# OFFICE OF THE PROJECT DIRECTOR ORR RIVER PROJECT MANAGEMENT UNIT BAMORE KALAN, SHIVPURI (M.P.)

COMPLIANCE REPORT FOR SANCTION OF STAGE-II FOR LAND COMING UNDER SUBMERGENCE OF

# LOWER ORR MAJOR IRRIGATION PROJECT BAMORE KALAN SHIVPURI (M.P.)

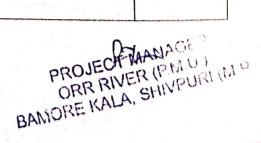
S.N	Conditions	Compliance	Remark	
1	Legal status of the diverted forest land shall remain unchanged	Agreed		
The compensatory afforestation shall be done over equal non-forest land (NFL) to the forest area proposed to be diverted within a period of three years with effect from the date of issue of stage II clearance and maintained thereafter in accordance with the approved plan in consultation with the state forest department at the cost of the user agency. At least 1000 saplings per hectare shall be planted over 968.24 hectare (968240). If this is not possible to plant these many seedlings in the identified NFL the balance seedling will be planted in degraded forest land as per the prescription of the working plan at the cost of the user agency. In such case CA cost will be revised and duly approved by competent authority and deposited online in the CAF managed by CAMPA.		Related to Forest Department		
3	The user agency shall submit the revised cost benefit analysis after considering the ecological cost of being diverted forest area.	Agreed . Revised cost-benefit is enclosed.	Annexure-I	
4	The state government and the user agency shall ensure that the water flow downstream shall be regulated in line with the natural flow regime and in the lean period 100% of the existing flow regime should be maintained while in the non-lean period the prescribed minimum flow of the water by hydrology and aquatic biodiversity experts should be ensured. The minimum flow of water in the ken river will be maintained till it joins the Yamuna to save wildlife including crocodiles and othe aquatic animals. The user agency shall also construct a number of concrete dykes across smaller streams going off from the main reservoir which during FRL shall be over flown but which during lean season shall dam up	Agreed. Undertaking enclosed.	Annexure-II	



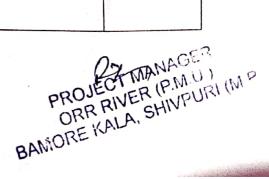
	the hon'ble Supreme court in India dated		
	28.03.2008, 24.04.2008 and 09.05.2008 in writ		
. ]	petition (civil) no 202/1995 and the guidelines		
	issued requisite funds shall be transferred	경기에는 이 성분들은 기업하는 뭐	
	through online portal into Ad-hoc CAMPA		
	account of the state concerned;		- 3-4 4 3
12	Any fund received from the user agency under	Agreed. All the payments has	A PARTY OF THE PAR
	the project and deposited in the state forest	been done online through e-	
	department account except the funds realize for	portal	
	regeneration/demarcation of safety zone shall be	porter	STATE OF THE
	transferred through poline mostal into Ad hos		
1	transferred through online portal into Ad-hoc		
13	CAMPA account of the state concerned;		
	The user agency should ensure that the	Agreed. All the payments has	
	compensatory levies (CA cost ,NPV etc.) are	been done online through e-	
	deposited through challan generated online on	portal	
,	web portal and deposited in appropriate bank		
	online only Amount deposited through other		
	mode will not be accepted as compliance of the		
	stage-I clearance;		
14	At the time of payment on the net present value	Agreed, Undertaking	Annexure-VI
1	(NPV) at the then prevailing rate the user agency	enclosed.	
	shall furnish an undertaking to pay the additional		
	amount of NPV if so determined as per final		
	decision of the hon'ble supreme court of India;	la v j	
15		The amount of CAT plan has	Annexure-VIII
15	The approved catchment area treatment (CAT)	The amount of CAT plan has	Annexure-VIII
15	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user	been deposited online in	Annexure-VIII
15	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will	been deposited online in CAMPA funds. Copy of CAT	Annexure-VII
15	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund	been deposited online in	Annexure-VII
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed	Annexure-VIII
15	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate	been deposited online in CAMPA funds. Copy of CAT	Annexure-VIII
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all	been deposited online in CAMPA funds. Copy of CAT plan is enclosed	Annexure-VIII
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances	been deposited online in CAMPA funds. Copy of CAT plan is enclosed	Annexure-VIII
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal	been deposited online in CAMPA funds. Copy of CAT plan is enclosed	Annexure-VIII
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department	
	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter	Annexure-
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department	
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter	Annexure-
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter	Annexure-
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed	Annexure-
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed	Annexure- VIII
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking	Annexure- VIII
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking	Annexure- VIII
16 17 18	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.	Annexure- VIII Annexure-IX
16	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;  The user agency shall undertake afforestation	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.  Agreed. Undertaking	Annexure- VIII
16 17 18	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;  The user agency shall undertake afforestation along the periphery of the reservoir;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.  Agreed. Undertaking enclosed.	Annexure-IX Annexure-X
16 17 18	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;  The user agency shall undertake afforestation along the periphery of the reservoir;  User agency shall provide free water for the	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.  Agreed. Undertaking enclosed.  Agreed. Undertaking	Annexure- VIII Annexure-IX
16 17 18	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;  The user agency shall undertake afforestation along the periphery of the reservoir;	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.  Agreed. Undertaking enclosed.	Annexure-IX Annexure-IX
16 17 18	The approved catchment area treatment (CAT) plan shall be implemented at the cost of user agency the commensurate cost of CAT plan will be deposited in compensatory Afforestation fund of state;  The state government shall submit a certificate that site for CA is suitable and free from all encroachment and the other circumstances under the signature not below the rank of nodal officer (FCA) in the state government;  User agency shall obtain the environment clearance as per the provisions of the environment of the environment (protection) act ,1986 if required;  The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;  The user agency shall undertake afforestation along the periphery of the reservoir;  User agency shall provide free water for the	been deposited online in CAMPA funds. Copy of CAT plan is enclosed  Related to Forest Department  Environment clearance letter is enclosed  Agreed. Undertaking enclosed.  Agreed. Undertaking enclosed.  Agreed. Undertaking	Annexure-iX Annexure-iX Annexure-X



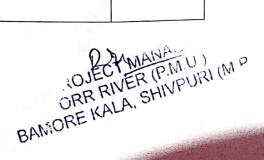
	small isolated water bodies for the benefit of the wildlife.		Company of the Control of the Contro
5	The state government and the user agency shall ensure that the canal should be realigned to minimize the use of forest land for construction of canal.	All the alternative alignments for this canal was explored. The present alignment is found to be minimum.	
6	Along the canal alignment, structural interventions shall be carried out at wildlife cross over points which are duly camouflaged and mimic nature at cost to the user agency so that dispersal is not hindered.	Agreed. Undertaking enclosed.	Annexure-III
7	The land identified for the purpose of CA shall be clearly depicted on a survey of India toposheet of 1:50000 scale.	Toposheet has been enclosed	Annexure-IV
8	The identified non-forest land to be transferred and mutated in favour of the state forest department for raising compensatory Afforestation shall be notified as reserved forest under section-4 or protected forest under section-29 of the Indian forest act, 1927 or under the relevant section(s) of the local forest act. The nodal officer must report compliance within a period of 6 month from the date of grant of final approval and send a copy of the 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 local forest act as the case may be to this ministry for information and	Non forest-Land has been transferred and mutated in favour of state forest department. Copies of mutation is enclosed	Annexure-V
9	record.  The user agency shall transfer the cost of raising and maintaining the compensatory afforestation at the current wage rate in consultation with state forest department in the account of Ad-hoc CAMPA of the concerned state through online portal. The scheme may include appropriate provision for anticipated cost increase for works scheduled for subsequent years.	Payment of Rs. 4555.07 lakhs has been done in CAMPA funds. This includes the cost of Soil & moisture conservation measures.	
10	The user agency shall provide additionally 25% of the CA cost towards soil and moisture conservation measures in the proposed CA area as per site requirement and the said amount may be deposited in the account of Ad-hoc CAMPA of the concerned state through online e-portal only.	Payment of Rs. 4555.07 lakhs has been done in CAMPA funds. This includes the cost of Soil & moisture conservation measures.	
11	The user agency shall transfer online the net present value (NPV) of the forest land being diverted under this proposal as per the orders of	Payment of 6767.80 lakhs has been done for NPV	



	without the prior approval of the central government;	enclosed.	
22	No labour camp huts shall be established on the forest land;	Agreed. Undertaking enclosed.	Annexure-
23	The forest land shall not be used for any purpose other than that specified in the proposal and the under no circumstances be transferred to any other agency department or person;	Agreed. Undertaking enclosed.	Annexure- XIV
24	Felling of tree if unavoidable on the forest land being diverted shall be reduced to the bare minimum and trees should be felled under strict supervision of the state forest department.  Moreover it shall be ensure that wherever possible maximum marked trees for felling should be translocated in the consultation of the state forest department;	Agreed. Undertaking enclosed.	Annexure-XV
25	The state government ensure that the user agency shall implement the R&R plan as per the R&R policy of the state government in consonance with national R&R policy government of India before the commencement of the project work. The said R&R plan will be monitored by the state government /Regional office of MoEF & CC along with indicators for monitoring and expected observable milestone;	Agreed. Undertaking enclosed.	Annexure- XVI
26	To prevent illegal occupation/encroachment of the forest land by the families to be displaced from the project site the user agency shall ensure that each family being displaced from the project site actually acquires and settles on non-forest land. Apart from taking other measures to achieve the said objective as a measure to discourage the project affected families from encroachment on the forest land, payment of annuity for a period of atleast five years at the rate of the minimum wages payable to the unskilled person for 200 person days per annum to each adult member of the project affected families on receipt of a certificate signed by a forest officer not below the rank of a Range officer having jurisdiction over the area where such person has settled after displacement from	Agreed. Undertaking enclosed.	Annexure- XVII
	the project site should be incorporated in the R&R plan payment of the said annuity should be an additionally and not in replacement of any of the benefit to be accrued to the project affected persons as per the approved R&R plan;		



