed falling under low and very low priority in third year. Maintenance period will be subsequent 5 years, except for energy plantation where maintenance period will be subsequent 3 years. Since engineering measures provides immediate control of erosion therefore it is proposed to implement them in the second year itself for all the sub- watersheds.

5.2 Treatment Measures

Watershed management is the optimal use of soil and water resources within a given geographical area so as to enable sustainable production. It implies changes in land use, vegetative cover, and other structural and non-structural action that are taken in a watershed to achieve specific watershed

management objectives. The overall objectives of watershed management programme are to:

- increase infiltration into soil;
- control excessive runoff;
- manage & utilize runoff for useful purpose.

The basis of site selection for different engineering treatment measures under CAT are given in **Table 11**.

Table 11: Basis for Selection of Catchment Area Treatment Measures

Treatment measure	*Basis for selection*
Normal Afforestation	Area under severe and very severe erosion category falling under Scrub forest
Enrichment	Area under severe and very severe erosion category falling under Deciduous forest
Energy Plantation	Area under severe and very severe erosion category falling under Scrub land
Dry stone masonry Check Dams	In the streams of 3rd and 4th order
Gabion Check Dams	Wherever loose boulders are not stable in particular stretch of a stream

5.2.1 Biological Measures

The biological measures would comprise of:

- Normal Afforestation
- Enrichment
- Energy Plantation

5.2.1.1 Normal Afforestation

A well stocked forest is the best insurance against soil loss as well as for ecological rehabilitation. It is therefore proposed to increase the vegetation cover in the tract. For this, patches of scrub forest falling under severe and very severe erosion intensity category shall be brought under afforestation. The locality factors prevalent in the area such as fires, grazing etc. are fairly adverse to the establishment of plantations. Thus, special and intensive efforts are needed to ensure the success of afforestation work. Owing to the above enumeration factors, the plantation will require higher levels of maintenance also. This will include raising of multi-tier mixed vegetation of suitable local species. 1000 plants per hectare will be planted under this scheme. Planting will be done in pits. Earth work should be done well in advance. Plants should be healthy with strong stems. Planting should be done in June when the water supply starts. RCC fence posts with 4 strand barbed wire fencing, interlaced with thorny bushes will be done in the plantation areas. Further, it is assessed that it is essential to make provision for soil and moisture conservation measures in the areas proposed for afforestation.

Provision had been made for undertaking various necessary soil and moisture conservation measures in these areas. Provision is also made for five years maintenance of afforestation undertaken as part of the catchment area treatment. For providing the maintenance it is assumed that mortality for first year will be 25 per cent and will reduce to 20 per cent during second year and to 15 per cent during third, fourth and fifth year. The unit cost for afforestation including maintenance cost for five years is estimated to be **Rs 80,950** per ha consisting of Rs 56,000 for plantation and Rs 24,950 for maintenance for five years. The detailed break-up of item-wise cost for afforestation is furnished in **Annexure I**. The area to be brought under afforestation and its unit cost is given at **Table 12**.

5.2.1.2 Enrichment Plantation

Maintaining and enhancing existing forest cover reduces soil erosion to a great extent. It is therefore proposed to increase the vegetation cover of the existing forests. For this, patches of deciduous forest land falling under severe and very severe erosion intensity category shall be brought under enrichment plantation. 700 plants per hectare will be planted under this scheme. The plantation will be maintained for subsequent five years. RCC fence posts with 4 strand barbed wire fencing, interlaced with thorny bushes will be done in the plantation areas. The unit cost for enrichment plantation including maintenance cost for five years is estimated to be **Rs. 68,100** per ha consisting of Rs. 47,000 for plantation and Rs. 21,100 for maintenance for five years. The detailed break-up of item-wise cost for enrichment plantation is furnished in **Annexure I**. The area to be brought under enrichment plantation is given at **Table 12.**

5.2.1.3 Energy Plantation

Energy plantation scheme is essential for a continuous supply of fuel and fodder. It can be easily carried out and it is economical to carry out. Agricultural land will not be used for energy plantation, instead, fallow land falling under severe and very severe erosion intensity category will be used for energy plantation. 1000 plants per hectare will be planted under this scheme. The plantation will be maintained for subsequent three years. Wooden fence posts with 4 strand barbed wire fencing, interlaced with thorny bushes will be done in the plantation areas. The unit cost for energy plantation including maintenance cost for three years is estimated to be **Rs. 65,250** per ha consisting of Rs. 49,000 for plantation and Rs. 16,250 for maintenance for three years. The detailed break-up of item-wise cost for energy plantation is furnished in **Annexure I**. The area to be brought under energy plantation is given at **Table 12**.

