Minutes of the 30th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects held on 27th January, 2020 at Teesta Hall, 1st Floor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–110003.

The 30th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 27.01.2020 with 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 Chetan Pandit	-	Member
5.	Dr. D.M. More	-	Member
6.	Dr. S.R. Yadav	-	Member
7.	Dr. J.P. Shukla	-	Member
8.	Dr. (Mrs.) Poonam Kumria	-	Member
9.	Dr. S. Kerketta	-	Member Secretary

Shri N.N. Rai, Dr. A.K. Sahoo, 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. 30.0 Confirmation of the minutes of 29th EAC meeting.

The following corrections/modifications are to be incorporated in the Minutes of the 29th EAC meeting held on 27.12.2019.

Item No. 29.1 Cumulative Impact Assessment and Carrying Capacity Study of Hydroelectric projects in Sutlej River Basin in Himachal Pradesh including less than 10 MW projects- reconsideration of the draft report.

- Page 6, Section 3 Environmental Flow.
 Recommendation II, III and IV be corrected and read as "EFR requirement for Fish Zone", instead of "EFR Requirement for No Fish Zone".
- Page 6, Recommendation III be corrected and read as EFR Requirement for Fish Zone
 April, May October and November 20% of the actual inflow (of 90% dependable year) or Flow at required water depth whichever is more".
- (iii) Page 14 of the Minutes, Annexure I, is corrected and enclosed.

Thereafter the minutes of the 29th EAC (River Valley Hydroelectric Project) meeting held on 27th December, 2019 were confirmed.

Item No. 30.1 Dagmara Multipurpose Hydropower Project (I/C 130 MW) on Kosi River, District Supaul, Bihar by Bihar-State Hydro-Electric Power Corporation - reg. consideration of fresh ToR. File No. J-12011/01/2020-IA.I (R), Proposal No. IA/BR/RIV/129586/2019

The project proponent along with Consultant Mantec Consultant Pvt. Ltd

(NABET/EIA/1619/SA 083 (Rev. 01) dated November 14, 2019) presented the proposal and *inter alia* provided the following information:

The Dagmara Multipurpose Hydropower Project envisages utilization of water flows in Kosi River, for power generation, flood control and other benefits. Project envisages construction of an Earthen dam and concrete barrage, a second barrage at Dagmara downstream of existing Bhimanagar barrage across the Kosi River with fully gated spillway and a surface powerhouse.

The proposed project is located near village old Bhaptiahi on left bank, about 31 km downstream of Bhimnagar barrage on Kosi River in district Supaul of Bihar. The proposed barrage site is located at Latitude: 26°18'50.4" N, Longitude: 86° 45'32.4" E on Eastern Embankment (Left Side) and Latitude: 26°21'25.2"N, Longitude: 86°42'3.6" E on Western Embankment (Right Side). The project site is about 250 km away from Patna and well connected by road. National Highway NH-57, which connects Purnia to Muzaffarpur via Forbesganj and Darbhanga is crossing the Kosi river just 10 km downstream of proposed Dagmara barrage and is approachable from both ends of the proposed barrage via embankment roads.

Proposed Dagmara Multipurpose Hydropower Project is a multipurpose Run-of-River scheme with a gross head of about 5.87 meter for power generation. The project envisages construction of a concrete barrage of 945.5 m length and earthen dam of about 5,750 m length across Kosi River. Surface powerhouse of length 381.50 m having 17 units of installed capacity of 7.655 MW each (Proposed Total Installed Capacity 130 MW (17x7.65). The spillway has 40 Nos. of bays with opening of 18 m wide x 8 m high to pass 27,000 cumecs flood. The pondage level is optimized at elevation of 65.50 m at which the submergence area is of about 7790 ha retaining about 255.83 MCM of water.

PP informed that earlier Bihar State Hydroelectric Power Corporation (BHPC) got prepared a Pre-Feasibility Report in respect of Proposed Dagmara H.E. Project and further signed an agreement with WAPCOS Limited in September 2007 to prepare a Detailed Project Report at a location about 22.5 km downstream of Bhimnagar barrage on Kosi River. However, since the submergence area of project at that location was extending in to Nepal territory, the location was shifted further downstream by about 8.5 km (RD 31 km from Bhimnagar Barrage) to restrict the submergence area in Indian Territory only and a PFR for 130 MW HEP was prepared by BHPC Ltd.

