Minutes of the 25th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects held on 19.07.2019 at Teesta Meeting Hall, 1st Floor, Vayu Block, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–3.

The 25th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 19.07.2019 under the Chairmanship of Dr. S. K. Jain in the Ministry of Environment, Forest & Climate Change at Teesta Meeting Hall, 1st Floor, Vayu Block, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-3. The following members were present.

1.	Dr. S.K. Jain	-	Chairman
2.	Shri Sharvan Kumar	-	Representative of CEA
3.	Dr. J.A. Johnson	-	Representative of WII
4.	Shri N.N. Rai	-	Representative of CWC
5.	Dr. A.K. Sahoo	-	Representative of Director of CIFRI
6.	Dr. D.M. More	-	Member
7.	Shri Chetan Pandit	-	Member
8.	Dr. S.R. Yadav	-	Member
9.	Dr. J.P. Shukla	-	Member
10.	Dr. (Mrs.) Poonam Kumria	-	Member
11.	Dr. S. Kerketta	-	Member Secretary

Dr. Vijay Kumar, Prof. R.K. Kohli and Dr. Govind Chakrapani could not present due to pre-occupation. The deliberations held and the decisions taken are as under:

Item No. 25.0 Confirmation of the minutes of 24th EAC meeting.

The Minutes of the 24th EAC (River Valley & Hydroelectric Projects) meeting held on 27.05.2019 were confirmed. Some members opined in the minutes of the 23rd EAC (River Valley & Hydroelectric Projects) meeting held on 23.04.2019, the following:

"As per S.O. 648 (E) dated 03.03.2016 of the Ministry, the project seeking for grant of ToR/Scoping Clearance could only be appraised in the EAC meeting provided the PP is present along with NABET approved Consultant. In this regards, some members expressed that presence of NABET approved Consultant be relaxed because the project implemented by the State Government/PSUs would have difficulty in hiring the Consultant at the initial stages. The Member Secretary clarified that as this is a policy issue of the Ministry, presence of the Consultant is necessary at the time of appraisal of the project for preparation of EIA/EMP report."

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Item No. 25.1 Lakhwar Multipurpose Project in the district of Dehradun in Uttarakhand by M/s UJVN LTD - Regarding Fresh ToR.

Proposal No. IA/UK/RIV/107946/2019, File No. J-12011/11/2019-IA-I (R)

Earlier, the project was discussed in the EAC meeting held on 28.01.2019 based on the order vide dated 10.01.2019 **(OA No. 431 of 2015 by Manoj Mishra Vs. Union of India and Others)** of the Hon'ble NGT, Principal Bench, New Delhi. The EAC had recommended for a site visit by a Sub-Committee of the EAC to the project site for any additional study, if any, to be taken up based on the standard ToR for River Valley Projects. A Sub-committee consisting 7 members was constituted and the Sub-committee visited the project site on 22.04.2019. The Sub-committee made the following observations:

i. In the EAC meeting, it has been recommended that as the base line data of the EIA/EMP report submitted in 2007 was found more than three years old, once again 3 seasons baseline data to be collected and the same be incorporated in the previous EIA/EMP report. However, the Sub-committee during visit found at the site that till 1992, a substantial construction work had been done on the project, viz. 40 km Road infrastructure, Dam stripping on both banks, Diversion tunnel, Intake, Underground power house, Adit for Control Room, Adit to erection bay, Tail race tunnel, etc. The sub-committee considered a colossal loss to state's exchequer. Therefore, it was suggested that baseline data for pre-monsoon and monsoon be collected and the same be incorporated in the previous EIA/EMP report. An amount of more than Rs. 400.00 crores had been invested and the said Public money is blocked for more than 27 years.
ii. Vyasi HEP, which is in advanced stage of construction, is a ROR scheme, located at 5 km downstream of Lakhwar HEP. Both the projects were approved as early as 1986-87. During that period concept of minimum free flow stretches was not in place. Therefore, minimum distance from FRL of Vyasi HEP to TRT of Lakhwar HEP has been kept only 100 m. After detailed deliberation, it has been opined that as the FRL for the downstream project shall be maintained at FRL and MDDL and further there would be a continuous flow of water through a pondage area. Further, both the proposals are integrated one and have been planned long back, minimum distance of 100 m from FRL of Vyasi HEP to TRT of Lakhwar HEP be allowed.
iii. Social Impact Assessment report to be prepared. The EMP and other aspects of the study are to be revised/updated accordingly.
iv. Due to this project, 22 km upstream of Yamuna river and 4 km of Agalar river will be submerged. Every year, the locals celebrate a mass fish catch in Agalar river which is a traditional festival for them. Further, Mahaseer do migrate from Yamuna river to Agalar river for spawning as this river is relatively calm and undisturbed. Therefore, a separate *in-situ* conservation plan to be prepared as a part of fish management plan.
v. As the proposed project falls in Yamuna River Basin and its CIA & CCS is already complete, the recommendation of CIA & CCS to be also part of the Project.

The above issues were discussed in detail in the EAC meeting held on 23.04.2019 and the EAC agreed with the observations of the Sub-committee. It has also been mentioned that this project has been declared as the National Project. Therefore, special consideration be given for early resumption of the project work. The *status quo order* given by the Hon'ble NGT has stalled all the activities on the field. The Sub-committee is inclined to get the mitigation measures complied as shall be suggested in the revised EIA/EMP report. At the same time the EAC recommended partial vacation of the *status quo* so that activities such as tendering, etc. (which do not impact environment) could be under taken by the Project Proponent.

Construction work on the project had been initiated long ago and 30% work has already been completed. During the last 27 years, impact of the project components on environment is already taking place. After a discussion on this aspect, the EAC in its meeting agreed with the suggestion of the Sub-committee and recommended that two seasons data be collected and analyzed along with the previous EIA/EMP report. Any unexpected behaviour and important finding be highlighted. After deliberation on the site visit report, the EAC recommended for the grant of **fresh TOR** for preparation of EIA/EMP report with the same recommendation of the Sub-committee.

Thereafter, the PP applied for grant of ToR online on 17.06.2019 afresh. The PP along with M/s R.S. Envirolink Technologies Pvt. Ltd., Gurgaon, Consultant made the detailed presentation on the project and *inert-alia,* provided the following information to the EAC:

Combined Lakhwar Vyasi project was accepted by NITIAYOG (erstwhile Planning Commission) in its Fifth five-year plan with an estimated cost of Rs. 140.97 crores on 09.01.1997. Lakhwar Vyasi project had three major components viz., Lakhwar dam, Vyasi dam and Katapathar barrage in the district of Dehradun, Uttarakhand. The Ministry granted the Environmental Clearance (EC) to this combined project in February, 1987. The then U.P. Irrigation Department started the major works of the project in 1987 and continued up to 1992. Till 1992, substantial construction work has been done on the project such as 40 km Road infrastructure, Dam stripping, Diversion tunnel, Intake, Underground power house, Adit to control room, Adit to erection bay, Tail race tunnel, etc. MoU between Uttar Pradesh, Haryana, Rajasthan, Himachal Pradesh and National Capital Territory of Delhi on allocation of surface flow of Yamuna was signed on 12.05.1994. As per MoU, 11.983 BCM water has been assessed as an annual utilizable flow of river Yamuna and has been allocated to the five beneficiary states.

After formation of Uttarakhand State, the project was handed over to M/s NHPC for its early completion through a MoU signed on 01.11.2003. The above project was bifurcated into two hydel components viz., Lakhwar HEP (300 MW) and Vyasi HEP (120 MW) (Hathiari Power Station) 5 km downstream of Lakhwar HEP and construction of a barrage at Katapathar about 3 km downstream of Vyasi HEP. Thereafter, a fresh environmental clearance to Vyasi HEP (120 MW) was accorded on 07.09.2007. Due to certain reason, NHPC could not implement the project and then the project was transferred to M/s UJVNL on 23.06.2008 including the EC of Vyasi HEP vide dated 22.04.2010. After review of the request of UJVNL, validity of Environmental Clearance of Lakhwar Multipurpose Project had been extended vide dated 10.01.2011. The revised DPR of Lakhwar Multipurpose Project has been prepared with an estimated cost of Rs. 3966.51 Crore. The total cost of irrigation/ drinking water component was worked out to be as Rs 2578.23 crores (65% of total cost) and the cost of power component was worked out to be as Rs. 1388.28 crores (35% of the total cost).

Lakhwar Multipurpose Project (300 MW) is a peaking power station proposed on river Yamuna near Lohari village in the district of Dehradun in Uttarakhand and is being developed by Uttarakhand Jal Vidyut Nigam Ltd. (UJVN Ltd). The Dam site of Lakhwar Multipurpose Project is located on the Yamuna river near Lohari village, in Dehradun district, 72 km away from Dehradun and approachable by National Highway 123. It is located at latitude $30^0 31'03''$ N and longitude $77^0 56'58''$ E. As approved by CWC and CEA in May, 2018, the total cost of project (RCE PL July, 2018) has been revised to Rs. 5747.17 Crores and the revised DPR of Lakhwar Multipurpose Project has been prepared with an estimated cost of Rs. 5747.17 Crore. The total cost of irrigation/ drinking water component was worked out to be Rs 3735.6605 crores (65% of total cost) and the cost of power component was worked out to be Rs. 2011.5095 crores (35% of the total cost).

Project Component:

1.	Concrete Dam	Height	:	204.0 m
		Length at Top	:	481.5 m
2.	Diversion Tunnel	2 Nos.	:	5 m dia. Horse Shoe Shaped
		Length	:	i. 567 m, ii. 596 m
3.	Reservoir	FRL	:	El. 796.00 m
		MDDL	:	El. 752.00 m
		Area at FRL	:	9.57 km^2
4.	Power House Complex (Underground)	Size of Cavern	:	165x20x48.05 m, D-shaped (Finished)
5.	Tail Race Tunnel	Diameter	:	8.25 m

		Length	:	240.49 m

The catchment area up to the dam site is 2,080 km^2 and 9.57 km^2 area will be submerged at FRL. A total of 927.0822 ha land is to be acquired, of which 158.927 ha is private/Govt. land and 768.15 ha is forestland. As informed, an area of 105.422 ha of private land has already been acquired by UP Irrigation Department and has been transferred to UJVNL. Balance, 53.505 ha of private land is to be acquired. Approval of diversion of 868.08 ha forestland (total forest land for Lakhwar-Vyasi Multipurpose Project in favor of Uttar Pradesh Irrigation Department was accorded by MoEF vide dated 31.10.1986. MoEF & CC vide dated 31.01.2014 accorded the approval for transfer of the lease in favour of UJVNL in respect of 768.1552 ha of forestland already diverted during 1986 in favour of Irrigation Department, U.P. for construction of Lakhwar Project. Binog Wildlife Sanctuary and Mussoorie Ecosensitive Zone are located at 3.1 km and 1.99 km, respectively from Lakhwar project.