5.2.2 *Engineering Measures*

The engineering treatment measures require less time to be put in place and can provide quick solutions. These would comprise mainly of Dry stone masonry check dams and Gabion check dams.

5.2.2.1 Dry Stone Masonry Check Dam

Dry stone masonry check dams can be made of boulder piled up across the streams if they are locally available. Such structures for damming a stream to refine the flow velocity and to control bank erosion are called dry stone masonry/ loose bolder check dams. The unit cost for dry stone masonry check dam is estimated to be **Rs. 22,300** per structure. The number of dry stone masonry check dams suggested is given at **Table 12.**

5.2.2.2 Gabion Check Dam

If dry stone masonry check dams are considered not to be stable in a particular reach of the stream, Gabion structure can be installed. The unit cost for gabion check dam is estimated to be **Rs. 46,875** per structure. The number of gabion check dams suggested is given at **Table 12.**

5.2.3 *Summary of Treatment Measures*

Subwatershed wise areas identified for treatment with different treatment measures is given in **Table 12.** The total cost required for the treatment of 50 ha by the means of different treatment measures is **Rs. 59.54 lakh.** The summary of treatment measures and their cost is given in **Table 13.**

Table 12: Sub-Watershed wise Summary of Treatment Measures

S. No.	Treatment Measures	Sub-Watershed				Total
		2D1B3 d	2D1B3 f	2D1B3 g	2D1B3 h	
1	Normal Afforestation (ha)	0	0	0	1	**1**
2	Enrichment Plantation (ha)	2	0	0	0	**2**
3	Energy Plantation (ha)	2	1	16	28	**47**
4	Dry stone Masonry Check Dams (No)	10	4	40	30	**84**
5	Gabion Check Dams (No)	2	1	8	6	**17**

Table 13: Summary of treatment measures and their cost for CAT Plan

Treatment Measures	Quantity	Unit Cost (Rs)*	Total Cost (Rs.)
Normal Afforestation (ha)	1	80,950	**80,950**
Enrichment Plantation (ha)	2	68,100	**1,36,200**
Energy Plantation (ha)	47	65,250	**30,66,750**
Dry stone Masonry Check Dams (No)	84	22,300	**18,73,200**
Gabion Check Dams (No)	17	46,875	**7,96,875**
TOTAL			**59,53,975**

Note*: Unit Cost has been taken as per the cost norms given in **Annexure I**

6 OTHER COMPONENTS OF CAT PLAN

Apart from the biological and engineering treatment measures in the catchment area there are other aspects of the CAT Plan to be addressed and their cost included in the overall cost estimate of the plan. The charges for operational support, forest protection, social mobilization, documentation and publication, monitoring and evaluation and providing environmental services are some of the integral ingredients which have to be considered and included while formulating the CAT plans.

6.1Administrative Charges

For an efficient management of forest resources, it is essential that operational support to the Forest Department is adequately developed. Similarly, in remote localities there are no places for shelter for the staff, people and trekkers. Therefore, a budgetary provision of **Rs 2.98 lakh** has been kept for this component.

6.2Provision for Micro Planning

The year-wise areas requiring treatment measures have been suggested but have not been marked. The spatial location of specific treatment to be carried out in the catchment area would require extensive detailing during the implementation of CAT and a provision for micro-planning has been made in the total CAT financial allocation. For this purpose, a provision of **Rs 1.19 lakh** is being made.

6.3Monitoring & Evaluation

Monitoring and evaluation will be undertaken as a part of project management. A process of self-evaluation at specified intervals of time will ensure the field level verification of suggested treatment measures and efficacy of the CAT plan.