Total land requirement for the project is 7860.35 ha. Out of which submergence area is 7790 ha. Total estimated cost of the project is Rs. 2553.63 Crores. As far as project benefit is concerned, proposed multipurpose project will not only arrest the Kosi flood events but will also develop the scope for several development and recreational activities. The project will be a boost to power generation status of the Bihar. This will create opportunities of employment and will encourage eco-tourism in the area.

PP submitted in the Form 1 that there is no Protected Area notified under the Wild Life (Protection) Act, 1972; Critically Polluted areas as identified by the CPCB constituted under the Water (Prevention and Control of Pollution) Act, 1974; Eco-sensitive areas as notified within 10 km of the Project boundary.

EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and after detailed deliberation on the information submitted and as presented, the EAC **recommended** for grant of Standard ToR to the proposed project with the following Additional ToR conditions:

- 1. Land acquired for the project shall be suitably compensated 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.
- 2. The project involves diversion of forestland, if any, then Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980.
- 3. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980 for diversion of forest land required should be submitted as soon as the actual extent of forest land required for the project is known, and in any case, within six months of issuance of this letter.
- 4. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/EMP report in the relevant chapter.
- 5. 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.
- 6. Funds allocation for Corporate Environment Responsibility (CER) shall be made as per O.M. No. 22-65/2017-IA.III dated 01.05.2018 for various activities therein.
- 7. The details of funds allocation and activities for CER shall be incorporated in EIA/EMP report.
- 8. Consolidated EIA/EMP report is to be submitted as per the generic structure (Appendix III & IIIA) given in the EIA Notification, 2006.
- 9. Conservation plan for the Scheduled I species, if any, in the project study area shall be prepared and submitted to the Competent Authority for approval.
- 10. Hydrological studies approved by the CWC shall be submitted.
- 11. Dam break analysis and Disaster Management Plan be prepared and submitted in the EIA/EMP report.
- 12. Environmental matrix during construction and operational phase needs to be submitted.
- 13. Both capital and recurring expenditure under EMP shall be submitted.
- 14. Management plan for handling sediments shall be submitted.
- 15. Detail plan to avoid submergence in Nepal be prepared and submitted.
- 16. Impact of proposed project activity on the nearest wildlife habitat, if any shall be studies and conservation plan shall be prepared accordingly.

Item No. 30.2 Expansion of Tubachi-Bableshwar Lift Irrigation Scheme (CCA: 52,700 ha) in Bagalkot District of Karnataka by M/s Karnataka Neeravari Nigam Ltd., Government of Karnataka–reg. consideration of fresh EC File No. J-12011/05/2015-IA-I, Proposal No. IA/KA/RIV/70372/2017

The project proponent along with Consultant M/s Environmental Health and Safety Consultants Pvt. Ltd (QCI/NABET/EIA/1821/RA 0107 dated 19.11.2018), presented the proposal and *inter alia* provided the following information:

Tubachi-Bableshwara Lift Irrigation Scheme was accorded Environmental Clearance by the Ministry of Environment, Forest and Climate Change, New Delhi on 31.07.2017 to irrigate 42,000 ha of command area by utilizing 3.8 TMC of water from Krishna River to benefit 36 villages of Vijayapura, Bagalkot and Belagavi Districts. The expansion proposal of Tubachi-Bableshwara Lift Irrigation Scheme involves expansion of command area from 42,500 ha to 52,700 ha with an additional water allocation of 2.473 TMC of water (totalling to 6.273 TMC) benefitting 31 more villages. The benefit cost ratio of the project is 1.29. An intake canal of length

1800 m will be used to convey water to Pump house. Water will be lifted up to Delivery Chamber through Raising Main. Thereafter, water will be conveyed to fields through canal and distributary network. The estimated project cost is Rs. 3572 Crores.

The Scoping/TOR clearance for the project was accorded on 29.11.2017. In order to assess the baseline environmental status, command area, 10 Km radius from the lift component and command area were considered and the data was collected for three seasons namely Post monsoon (Dec, 2017-Feb, 2018), Pre monsoon (March, 2018-May, 2018) and monsoon (June, 2018-Aug, 2018).