The annual expected generation of electricity is 572.54 MU. A total of 78.83 MCM water is to be used for domestic/Industrial use. 19.03 MCM (1,90,30,000 KL) water is available as drinking water for Delhi. Besides, the project will also be used as flood control measures of the area. A total of 1,700 people (Technical and Non-technical) will be engaged during construction of the project.

The EAC deliberated on the proposed project in detailed based on the information provided by the PP and, **recommended for grant of fresh ToR/Scoping clearance** with the following additional conditions:

i. All the statutory clearances required for the project shall be obtained and incorporated in the EIA/EMP including Wildlife Clearance from the National Board of Wildlife as per the Wildlife (Protection) Act, 1972.
ii. Private land acquired for the project shall be suitably compensated for in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
iii. Appropriate Biodiversity Conservation and Management plan for the Native, Rare & Endangered floral and faunal species getting affected due to the project shall be prepared.
iv. All the tasks including conducting public hearing (as per the provisions of EIA Notification, 2006 as amended from time to time) be completed and PP will submit the application for final environmental clearance within the stipulated time.
v. Baseline data for pre-monsoon and monsoon be collected and the same be incorporated in the previous EIA/EMP report.
vi. Social Impact Assessment report to be prepared. Similarly, the EMP and other aspects of the study are to be revised/updated accordingly.
vii. Due to this project, 22 km upstream of Yamuna river and 4 km of Agalar river will be submerged. Every year, the locals celebrate a mass fish catch event in Agalar river which is a traditional festival for them. Further, Mahaseer do migrate from Yamuna river to Agalar river for spawning as this river is relatively calm and undisturbed. Therefore, a separate *in-situ* conservation plan be prepared as a part of fish management plan.
viii. As the proposed project falls in Yamuna River Basin and its CIA & CCS is already complete, the recommendation of CIA & CCS to be also part of the Project.

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Item No. 25.2 **Mekedatu Balancing Reservoir and Drinking Water Project in Ramanagara and Chamarajanagar Districts of Karnataka by M/s Cauvery Neeravari Nigam Limited - Regarding Fresh ToR.**

Proposal No. IA/KA/RIV/108673/2019, File No. J-12011/10/2019-IA-1 (R)

PP applied for grant of ToR online on 22.06.2019 afresh. The PP along with M/s Environmental Health and Safety Consultants Pvt. Ltd., Bengaluru (Consultant), made the detailed presentation on the project and *inert-alia,* provided the following information to the EAC:

Mekedatu Balancing Reservoir and Drinking Water Project is located at Latitude $12^0$16'20"N Longitude $77^0$26'25"E in Muguru and Mekedatu villages, Kanakapura and Kollegal Taluks of Ramanagara and Chamarajanagar Districts. It involves construction of balancing Reservoir near Mekedatu in the downstream of confluence point of River Cauvery and Arkavathy called "Sangama". The proposed project aims at providing drinking water facilities (4.75 TMC) to the Bengaluru Metropolitan City and its surrounding areas along with construction of 400 MW (3x120 MW+1x40 MW) (650.28 MU of renewable energy annually @90% dependable year) of hydropower project by utilizing the natural bed slope. As per CWDT Award, the committed utilization is 270 TMC water by the Karnataka State and additional allocation as per Hon'ble Supreme Court judgement dated 16.02.2018 is 14.75 TMC. The project also ensures that the downstream commitment of allowing 177.25 TMC (including 10 TMC towards e-flow) to Tamil Nadu state is met. The proposed project falls within Cauvery Wildlife Sanctuary. The interstate boundary of Tamil Nadu is located at a distance of 3.90 km. The total catchment of Cauvery at Mekedatu Dam site is 34,273 km^2. A total of 4996 ha area at FRL 440 m will be submerged due to this project, of which 2925.5 ha is Cauvery Wildlife Sanctuary and 1869.50 ha is Reserved Forest. Application for diversion of Forest and wildlife land is yet to be submitted. Five villages viz., Sangama, Kongedoddi, Mdavala, Bommasandra and Muthathi are coming under submergence area. The total cost of the project is Rs. 9,000 Crores.

Project components:

1. Construction of Concrete Gravity dam (Balancing Reservoir) at Mekedatu referred to as Mekedatu site with FRL at RL 440.00 m having a Gross Storage Capacity of 67.16 TMC (1901.97 MCM) of water, bridge, underground Powerhouse and Tailrace Tunnel.
2. The Concrete Dam (of height 99 m at El. 350.00 m) will have a central spillway with radial gates to effectively discharge the design flood with suitable energy dissipating arrangement (Flip bucket) on the downstream side.
3. Intake structure with water conducting system consisting of required number of penstocks, pressure shafts, etc. which will be embedded partly in the body of the dam and the rock mass to feed the water continuously to the generating units.
4. Construction of Jack well cum pump house on the foreshore of the reservoir to lift the required quantum of water along with raising main and Delivery chamber at the identified location to plan for further transportation and distribution.

Land requirement:

Sl. No.	Type of land	Area (ha)	Remarks
1	Cauvery Wildlife Sanctuary	2925.5	Area under submergence
2	Forest land	1869.5	
3	Revenue land	201.0	
	Total (A)	**4996.0**	

4	For seating of Dam, Construction of intake tunnel, Underground power house and TRT	150.0	-
5	For construction of approach road to Sangama	80.4	-
6	Colony	26.0	-
	Total (B)	**256.4**	-
	Total land to be acquired	**5252.4**	-

Expected Project benefits:

Socio-economic benefits:

1. Provides drinking water facilities to Bengaluru Metropolitan City and its surrounding areas.
2. 400 MW of hydropower is generated thereby meeting the local energy demand.
3. Creation of reservoirs offers a variety of recreational opportunities, notably fishing and boating thereby increasing tourism potential.
4. Local Area Development.
5. Project related infrastructures such as roads, health facilities, education facilities, etc. will help the local people as well as project affected people. There will be net improvement in community health.
6. Improvement in living standard of local people.
7. Generation of employment opportunities locally.

Ecological benefits:

1. Increased water surface creates habitat for aquatic life in or near the reservoir.
2. Receiving waters create dry mudflats, which provide feeding sites for migratory birds and breeding habitat for resident species.
3. Improved groundwater table enhancing greenery all around.
4. Availability of drinking water to wildlife during summer seasons.
5. Creation of new habitats.
6. Modification of microclimate due to storage and regulation of water.
7. Enhances proliferation of fishes.

The EAC deliberated on the proposed project in detail based on the information provided by the PP and representation received from the Tamil Nadu State. The EAC didn't **recommend for grant of fresh ToR/Scoping clearance** to the present proposal and sought the following additional information/clarification:

1. While doing the study on the Analysis of Alternatives, there is no consideration of alternate sites and rather two options at one location of different dam height have been considered. It requires to be revisited and the best alternative be decided after a detailed study.
2. The forestland and wildlife area will be diverted as per the provisions of Forest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972, respectively. However, a total of 4,996 ha (WLS and RF) area will be involved and this seems to be very high. Once again, optimization of the land required to be attempted.
3. The private land to be acquired as per the Right to Fair Compensation and Transparency in Land Acquisition Act, 2013.
4. As there are couple of representations received from the Tamil Nadu State Government requesting not to grant ToR to the present proposal. The EAC opined that

an amicable solution be arrived at between the two states and put up for reconsideration for grant of ToR.

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Item No. 25.3 Jakhol Sankri Hydro Electric Project (44 MW), in district Uttarkashi, Uttarakhand by M/s SJVN LIMITED- Regarding Fresh Environmental Clearance.

Proposal No. IA/UK/RIV/41642/2016, File No. J-12011/07/2016-IA-1 (R)

Project proponent along with the consultant M/s WAPCOS, Consultant presented the proposal before the EAC and *inter alia,* provided the following**:**

The Jakhol Sankri Hydro Electric Project (44 MW) is proposed on river Supin (a tributary of River Tons), near village Jakhol in District Uttarkashi of Uttarakhand. The project envisages construction of a 7.2 m high (from average river bed level) barrage which will divert through a 6.6 km long 3.0 m dia. HRT to an underground power house with two units of 22 MW each shall be installed for generation of 166.19MU per annum. This is a run-of-the-river scheme. The catchment area of the project is 268.20 sq.km.

At present JSHEP is the only hydropower project proposed under development on river Supin. Since, there is no project proposed upstream of this project, there is no impact on the flow volume or the flow pattern as far as JSHEP is concerned. Downstream of the proposed JSHEP is Naitwar Mori HEP (60 MW) on river Tons which is presently under construction. Hydrological analysis has been conducted on the basis of water years. The JSHEP catchment is a part of the bigger catchment of Tons at Tuini located downstream. The proportion of snow bound area is higher in case of the upper catchment (JSHEP). Some of the flow figures characterizing the flow pattern of the river at the project site are given in the table below:

Characteristic Flow	Value in Mm^3
Average annual flow	359.72
Maximum annual flow	667.96 - Year 1990-91
Minimum annual flow	214.07 - Year 2000-01
Av. monsoon flow (July-Oct.)	205.98
Av. Non-monsoon flow (Remaining months)	153.74
Maximum 10-daily discharge	65.24 m^3/s
Minimum 10-daily discharge	1.56 m^3/s

Total land requirement is 39.088 ha, out of which 24.317 ha is forest land including Civil Soyam land and 14.771 ha is private land. Total submergence area is about 3 ha. An underground powerhouse is proposed with 2 units of 22 MW capacities each. About 216 families (average size 6 persons per family) in 4 villages are likely to be affected by this project. The total cost of project is about Rs. 477.15 crores. Forest Clearance, Stage I is under process.

Presently file is with RO, MoEF & CC, Dehradun. There are no families losing homesteads & 216 families losing land only. There are 6 project affected villages in Tehsil Mori of District Uttarkashi namely Dhara, Jakhol, Sunkundi, Pawn Malla, Pawn Talla and Sawani. Whereas the private land is to be acquired in four villages, in village Jakhol & Sawani entire land to be acquired is Government Land. The R&R plan has been devised in line with

the "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013". SIA study is complete and the District Magistrate has approved the report on 26.06.2019. Notification under Section 11 is issued on 27th June 2019.