The year-wise areas requiring treatment measures have been suggested but have not been marked. The spatial location of specific treatment to be carried out in the catchment area would require extensive detailing during the implementation of CAT and a provision for micro-planning has been made in the total CAT financial allocation. Thereafter, annual work plan would be prepared well in advance after undertaking initial ground surveys during micro-planning, specifying physical and financial targets, sites, locations and beneficiaries of each component of the project activity. Month-wise work schedule of various items of each component for the financial year would also be prepared in advance and its timely implementation would be ensured. Monthly progress report on all activities would be submitted by the Range

Officers to Divisional Forest Officer. The monitoring committee shall be constituted at the project level for this purpose which too would monitor on a regular basis the quality and quantity of works being carried out under the CAT plan area. A provision of **Rs 1.79 lakh** has been made for this component.

6.4Contingencies

A provision of **Rs 5.95 lakh** has been kept under this component for some leeway to adjust any unforeseen expenditure.

7 COST ESTIMATE

The estimated cost of implementation of CAT plan including monitoring and evaluation is **Rs. 71.45 lakh** and is given at **Table 14**. The phasing of physical and financial targets is given in **Table 15.**

Table 14: Estimated Cost of CAT Plan Implementation

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs)
I	**Biological Measures**				
1	Normal Afforestation		ha		
	i) Creation	56,000		1	56,000.00
	ii) Maintenance for 5 years	24,950		1	24,950.00
2	Enrichment		ha		
	i) Creation	47,000		2	94,000.00
	ii) Maintenance for 5 years	21,100		2	42,200.00
3	Energy Plantation		ha		
	i) Creation	49,000		47	2,303,000.00
	ii) Maintenance for 3 years	16,250		47	763,750.00
	Sub Total I (1+2+3)				**3,283,900.00**
II	**Engineering Measures**				
4	Check Dams (DRSM)	22,300	No	84	1,873,200.00
5	Gabion Check Dams	46,875	No	17	796,875.00
	Sub Total II (4+5)				**2,670,075.00**
A	**Treatment Cost (Sub Total I + II)**				**5,953,975.00**
III	**Administrative Measures**				
6	Administrative Charges @5% of Total				297,698.75
7	Micro planning @2% of Treatment Cost				119,079.50
8	Monitoring & Evaluation Cost @3% of Treatment Cost				178,619.25
9	Contingencies @10% of Treatment Cost				595,397.50
B	**Sub Total III**				**1,190,795.00**
	Total CAT Plan Cost (A + B)				**7,144,770.00**

Table 15: Year Wise Physical & Financial Targets of Treatment Measures for CAT Plan