27	The years of each	Agreed. Undertaking	Annexure-
-/	The user agency shall track location of each	enclosed.	XVIII
	displaced family and ensure none of them	그 아이 아이 아이를 하셨다.	
	encroach/occupy forest land in support of		
	compliance to the said condition at least for five		2 (2)
	years from the date of taking of possession of the		
	forest land the user agency shall submit an		
	annual certificate to the PCCF Madhya Pradesh		
	that none of the persons displayed from the		1000
	project land has encroached/settled in the forest		
28	land during the year;	related to forest department	1.23
40	The forest department shall prepare a plan of	Telaced to forest department	
	action to utilize the water potential available	T =	
	nearby for the benefit of forest crop and also to	1	
	the wild animal at the cost of the user agency;	Ad Undortaking	Annexure-
29	A plan for conservation of wildlife will be made	Agreed. Undertaking	XIX
	by the user agency in consultation with the PCF	enclosed.	N/A
	(wildlife) to be implemented at the cost of user		-
20	agency;	A 1 11, 1-4-10	Annexure-XX
30	User agency in consultation with the state forest	Agreed. Undertaking	Allie Aute-AA
	department shall create and maintain alternate	enclosed.	,
	habitat /home for the avifauna whose nesting		
	tress are to be cleared in this project. Bird nests		
	artificially made out of ecofriendly materials shall	*-	
	be used in the area, including forest area and	9.7	
	human settlement adjoining the forest area being	Ži i i	
	diverted for the project;	(3)	
31	State government shall complete settlement of	Agreed. Undertaking	Annexure-
	rights in terms of the scheduled tribes and other	enclosed.	XXI
	traditional forest dwellers(Recognition of forest	1	
	right ) Act 2006 if any on the forest land to be		
	diverted submit the documentary evidence as		
	prescribed by this ministry in its letter no	,	
	11.9/1998-FC(pt.) dated 03.08.2009 read with		
	05.07.2013 in support thereof;	51	
32	The user agency shall provide alternate fuels to	Agreed. Undertaking	Annexure-
	the labourers and the staff working at the site so	enclosed.	XXII
	as to avoid any damage and pressure on the		.1
	nearby forest area;		, , , , , , , , , , , , , , , , , , ,
33	Boundary of the forest land proposed to be	Agreed. Undertaking	Annexure-
	diverted shall be demarcated on ground at the	enclosed.	XXIII
	project cost by erecting four feet high reinforced		2.6
	cement concrete pillars each inscribed with its		1 4
	serial number forward and back bearing distance		,
	from pillar to pillar and GPS co-ordinates;		
	from piliar to piliar and Gr3 co-ordinates,		
34	The state government shall maintain the	Agreed. Undertaking	Annexure-
34		Agreed. Undertaking enclosed.	Annexure- XXIV



	the command area no more diversion water from the project for the industrial projects will be permitted in future;		MERALINE COMPRESSION DE L'ANNO DE MANOR DE L'ANNO D
35	Any other condition that the concerned Regional offices of this ministry may stipulate from time to time in the interest of conservation, protection and development of forests& wildlife with the approval of the competent authority;	Agreed. Undertaking enclosed.	Annexure- XXV
36	The user agency shall submit the annual self compliance report in respect of the above conditions to the state government concerned regional office and this ministry by the end of march of every year regularly;	Agreed. Undertaking enclosed.	Annexure- XXVI
37	The user agency and the state government shall ensure compliance to provisions of the all acts, rules, regulations, guideline, relevant hon'ble court orders(s) if any pertaining to this project for the time being in force as applicable to the project;	Agreed, Undertaking enclosed.	Annexure- XXVII

# **Cost Benefit Analysis**

Project Director Orr River Project Management Unit Bamorekalan Dist. Shivpuri
On the basis of Guidelines for forest land diversion 2017

Table- A cases under which a cost benefit analysis for forest diversion are required

No.	Natures of Proposal	Applicable/Not applicable	Remark
	All categories of proposal involving	Not applicable	
1 .	forest land up to 20 hectares in plains		
	and up to 5 hectares in hills.		
2	Proposal for defence installation	Not applicable	
	purpose		
3	Habitation, establishment of industrial	Not applicable	
	units, tourist lodges complex and other		
	All other proposals involving forest	Applicable	Lower Orr
	land more than 20 hectares in plains		Project Falls
	and more than 5 hectares in hills	the terms of an age of	under this
	including reads, transmission lilnes,		category.
4	minor, medium and major irrigation	1,	
	projects, hydro projects, mining		
	activity railway lines, location specific		
	installations like micro- wave station,		
	auto retreater centers, TV towers etc.		

(R.K. Shrivastava)

Project Manager

O.R.P.M.U. Bamorekalan

Distt- Shivpuri (M.P.)

Table-B Estimation of cost of forest Diversion

No.	Parameters	Remark
1	Ecosystem services losses due to proposed forest diversion.	Ecosystem service due to diversion of forest land suggested by the central powered committee as per the forest classification report of proposed Lower Orr Project is Rs. 6.26 Lakh/Ha.  Cost of land  =968,24x6,26 = 6061.18 lakh
2	Loss of animal husbandryproductivity including cost of fodder.	As per the cost benefits guideline i.e. 10% of N.P.V.
3	Cost of human resettlement	There is no loss of public facilities and administrative infrastructures of forest land due to construction of Lower Orr Project, no cost has been added on this amount.
4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electries, railways etc) on forest land which would required forest land if these facilities were diverted due to the project.	There is no loss of public facilities and administrative infrastructures of forest land due to construction of Lower Orr Project, no cost has been added on this amount.
5	Possession value of forest land diverted.	The possession value of forest diverted is taken 30% of the N.P.V. due to loss of forest i.e. 1.878 lakh/Ha. =968.24x1.878 = 1818.35
6	Cost of Suffering to out sees	Not Applicable
7	Habital Fragmentation cost	Forest land is being acquired for construction of dam submergence & spill channel of Lower Orr irrigation Project. There is no amount is taken under this amount.
8	Compensatory afforestation and soil & moisture conservation cost	The cost @ Rs. 4.0 Lakh per Ha. Is taken for compensatory afforestation and soil moisture conservation. Hence amount will be =968.24x4.00 = 3872.96
9	Total cost due to forest land diversion	Total cost due to forest land diversion for Lower Orr Project will be: =6061.18+606.11+1818.35+3872.96 = Rs.12358.60

(R.K. Shrivastava)
Project Manager
O.R.P.M.U. Bamorekalan
Distt- Shivpuri (M.P.)

Table-C Existing guidelines for estimation benefits of forest diversion in CBA

S.no.	Parameters	Remark
1	Increase in productory/attitude to the specific project	The crop production benefit due to lower orr project will be 57724.72 lakh in designed life of 100 years. Water level will be increased and economic growth of command area will be boosted. Project also reserves water for Drinking purpose of Pichore town and adjacent villages.
2	Benefits to Economy due to the specific project.	Lower orr project will trigger economicaldevelopment with irrigation facility to a land of 110400 ha. In the command area. Irrigation is proposed by pressurized pipe system.
3	No. of population benefitted due to specific project	After completion of project 150000 villagers will be benefitted.
4	Economic benefits due to direct and indirect employment due to the project.	The project will provide direct and indirect employment for approximate 5000 people due to the project.
5	Economic benefits due to compensatory afforestation	Economic benefit due to compensatory afforestation has been considered as per the benefit of CA guideline of ministry for NPV estimation

(R.K. Shfivastava)
Project Manager
O.R.P.M.U. Bamorekalan
Distt- Shivpuri (M.P.)

# COST BENEFIT ANALYSI

Total cost due to forest land (Rs. Lakh)

:12358.60 lakh

Total benefit due to the project (Rs. Lakh)

:57724.72lakh

Benefit Ratio of Project

:4.67

(R.K. Shrivastava)

Project Manager

O.R.P.M.U. Bamorekalan

Distt- Shivpuri (M.P.)