Environment base line status has been collected during 2017 for three seasons (winter: January 2017, Pre-Monsoon June 2017 and Monsoon in September 2017). Average PM_{10} levels are between 42.0 to 55.0 $\mu g/m^3$. Average $PM_{2.5}$ levels are to be found between 14.0 to 27.0 $\mu g/m^3$. The highest values of NO_2 observed in the winter, pre-monsoon and monsoon season are 6.2, 7 and 7 $\mu g/m^3$, respectively. The maximum SO_2 levels were 10.7, 11.1 and 10.0 $\mu g/m^3$ in the winter, pre-monsoon and monsoon season, respectively. Ambient air quality is good in the area.

The noise level in winter and pre-monsoon seasons ranged from 36.6 to 38.1 dBA and 38.4 to 40.3 dBA, respectively. The daytime equivalent noise level in monsoon season at various sampling stations ranged from 36 to 38 dBA. The noise levels were well within the permissible limit.

There are no major sources of organic pollution loading in the basin. The total hardness in various water samples was 24-44 mg/l, 21-42 mg/l and 20-44 mg/l in winter, pre-monsoon and monsoon seasons, respectively. The low calcium and magnesium levels are responsible for soft nature of water. The total hardness level in the water is well below the permissible limit of 200 mg/l. The low EC and TDS values indicate the lower concentration of cations and anions. The BOD and COD values were very low. Level of heavy metal in the water of the project area is found to be below the permissible limit used for drinking purposes. No total Coliform count in the study area.

The catchment area of the proposed JSHEP covers almost of these forests. The forests in the project area fall in the Tons Forest Division. As per "Revised Survey of Indian Forest type" by Champion & Seth (1968), following forest types have been observed: Sub-tropical chir pine forest, Banj Oak forests (*Quercusleucotricophora,* Moru oak forest (*Quercus floribunda*), Moist deodar forest (*Cedrus deodara*), Western mixed coniferous forest, Moist Temperate Deciduous Forest.

The fauna of the study area consists mostly of species with zoo-geographic affinities of Palearctic, Indo-Malayan and indigenous species. Mammals (Wild Boar, Jackal, Rhesus Macaque, Yellow throated marten, Barking deer, etc.) Birds: White-cheeked Bulbul, Indian Myna, Hoopoe, Spotted Forktail, etc. Butterflies: Small copper, Common Sailor, Common leopard, etc. As per secondary data sources, total 9 species of reptiles and 4 species of amphibians has been recorded from the area. However, no such species was encountered except the Rock agama and skinks. Fishes: A total of 6 species (*Schizothorax richardsoni*, *Schizothorax progastus*, *Garra gotyla gotyla*, *Barilius bendelisis*, *Paraschistura montana* and *Glyptothorax pectinopterus*) were found close to the confluence of Tons and Supin River at downstream site of power house under the area of JSHEP. No fish was found at other sites.

PP presented the anticipated environment impacts due to proposed project such as diversion of forest land, deforestation, effect on wildlife, Erosion, silting, loss of trees, effects on reservoir periphery due to impoundment, Impact on Fishes, Impact on health due to pondage, vector borne diseases, etc., Muck generation, Quarrying activities, Construction activities, air and water pollution, noise pollution, scarring of land and submitted the corresponding environment management plan as a mitigation measures.

Project benefits include addition of 166.19 MU of energy in the northern grid, Generation of clean electricity replacing the requirement of Thermal Power Plant, Social up

liftment of project affected persons, improved facilities w.r.t schools, dispensaries, medical facilities, banking, telecommunication, road network, etc., Local area development (infrastructural/community development) in project Panchayat.

ENVIRONMENT MANAGEMENT PLAN WITH BUDGET BREAKUP

Sl. No	Item	Cost (Rs. Lakh)
1.	Biodiversity Conservation Plan	724.50
2.	Catchment Area Treatment Plan	680.0
3.	Sustenance of riverine fisheries	105.88
4.	Health Delivery System	142.30
5.	Environmental Management in Labour Camps	490.43
6.	Stabilization of Muck Disposal Sites	421.00
7.	Landscaping and Restoration of Construction Area	100.00
8.	Environmental Management in Road Construction	270.00
9.	Greenbelt Development	30.00
10.	Control of Air Pollution	66.80
11.	Control of Noise Pollution	11.00
12.	Water Pollution Control	10.00
13.	Public Awareness Program	50.00
14.	Disaster Management Plan	60.00
15.	Resettlement and Rehabilitation Plan	1369.13
16.	Livelihood Plan for PAF	192.64
17.	CER & Local Area Development Plan	723.10
18.	Monitoring and Evaluation Aspects for social aspects	30.0
19.	Implementation of Environmental Monitoring Programme during construction stage	45.6
20.	Purchase of Meteorological Instruments and Noise Meter	15.0
	Total	5537.38 lakh say 55.38 Crore

PP apprised EAC that ToR for 51 MW capacity was accorded by MoEF & CC on 11.01.2011. Accordingly, EIA/EMP report was prepared. However due to June 2013 floods in Uttarakhand, Hon'ble Supreme Court in its judgment dated 13.08.2013 directed MoEF & CC not to take up any new project for Environmental & Forest Clearances in Uttarakhand till further orders. Hon'ble Supreme Court vide its proceedings dated 24.11.2015 clarifies that its judgment dated 13.08.2013 is not applicable to three projects of SJVN limited in Uttarakhand including JSHEP.

Taking into account the same, the project capacity was revised to 44MW. However, the location of barrage site and powerhouse site remain unchanged. Accordingly, EAC in its 92nd meeting held during 28-29 March, 216 recommended the ToR for 44 MW project. ToR was issued vide letter dated 07.06.2016. Uttarakhand Environment Protection and Pollution Control Board organized the public Hearing for JSHEP on 01.03.2019 at Khand Vikas Adhikari Office, Mori, Uttarkashi at 11:00 am and Chaired by the Additional District Magistrate, Uttarkashi. The Regional Officer and Assistant Scientist represented UEPPCB. The National Board has recommended the proposed project for Wildlife clearance on 21.09.2016. GoUK issued the TEC Clearance on 03.06.2019.

EAC observed that earlier Public Hearing was scheduled on 12.06.2018; however, PH could not be completed because of the protest against the proposed project. Later on 01.03.2019 PH was done at Vikas Khand Karvalaye Parisar, district Uttarkashi. EAC took the

cognizance of the complaint received from the Matu Jan Sanghtan in the Ministry on the issue of Public Hearing. EAC further observed that proposed project is near to GPV Wildlife Sanctuary/ National Park and project was recommended in the 39th meeting of Standing Committee of National Board of Wildlife (SC-NBWL). EAC after detailed deliberation on the information as presented and submitted to the Ministry **deferred** the project for want of following information:

i. Details of the public hearing issues raised along with the compliance shall be submitted.
ii. PP is required to submit clarification from the State Pollution Control Board that whether Public Hearing was conducted following the procedure mentioned in the appendix V of EIA Notification and as amended thereof along with the justification for conducting PH distant from the project site.
iii. Possibility of subsidized electricity demanded by the locals should be explored.
iv. Environmental matrix during construction/operational phase needs to be submitted.
v. Environmental Management Plan with budget breakup (Capital as well as recurring) shall be submitted.
vi. Fund allocation for CER shall be made as per Ministry's O.M. No. 22-65/2017-IA.III dated 1st May, 2018 for various activities therein.
vii. The details of activities with budget allocation under CER shall be submitted and incorporated in EIA/EMP report.
viii. Consolidated EIA/EMP report is to be submitted as per the generic structure (Appendix III) given in the EIA Notification, 2006.
ix. Content of the summary EIA be made as per the Appendix III A of EIA Notification and therefore should be submitted in the EIA report
x. An undertaking as part of the EIA report from Project proponent, owning the contents (information and data) of the EIA report with the declaration about the contents of the EIA report pertaining to a project have not been copied from other EIA reports before grant of EC
xi. Fish species availability needs to be reviewed as Supin River has good number of *Rainbow trout.*
xii. Details of plant species of gymnosperm found in the area are to be included in plantation program.
xiii. Criteria taken into account for selection of threatened species is to be detailed out.
xiv. QCI & NABET Accredited certificate of the consultant for the period during which baseline data and other EIA/ EMP studies carried out.

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Item No. 25.4 **Banda Major Irrigation Project (CCA: 80,000 ha) in Sagar district of Madhya Pradesh by M/s Madhya Pradesh Water Resources Department-Regarding Fresh Environmental Clearance.**

Proposal No. IA/MP/RIV/73548/2018, File No. J-12011/08/2018-IA-1 (R)

M/s Water Resource Department, Government of Madhya Pradesh (Project Proponent) applied online on 19.06.2019 for grant of environmental clearance to the proposed project. The PP along with Consultant, M/s R.S. Envirolink Technologies Pvt. Ltd., Gurugram made a detailed presentation of the project and *inter-alia*, provided the detailed following information including findings of EIA/EMP study:

The Banda Major Irrigation project envisages construction of 23 m high composite dam having concrete gravity dam including earthen bund 710 m across Dashan River (tributary of Betwa River) near village Uldan in Sagar District of Madhya Pradesh to store 301 MCM of water to irrigate

80,000 ha CCA. The Central Spillway is 196 m long and 50 m NOF including key wall (on both sides) with 11 Nos. of Radial Gates of size 14x8.6 m with a maximum discharge capacity of 5,920 cumecs. There is a 661.50 m long earthen section on either sides of the dam portion. The gross storage is 301 MCM and the live storage is 282.31 MCM of water with approximately 20% of post monsoon flow in river. The catchment area of the project is about 1490.70 km^2. Total submergence area is 4699.08 ha (Forest land is 505.50 ha, private land is 3645.13 ha and government land is 548.45 ha). The project ensures use of micro-irrigation techniques by the users. A total of 28 villages consisting of 2,845 families are likely to be affected by this project. The total cost of the project is about Rs. 2610.54 Crores and proposed to be completed in 5 years.

Pressurized pipe canal system with micro network system to facilitate to irrigate 80,000 ha CCA in both Sagar and Chhatarpur districts of M.P. The command area (80,000 ha CCA) is spread over Banda, Malthon, Sagar and Shahgarh tehsils of Sagar district and Buxwaha tehsil of Chhatarpur district. A total of 318 villages will be benefitted due to this project, out of which 237 villages are benefiting from Sagar district and 81 villages from Chhatarpur district. A total 155.00 km network of gravity main and rising main for DC1 (Delivery Channel-1), DC2 and DC3 to irrigate an area of 28,400 ha, 15,600 ha and 36,000 ha, respectively. The total power required for the project is 28.23 MW.