S. No.	Year Wise Treatment Plan	Year - 1 (2020-21)		Year - 2 (2021-22)		Year - 3 (2022-23)		Year - 4 (2023-24)		Year - 5 (2024-25)		Year – 6 (2025-26)		Year - 7 (2026-27)		Year - 8 (2027-28)		Tota l	
		Phy.	Fin. (Rs)	Phy	Fin. (Rs)	Phy	Fin. (Rs)	Phy.	Fin. (Rs)	Phy.	Fin. (Rs)	Phy.	Fin. (Rs)	Phy	Fin. (Rs)	Phy	Fin. (Rs)	Phy	Fin. (Rs)
I	**Biological Measures (ha)**																		
1	**Normal Afforestation**					1	56,000											1	56,000
	1st Year maintenance							1	6,400									1	6,400
	2nd Year maintenance									1	5,500							1	5,500
	3rd Year maintenance											1	4,350					1	4,350
	4th Year maintenance													1	4,350			1	4,350
	5th Year maintenance															1	4,350	1	4,350
2	**Enrichment Plantation**			2	94,000													2	94,000
	1st Year maintenance					2	10,000											2	10,000
	2nd Year maintenance							2	8,800									2	8,800
	3rd Year maintenance									2	7,800							2	7,800
	4th Year maintenance											2	7,800					2	7,800
	5th Year maintenance													2	7,800			2	7,800
3	**Energy Plantation**			3	147,000	44	2,156,000											47	2,303,000
	1st Year maintenance					3	19,200	44	281,600									47	300,800
	2nd Year maintenance							3	16,500	44	242,000							47	258,500
	3rd Year maintenance									3	13,050	44	191,400					47	204,450
	Sub Total I			**5**	**241,000**	**50**	**2,241,200**	**50**	**313,300**	**50**	**268,350**	**47**	**203,550**	**3**	**12,150**	**1**	**4,350**		**3,283,900**
II	**Soil & Water Conservation Measures**																		
4	Dry Stone Masonry Check Dams (Nos)			84	1,873,200													84	1,873,200
5	Gabion Check Dams (Nos)			17	796,875													17	796,875
	Sub Total II				**2,670,075**														**2,670,075**
A	**Total (I and II)**				**2,911,075**		**2,241,200**		**313,300**		**268,350**		**203,550**		**12,150**		**4,350**		**5,953,975**
III	**ADMINISTRATIVE MEASURES**																		
6	Administrative Charges @5% of Total		148,849		148,849														**297,699**
7	Micro planning @2% of Treatment Cost		119,080																**119,080**
8	Monitoring & Evaluation Cost @3% of Treatment Cost				87,332		67,236		9,399		8,051		6,107		365		131		**178,619**
9	Contingencies @10% of Treatment Cost				291,108		224,120		31,330		26,835		20,355		1,215		435		**595,398**
B	**Sub Total III**		**267,929**		**527,289**		**291,356**		**40,729**		**34,886**		**26,462**		**1,580**		**566**		**1,190,795**
	Total (A and B)		**267,929**		**3,438,364**		**2,532,556**		**354,029**		**303,236**		**230,012**		**13,730**		**4,916**		**7,144,770**

ANNEXURE I

1. Per Hectare Cost Norm for Normal Afforestation

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Survey & demarcation and preparation of map	ha.	1	450	450.00
2	Bush cutting in the plantation site	ha.	1	750	750.00
3	Interlacing of thorny bushes in B/wire	Rmt	180	3	540.00
4	Preparation of inspection path 60 cm wide	Rmt	150	15	2250.00
5	Layout of Pits	ha.	1	500	500.00
6	Digging of pits 45x45x45 cm (40% of total)	00	4	1200	4800.00
7	Digging of pits 30x30x30 cm(60% of total)	00	6	900	5400.00
8	Filling of pits 45x45x45 cm (40% of total)	00	4	200	800.00
9	Filling of pits 30x30x30 cm (60% of total)	00	6	150	900.00
10	Carriage of naked roots plants over a distance of 0.5 km up hill	00	2	100	200.00
11	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	3	150	450.00
12	Planting of entire Plants raised in P/bags	00	6	300	1800.00
13	Planting of naked root plants	00	4	200	800.00
14	Nursery cost of Plants	Nos	1000	9	9000.00
	Total				**28640.00**
15	Soil & moisture conservation works (25% of initial planting cost)		25%		7160.00
16	Add cost of RCC fence post and B/Wire			LS	20000.00
	Grand Total				**55800.00**
	Or Say				**56000.00**
I	**1st Year Maintenance - 25% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	1	600	600.00
2	Re-digging of Pits 30x30x30 cm	00	1.5	450	675.00
3	Filling of pits 45x45x45 cm	00	1	100	100.00
4	Filling of pits 30x30x30 cm	00	1.5	75	112.50
5	Planting of P/bags plants	00	1.5	300	450.00
6	Planting of naked root plants	00	1.0	200	200.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.8	150	112.50
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.5	100	50.00
9	Nursery cost of Plants	No.	250	9	2250.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**6410.00**
	Or Say				**6400.00**
II	**2nd Year Maintenance - 20% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.8	600	480.00
2	Re-digging of Pits 30x30x30 cm	00	1.2	450	540.00
3	Filling of pits 45x45x45 cm	00	0.8	100	80.00
4	Filling of pits 30x30x30 cm	00	1.2	75	90.00
5	Planting of P/bags plants	00	1.2	300	360.00
6	Planting of naked root plants	00	0.8	200	160.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.6	150	90.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.4	100	40.00
9	Nursery cost of Plants	No.	200	9	1800.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**5500.00**
	Or Say				**5500.00**