## शर्त-4

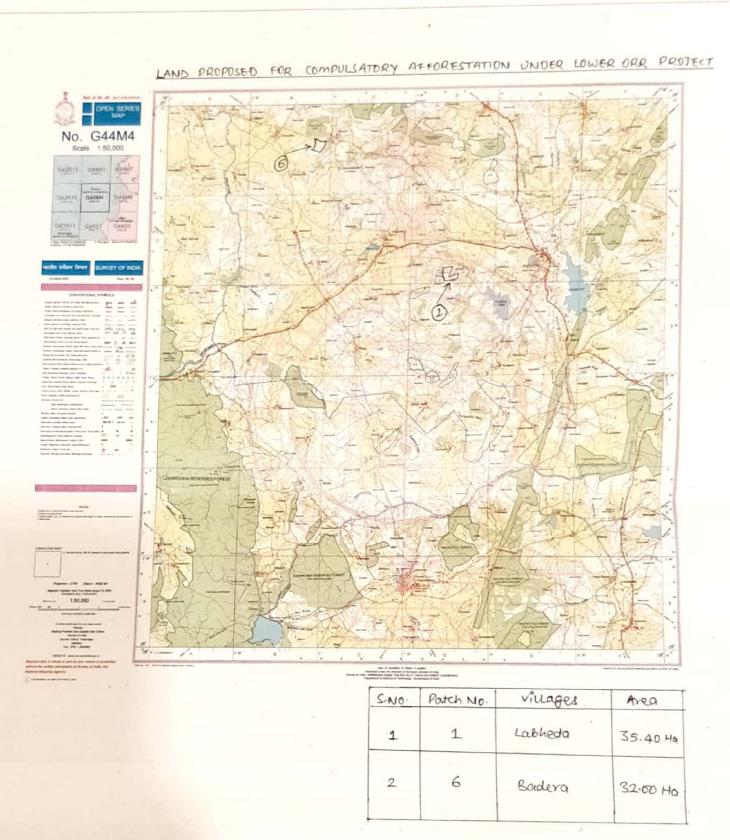
The state government and the user agency shall ensure that the water flow downstream shall be regulated in line with the natural flow regime and in the lean period 100% of the existing flow regime should be maintained while in the non-lean period the prescribed minimum flow of the water by hydrology and aquatic biodiversity experts should be ensured. The minimum flow of water in the ken river will be maintained till it joins the Yamuna to save wildlife including crocodiles and othe aquatic animals. The user agency shall also construct a number of concrete dykes across smaller streams going off from the main reservoir which during FRL shall be over flown but which during lean season shall dam up small isolated water bodies for the benefit of the wildlife.

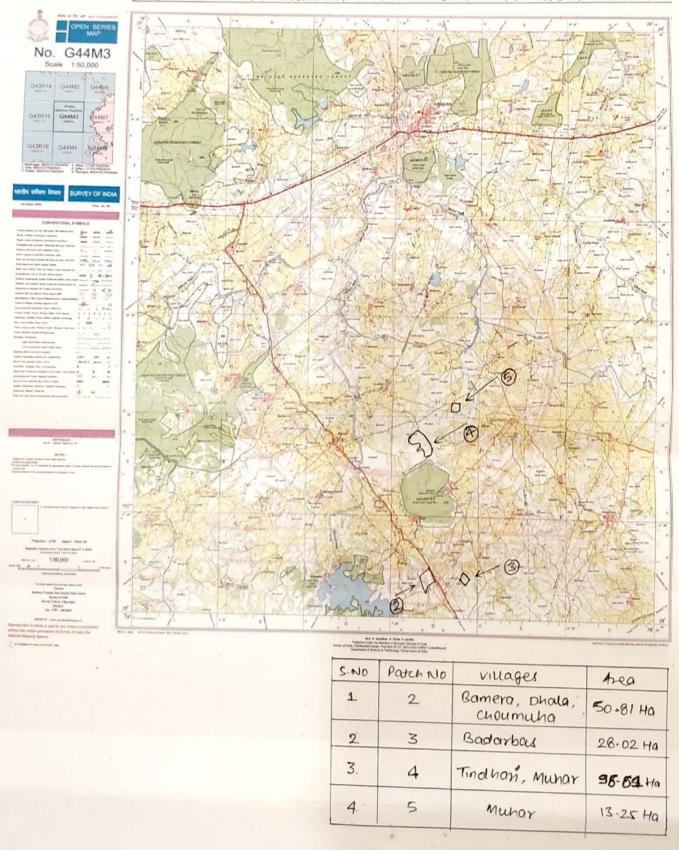
उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

# शर्त-6

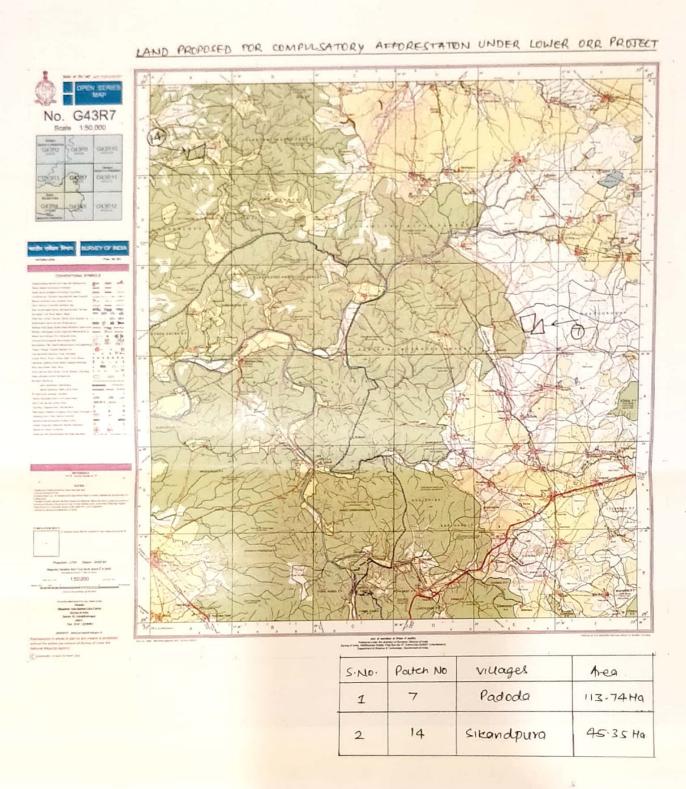
Along the canal alignment, structural interventions shall be carried out at wildlife cross over points which are duly camouflaged and mimic nature at cost to the user agency so that dispersal is not hindered.

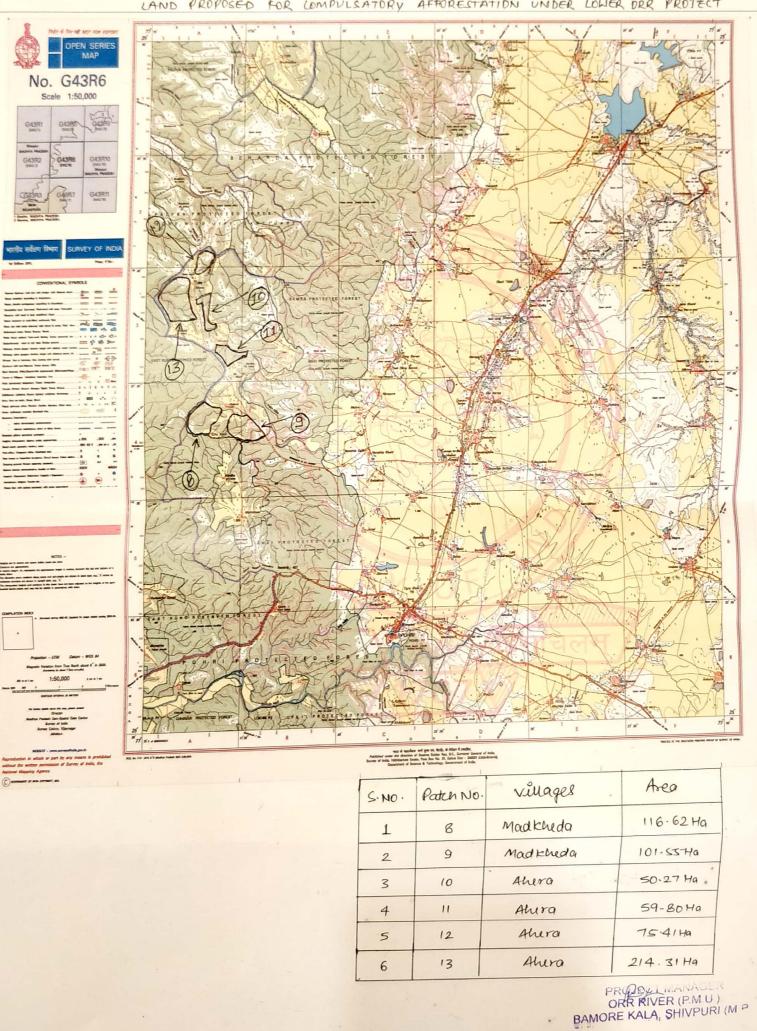
उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।





ORR RIVER (P.M.U.)
BAMORE KALA, SHIVPURI (M.P.