The project proponent has submitted this proposal online on 17.03.2018 for grant of fresh Terms of Reference to the Project for preparation of EIA/EMP report. The EAC considered the same in its meeting held on 27.04.2018. After recommendation of EAC for grant of ToR, Scoping Clearance for this project to irrigate 72,000 ha CCA was issued by MoEF & CC on 14.05.2018. Then, Revised Scoping Clearance due to change in project capacity (from 72,000 ha to 80,000 ha), submergence area and related connecting parameters was issued by MoEF & CC on 11.03. 2019

Land requirement:

(a)	Government Revenue Land	**548.45 ha**
(b)	Forest Land	**505.50 ha**
(c)	Private land	
	(i) Irrigated	1402.86 ha
	(ii) Un-irrigated	2242.27 ha
	Total Private Land (i+ii)	**3645.13 ha**
Total Land requirement (a to c)		**4699.08 ha**

The Stage-I clearance for diversion of forestland is under process; the proposal was submitted to MoEF & CC vide dated 26.09.2018. The entire forest area proposed to be diverted falls under Sagar North (T) Forest Division. Process of private land acquisition has been initiated by district authorities as per Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (LARRA); Section 11 has been completed, notification under Section 19 has been issued.

Hydrology and water assessment:

Total 75% dependable virgin yield is computed as 540 MCM using R-R Relationship and taking into consideration 24.65 MCM as upstream utilization, the net yield at the dam site comes to 515.35 MCM; whereas live storage/proposed utilization is only 282.31 MCM. Therefore, more than 50% of the water stored will be available as surplus water downstream of the dam.

Brief of base line Environment:

Baseline Data was collected for 3 seasons such as Pre-monsoon (May, 2018), Monsoon (August, 2018) and Winter/lean (December, 2018) for preparation of EIA report and conduct of Public Hearing which was held on 02.03.2019 at Village Uldan in Sagar District and at Village Bakswaha in Chhatarpur District, Madhya Pradesh.

Ambient Air Quality

It has observed during the air quality monitoring that the vehicles are the only source of air pollution in the study area. The concentrations of PM_{10}, $PM_{2.5}$, SOx and NOx at all the sites were well within the permissible limits of Residential & Rural areas as per the National Ambient Air Quality Standards, 2009. As per results of ambient noise quality monitoring, the noise level in the area are within permissible limits as per CPCB standards i.e. 'The Noise Pollution (Regulation and Control) Rules, 2000 (amended to date)'. This is mainly due to absence of any industrial establishment and low traffic density in the study area.

Land use/Land cover

The land use/ land cover pattern of the study was interpreted from the latest satellite data and the classified land use/ land cover categories. Agriculture land constitutes predominant land use in the proposed command areas. Dense to Open Deciduous forest is predominantly found in the area, in and around dam site and at the upstream catchment.

Land use / Land cover Classes	**Area (ha)**	**Area (%)**
Deciduous Forest	25948.03	14.90
Scrub Forest	4097.33	2.35
Scrub Land	25157.17	14.45
Barren Land	2178.11	1.25
Agricultural/ Fallow Land	112834.37	64.80
Settlement	2292.74	1.32
Water body	1624.84	0.93
Total	**1,74,132.60**	**100**

Flora & Fauna

During the present study of Banda Major Irrigation project area, in all 155 plant species belonging to 52 families could be recorded. Fabaceae (24 species) is the largest family followed by Poaceae (13 species), Asteraceae (11 species), Apocynaceae (8 species), Malvaceae (8 species) and Lamiaceae (7 species), the most dominant families found in the study area. The study area comprises of plains characterized by agricultural fields, grassland, scrub forest and settlements. There are few scattered patches of open forest in the study area of proposed project and these forests are mainly of mixed Tropical dry deciduous type mainly represented by *Butea monosperma, Tectonagrandis, Anogeissuslatifolia, Bombaxceiba, Cassia fistula, Holopteleaintegrifolia, Ziziphus spp.*, etc. However, majority of the area is under severe biotic pressure as there are number of habitations in the entire area. At some places commercial plantations of teak on private farms was also seen in the study area. The bushes are comprised of shrubs like *Lantana camara, Acacia pennata, Justiciaadhatoda, Colebrookeaoppositifolia* and *Dendrocalamusstrictus.* Commonly found herbaceous species are *Datura stramonium, Embeliarobusta, Senna obtusifolia, Carissa spinarum, Calotropisgigantea, Asparagus racemosus* and *Agave americana*. Threatened Species Version 2019-1. Majority of the 155 species have not been evaluated or assessed yet by IUCN (2019-1). All species that have been assessed are under Least Concern (LC) category.

During the field survey a Wild Boar (*Sus scrofa),* Nilgai (*Boselaphustragocamelus*), Rhesus macaque (*Macacamulatta*), Common langur (*Semnopithecus entellus*), House Mouse (*Mus musculus*) and Five-striped Palm Squirrel (*Funambuluspennantii*) were sighted in the study area. Common Hoopoe, House Swift, Red-wattled Lapwing, Blue Rock Pigeon, Indian Roller Bird, Little Green Bee-Eater, Common Kingfisher, Crow Pheasant, Common Moorhen, House Crow, Rufous Treepie, Jungle Crow, Black Drongo, Flycatcher, White-Browed Wagtail, Oriental Magpie Robin, House Sparrow, Jungle Babbler, Common Myna, Indian Pond Heron, Cattle Egret, Little Egret, Little Cormorant and Rose Ringed Parakeet were most frequently sighted bird species in the study area. As per IUCN Red list of Threatened Species Version 2019-1, all species of mammals and avifaunal species reported from the study have been listed under Least Concern (LC) category. According to Wildlife (Protection) Act, 1972; two mammalian species reported from the study area are listed as Schedule-II species and two each species are listed as Schedule-III and Schedule-IV. Similarly, all the birds reported in the study area fall under Least Concern category of IUCN Ver. 2019-1. As per the Wildlife (Protection) Act, 1972 avifaunal species reported from the study area are listed in Schedule IV and V.

Aquatic Ecology

Secondary sources and field visit survey was used to collect information on fish diversity in the study area. During experimental fishing, 5 species landed in the net. These are *Labeocalbasu, L. gonius, Puntius sophore* and *Wallago attu.* In all, 13 species are reportedly found in the river. All these species are under Least Concern category of IUCN Red list Ver. 2019-1.

Impact due to Land Requirement and change in land-use

Major impact of land acquisition is permanent change of land use, which is unavoidable. Additionally, land acquisition has impacts on local population by way of loss of their agriculture land and hence livelihood and also impact on flora and fauna by way of loss of forestland and clearing of vegetation on acquired land. Mitigation and management of such impacts is discussed as part of EMP.

Impact Due to Muck Generation

Muck, if not securely transported and dumped at pre-designated sites, can have serious environmental impacts, such as:

- Can be washed away into the main river, which can cause negative impacts on the aquatic ecosystem of the river.
- Can lead to impacts on various aspects of environment. Normally, the land is cleared before muck disposal. During clearing operations, trees are cut, and undergrowth perishes as a result of muck disposal.
- In many of the sites, muck is stacked without adequate stabilization measures. In such a scenario, the muck moves along with runoff and creates landslide like situations. Many a times, boulders/large stone pieces enter the river/water body, affecting the benthic fauna and other components of aquatic biota.
- Normally muck disposal is done at low-lying areas, which get filled up due to stacking of muck. This can sometimes affect the natural drainage pattern of the area leading to accumulation of water or partial flooding of some area which can provide ideal breeding habitat for mosquitoes.

Impact due to Waste Generation

The main sources of wastes in case of the proposed project can be divided into following categories:

- Municipal waste from residential areas
- Solid wastes from labour camps
- Bio-medical wastes from Dispensary
- Construction and demolition waste

Solid waste generated from temporary and permanent colonies during construction and operation phase will be disposed of as per Solid Wastes Management Rules, 2016 issued by MOEF vide S.O.1357 (E) dated 8th April, 2016, and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.

Terrestrial Ecology

The project construction would require acquisition of 505.50 ha of forestland. All the vegetation will be cleared for construction of project component. This is a permanent impact and can only be compensated by Compensatory Afforestation.

Impact on Socio-economic Environment

Positive Impacts on Socio-Economic Environment

- The entire project has been designed to benefit the farmers and bring about positive change by providing water for irrigation
- A number of marginal activities and jobs would be available to the locals during construction phase.

Negative Impacts on Socio-Economic Environment

- Project would require acquisition of 3645.13 ha of private land leading to displacement of 2845 families. These families will be resettled and rehabilitated as per the provisions of The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
- In addition, influx of workers and floating population during project construction phase can lead to cultural clashes, law and order concerns and health issues.
- Project construction may bring about some changes in the socio-economic environment of the area including increased threats to the health of the community.

Project benefit:

On completion of the Project the following benefits can be derived.

- Annual Rabi irrigation of 80,000 ha
- Rise in sub-soil water level in the project Area
- Development of fisheries in the reservoir
- Employment to local labour during construction period.
- The ratio of submergence of Culturable land to the proposed irrigation is 5.87%.

Public hearing details:

Madhya Pradesh State Pollution Control Board (MPSPCB) has conducted public Hearings for the Banda Major Irrigation Project on 02.03.2019. On 02.03.2019, 11.00 am, at Community Hall,

Mahadev Ghata Mela Premises, Village: Uldan, Tehsil: Banda, District: Sagar; on 02.03.2019, 03:00 pm at Krishi Upaj Mandi Premises, Village: Buxwaha, Tehsil: Buxwaha, District: Chhatarpur.

Social Impact Assessment and Rehabilitation and Resettlement Plan:

There are 2,845 project affected families, from 28 villages who are identified as the families whose land and/or houses will be acquired for the project. A total of 1,400 Kuccha houses will be submerged and 880 pucca houses will be submerged. The total land requirement for proposed project is 4699.08 ha; out of which 548.45 ha is government revenue land, 3645.13 ha is private land and 505.50 ha is forestland. The Rehabilitation and Resettlement Plan has been prepared to comprehensively address the issues arising out of land acquisition, assessment of land/house/asset coming under acquisition, estimation of extent of loss and compensation to be offered in line with The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCT_LARR).