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
III	**3rd Year Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.6	600	360.00
2	Re-digging of Pits 30x30x30 cm	00	0.9	450	405.00
3	Filling of pits 45x45x45 cm	00	0.6	100	60.00
4	Filling of pits 30x30x30 cm	00	0.9	75	67.50
5	Planting of P/bags plants	00	0.9	300	270.00
6	Planting of naked root plants	00	0.6	200	120.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.5	150	67.50
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.3	100	30.00
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**4360.00**
	Or Say				**4350.00**
IV	**4th Year Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.6	600	360.00
2	Re-digging of Pits 30x30x30 cm	00	0.9	450	405.00
3	Filling of pits 45x45x45 cm	00	0.6	100	60.00
4	Filling of pits 30x30x30 cm	00	0.9	75	67.50
5	Planting of P/bags plants	00	0.9	300	270.00
6	Planting of naked root plants	00	0.6	200	120.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.5	150	67.50
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.3	100	30.00
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**4360.00**
	Or Say				**4350.00**
V	**5thYear Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.6	600	360.00
2	Re-digging of Pits 30x30x30 cm	00	0.9	450	405.00
3	Filling of pits 45x45x45 cm	00	0.6	100	60.00
4	Filling of pits 30x30x30 cm	00	0.9	75	67.50
5	Planting of P/bags plants	00	0.9	300	270.00
6	Planting of naked root plants	00	0.6	200	120.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.5	150	67.50
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.3	100	30.00
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**4360.00**
	Or Say				**4350.00**
	Total Maintenance Cost				**24,950.00**
	GRAND TOTAL	**ha.**	**1**		**80,950.00**

2. Per Hectare Cost Norm for Enrichment

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Survey & demarcation and preparation of map	ha.	1	450	450.00
2	Bush cutting in the plantation site	ha.	1	750	750.00
3	Interlacing of thorny bushes in B/wire	Rmt	180	3	540.00
4	Preparation of inspection path 60 cm wide	Rmt	150	15	2250.00
5	Layout of Pits	ha.	1	500	500.00
6	Digging of pits 45x45x45 cm (40% of total)	00	2.8	1200	3360.00
7	Digging of pits 30x30x30 cm(60% of total)	00	4.2	900	3780.00
8	Filling of pits 45x45x45 cm (40% of total)	00	2.8	200	560.00
9	Filling of pits 30x30x30 cm (60% of total)	00	4.2	150	630.00
10	Carriage of naked roots plants over a distance of 0.5 km up hill	00	1.5	100	150.00
11	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	2	150	300.00
12	Planting of entire Plants raised in P/bags	00	4.2	300	1260.00
13	Planting of naked root plants	00	2.8	200	560.00
14	Nursery cost of Plants	Nos	700	9	6300.00
	Total				**21390.00**
15	Soil & moisture conservation works (25% of initial planting cost)		25%		5347.50
16	Add cost of RCC fence post and B/Wire			LS	20000.00
	Grand Total				**46737.50**
	Or Say				**47000.00**
I	**1st Year Maintenance - 25% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.7	600	420.00
2	Re-digging of Pits 30x30x30 cm	00	1.05	450	472.50
3	Filling of pits 45x45x45 cm	00	0.7	100	70.00
4	Filling of pits 30x30x30 cm	00	1.05	75	78.75
5	Planting of P/bags plants	00	1.1	300	315.00
6	Planting of naked root plants	00	0.7	200	140.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.5	150	75.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.4	100	37.50
9	Nursery cost of Plants	No.	175	9	1575.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**5043.75**
	Or Say				**5000.00**
II	**2nd Year Maintenance - 20% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.6	600	336.00
2	Re-digging of Pits 30x30x30 cm	00	0.8	450	378.00
3	Filling of pits 45x45x45 cm	00	0.6	100	56.00
4	Filling of pits 30x30x30 cm	00	0.8	75	63.00
5	Planting of P/bags plants	00	0.84	300	252.00
6	Planting of naked root plants	00	0.56	200	112.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.4	150	60.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.3	100	30.00
9	Nursery cost of Plants	No.	140	9	1260.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**4407.00**
	Or Say				**4400.00**
III	**3rd Year Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.4	600	252.00
2	Re-digging of Pits 30x30x30 cm	00	0.6	450	283.50