# शर्त-8

The identified non-forest land to be transferred and mutated in favour of the state forest department for raising compensatory Afforestation shall be notified as reserved forest under section-4 or protected forest under section-29 of the Indian forest act, 1927 or under the relevant section(s) of the local forest act. The nodal officer must report compliance within a period of 6 month from the date of grant of final approval and send a copy of the 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 local forest act as the case may be to this ministry for information and record.

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

# शर्त-14

At the time of payment on 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 final decision of the hon'ble supreme court of India;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

# KEN - BETWA LINK PROJECT- PHASE-II

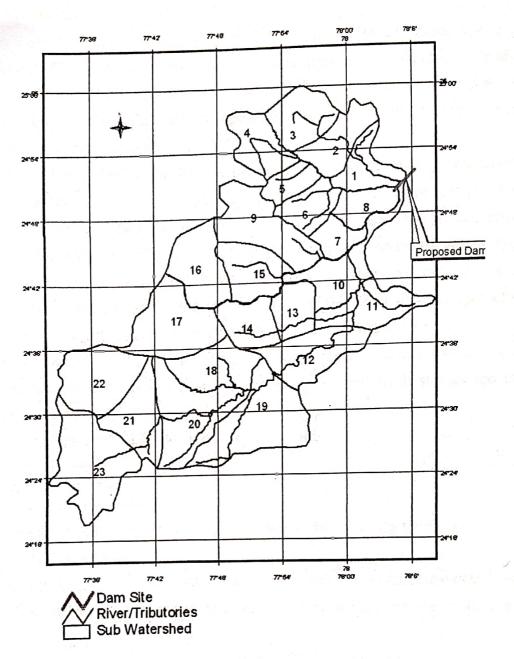
# CATCHMENT AREA TREATMENT PLAN OF LOWER ORR MAJOR IRRIGATION PROJECT 10.1 NEED FOR CATCHMENT AREA TREATMENT

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 study of erosion and sediment yield from catchments is of utmost importance as the deposition of sediment in reservoir reduces 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 agricultural production. Thus, a well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above-mentioned adverse process of soil erosion.

Soil erosion may be defined as the detachment and transportation of soil. Water is the major agent responsible for this erosion. In many locations, winds, glaciers, etc. also cause soil erosion. In a hilly catchment area as in the present case erosion due to water is a common phenomenon and the same has been studied as a part of the Catchment Area Treatment (CAT) Plan.

The Catchment Area Treatment (CAT) plan highlights the management techniques to control erosion in the catchment area. Life span of a reservoir in case of a seasonal storage dams is greatly reduced due to erosion in the catchment area. The catchment area considered for treatment of Lower Orr Irrigation project is 1843 sq.km. The sub-watersheds in the catchment area of considered for the present study is given in Figure-10.1.

In the present study 'Silt Yield Index' (SYI), method has been used. In this method, the terrain is subdivided into various watersheds and the erodibility is determined on relative basis. SYI provides a comparative erodibility criteria of catchment (low, moderate, high, etc.) and do not provide the absolute silt yield. SYI method is widely used mainly because of the fact that it is easy to use and has lesser data requirement. Moreover, it can be applied to larger areas like sub-watersheds, etc.



# SUB WATERSHEDS FOR LOWER ORR CATCHMENT

Figure-10.1: Drainage Map for Lower Orr Irrigation Project

#### 10.2 APPROACH FOR THE STUDY

Various thematic maps have been used in preparation of the CAT plan. Due to the spatial variability of site parameters such as soils, topography, land use and rainfall, not all areas contribute equally to the erosion problem. Several techniques like manual overlay of spatially index-mapped data have been used to estimate soil erosion in complex landscapes.

Geographic Information System (GIS) is a computerized resource data base system, which is referenced to some geographic coordinate system. In the present study, real coordinate system has been used. The GIS is a tool to store, analyze and display various spatial data. In addition, GIS because of its special hardware and software characteristics, has a capacity to perform numerous functions and operations on the various spatial data layers residing in the database. GIS provides the capability to analyze large amounts of data in relation to a set of established criteria.

In order to ensure that latest and accurate data is used for the analysis, satellite data has been used for deriving land use data and ground truth studies too have been conducted.

The various steps covered in the study are as follows:

- Data acquisition
- Data preparation
- Output presentation

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

#### 10.2.1 Data Acquisition

The requirement of the study was first defined and the outputs expected were noted. The various data layers of the catchment area used for the study are as follows:

- Soil Map
- Land use Classification Map
- Current Management Practices
- Catchment Area Map.

# 10.2.2 Data Preparation

The data available from various sources was collected. The ground maps, contour information, etc. were scanned, digitized and registered as per the requirement. Data was prepared depending on the level of accuracy required and any corrections required were made. All the layers were geo-referenced and brought to a common scale (real coordinates), so that overlay could be performed. A computer programme was used to estimate the soil loss. The formats of outputs from each layer were firmed up to match the formats of inputs in the program. The grid size to be used was also decided to match the level of accuracy required, the data availability and the software and time limitations. The format of output was finalized. Ground truthing and data collection was also included in the procedure. For the present study landsat, path 145 row 045 digital satellite data was used for interpretation & classification. The classified land use map of the catchment area is

Table-10.1: Landuse pattern of the catchment area

Category	Area (ha)	Percentage
Open Vegetation	18296	9.93
Forest cover	55837	30.30
Scrub	31457	17.07
Agricultural Land	77001	41.78
River/ Water body	1671	0.91
Settlements	38	0.02
Total	184300	100.00

shown in Figure-10.2. The land use pattern of the catchment area is summarized in

Digitized contours from toposheets were used for preparation of Digital Elevation Model (DEM) of the catchment area and to prepare a slope map. The first step in generation of slope map is to create surface using the elevation values stored in the form of contours or points. After marking the catchment area, all the contours on the toposheet were digitized (100 m interval). The output of the digitization procedure was the contours as well as points contours in form of x, y & z points. (x, y location and their elevation). All this information was in real world coordinates (latitude, longitude and height in meters above sea level).

WAPCOS Limited

Table-10.1.

A Digital Terrain Model (DTM) of the area was then prepared, which was used to derive a slope map

Various layers thus prepared were used for Modeling. Software was prepared to calculate the soil loss using input from all the layers.

#### 10.2.3 Output Presentation

The result of the modeling was interpreted in pictorial form to identify the areas with high soil erosion rates. The primary and secondary data collected as a part of the field studies were used as an input for the model.

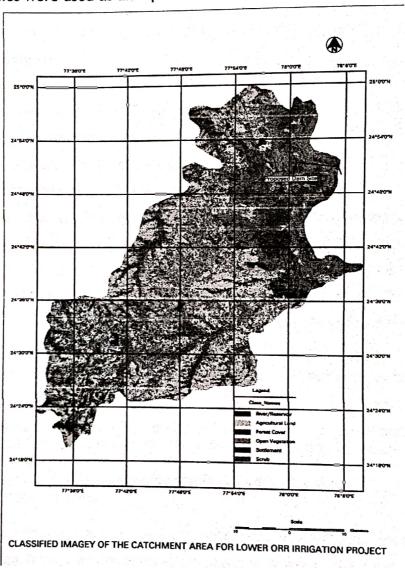


Figure-10.2 Classified Imagery of the Lower Orr Irrigation Project

# 10.3 ESTIMATION OF SOIL LOSS USING SILT YIELD INDEX (SYI) METHOD

The Silt Yield Index Model (SYI), considering sedimentation as product of erosivity, erodibility and arial extent was conceptualized in the All India Soil and Land Use Survey (AISLUS) as early as 1969 and has been in operational use since then to meet the requirements of prioritization of smaller hydrologic units.

The erosivity determinants are the climatic factors and soil and land attributes that have direct or reciprocal bearing on the unit of the detached soil material. The relationship can be expressed as:

Soil erosivity = f (Climate, physiography, slope, soil parameters, land use/land cover, soil management)

#### Silt Yield Index

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.

#### Prioritization of Watersheds/Subwatersheds:

The prioritization of smaller hydrologic units within the vast catchments are based on the Silt Yield Indices (SYI) of the smaller units. The boundary values or range of SYI values for different priority categories are arrived at by studying the frequency distribution of SYI values and locating the suitable breaking points. The watersheds/sub-watersheds are subsequently rated into various categories corresponding to their respective SYI values.

The application of SYI model for prioritization of sub watersheds in the catchment areas involves the evaluation of:

- a) Climatic factors comprising total precipitation, its frequency and intensity,
- b) Geomorphic factors comprising land forms, physiography, slope and drainage characteristics,
- c) Surface cover factors governing the flow hydraulics and
- d) Management factors.

The data on climatic factors can be obtained for different locations in the catchment area from the meteorological stations whereas the field investigations are required for estimating the other attributes.

The various steps involved in the application of model are:

- Preparation of a framework of sub-watersheds through systematic delineation
- Rapid reconnaissance surveys on 1:50,000 scale leading to the generation of a map indicating erosion-intensity mapping units.
- Assignment of weightage values to various mapping units based on relative silt-yield potential.
- Computing Silt Yield Index for individual watersheds/sub watersheds.
- Grading of watersheds/sub watersheds into very high, high medium, low and very low priority categories.