EMP with budget breakup:

An amount of **Rs. 38708.395 lakhs** has been allocated for the implementation of Environmental Management Plan and Corporate Environment Responsibility Plan for Banda Major Irrigation Project which are summarized in the table given below:

S. No.	Management Plans	Amount (Rs. in lakh)
A	**Environmental Management Plan**	
1	Biodiversity Conservation and Wildlife Management Plan	60.00
2	Catchment Area Treatment Plan	294.00
3	Fisheries Conservation and Management Plan	113.54
4	Command Area Development Plan	1200.00
5	Rehabilitation and Resettlement Plan	24500.00
6	Landscaping, Restoration and GB Development Plan	78.00
7	Reservoir Rim Treatment Plan	65.00
8	Muck Management Plan	500.00
9	Solid Waste Management Plan	92.50
10	Public Health Delivery System	150.00
11	Energy Conservation Measures	150.50
12	Disaster Management Plan	100.00
13	Compensatory Afforestation Plan	9862.635
14	Implementation of Mitigation and Safety Measures	125.00
15	Environmental Monitoring Plan	111.95
Total A		37403.125
B	**Corporate Environment Responsibility Plan**	1305.27
Total (A+B)		**38708.395**

EAC observed that Dam Break Analysis has been carried and Disaster Management Plan proposed for a dam of maximum height of 23 m and suggested that dam break is relevant only for large dams i.e. with height ≥30 m.

EAC enquired about the environment flow for downstream users. It was explained that the catchment area at dam site is 1490.72 km^2 and yield is 540.0 MCM in 75% dependable year, which is substantially higher than live storage of reservoir (282.82 MCM) and water for irrigation is only 252.37 MCM. 99% of the river discharge is in monsoon period i.e. out of total 75% dependable year, an yield of 540 MCM at dam site and 5.64 MCM is in non-monsoon period. Available yield is about 1.8 times of the storage capacity, hence in monsoon sufficient surplus water will be available in the river downstream of the dam. During non-monsoon season, in order to provide adequate water to downstream users and for the survival of aquatic life in the river, entire available 5.64 MCM water during non-monsoon season shall be released as environmental flow.

After detailed deliberations, EAC made the following observations:

1. NOC from Govt. of Uttar Pradesh has not been obtained and submitted during the final presentation of EIA/EMP report.
2. The environmental impacts be assessed on the basis of Environmental Matrix and the same should be detailed out in the report.
3. Point wise response to issues raised during Public Hearing should be submitted.
4. Corporate Environment Responsibility Plan should be prepared in detail and submitted with break up.
5. Specific activities should be suggested and budget to be taken under CSR activities proposed to be implemented.

Keeping in view, the project proposal has been **deferred** and shall be reconsidered in a subsequent EAC meeting.

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Item No. 25.5 **Damanganga–Vaitarna-Godavari Intrastate Link project by M/s Executive Engineer, Nandpur, Madhyameshwar Project Division, at Thane district, Maharashtra- Regarding Fresh ToR.**

Proposal No. IA/MH/RIV/83263/2018, File No. J-12011/02/2019-IA-1 (R)

The PP applied online on 28.06.2019 for implementation of Damanganga–Vaitarna-Godavari Intrastate Link project by Govt. of Maharashtra to divert the surplus waters of west flowing rivers of Damanganga and Vaitarna basins to east flowing Godavari river basin to cater the domestic & industrial and irrigation (11,480 ha CCA) needs of drought prone Sinnar Taluk of Nasik district in Upper Godavari sub-basin. The PP informed in writing on 17.07.2019 that the PP is not in readiness for presentation and requested to defer the appraisal and may be given another opportunity for presentation of the proposal. Accordingly, the proposal was **deferred.**

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Item No. 25.6 **Rahi Chu HEP (25 MW) in North Sikkim District of Sikkim by M/s. Sikkim Engineering Pvt. Ltd-Regarding Fresh Environmental Clearance.**

Proposal No. IA/SK/RIV/27514/2015, File No. J-12011/11/2015-IA-I

Project proponent along with the consultant M/s R.S. Envirolink Technologies Pvt. Ltd, 402, Bestech Chamber Commercial Plaza, B Block, Sushant Lok I, Gurgaon, Haryana presented the proposal before the EAC and *inter alia*, provided the following:

The present project is proposed on river Rahi Chu near village Saffo in District North Sikkim of Sikkim. The project envisages construction of a trench weir across river Rahi Chu with an installed capacity of 25 MW. This is a run-of-the-river scheme. Rahi Kyoung Hydro Electric Project would involve construction of a 3.5 m wide and 21 m long trench weir across the Rahi Chu River. A feeder channel of length 31 m will carry the water from the intake to the surface de-silting basin. The Head Race Tunnel (HRT) would be D-shaped of finished size 2.6 m (W) × 3.05 m (H) and would be about 2.462 km long. The Installed Capacity of the Project would be 25 MW comprising three generating units, each of 8.33 MW capacity.

The catchment area of the project is 53.50 km^2. Precipitation in the catchment of the Rahi Chu is primarily in the form of rain and marginally in the form of snow. The average annual rainfall in the rain-fed area and snow-fed area of the catchment of Rahi Chu worked out to be 2,799 mm and 2,661 mm, respectively. The discharge data of Teesta IV (near Sankalang), by applying the volume of annual precipitation ratio was considered appropriate to derive the discharge data of the Rahi Chu river at diversion weir site of Rahi Chu HEP, accordingly, ten-daily discharge series were developed for 23 years from 1989-90 to 2011-12 and year 2003-2004 was considered as 75% dependable year.

Total land requirement is 15.5558 ha, out of which 4.7685 ha is forest land, and 10.7873 ha is private land. Since the project is trench weir type, no submergence is envisaged. An underground/surface powerhouse is proposed with 3 units of 8.33 MW capacity each. As per the Socio-Economic survey, only Salim Pakyel village shall be partially affected due to acquisition of land for various components of proposed Rahi Kyoung HE project. There are about 40 households having 124 nuclear PAFs who are likely to be affected. The total number of affected population is 252. None of the families are going to get displaced. R&R Plan has been prepared keeping in view the provisions of RFCT_LARR, National and State Policy to ensure that adequate benefits are given to the PAFs. The total cost of project is about Rs. 215 crores.

The Primary data for Baseline Environmental Conditions was collected through field surveys for three seasons of the year: Winter / Lean season (January 2016), Summer season (May 2016), Monsoon season (August 2015) and additional one season study i.e. Summer season was undertaken during May-2019.

Ambient Air Quality Monitoring was carried out at 6 locations in the study area. SO_2 concentration observed ranged from 2.1 to 7.1 $\mu g/m^3$, NO_2 values ranged from 5.9 to 12.8 $\mu g/m^3$, PM_{10} values ranged from 6.2 to 18.2 $\mu g/m^3$ and $PM_{2.5}$ values ranged from 3.1 to 12.0 $\mu g/m^3$. The level of pollutant observed at various sampling stations was much lower than the permissible limit of the National Ambient Air Quality Standard notified by CPCB.

Noise monitoring was carried out at six locations in the study area. It was observed that the Ambient Noise Levels in and around proposed Rahi Kyoung HEP sites was well within acceptable limits of Residential area.

The sampling was carried out for water quality assessment at 6 different locations on Rahi Chu, Tolung Chu and Teesta river in proposed study area for the evaluation of water and limnological parameters. All the parameters of surface water stand below the desirable limit of water quality standard (IS: 10500). WQI for sampling sites of Rahi Chu was Excellent in quality during all seasons.

Flora and Fauna: Quadrat sampling was undertaken at 6 different locations for carrying out phytosociological surveys of the vegetation. Based on the available information and filed surveys conducted, an inventory of 237 plant species in the study area has been prepared. This includes species of angiosperms, pteridophytes, bryophytes and lichen.

The mammalian species sighted in the study area includes Assamese macaque (*Macacaassamensis*) and Himalayan striped squirrel (*Tamiopsmcclellandii*). Besides these, no other wild animals were sighted during field investigation. However, based on secondary sources six mammals reported in the study area fall under the category RET fauna. Snow Leopard (*Panthera uncia*) and Red Panda (*Ailurus fulgens*) are under Endangered category, Himalayan black bear (*Ursusthibetanus*) and Common Leopard (*Panthera pardus*) is falls under Vulnerable category and Goral (*Naemorhedusgoralcomes*) and Assamese macaque (*Macacaassamensis*) are under Near Threatened category as per IUCN Red list of Threatened Species.

A total of 39 species of bird species belonging to 21 families was compiled based upon sighting during field survey as well as secondary data. Aquatic ecology: with the help of published literature and consultation with local a total of 22 species could be confirmed from the Teesta river and Tolung Chu. However, no fish species were reported from the upper catchment of Rahi Chu. As per IUCN, *Tor putitora* and *Schistura kangjupkhulensis* was under Endangered category, 2 species *Schistura devdevi* and *Bagarius bagarius* are under Near Threatened category and 3 species *Schizothorax richardsonii*, *Cyprinion semiplotum* and *Cyprinus carpio* falls under Vulnerable category in the study area.

PP presented the anticipated environment impacts due to proposed project during the project construction & operation phase various short & long term impacts are envisaged like immigration of Construction Workers, Muck Disposal: impacts due to road construction, Impact on Water Quality, Sewage from Construction worker Camps, Effluent from Construction Plants and Workshops, Impact on Terrestrial Flora, Impact on Terrestrial Fauna, Disturbance to Wildlife, Impact on Noise Environment, Impact on Air Quality, Impact on Socio-economic Environment etc. For effective mitigation of the envisaged impacts detailed management measures were proposed under Environmental Management Plan like Biodiversity Conservation & Wildlife Management Plan, Muck Management Plan, Solid Waste Management Plan, Public Health Delivery System, Catchment Area Treatment Plan, Fisheries Conservation and Management Plan, Energy Conservation Measures, Landscaping, Restoration & Green Belt Development Plan, Compensatory Afforestation Plan, Environmental Monitoring Plan, Rehabilitation & Resettlement Plan and Corporate Environment Responsibility Plan.

The costs involved for implementation of Environmental Management Plan and Monitoring Plan for Rahi Kyoung HE Project are summarized in the table given below. The total expenditure on Environmental Management Plan will be about **Rs. 1976.10 lakhs.**

S. No.	Management Plan	Amount (Rs. in lakh)
1.	Biodiversity Conservation & Wildlife Management Plan	70.00
2.	Catchment Area Treatment Plan	45.00
3.	Fisheries Development Plan	33.23
4.	Solid Waste Management Plan	73.70
5.	Public Health Delivery System	87.40
6.	Energy Conservation Measures	81.10
7.	Muck Dumping Plan	178.00

S. No.	Management Plan	Amount (Rs. in lakh)
8.	Landscaping, Restoration & Green Belt Development Plan	32.21
9.	Air & Water Management Plan	33.00
10.	Compensatory Afforestation Plan*	123.96
11.	Rehabilitation and Resettlement Plan	794.00
12.	Corporate Environment Responsibility Plan	322.50
13 .	Environmental Monitoring Program	102.00
Total		**1976.10**

**Actual cost of Compensatory Afforestation will be finalized by forest Department.*

Project benefit: The Project is a renewable green source of energy and helps to reduce carbon foot-print, direct and In-direct economic opportunities like employment opportunities petty work contracts, machinery hiring, business opportunity etc., Infrastructure development contracts (roads, retaining walls etc.). Further, as a part of CER/LADP area development and community development activities like Training Courses for Local Youth, Tailoring, Knitting & Embroidery Training Centers, Computer Courses, Emergency Medical Response, Vocational Training, Nursing/Paramedics Training, Literacy Promotion Programme, General Welfare Activities, Sports Promotion Schemes etc. are proposed.