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
3	Filling of pits 45x45x45 cm	00	0.4	100	42.00
4	Filling of pits 30x30x30 cm	00	0.6	75	47.25
5	Planting of P/bags plants	00	0.6	300	189.00
6	Planting of naked root plants	00	0.4	200	84.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.3	150	45.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.2	100	22.50
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**3945.25**
	Or Say				**3900.00**
IV	**4th Year Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.4	600	252.00
2	Re-digging of Pits 30x30x30 cm	00	0.6	450	283.50
3	Filling of pits 45x45x45 cm	00	0.4	100	42.00
4	Filling of pits 30x30x30 cm	00	0.6	75	47.25
5	Planting of P/bags plants	00	0.6	300	189.00
6	Planting of naked root plants	00	0.4	200	84.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.3	150	45.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.2	100	22.50
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**3945.25**
	Or Say				**3900.00**
V	**5thYear Maintenance - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	00	0.4	600	252.00
2	Re-digging of Pits 30x30x30 cm	00	0.6	450	283.50
3	Filling of pits 45x45x45 cm	00	0.4	100	42.00
4	Filling of pits 30x30x30 cm	00	0.6	75	47.25
5	Planting of P/bags plants	00	0.6	300	189.00
6	Planting of naked root plants	00	0.4	200	84.00
7	Carriage of plants in P/bags over a distance of 0.5 km up hill	00	0.3	150	45.00
8	Carriage of naked roots plants over a distance of 0.5 km up hill	00	0.2	100	22.50
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**3945.25**
	Or Say				**3900.00**
	Total Maintenance Cost				**21,100.00**
	GRAND TOTAL	**ha.**	**1**		**68,100.00**

3. Per Hectare Cost Norm for Energy Plantation

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Survey & demarcation and preparation of map	ha.	1	450	450.00
2	Bush cutting in the plantation site	ha.	1	750	750.00
3	Interlacing of thorny bushes in B/wire	Rmt	180	3	540.00
4	Preparation of inspection path 60 cm wide	Rmt	150	15	2,250.00
5	Layout of Pits	ha.	1	500	500.00
6	Digging of pits 45x45x45 cm (40% of total)	"00	4	1200	4800.00
7	Digging of pits 30x30x30 cm(60% of total)	"00	6	900	5400.00
8	Filling of pits 45x45x45 cm (40% of total)	"00	4	200	800.00
9	Filling of pits 30x30x30 cm (60% of total)	"00	6	150	900.00
10	Carriage of naked roots plants over a distance of 2 km up hill	"00	2	100	200.00
11	Carriage of plants in P/bags over a distance of 2 km up hill	"00	3	150	450.00
12	Planting of entire Plants raised in P/bags	"00	6	300	1800.00
13	Planting of naked root plants	"00	4	200	800.00
14	Nursery cost of Plants	Nos	1000	9	9000.00
	Total				**28640.00**
15	Soil & moisture conservation works (25% of initial planting cost)		25%		7160.00
16	Add cost of RCC fence post and B/Wire			LS	13000.00
	Total Plantation Cost				**48800.00**
	Or Say				**49000.00**
	Maintenance				
I	**1st Year - 25% Mortality**				
1	Re-digging of Pits 45x45x45 cm	"00	1	600	600.00
2	Re-digging of Pits 30x30x30 cm	"00	1.5	450	675.00
3	Filling of pits 45x45x45 cm	"00	1	100	100.00
4	Filling of pits 30x30x30 cm	"00	1.5	75	112.50
5	Planting of P/bags plants	"00	1.5	300	450.00
6	Planting of naked root plants	"00	1.0	200	200.00
7	Carriage of plants in P/bags over a distance of 2 km up hill	"00	0.8	150	112.50
8	Carriage of naked roots plants over a distance of 2 km up hill	"00	0.5	100	50.00
9	Nursery cost of Plants	No.	250	9	2250.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total I				**6410.00**
	Or Say				**6400.00**
II	**2nd Year - 20% Mortality**				
1	Re-digging of Pits 45x45x45 cm	"00	0.8	600	480.00
2	Re-digging of Pits 30x30x30 cm	"00	1.2	450	540.00
3	Filling of pits 45x45x45 cm	"00	0.8	100	80.00
4	Filling of pits 30x30x30 cm	"00	1.2	75	90.00
5	Planting of P/bags plants	"00	1.2	300	360.00
6	Planting of naked root plants	"00	0.8	200	160.00
7	Carriage of plants in P/bags over a distance of 2 km up hill	"00	0.6	150	90.00
8	Carriage of naked roots plants over a distance of 2 km up hill	"00	0.4	100	40.00
9	Nursery cost of Plants	No.	200	9	1800.00
10	Repair of fence	Rmt	180	2	360.00
11	Repair of Inspection path	LS			500.00
12	Repair of soil and moisture conservation works	LS			1000.00
	Total II				**5500.00**
	Or Say				**5500.00**
III	**3rd Year - 15% Mortality**				
1	Re-digging of Pits 45x45x45 cm	"00	0.6	600	360.00