The area of each of the mapping units is computed and silt yield indices of individual sub watersheds are calculated using the following equations:

#### a. Silt Yield Index

$$SYI = \underbrace{\sum (Ai \times Wi) \times 100;}_{AW} \qquad \text{where } i = 1 \text{ to n}$$

$$Where$$

$$Ai = Area \text{ of ith unit (EIMU)}$$

$$Wi = Weightage value \text{ of ith mapping unit}}$$

$$n = No. \text{ of mapping units}$$

$$AW = Total \text{ area of sub-watershed.}$$

The SYI values for classification of various categories of erosion intensity rates are given in Table-10.2.

Table-10.2: Criteria for erosion intensity rate

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

# 10.4 WATERSHED MANAGEMENT - AVAILABLE TECHNIQUES

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.

Following Engineering and Biological measures have been suggested for the catchment area treatment.

#### 1. Engineering measures

- Nallah Bunding
- Contour Bunding
- Angle iron barbed wire fencing

### 2. Biological measures

- Development of nurseries
- Plantation/afforestation
- Pasture development
- Social forestry

The basis of site selection for different biological and engineering treatment measures under CAT are given in Table-10.3.

Table-10.3: Basis for selection of catchment area treatment measures

Treatment measure	Basis for selection
Social forestry, fuel wood and	Near settlements to control tree felling
fodder grass development	
Contour Bunding	Control of soil erosion from agricultural fields.
Pasture Development	Open canopy, barren land, degraded surface
Afforestation	Open canopy, degraded surface, high soil erosion, gentle to moderate slope
Barbed wire fencing	In the vicinity of afforestation work to protect it from grazing etc.
Nallah Bunding	Nala bunding work consists of constructing bunds of suitable dimensions across the nala or gullies to hold the maximum runoff water to create flooding of the upstream area temporarily for some days or weeks, with surplusing arrangements at suitable intervals to drain the water.
Nursery	Centrally located points for better supervision of proposed afforestation, minimize cost of transportation of seedling and ensure better survival.

## 10.5 CATCHMENT AREA TREATMENT MEASURES

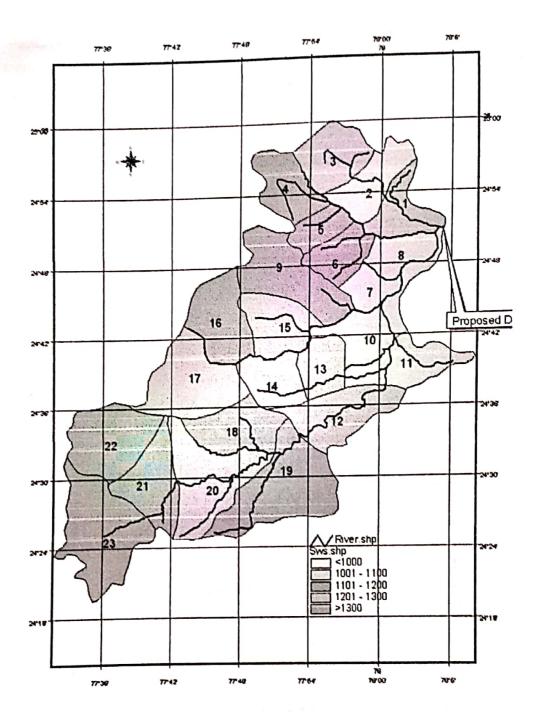
The erosion category of sub-watersheds in the catchment area as per a SYI index is given in Table-10.4. The details are shown in Figure-3. The area under different erosion categories are given in Table-10.5.

Table-10.4: Erosion intensity categorization as per SYI classification

Watershed number	Area	SYI values	Category
W1	5384	1230	High
W2	6479	1050	Low
W3	7120	1230	High
W4	6453	1150	Medium
W5	3428	1160	Medium
W6	4914	1180	Medium
W7	3240	1080	Low
W8	4191	1070	Low
W9	11087	1160	Medium
W10	7843	1080	Low
W11	7241	1090	Low
W12	9065	1210	High
W13	4893	1220	High
W14	5839	1210	High
W15	7307	1240	High
W16	8805	1180	Medium
W17	12093	1230_	High
W18	7794	1170	Medium
W19	14904	1160	High
W20	12501	1220	High
W21	8422	1150	Medium
W22	10627	1160	Medium
W23	14670	1170	Medium
Total	184300		

Table-10.5: Area under different erosion categories

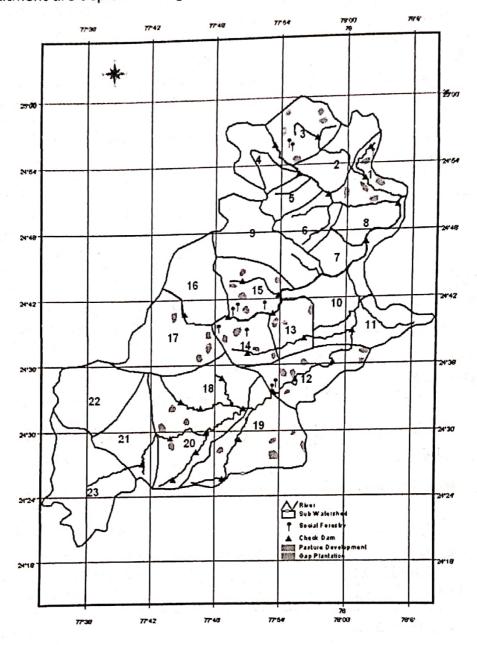
Category	Area (ha)	Percentage
Low	28994	15.73
Medium	76199	41.35
High	79106	42.92
Total	184300	100.00



PRIORITISATION OF SUB WATERSHEDS FOR LOWER ORR IRRIGATION PROJECT

Figure-10.3: Prioritisation of Sub Watersheds for Lowe Orr Irrigation Project

The objective of the SYI method is to prioritize sub-watershed in a catchment area for treatment. The total area under high erosion category in various dams is to be treated as a part of the project cost. The various measures suggested for catchment area treatment are depicted in Figure-10.4.



PROPOSED CATCHMENT AREA TREATMENT MEASURES FOR LOWER ORR CATCHMENT

Figure-10.4: Catchment Area Treatment Measures for Lower Orr Irrigation Project

## 10.6 COST ESTIMATES FOR CAT PLAN

The cost required for Catchment Area Treatment is Rs. 47.04 crore. The details are given in Tables -10.6 and 10.7.

Table-10.6: Cost estimate for Catchment Area Treatment of Lower Orr Irrigation

Pro	ect-	Biologica	al Measures

	ect- Biological Measures	Rate/unit	Ta	rget
S. No.	Item	(Rs.) (including maintenance cost)	Physical	Financial (Rs. lakh)
1.	Afforestation (Refer Table-10.8)	165949/ha	1390	2306.69
2.	Pasture Development	70,000/ha	1240	868.0
3,	Social forestry	70,000/ha	45	31.5 75.0
4.	Nursery development	3,00,000/no.	25 no	67.5
5.	Maintenance of nursery	2,70,000/no	25 no.	211.68
6.	Watch and ward for 7 years for 30 persons Escalation@10% per	6000/ man-month	-	211.00
	annum considered Total (A)			3560.37

Table-10.7: Cost estimate for Catchment Area Treatment of Lower Orr Irrigation

Project- Engineering Measures

S. No.	Item	Rate (Rs.)	Unit		Target
5. 110.	lice	11210 (121)		Physical	Financial (Rs. lakh)
1.	Contour Bunding	15000/ha	ha	3000	450.0
2.	Nallah Bunding	150,000	No.	30 No.	45.0
	Total (B)				495.0

Total (C) = (A+B) cost for Biological and Engineering measures = Rs. 4055.37 lakh

#### Administrative expenditure

Grand Total (C+D) Rs. 4704.23 lal	kh Say Rs. 47.04 crore
Total (D) R	s 648.86 Lakh
- Establishment cost 8% of C	s. 121.66 lakh s. 324.43lakh s. 202.77 lakh

TABLE-10.8
General abstract of afforestation

Particular	Area (ha)	Rate (Rs./ha)	Amount (Rs. lakh)
Cost of afforestation including cost of material (Refer Table-10.9)	1390	69390	964.52
Ist year maintenance (Refer Table-10.10)	1390	10340	143.73
2nd year maintenance (Refer Table-10.11)	1390	9610	133.58
3rd year maintenance (Refer Table-10.12)	1390	8670	120.51
4th year maintenance (Refer Table- 10.13)	1390	8120	112.87
5th year maintenance (Refer Table- 10.14)	1390	6610	91.88
6th year maintenance (Refer Table- 10.15)	1390	6050	84.09
7th year maintenance (Refer Table- 10.16)	1390	6430	89.38
Total			1740.56
Contingencies (% of Total Cost)	5%		87.03
Total			1827.59
Departmental Charges	20.0%		365.52
Total			2193.11