Terms of Reference to the proposed project was issued by the Ministry vide letter dated 14th July, 2015. As per the provisions of EIA notification, 2006, Public Hearing was conducted by the Sikkim State Pollution Control Board, on 20.04.2017 at Saffo Gumpa Ground, North Sikkim and presided by the District Collector. Main issues raised during PH were related to job opportunity, project benefits, provision of education/hostel facility, scholarship, develop dairy farming and promote ecotourism and organic farming in the villages, maintaining the road and maintain sufficient flow of water in river water during lean season, permanent source for safe drinking water, construct/install garbage disposal machine along with sanitation facility, primary health center etc.

Application for diversion of 4.7685 ha of forestland (online application) has been submitted to MoEF & CC vide proposal No.: FP/SK/HYD/18894/2016. Initial application for Environmental Clearance was submitted in May, 2019. Subsequently EDS was raised and thereafter reply to EDS was submitted on 13.06.2019.

The EAC observed that baseline data collected for two seasons (Winter / Lean season (January, 2016), and Monsoon season (August 2015)) was more than three years old at the time submission of initial EC application (May 2019). Accordingly, EDS was raised regarding base line data to be collected afresh. EAC further observed that PP collected base line data afresh for one season (summer season, Ma 2019) only. EAC deliberated on the information provided by the PP and deferred the project for want of following information:

i. ToR was issued to Rahi Chu HEP (25 MW) project whereas in EIA reports project name is Rahi Kyoung HEP. Clarification is to be submitted in this regard.
ii. Baseline data for environmental attributes to be collected afresh for monsoon & winter season.
iii. Submission of certificate from Chief Wildlife Warden that project component falls outside the ESZ of the Khangchenzonga National Park.
iv. An undertaking /declaration from the PP / Consultant be submitted mentioning that the content / data of the EIA report are solely owned by them.
v. Content of the summary EIA be made as per the Appendix III A of EIA Notification and to be submitted.

vi. The details of funds allocation along with the time line and activities under CER as per Ministry's O.M. No. 22-65/2017-IA.III dated 1st May, 2018 shall be submitted.
vii. Environmental matrix during construction and operational phase needs to be submitted.
viii. Fish species list needs to be reviewed and supported with photographic evidence.
ix. Environmental flows seasonal (monsoon, pre/post monsoon) requirement for the Schizothorax fish species must be estimated.
x. CER cost should not be included in the EMP cost. Therefore, the costs involved for implementation of Environmental Management Plan shall be revised.
xi. Both capital and recurring expenditure under EMP shall be submitted.
xii. As per the Form 2, No Schedule I species in the project affected/studies area. However, in EIA report submitted various Schedule I species are reported. Justification in this regard is to be submitted.
xiii. QCI & NABET Accredited certificate of the consultant for the period during which baseline data and other EIA/ EMP studies carried out needs to be provided.
xiv. Approved conservation plan for Schedule I species from Chief Wildlife Warden, if any in the project site, should be submitted.

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Item No. 25.7 Parbati (Rinsi) major Irrigation Project in Rajgarh district of Madhya Pradesh by M/s EEWRD NARSINGHGARH- Regarding Fresh Environmental Clearance.

Proposal No. IA/MP/RIV/71975/2017, File No. J-12011/01/2018-IA-I

PP presented the anticipated environment impacts due to proposed project during the construction and operation phase. Irrigation schemes in general do not have much impact on air environment during their operation, however, due to construction activities such as excavation, movement of material, operation of construction equipment, storage of material, etc. air pollution do occur requiring control by mitigation measures. In an irrigation project, air pollution occurs mainly during project construction phase. During operation phase, no major impacts are envisaged.

During construction period sources of noise will be the vehicles and equipment for excavation and construction at the project site. Due to construction activity in the area, noise levels will increase during the period of construction. However, they will remain limited to the work area mainly where large-scale construction activity will progress. Additionally, noise levels will increase on approach roads due to increased traffic. However, no major impacts are envisaged on noise environment during project operation phase.

Water is used in construction activities leading to wastewater generation with high suspended solids. Similarly, effluents due to washing from truck or equipment, etc. would have high concentration of oil and grease. Assessment of quantum of wastewater from such activities is difficult, however, they can impact the nearby water bodies if surface run off with high suspended solid is washed into them. The major impacts during operation of project considered as a part of the study are i) Improvement of Ground water level; ii) Impacts on waterlogging and soil salinity; iii) Changes in water quality due to increased use of fertilizers.

Also, Impact Due to Muck Generation, Waste Generation, Land Requirement and change in land-use, Terrestrial Ecology and on Socio-economic Environment were studied.

An amount of **Rs. 13218.16 lakhs** has been allocated for the implementation of Environmental Management Plan and Corporate Environment Responsibility Plan for Parbati Major Irrigation Project are summarized in the table given below.

S. No.	Management Plans	Amount (Rs. in lakh)
A	**Environmental Management Plan**	
1	Biodiversity Conservation And Wildlife Management Plan	130.00
2	Catchment Area Treatment Plan	360.89
3	Fisheries Conservation and Management Plan	91.00
4	Command Area Development Plan	750.00
5	Rehabilitation and Resettlement Plan	9959.50
6	Landscaping, Restoration and Green Belt Development Plan	78.00
7	Reservoir Rim Treatment Plan	65.00
8	Muck Management Plan	300.00
9	Solid Waste Management Plan	92.50
10	Public Health Delivery System	147.00
11	Energy Conservation Measures	121.50
12	Disaster Management Plan	90.00
13	Implementation of Mitigation and Safety Measures	125.00
Total A		12310.39
B	**Corporate Environment Responsibility Plan**	907.77
Total (A+B)		**13218.16**

Terms of Reference to the proposed project was issued by the Ministry vide letter dated 26 Feb 2018. Instant project falls under category A as Narsinghgarh Wildlife Sanctuary is in close proximity of the project; hence general condition is applicable to the project. Revised Scoping Clearance due to change in dam site location so as to avoid project components falling within Narsinghgarh Wildlife Sanctuary was issued by MoEF & CC on February 22, 2019.

As per the provisions of EIA notification, 2006, Public Hearings (PH) for the Parbati Major Irrigation Project were conducted by Madhya Pradesh State Pollution Control Board (MPSPCB) on 02.03.2019 at Gram Panchayat Bhawan, Village Mangalgarh, Tehsil Bersia, District: Bhopal; 06.03.2019 at Gram Panchayat Bhawan, Village Chandbad, Tehsil: Shyampur, District: Sehore and 08.03.2019 at Gram Panchayat Bhawan, Village Shivpura Jagir, Tehsil: Narsinghgarh, District: Rajgarh. PH at Bhopal and Sehore was presided by the additional District Magistrate, respectively whereas at Rajgarh Sub Divisional Magistrate presided.

Project benefit includes **a**nnual Rabi irrigation of 48,000 ha, rise in sub-soil water level in the project Area, development of fisheries in the reservoir, employment to local labour during construction period, the ratio of submergence of Culturable land to the proposed irrigation is 7.44%.

PP submitted that project construction doesn't require acquisition of any forestland. All project components including the submergence area falls outside the boundary of Narsinghgarh WLS. A certificate has also been issued by DFO in this regard.

EAC deliberated on the information provided by the PP and **deferred** the project for want of following information:

i. An undertaking as part of the EIA report from Project proponent, owning the contents (information and data) of the EIA report with the declaration about the contents of the EIA report pertaining to a project have not been copied from other EIA reports.
ii. Content of the summary EIA be made as per the Appendix III A of EIA Notification and shall be submitted.
iii. The details of funds allocation along with the time line and activities under CER as per Ministry's O.M. No. 22-65/2017-IA.III dated 1st May, 2018 shall be submitted.
iv. Environmental matrix during construction and operational phase needs to be submitted.
v. Fish species list needs to be reviewed with photographic evidence.
vi. Both capital and recurring expenditure under EMP shall be submitted.
vii. Approved conservation plan for Schedule I species from Chief Wildlife Warden should be submitted.
viii. PH at Rajgarh district was presided by Sub Divisional Magistrate having rank below the Additional District Magistrate. Clarification in this regard is to be submitted.
ix. Provision of irrigation to kharif crop is to be explored.
x. Possibilities of fish passages needs to be included for better migration of local fish species.
xi. Details of ESZ of Narsinghgarh Wildlife sanctuary are to be submitted.
xii. In EIA report length of central spillway is mentioned 369.65 m long with 18 nos. of vertical gates of size 13.80x12.0 m whereas during presentation length of spillway was mentioned 311 m with 22 nos. of radial gates. Clarification is to be submitted in this regard
xiii. Maximum dam height mentioned in the EIA report is 25 m whereas in the presentation made before the committee it was submitted 23.40 m high. Clarification is to be submitted in this regard.

Item No. 25.8 Discussion on the report – Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam projects.

Background

The Dam Rehabilitation and Improvement Project (DRIP) is a program under the initiative of the Government of India with financial assistance of the World Bank which aims to mitigate the ageing in Indian dams by not only facilitating the reconditioning and structural upgrading of the participating dams, but also assisting in the development of institutional capacities for the safe operation of all dams in India. In this line, DRIP project has been conceptualized with three main components: Rehabilitation and Improvement of Dams and associated appurtenances, Institutional Strengthening and Project Management.

The first component (i.e. Rehabilitation and Improvement) focuses on structural and non-structural measures at 198 participating project dams, many of which are more than 25 years old. These rehabilitation measures address the safety concern of dam, population, environment and property downstream of dam in case of dam failure. As consequence of these rehabilitation measures (especially for structural measures) there could be location-specific cases where a sub-project activity in

isolation or in combination with other activities, may have substantial environmental and/or social impact.