S. No.	Particulars of Work	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
2	Re-digging of Pits 30x30x30 cm	"00	0.9	450	405.00
3	Filling of pits 45x45x45 cm	"00	0.6	100	60.00
4	Filling of pits 30x30x30 cm	"00	0.9	75	67.50
5	Planting of P/bags plants	"00	0.9	300	270.00
6	Planting of naked root plants	"00	0.6	200	120.00
7	Carriage of plants in P/bags over a distance of 2 km up hill	"00	0.5	150	67.50
8	Carriage of naked roots plants over a distance of 2 km up hill	"00	0.3	100	30.00
9	Nursery cost of Plants	No.	120	9	1080.00
10	Repair of fence	Rmt	200	2	400.00
11	Repair of Inspection path	LS			1000.00
12	Repair of soil and moisture conservation works	LS			4360.00
	Total III				**4350.00**
	Or Say				
	Total Maintenance Cost				**16,250.00**
	GRAND TOTAL	**Ha.**	1		**65,250.00**

Sub Divisional Officer
W.R. Sub Division No. I
Shivpuri (M.P.)

O P GUPTA
Executive Engineer
Water Resources
Division Shivpuri (M.P.)

परिशिष्ट - 3

(For projects other than linear projects)

GOVERNMENT OF MADHYA PRADESH

OFFICE OF THE DISTRICT COLLECTOR SHIVPURI

No. 18423

Dated 13-09-2021

TO WHOMSOEVER IT MAY CONCERN

In compliance of the Ministry of Environment and Forests (MoEF), Government of India's letter No. 11-9/98-FC (pt.) dated 3rd August 2009 wherein the MoEF issued guidelines on submission of evidences for having initiated and completed the process of settlement of rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights), Act., 2006 (FRA, for short) on the forest and proposed to be diverted for non forest purposes, it is certified that 126.42 hectares of forest land proposed to be diverted in favors of Executive Engineer, Water Resources Division Shivpuri (name of user agency) for Surkula Medium Irrigation Project (purpose for diversion of forest land) in Shivpuri district falls within jurisdiction of Pohari, Krishnagarj, Sonipura, Bagadiya, Machakhurd, Bhojpur, Amrouda Sarasua, Piparghar, Kolapur in Pohari Tehsil.