TABLE-10.9
Unit cost for Afforestation

Particulars of works	Unit	Qty.	Rate (Rs.)		Amount (Rs.)
Survey and demarcation of plantation area including marking of sections, I/path and preparation of map	ha	1	450	ha	450
Carriage of angle iron fence post up to 2 mtr long and 8 to 10 cm dia over distance 1 kms	Nos	60	300	per hundred per km	180
Preparation/digging of holes 20-30 cm dia and 45 cm deep	Nos	60	1200	per hundred	720
Fixing of angle iron fence posts	Nos	60	500	per hundred	300
Carriage of B/wire over average distance of 1 km up hills	Qtls	1	150	per Qtls. Per km	150
Stretching and fixing of barbed wire in each stand (3 stands)	Rmt	540	10	per Rmt.	5400
Bush cutting in the plantation site	ha	1	750	per ha	750
Interlacing of thorny bushes in B/wire	Rmt	180	3	per Rmt.	540
Preparation of inspection path 60 cm wide	Rmt	250	15	per Rmt	3750
Layout of pits	ha	1	500	ha	500
Digging of pits 45x45x45 cm (40% of total)	Nos	440	1200	per hundred	5280

Particulars of works	Unit	Qty.	Rate (Rs.)		Amount (Rs.)
Digging of pits 30x30x30 cm (60% of total)	Nos	660	900	per hundred	5940
Filling of pits 45x45x45 cm	Nos	440	200	per hundred	880
Filling of pits 30x30x30 cm (60% of total)	Nos	660	150	per hundred	990
Carriage of naked root plants over distance 2 kms up	Nos	400	100	per hundred per km	800
Carriage of plants in P/bags over distance 2 kms up hills	Nos	700	150	per hundred per km	2100
Planting of entire plants raised in P/bags	Nos	700	300	per hundred	2100
Planting of Naked root plants	Nos	400	200	per hundred	800
Nursery cost of plants	Nos	1100	9	per plant	9900
Total					41530
Add on account of increase on wage rate		0.00			0
Total	,				41530
Soil and moisture conservation works (25% of initial planting)		1 ha		25%	10383
Total					51913
Add Tribal increase				25%	12978
Total					64891
Add cost of B/wire including cost of U nails		75 Kg		60	4500
Grand Total					69391
Say					69390

TABLE-10.10
1st Year Maintenance 25 % Mortality

Particulars of works	Unit	Qty.	Ra	ate (Rs.)	Amount (Rs.)
Redigging of pits 45x45x45 cms	Nos	110	600	per hundred	660
Redigging of pits 30x30x30 cms	Nos	165	450	per hundred	743
Filling of pits 45x45x45 cms	Nos	110	100	per hundred	110
Filling of pits 30x30x30 cms	Nos	165	75	per hundred	124
Planting of polythene bags plants	Nos	175	300	per hundred	525
Planting of Naked root plants	Nos	100	200	per hundred	200
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	175	150	per hundred	525
Carriage of Naked root plants over a distance of 2 kms	Nos	100	100	per hundred	200

Nursery cost of plants	Nos	275	9	per plants	2475
Repair of fence	Rmt	180	2	per Rmt.	360
Repair of inspection path		L/S			600
Repair of soil and moisture conserv	oil and moisture conservation works				1000
Total					7521
Add on account of increase on wage rate		10.00%			752
Total		-			8273
Add Tribal increase		25%	1231.71		2068
Grand Total					10341
Say		1/			10340

TABLE-10.11
2nd Year Maintenance 20 % Mortality

Particulars of works	Unit	Qty.	Ra	ate (Rs.)	Amount (Rs.)
Redigging of pits 45x45x45 cms	Nos	88	600	per hundred	528
Redigging of pits 30x30x30 cms	Nos	132	450	per hundred	594
Filling of pits 45x45x45 cms	Nos	88	100	per hundred	88
Filling of pits 30x30x30 cms	Nos	132	75	per hundred	99
Planting of polythene bags plants	Nos	140	300	per hundred	420
Planting of Naked root plants	Nos	80	200	per hundred	160
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	140	150	per hundred	420
Carriage of Naked root plants over a distance of 2 kms	Nos	80	100	per hundred	160
Nursery cost of plants	Nos	220	9	per plants	1980
Repair of fence	Rmt	180	2	per Rmt.	360
Repair of inspection path		L/S		<u> </u>	600
Repair of soil and moisture conservation	works	L/S			1000
Total			29		6409
Add on account of increase on wage rate		20%		9.2.	1281.8
Total		15			7690.8
Add Tribal increase	* I	25%	1231.7 1		1922.7
Grand Total	6158.57				9613.50
Or say	6160	31		La Santa II.	9610

TABLE-10.12

3rd Year Maintenance 15 % Mortality

Particulars of works	Unit	Qty.	Rate (Rs.)		Amount (Rs.)	
Dodina - C - A - AF-AF-AF-AF-	Nos	66	600	per hundred	396	
Redigging of pits 45x45x45 cms	Nos	99	450	per hundred	446	
Redigging of pits 30x30x30 cms		66	100	per hundred	66	
Filling of pits 45x45x45 cms	Nos	99	75	per hundred	74	
Filling of pits 30x30x30 cms	Nos	105	300	per hundred	315	
Planting of polythene bags plants	Nos		200	per hundred	120	
Planting of Naked root plants	Nos	60		per hundred	315	
Carriage of polythene bags plants over a	Nos	105	150	•		
distance of 2 kms uphills  Carriage of Naked root plants over a	Nos	60	100	per hundred	120	
distance of 2 kms		1/5	9	per plants	1485	
Nursery cost of plants	Nos	165	2	per Rmt.	400	
Repair of fence	Rmt	200		per Kinc.	600	
Repair of inspection path		L/S			1000	
Repair of soil and conservation works		L/S	V		5337	
Total	_ :				1601	
Add on account of increase on wage	_	30%	8 3		1001	
rate	-				6938	
Total		25%	1231.71		1735	
Add Tribal increase		20%	1231.71		8673	
Grand Total				11111	8670	
Say	TABLE 40		-	,—11 Tu-14	0070	

TABLE-10.13
4th Year Maintenance 15 % Mortality

Particulars of works	Unit Nos	Qty.	Rate (Rs.)		Amount (Rs.)
Redigging of pits 45x45x45 cms		66	600	per hundred	396
Redigging of pits 30x30x30 cms	Nos	99	450	per hundred	446
Filling of pits 45x45x45 cms	Nos	66	100	per hundred	66
Filling of pits 30x30x30 cms	Nos	99	75	per hundred	74
Planting of polythene bags plants	Nos	105	300	per hundred	315
Planting of Naked root plants	Nos	60	200	per hundred	120
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	105	150	per hundred	315
Carriage of Naked root over a distance of 2 kms	Nos	60	100	per hundred	120
Nursery cost of plants	Nos	165	9	per plants	1485
Repair of fence	Rmt	200	2	per Rmt.	400
Repair of inspection path	all a.	L/S		11 2- 3 52	450
Repair of soil and conservation works	14	L/S	4 14	a 7	450

Particulars of works	Unit	Qty.	Re	Amount (Rs.)	
Total	GC/SALLON SING	100000000000000000000000000000000000000	Control of the Contro	elicophical Comment of Albert	4637
Add on account of increase on wage rate	District Masses	40%	a la caractéria de presente	and a second transfer of the second s	1855
Total	- with a subside	مالك أمامة والمطالح والمالية	CONTRACTOR	and the second s	6492
Add Tribal Increase		25%	1231.71	Analysis and a second second second second	1623
Grand Total	district and continued	and the same of the same of			8115
	فاستسادهم والبوية الاست	and the second	and the second second		8120

TABLE-10.14
5th Year Maintenance 10 % Mortality

Particulars of works	Unit	Qty.	Re	Amount (Rs.)	
Redigging of pits 45x45x45 cms	Nos	44	600	per hundred	264
Redigging of pits 30x30x30 cms	Nos	66	450	per hundred	297
Filling of pits 45x45x45 cms	Nos	44	100	per hundred	44
Filling of pits 30x30x30 cms	Nos	66	75	per hundred	50
Planting of polythene bags plants	Nos	70	300	per hundred	210
Planting of Naked root plants	Nos	40	200	per hundred	80
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	70	150	per hundred	210
Carriage of Naked root plants over a distance of 2 kms	Nos	40	100	per hundred	80
Nursery cost of plants	Nos	110	9	per plants	990
Repair of fence	Rmt	200	2	per Rmt.	400
Hands of harries been made	The same of the same of the same of	L/S			450
Repair of inspection path Repair of soil and moisture conservation v	vorks	L/S			450
TATAL	The state of the s				3525
Add on account of increase on wage rate		50%			1762
Total					5287
Add Tribal Increase		25%	1231.71		1322
Grand Total					6609
SAY					6610