Objective of The Document:

Presently, no guideline is available for managing the environmental impacts due to the dam rehabilitation works and guide the dam owners explicitly whether any advance action is required to address environmental protocols for executing a rehabilitation work. Depending upon the extend and location of the project as well as extent of environmental impacts, few of the rehabilitation activities may attract the statutory provisions for environmental clearance, forest clearance and wildlife clearance and the Dam owners have to obtain necessary clearance and approval in advance.

Keeping in view of the above, an effort has been made for preparation of a document with an objective to guide the dam owners to systematically address in advance the environmental safeguard requirements of the proposed dam rehabilitation projects in case it is applicable, and execute the relevant rehabilitation work safety and systematically without any concern to meet the particular timelines of a given project, facilitate the contract agencies to transport construction material, manpower and machineries without any hassle by taking necessary approval in advance from the concerned agency/department.

The guidelines have taken into consideration the environmental regulations & policies, lending agencies policies, other literatures and experience gained under DRIP to produce comprehensive Guidelines for all dam owners in India. The document provides:

- General overview of need and extent of environmental impact studies for dam projects,
- Policy and legal framework on environmental safeguards and applicability in Dam Projects
- Procedures for obtaining environmental, forest and wildlife clearances
- Procedures for conducting EIA study
- Good practices for managing environmental issues during different stages of the dam projects.
- Compliance requirements of the lending agencies such as World Bank and Asian Development for seeking financial assistance for the proposed project

Central Water Commission (CWC) constituted a Guideline Review Committee to review the Guideline and provide suggestions for finalization of the Guideline. The committee is as follows:

Chairman	Shri Gulshan Raj	Chief Engineer, Dam Safety Organisation, CWC, New Delhi
Member Secretary	Shri Pramod Narayan	Director, CWC, New Delhi & Project Director, DRIP
Member:		
Shri Nitya Nand Rai	Director, Hydrology (DSR), CWC, New Delhi	
Shri B.B. Saikia	Director, EM & EIA, CWC, New Delhi	

Shri Piyush Dorga	Sr. Environmental Specialist, World Bank, New Delhi
Dr. S. Kerketta	Director (IA.I), Ministry of Environment, Forest & Climate Change, Govt. of India, New Delhi
Shri Sharvan Kumar	Director, CEA, New Delhi

Based on the past experiences and anticipated dam rehabilitation works for upcoming projects, altogether 31 rehabilitation activities have been identified and analyzed for the applicability of different statutes & regulations. For the purpose, a matrix of identified 31 rehabilitation activities for the existing dam projects and applicability of statutory clearances/ permissions under EIA Notification, Forest Conservation Act, Wildlife Protection Act, 1972, etc. has been included in the document. The matrix of dam rehabilitation activities and the applicability of different statutory permissions / clearances are annexed as **Annexure-I**.

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Annexure-I.

Activity-wise Applicability of Environmental, Forest and Wildlife Clearances for Dam Rehabilitation and Improvement Works

Sl. No.	Types of Rehabilitation Works	Nature of Activities	EC	FC	WL Clearance	Remarks
1.	**Pointing of upstream face of masonry dams with special UV resistant mortar to control seepage.**	This activity is a localized activity limited to the U/S face of masonry dam. It requires grouting materials, light drills/ hand tools only with few manpower. This does not require any major equipments/ batching plant/Crusher. Materials for work (cement, sand, additives etc.) are to be brought to dam top for use.	No	No	No	If a given dam is located **within WLS/NP/PT** then permission is required from concerned department to transport construction material, manpower and equipments to the dam site.
2.	**Treatment of dam contraction joints for damaged seals using hydrophilic materials.**	This activity is localized at the transverse contraction joints of the dam. This activity requires drilling of hole at the transverse contraction joints of the dam and filling with hydrophilic materials. It is normally carried out from dam top spillway crest. Requires	No	No	No	

		transportation of drilling equipments to dam site and joint filler material along with few manpower				
3.	**Grouting of Masonry/Concrete dams to control seepage.**	This activity is confined to body of Masonry/ Concrete dam. This activity is carried out from dam top or spillway crest or from d/s face or from dam galleries.	No	No	No	
4.	**Reaming of porous drains and re-drilling of foundation drains.**	This is a localized activity. It is undertaken from dam top and from inspection/ foundation galleries.	No	No	No	
5.	**Replacement of rubber seals of the spillway gates, sluice gates and periodic overhauling of gate hoisting systems.**	It is a localized activity. Replacement of rubber seal require hand tools etc. Servicing/overhauling of gate require lubricants, painting works, transportation of materials, etc.	No	No	No	
6.	**Repair and replacement of spillway gates/under sluice gates or provision of additional stop log gates**	In the case of gate repair, it is a minor activity. In case gates are to be replaced, then it requires transportation of fabricated components of Gates/Stop logs using	No	No	No.	

		heavy duty cranes/ trailers supply of material and gates to the dam site.				
7.	**Repair or replacement of Gate Hoist/ Gantry Cranes**	Requires transportation of fabricated components of Gates/Shop logs using heavy duty cranes/ trailers, and assembly and installation of gantry on dam top etc.	No	No	No	
8.	**Provision of automation of spillway gates and control room structures.**	It is a localized work. It involves transportation of construction materials, concrete mixer, etc. for construction of control room. Automation of Gates require transportation of control panels and related equipments.	No	No	No	
9.	**Bringing the earth dam section to design section to address the stability aspect**	It is a minor and localized work, It requires survey works and transportation of selected earth from borrow areas, compaction equipment, etc.	No	No	No	If a given dam is located **within WLS/NP/TR** then permission is required from concerned department to transport construction material, manpower and equipments to the dam site.
10.	**Improvement of rip-rap, turfing on downstream face, chute drains, toe drains, rock toe and**	This activity is limited to the dam body, it involves transportation of requisite materials for carrying out of these works. These	No	No	No	

	general drainage system for earthen dams	works are to be carried out manually.				
11.	**Improvement of existing access road to dam body as well as existing access roads to different components of the dam project and dam crest railing.**	This activity involves transportation of construction materials, use of heavy equipments like road rollers, hotmix asphalt plant, paving machine etc.	No	No	No	
12.	**Providing security system to guard dam / project area.**	This work would be limited to project area only. It involves transportation of construction materials for fencing/security and construction of fencing to guard the dam / Project area	No	No	No	
13.	**Improving dam instrumentation and monitoring, SCADA and automation system of dams**	Involves carriage of the instruments, cables etc. to project site and their installation in the project area.	No	No	No	

14.	**Providing additional spillway structures/fuse plugs/flush bars to take care of hydrological safety**	Case(a) In this case, no public as well as forest land acquisition required, no R&R issues involved, no change in reservoir storage, no submergence, no increase in CCA of dam project, no flow modification during lean period etc.	Amendment in EC.	No	No	If activity falls within a WLS/NP/TR then permission is required from concerned department to transport construction materials, manpower and equipments to the dam site.
		Case(b) In this case, *some public/ forest land acquisition required, R&R issues involved,* no change in reservoir storage, no submergence, no increase in CCA of dam project, no flow modification during lean period etc. This is a major civil work, involving transportation of all construction materials and equipments, Hydro-Mechanical, electrical works including spill channel, etc. within the project area.	EC/ Amend-ment in EC is required	Yes, if forest land is to be needed.	Yes, in case activity falls in the WLS/NP/ TR areas.	The proposal may involve displacement of population living in the proposed layout of newly proposed spillway or living in water way of newly proposed spill channel connecting spillway and river to dispose off the flood water.

15.	**Raising height of dams to cater for increased design flood to address hydrological safety (No change in FRL)**	This is a major work within the dam body involving construction activities like earthwork, concrete works, H-M works. Also transportation of construction materials and equipment is involved. There is no change in the storage capacity of reservoir at the FRL. This is required for free board purposes only. Also, no change in CCA, no flow modification pattern, no submergence etc.	Amendment in EC	No	No	If activity falls **within WLS/NP/TR** then permission is required from concerned department to transport construction material, manpower and equipments to dam site.
16.	**Repair of spillway glacis, discharge channel and energy dissipation arrangements etc.**	It is a activity limited to existing spillway area, energy dissipation arrangements, and discharge channel. Involves transportation of construction materials, equipments for undertaking the repair works, and manpower within the dam compound area.	No	No	No	If activity falls **within WLS/NP/TR** then permission is required from concerned department to transport construction material, manpower and equipments to dam site.
17.	**Survey and mapping of cracks and its**	This is limited to the dam body only. Require hand	No	No	No	

	remedial measures	tools, repair materials, and manpower.				
18.	**Dredging/ De-siltation of dam reservoirs on selective basis.**	This is an activity limited to reservoir water spread area. It requires boats and equipments for bathymetry, heavy equipments/ carriers for removal of silt deposited in the pond/reservoir, and transportation to the approved dumping area. This activity generally is a part of maintenance to restore the original capacity of reservoir.	No Dredging and de-siltation of dams, reservoirs, weirs, barrage, river and canals for the purpose of their maintenance, upkeep and disaster management is exempted from EC as per S.O.141(E) of MoEFCC dated 15th January, 2016	No	(a) No, in case reservoir is not a declared bird sanctuary. (b) Yes, in case reservoir is a declared Bird Sanctuary	In the de-siltation activity, a proper Feasibility Report along with EMP to dispose the silt is required as per the Handbook for Assessing and Managing the Reservoir Sedimentation, CWC, 2019. NOC from SPCB/ UTPCC as well as concerned local authorities is required in advance for disposal site for disposal of dredged materials.
19.	**Provision of standby DG Sets, dewatering**	These are very minor items, and their	No	No	No	

	pumps etc.	installation is limited to the dam compound only.				
20.	**Geo-membrane sealing system for upstream face treatment of dams**	This is a localized work. It involves transportation and storage of geo-membrane materials, equipment and manpower to the dam site.	No	No	No	If activity falls **within WLS/NP/TR** then permission is required from concerned department to transport dredged material, manpower and equipments to dam site, as well as to disposal site.
21.	**Repair of sluice outlet structures & Fish Passes and Ladders**	This is a localized work. It is limited to sluice outlets only, which is within dam body and overflow section of dam and very minor spatial extent. It involves transportation of materials and equipments to the dam.	No	No	No	
22.	**Downstream face pointing with mortar**	This is a minor activity and localized work. It involves transportation of materials, equipments and manpower to the dam site. It is managed by few persons with small supporting equipments etc.	No	No	No	
23.	**Grouting of embankment dam**	This is a minor activity and localized work. It is	No	No	No	