It is further certified that:

- the complete process for identification and settlement of rights under the FRA has been carried out for the entire 126.42 hectares of forest land proposed for diversion. A copy of records of all consultation and meetings of the Forest Rights Committee (s), Gram Sabha(s), Sub-Division Level Committee (s) and the District Level Committee are enclosed as annexure 1 to 2 annexure X.
- the proposal for such diversion (with full details of the project and its implications, in vernacular/ local language) have been placed before each concerned Gram Sabha of forest-dwellers, who are eligible under the FRA.
- the each of concerned Gram Sabha (s), has certified that all formalities/processes under the FRA have been carried out, and that they have given their consent to the proposed diversion and the compensation and ameliorative measures, if any, having understood the, purpose and details of proposed diversion. A copy of certificate issued by the gram sabha of Pohari, Krishnagarj, Sonipura, Bagadiya, Machakhurd, Bhojpur, Amrouda Sarasua, Piparghar, Kolapur villages (s) is enclosed as annexure X to annexure X
- the discussion and decisions on such proposals had taken pace only when there was a quorum of minimum 50% of the members of Gram Sabha present.
- the diversion of forest land for facilities managed by the Government as required under section 3 (2) of the FRA have been completed and the Gram Sabhas have given their consent to it.
- the rights of Primitive Tribal Groups and Pre-Agricultural Communities, where applicable have been specifically safeguarded as per section 3(1) (e) of the FRA.

Encl: As above.

Signature

(Full name and official seal of the District Collector)

Prepared by me

Executive Engineer
Water Resources
Division Shivpuri (M.P.)

Checked by me and found correct

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परिशिष्ट–4

शर्त– B(i)

Legal status of the diverted forest land shall remain unchanged;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

परिशिष्ट–5

शर्त– B(ii)

Forest land will be handed over only after required non-forest land in the project in obtained by the user agency;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

परिशिष्ट–6

शर्त– B(iii)

At the time of payment of the Net Present Value (NPV) at the then prevailing 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;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

परिशिष्ट–7

शर्त– B(iv)

The felling of trees shall be restricted to FRL-4 meter only. Number of Trees to be removed shall be kept at barest minimum during the execution of the project;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

परिशिष्ट–8

शर्त– B(v)

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 satate Government/Regional Office of MoEE&CC along with indicators for monitoring and expected observable milestones;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

(विनोद कुमार शर्मा)
कार्यपालन यंत्री
जल संसाधन संभाग
शिवपुरी (म.प्र.)

परिशिष्ट–9

शर्त– B(vi)

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

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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शिवपुरी (म.प्र.)

परिशिष्ट–10

शर्त– B(vii)

The User Agency shall undertake afforestation along the periphery of the reservoir;

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शिवपुरी (म.प्र.)

परिशिष्ट–11

शर्त– B(viii)

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;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–12

शर्त– B(ix)

The boundary of the diverted forest land, be demarcated on ground at the project cost, be erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–13

शर्त– B(x)

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;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–14

शर्त– B(xi)

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

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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शिवपुरी (म.प्र.)

परिशिष्ट–15

शर्त– B(xii)

Sufficient Firewood, preferably the alternate fuel, shall be provided by the user agency to the labourer after purchasing the same from the state Forest Department or the forest Development Corporation or any other legal source of alternate fuel;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–16

शर्त– B(xiii)

The layout plan of the proposal shall not be changed without the prior approval of the Central Government;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–17

शर्त– B(xiv)

No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–18

शर्त– B(xv)

The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–19

शर्त– B(xvi)

The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project, Bird's nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–20

शर्त– B(xviii)

The user agency shall restrict the felling of Trees to minimum numbers in the diverted forest land and trees shall be felled under strict supervision of the state forest Department;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–21

शर्त– B(xix)

The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the state forest Department;

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–22

शर्त– B(xx)

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

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–23

शर्त– B(xxi)

The user agency shall comply all the provisions of the all acts, Rules, Regulations, Guidelines, Hon'ble Court Order (8) and NGT order (s) pertaining to this project, if any, for the time being in force, as applicable to the project.

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–24

शर्त– B(xxii)

Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEE&CC Guideline F.No. 11-42/2017-FC dated 29-01-2018;

उपयोगकर्ता एजेंसी / कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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परिशिष्ट–25

शर्त– B(xxiii)

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.

उपयोगकर्ता एजेंसी/कार्यपालन यंत्री जल संसाधन विभाग शिवपुरी उल्लेखित शर्त के पालन हेतु वचनबद्ध है।

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