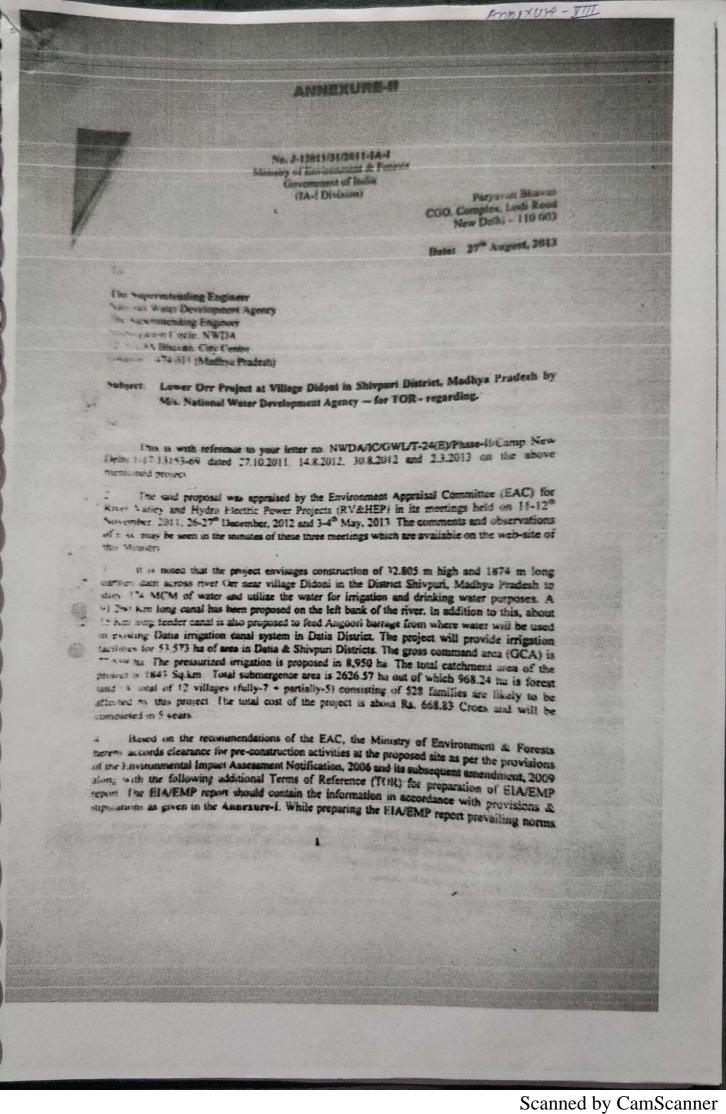
TABLE-10.15
6th Year Maintenance 10 % Mortality

Particulars of works  Redigging of pits 45x45x45 cms	Unit Nos	Qty.	Rate (Rs.)		Amount (Rs.)
			600	per hundred	264
Redigging of pits 30x30x30 cms	Nos	66	450	per hundred	297
Filling of pits 45x45x45 cms	Nos	44	100	per hundred	44
Filling of pits 30x30x30 cms	Nos	66	75	per hundred	50
Planting of polythene bags plants	Nos	70	300	per hundred	210

Particulars of works Planting of Naked root plants	Unit	Qty.	Rate (Rs.)		Amount (Rs.)
		40	200	per hundred	80
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	70	150	per hundred	210
Carriage of Naked root plants over a distance of 2 kms	Nos	40	100	per hundred	80
Nursery cost of plants	Nos	110	9	per plants	990
Repair of fence	Rmt	150	2	per Rmt.	300
Repair of Inspection path	nei nezistrerenenentrini	L/S			250
Repair of soil and conservation works	na negota adamente e esta alto	L/S			250
Total	the side was the transmission	SHOE COMMISSION OF THE PERSON			3025
Add on account of increase on wage rate	200 200 200 200 200	60%	A CONTRACTOR OF THE PROPERTY.	4.5	1815
Total	THE PERSON NAMED IN COLUMN	CHARLE STORY OF THE STORY OF TH	* Production of the Control of the C		4840
Add Tribal Increase		25%	1231.71		1210
Grand Total	TE TO THE PARTY OF	The state of the s			6050
Say					6050

TABLE-10.16
7th Year Maintenance 10 % Mortality

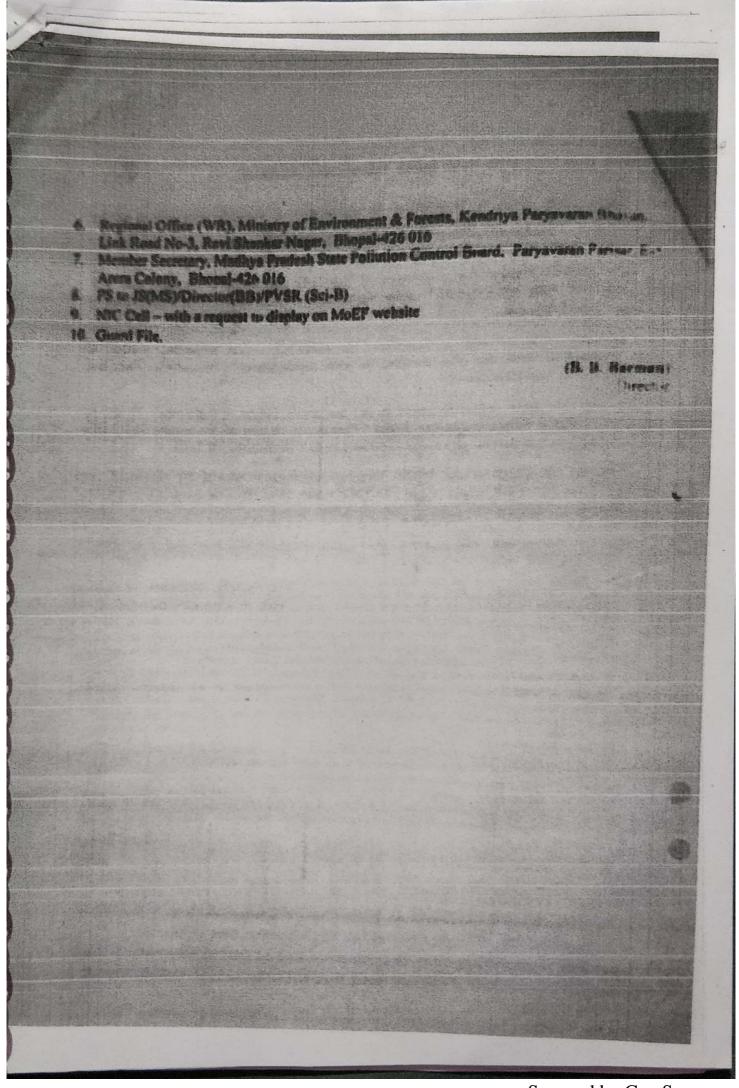
Particulars of works	Unit	Qty.	Ra	te (Rs.)	Amount (Rs.)
Redigging of pits 45x45x45 cms	Nos	44	600	per hundred	264
Redigging of pits 30x30x30 cms	Nos	66	450	per hundred	297
Filling of pits 45x45x45 cms	Nos	44	100	per hundred	44
Filling of pits 30x30x30 cms	Nos	66	75	per hundred	50
Planting of polythene bags plants	Nos	70	300	per hundred	210
Planting of Naked root plants	Nos	40	200	per hundred	80
Carriage of polythene bags plants over a distance of 2 kms uphills	Nos	70	150	per hundred	210
Carriage of Naked root plants over a distance of 2 kms	Nos	40	100	per hundred	80
Nursery cost of plants	Nos	110	9	per plants	990
Repair of fence	Rmt	150	2	per Rmt.	300
Repair of inspection path		L/S			250
Repair of inspection path Repair of soil and moisture conservation v	vorks	L/S			250
Total		The state of the s			3025
Add on account of increase on wage rate		70%			2118
Total	TOTAL OF PROPERTY AND ADDRESS.				5143
Add Tribal increase		25%	1231.71		1286
Grand Total				The state of the s	6429
Say	N. T. C.	Diens Common Many Long	Company of the Compan		6430



The property and afflore 7 extrages fully and 5 voltages parently. For of displaced carrilles out to 5.50 A separate report and bequate Assets from its mendatory. elating a reputed argunization is be trains, study to in the control and by aspectating en persents is to be taken into account, if imp I be Consultant enutged for proporation of ELA/EMP report has to be registered with the consect of bales (QCToNARET under the subside of Assertation) & Registeration of the consect of bales (QCToNARET under the subside of Assertation) as Registeration of the consect of bales (QCToNARET under the subside of Assertation). consultants shall reclude a "Centificate" in ELACTACE support negacifies portion of The draft EIATMY report prepared as per the above Terms of References should be appeared as the State Publication Control Board / Committee concerned for conducting Public Pharms. Ventulations as per the provisions stipulated in EIA Neutrinosis of ZEEG. who makes discussed in the Public Hearing/Consultations should be addressed and provided in the EIA/EMP Report. Final EIA/EMP report about the submitted to the Minustry of the provided to the Minustry of the provided to the Minustry of the provided to the Minustry. the TOR will remain valid for a period of 2 years from the date of issue of this letter for sections of EIA-EMP report along with public consultation. In case of any change in the Scope of the Project such as capacity enhancement, shifting to be the supervisor and change in submergence etc., Iresh scoping clearance has to be hatermation pertaining to Corporate Environmental Responsibility and Environmental Pers. shall be provided in the EIA/EMP Report as per this Ministry's circular dated 19.5.2012. The 14 dated 28.5 2017 shall also be referred and compliance to be ensured wherever STATE OF STATE I has approval of the Competent Authority. Yours faithfully. (B. D. Barman) Director £ cepre 10 -expensely Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, New Delhi -1. ing Advisor (I&CAD) Planning Commission, Yojna lihuwan, New Delhi - 1. The Principal Secretary (Irrigation), Government of Madhya Predesh, Secretariat, Bhopal. The Secretary, Department of Environment & Forests, Government of Madhya Pradesh. weretania. Bhopal The Chief Engineer, Project Appraisal Directorate, Central Water Commission, Sewa isnaman, K. K. Puram, New Delhi - 110 066.