	(with low pressure slurry) & foundation curtain	limited to dam body only. It involves transportation of materials and equipments to the dam.				
24.	**Provision or repair of parapet wall**	This is a minor activity and localized work. It involves transportation of materials and equipments to the dam.	No	No	No	
25.	**Providing backing concrete to dam for stability improvement**	This is a localized but major work. It involves transportation of materials and equipments to the dam.	No	No	No	If activity falls **within WLS/NP/TR** then permission is required from concerned department to transport dredged material, manpower and equipments to dam site, as well as to disposal site.
26.	**Catchment Area Treatment (CAT) and Reservoir rim treatment**	This activity is widespread within the dam catchment. Generally this activity is executed by Agriculture department/Forest department/ Watershed department of a given State. It involves transportation of materials and equipments for slope stabilization,	No	No,		The proposed CAT works in forest area will be carried out by the forest department, whereas in the non forest area CAT works will be responsibility of the dam authority.

		check dams, sapling etc. Also this activity is very rare and exceptional in the rehabilitation Project as it is done at the time of construction of a new Project.				
27.	**Various kind of investigations i.e. geo-technical, underwater, survey, geo-physical/sonic tomography etc.**	These activities are limited to dam compound only, and may require movement of experts/technician with few manpower to support the investigations etc.	No	No	No	
28.	**Pre and post Bathymetry survey for de-siltation of dam or for physical modelling inputs**	This is a specialised activity have spatial extension to cover the water spread area of reservoir upto FRL/MWL. It may require one or two motor boat alongwith necessary bathymetry equipments, and 3 to 4 supporting manpower	No	No	No	
29.	**Development of dam tourism, water recreation facilities, incidental power, in-situ conservation of fisheries, etc.**	This is an activity which may require initial planning, survey, design and preparation of Feasibility Report requiring movement of few experts, survey team				If activity falls **within WLS/NP/TR** then permission is required from concerned department to transport dredged material, manpower

		with requisite equipments etc.				and equipments to dam site, as well as to disposal site.
		The execution and implementation of dam tourism activity may require construction of some landscaping structures, opening of restaurants, public conveniences, licences to authorised agencies expert in water recreations, movement of tourist etc.	No	No	No	
		Development of high end fisheries, this activity is limited to reservoir water spread area.	No	No	No	
		Incidental solar/hydel power, the incidental solar power is limited to dam compound only, also incidental hydel power is a very rare activity and exceptional under rehabilitation Project, and various scenarios may arise in case it is being developed	Yes, if IC of HEP is >25 MW	No/ Yes	No/Yes	

		during the rehabilitation project depending upon the proposal which needs to be examined accordingly				
30.	**Establishment of telemetric stations, automatic weather stations and other equipments for integrated flood forecasting and reservoir operation etc.**	These are point activities generally do not have any spatial extent and limited to installation of equipments along with their transmission network	No	No	No	If activity falls within a sanctuary area, tiger reserve or national park, then permission is required from concerned department to transport dredged material, manpower and equipments to dam site, as well as to disposal site.
31.	**De-weeding of Dam body/ Reservoir**	This is localised activities confined to embankment & Dam body	No	No	No	

The EAC recommended few additions and changes in the matrix, which has been incorporated and recommended the Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam projects for its implementation after approval of the competent authority.

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Item No. 25.9 **Teesta-IV HEP (520 MW) project in North Sikkim District of Sikkim by M/s. NHPC Ltd- Regarding Amendment in Environmental Clearance.**

Proposal No. IA/SK/RIV/10139/2012, File No. J-12011/67/2008-IA-I

The Project Proponent (PP) applied for Amendment in Environmental Clearance for the proposed project online on 12.04.2019 for the proposed project in light of the Hon'ble NGT order dated 15.11.2017 in the matter of Application No.11/2014 (Tenzing Lepcha & Ors. Vs UoI and Ors). The PP along with the Consultant, M/s CIFRI, Barrackpore made a presentation of the proposal in the EAC meeting held on 23.04.2019 and after detailed deliberation, the EAC in the meeting sought the following additional information:

After the detailed deliberations on the issue, the EAC desired some additional information regarding the calculation done by CIFRI for arriving at the figure of 20 m^3/ sec for the desired depth of 0.6m. EAC also deliberated and mentioned that the Manning Coefficient taken for such studies is on quite higher side. EAC desired that the calculation done by the CIFRI may be presented before EAC in its next meeting. EAC have also sought clarification on the occurrence of Golden Mahaseer in the study area, which has otherwise been reported to occur in the Teesta river.

The PP submitted the additional information online on 20.06.2019. Accordingly, the PP made a presentation of the proposal based on the additional information provided by CIFRI and *inter-alia*, presented the following:

During the course of study, a total of 7.3 km stretch of Teesta river flowing down stream of Stage - IV HE Project dam axis up to TRT (reservoir tail end of Teesta-V Project) was surveyed during February-April, 2018 and both biotic & abiotic sampling was undertaken for generating the current status on river hydrology, river habitat and biological data including fish and fish food organisms. The survey was conducted in the form of direct site visit, observation from top view, secondary information collection from project officials and other sources on hydrobiology, diversity of plankton, fish species diversity and their migration pattern.

Based on the field surveys and data collected through secondary sources, it was found that *Snow Trout* was the most dominant fish species at the selected sampling sites in Teesta-IV Project area as such e-flow estimation has been done keeping in view that *Schizothorax richardsonii* as the target species. A minimum depth of 0.6 m with a flow velocity of 0.4 m/s would be essential for maintaining the spawning grounds or habitat for *Schizothorax* sp. particularly for the juveniles and other indigenous fish species.

In order to estimate the e-flow as per requirement of target species, hydrodynamic modeling has been carried out in the river stretch between Teesta-IV dam and TRT outlet using HEC-RAS software using available river cross-sections. The flow depths and velocities at different locations along the reach were worked out for discharges ranging from 15 cumecs to 19 cumecs considering two scenarios i.e. (i) without contribution from intermediate tributaries and (ii) with intermediate contribution at locations where tributaries meet the main Teesta river.

Simulation results for discharges ranging from 15 cumecs to 19 cumecs without any contribution of intermediate streams provides an average depth in the range of 1.22 m to 1.33 m and velocity ranges from 1.23 m/s to 1.32 m/s. With the contributions from intermediate

tributaries, the average depth and velocity ranges from 1.31 m to 1.41 m and from 1.31 m/s to 1.39 m/s, respectively.

During study, it has found that the recommended dedicated discharge (18 m^3/sec) from the dam was adequate for sustaining fish species during non-lean/non-monsoon months (March to May, October) as this release will suffice the requirement of minimum depth and flow velocity essential for maintaining the spawning grounds or habitat for *Schizothorax* sp. particularly for the juveniles and other indigenous fish species. The flows from the natural streams/nallas between the proposed dam and powerhouse would further augment the water availability for the aquatic life.

In view of the additional study and considering the need for a dependable ecological flow scenario for sustenance of *aquatic biota*, it has been recommended that a dedicated flow release of 18 m^3/sec from the proposed Teesta IV dam be made.

Regarding the occurrence of Golden Mahaseer in project area, referring to various study reports including their own studies during 2009-10, it was mentioned that although Golden Mahaseer has been historically reported to occur in Teesta river below the elevation of 850 m, the study could not confirm their occurrence between proposed Teesta IV dam and Powerhouse during 2009-10 and 2018 of the studies. However, during 2009-10, it was found in Dead Khola, approximately 7.5 km downstream of Teesta-IV Dam, i.e. near powerhouse area. It was also explained that the depth and flow velocity achieved from 18 cumecs during non-lean/ non-monsoon shall also suffice the requirement of Golden Mahaseer, if any.

In view of above, the PP proposed that Specific Condition No. (vi) related to e-flow in the EC may suitably be amended to indicate minimum environmental flow of 15 cumecs during lean months (November- February), 18 cumecs during non-lean/non-monsoon months (March-April and October) and 20 cumecs during the monsoon months (June-September) for sustenance of the aquatic life in the downstream.

After detailed deliberations on the matter, the EAC observed that the e-flow recommendation of 18 m^3/s was found to be adequate for sustenance of aquatic life in the downstream of Teesta-IV dam including the target *Schizothorax species*. The EAC also observed that though the occurrence of Golden Mahaseer has not been reported in the area, the depth and velocity of water estimated to be achieved with the e-flow release of 18 cumecs during non-lean/ non-monsoon season and would be sufficient for the sustenance of Golden Mahaseer as well. **Accordingly, the EAC recommended for amendment of e-flow condition as proposed by PP.**

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Item No. 25.10 Any other time with the permission of the chair.

As no agenda item was left for discussions, the meeting ended with thanks to the Chair.

Subject: **Re: Draft MOM 25th EAC-reg.**
To: Dr S Kerketta <s.kerketta66@gov.in>
Cc: S Kerketta <suna1466@rediffmail.com>

Date: 08/05/19 03:52 PM
From: Sharad Jain <s_k_jain@yahoo.com>
Reply-To: Sharad Jain <s_k_jain@yahoo.com>

25th EAC Hydro MOM_05.08.2019.docx (126kB)

Dear Dr Kerketta,
I am sending the approved minutes of the 25th EAC meeting.

Regards,

Sharad K Jain / शरद कुमार जैन
Director, NIH Roorkee and Chairman, EAC (RVH)
Tel: 01332 272106

On Monday, 5 August, 2019, 11:59:33 am IST, Dr S Kerketta <s.kerketta66@gov.in> wrote:

Sir,

PFA for kind approval please.

regards,

Kerketta

On 08/03/19 03:44 PM, **Sharad Jain** <s_k_jain@yahoo.com> wrote:

LIST OF MEMBERS

25th MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR RIVER VALLEY & HYDROELECTRIC PROJECTS

DATE : **19th July 2019**

TIME : **10:30 am onwards**

VENUE : **Teesta Hall, Indira Paryavaran Bhawan, New Delhi**

Sl.No.	Name of Member	Signature
1.	Prof. Sharad Kumar Jain, Chairman	
2.	Shri. T. P. Singh Member	Resigned.
3.	Shri. Sharvan Kumar, Member	19.7.19
4.	Shri N. N. Rai, Member	19.7.19
5.	Dr. J.A.Johnson, Member	19/7/19
6.	Dr. AK Sahoo, Member	19/7/19
7.	Dr. Vijay Kumar, Member	Abs
8.	Prof. Govind Chakrapani, Member	Abs
9.	Dr. Chetan Pandit, Member	
10.	Dr. Dinkar Madhavrao More, Member	
11.	Prof. R.K. Kohli, Member	Abs.
12.	Prof. S.R. Yadav, Member	
13.	Dr. Jai Prakash Shukla, Member	
14.	Dr. Poonam Kumria, Member	
15.	Dr. Kerketta, Member Secretary Director (IA-1)	19/7/2019