shall be strictly followed specially with respect to environmental flows and much despects side: and management plans. The additional TORs prescribed are as follows:

- 5. The Study Area in the project should also include the following aspects.
- (a) As large area will be affected, developer is to increase the sampling locations from the to-
- (b) Detailed Methodology to be followed, parameters to be studied, sampling locations and imensity (for example "number and size of Quadrants and their replications" on a mining form and in a map; instruments/ equipments to be used for the analysis, consular map stock map, relief map, drainage map, etc to be included/indicated
- (c) Aquatic Environment details physical-chemical properties of water to be studied
- (d) Baseline studies: source of secondary information will be cited wherever required and elistions included in a reference list; economic valuation of Biodiversity and excession
- (e) Under Data Collection Include "Land" before "Hydrology" and give appropriate details included under "Remote Sensing" and "Other details" pertaining to Land and ata- notate Control Map Slope Map, Relief Map, Drainage Map, etc.
- 6 The Rinlogical Environment also include the following aspects
- (a) Forest type classification should be based upon primary survey and should tollow a hampain
- (b) Number and species of trees in the submergence area and their hazal area should be studied. (c) General vegetation pattern will also include all groups of plants including "Pteristorhytes.
- (d) GPS reading of occurrence of RET species will be recorded for conservations and
- rehabilitation purpose. (e) Under faunal elements "Amphibians" will also be studied.
- (f) Environmental Management Plan Wildlife under Biodiversity Conservation Plan to be included
- 7. The Other Aspects include the following:
- (a) Relevant details as suggested (showing wells on the w/s and d/s reaches of the proposed dam site etc., on map) should be incorporated in the DPR and CEIA study
- (b) Social Impact Assessment should be conducted as a part of CEIA study
- (c) A table showing month-wise inflows, abstractions for various uses and environmental flows to be given. Detailed Reservoir Operation/Working Tables aboutd be included in the EPR
- (d) The EAC also suggested that one year discharge data of river Orr should be included in the DPR and CEIA Report.
- (e) Crop water requirements need to be reworked after considering appropriate values of irrigation efficiencies.
- (f) Sedimentation levels after 50 years and 100 years of operation as given in the PFR could be Re-examined.
- (g) The proponents should get the hydrology and irrigation planning features vened by the WC showing reduced Kharif drawl as early as possible and also document the contribution of the lower catchment up-to Betwa confluence (176 Km2 of free basin), which will supprement the ecological release (spill) from the reservoir.
- (h) Detailed ecological study, crop water study and the feasibility of reducing reservoir submergence as theoretically the reservoir should have live storage around 200 Mm at the end of monsoon for Rabi irrugation (60% = 35,000 ha of wheat as the principal Rabi - 1435and I) & I use to be carried-out



The state government shall ensure that the forest land located between FRL and the FRL-4 meters may be afforested by planting appropriate indigenous tree species;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध ।

PROJECT MANAGER

GRR RIVER (P.M.U.)

BAMORE KALA, SHIVPURI (M.

The user agency shall undertake afforestation along the periphery of the reservoir; उपयोगकर्ता एजेंसी/विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER

CRR RIVER (P.M U)

BAMORE KALA, SHIVPURI (M P

User agency shall provide free water for the forestry related projects; उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध ।

PROJECT MANAGER
ORR RIVER (P.M U )
BAMORE KALA, SHIVPURI (M P

Layout plan of the proposal shall not be changed without the prior approval of the central government;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

> PROJECT MANAGER ORR RIVER (P.M.U.) BAMORE KALA, SHIVPURI (M.P.

No labour camp huts shall be established on the forest land; उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध ।

PROJECT MANAGER
ORR RIVER (P.M.U)
BAMORE KALA, SHIVPURI (M P.

The forest land shall not be used for any purpose other than that specified in the proposal and the under no circumstances be transferred to any other agency department or person;

उपयोगकर्ता एजेंसी/विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
ORR RIVER (P.M U )
BAMORE KALA, SHIVPURI (M P

ph

Felling of tree if unavoidable on the forest land being diverted shall be reduced to the bare minimum and trees should be felled under strict supervision of the state forest department. Moreover it shall be ensure that wherever possible maximum marked trees for felling should be translocated in the consultation of the state forest department;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
ORR RIVER (P.M.U.)
BAMCRE KALA, ŞHIVPURI (M.P.

The state government ensure that the user agency shall implement the R&R plan as per the R&R policy of the state government in consonance with national R&R policy government of India before the commencement of the project work. The said R&R plan will be monitored by the state government /Regional office of MoEF & CC along with indicators for monitoring and expected observable milestone;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
ORR RIVER (P.M U )
BAMORE KALA, SHIVPURI (M P

To prevent illegal occupation/encroachment of the forest land by the families to be displaced from the project site the user agency shall ensure that each family being displaced from the project site actually acquires and settles on non-forest land. Apart from taking other measures to achieve the said objective as a measure to discourage the project affected families from encroachment on the forest land, payment of annuity for a period of atleast five years at the rate of the minimum wages payable to the unskilled person for 200 person days per annum to each adult member of the project affected families on receipt of a certificate signed by a forest officer not below the rank of a Range officer having jurisdiction over the area where such person has settled after displacement from the project site should be incorporated in the R&R plan payment of the said annuity should be an additionally and not in replacement of any of the benefit to be accrued to the project affected persons as per the approved R&R plan;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
ORR RIVER (P.M.U.)
BAMORE KALA, SHIVPURI (M.P.

The user agency shall track location of each displaced family and ensure none of them encroach/occupy forest land in support of compliance to the said condition at least for five years from the date of taking of possession of the forest land the user agency shall submit an annual certificate to the PCCF Madhya Pradesh that none of the persons displayed from the project land has encroached/settled in the forest land during the year;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

DOJECT MANAGER

IR RIVER (P.M.U.)

BAMURE KALA, SHIVPURI (M.P.

A plan for conservation of wildlife will be made by the user agency in consultation with the PCF (wildlife) to be implemented at the cost of user agency;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
ORR RIVER (P.M.U.)
BAMORE KALA, SHIVEURI (M.P.

User agency in consultation with the state forest department shall create and maintain alternate habitat /home for the avifauna whose nesting tress are to be cleared in this project. Bird nests artificially made out of ecofriendly materials shall be used in the area, including forest area and human settlement adjoining the forest area being diverted for the project;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

BAMORE KALA, SHIVPURI (M.P.

State government shall complete settlement of rights in terms of the scheduled tribes and other traditional forest dwellers(Recognition of forest right) Act 2006 if any on the forest land to be diverted submit the documentary evidence as prescribed by this ministry in its letter no 11.9/1998-FC(pt.) dated 03.08.2009 read with 05.07.2013 in support thereof;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

DAMORE KALA, SHIVPURI (M P

The user agency shall provide alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest area;

उपयोगकर्ता एजेंसी / विमाग जल संसाधन विमाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
RRIVER (PM 1) I
RRIVER (PM 1) I
BAMORE KALA, SHIVPURI (M P)

Boundary of the forest land proposed to be diverted shall be demarcated on ground at the project cost by erecting four feet high reinforced cement concrete pillars each inscribed with its serial number forward and back bearing distance from pillar to pillar and GPS co-ordinates;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

OJECT MANAGER

R RIVER (P.M.U)

BAMORE KALA, SHIVPURI (M P

The state government shall maintain the character of the project as an irrigation project and to ensure continued benefit to the farmers in the command area no more diversion water from the project for the industrial projects will be permitted in future; उपयोगकर्ता एजेंसी/विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

DIPONION DIPONIONI DIPONI DI

Any other condition that the concerned Regional offices of this ministry may stipulate from time to time in the interest of conservation, protection and development of forests& wildlife with the approval of the competent authority;

उपयोगकर्ता एजेंसी/विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER

ORR RIVER I.

BAMUNIL KALA, SHIVPUKI (M.D.)

The user agency shall submit the annual self-compliance report in respect of the above conditions to the state government concerned regional office and this ministry by the end of march of every year regularly;

उपयोगकर्ता एजेंसी / विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

BAMORE KALA, SHIVPURI (M.D.

# शर्त—37

The user agency and the state government shall ensure compliance to provisions of the all acts, rules, regulations, guideline, relevant hon'ble court orders(s) if any pertaining to this project for the time being in force as applicable to the project;

उपयोगकर्ता एजेंसी/विभाग जल संसाधन विभाग ओर नदी परियोजना प्रबंधन इकाई बामौरकलां जिला शिवपुरी उल्लेखित शर्त के पालन हेतु वचनवद्ध।

PROJECT MANAGER
URR RIVER (FM U)
BAMORE KALA, SHIVPURI (M P