As per the ToRs issued from MoEF&CC, New Delhi, the EIA/EMP report of the expansion project has been uploaded in the Karnataka State Pollution Control Board website for one month for receiving comments from common public during the period i.e., from 21.02.2019 to 20.03.2019 and no comments were received from the public.

Tubachi-Bableshwara Lift Irrigation Scheme was accorded Environmental Clearance by the Ministry of Environment, Forest and Climate Change, New Delhi on 31.07.2017 to irrigate 42,000 ha of command area. Application for according CWC clearance has been submitted on 09.05.2019. Diversion of 0.73 ha of forest land is required and Stage-I Forest Clearance has been accorded by the Ministry on 15.06.2017.

Based on the recommendation of Master Plan Committee, Govt. of Karnataka vide Government Order no. WRD 20 KBN 2016 dated 31.08.2017 allocated the 21 TMC of water reserved for the state of Karnataka under Indira Sagar Polavaram for various projects. Of this, 6.273 TMC of water has been allocated for the proposed project.

Ambient Air Quality Monitoring was carried out at 2 locations as per NAAQ guidelines. The observed values were well within the CPCB standards. The Ambient Noise Level Monitoring was carried out at 2 locations as per CPCB guidelines. Overall, the noise levels in all the seasons were observed to be well within the CPCB standards. The surface water samples were collected at 3 locations. According to CPCB surface water quality criteria, the water quality belongs to C (Post Monsoon), D (Pre-monsoon) and E (Monsoon) class. The ground water samples in the study area are confirming to IS 10500: 2012 Drinking water quality standards.

All the floral species recorded were common to the region and no RET species were observed during the study. All the recorded avifaunal species belonging to Least Concerned category as per IUCN conservation status 2019 except Indian peafowl belonging to Schedule I of Wildlife (Protection) Act, 1972.

PP submitted the anticipated environment impacts due to proposed project during the project construction & operation phase on air, water, noise, ecology, socioeconomic environment etc. To ameliorate the negative effects of the project construction and overall improvement of the environment management plans are formulated for implementation concurrent to the project construction.

PP also informed that as the project site i.e. lifts point / Jack well cum pump house is proposed in the Krishna River the litho unit covering the lift point is Basalt. There is no structure proposed or disturb the natural course. Only through pipes water is drawn in to the jack well where pump sets are installed to raise the water to raising mains and distribute through a delivery chamber to farmers. The seismic zoning map has been referred to know the zone in which the project site is falling. The proposed project site is falling on Zone-II which has very low risk of damage.

Improper treatment of sewage from labor camps leads to infiltration into the subsurface soil and finally affects the quality of ground water. Labors camp is expected to generate 8 KLD of sewage (considering 75 lpcd for 100 labors) which is likely to pollute ground water in an area of 1 ha from the source at 60-70 m bgl, if improperly treated/handled. Further, the source of pollution is at a distance of 800 m to the Kavatagi village. The sewage generated from the labor camps will be treated in septic tank followed by soak pit at site. Solid waste from labour camps will be collected in different bins and handed over to nearby municipal authorities.

About 97 ha of land have been acquired for the project and compensation for the same has been paid as per Right to Fair compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, (RFC&TLA) 2013. Remaining area acquisition in under process. Rs 358 Crores has been earmarked for Land Acquisition.

Environmental Management Plan with budget breakup: The cost estimates for implementation of EMP is as follows:

Sl. No.	Particulars	Cost in Rs.
A. Constru	uction Phase (Capital investment)	
1	Environmental safeguard measures	17,35,250/-
2	Land acquisition	358,00,00,000/-
3	Green belt development	10,74,000/-
4	Construction of embankment for intake canal	3,50,000/-
5	Fisheries conservation and management plan	2,00,000/-
6	Public health delivery system	4,00,000/-
7	Sanitation and Solid waste management plan	1,00,000/-
8	Energy conservation measures	5,00,000/-
9	Environmental monitoring programme	3,26,330/-
10	Muck management plan	4,00,000/-
	Sub Total (A)	358,50,85,580/-
B. Operati	ion Phase (Annual Recurring cost)	
1	Catchment area treatment plan	57,10,00,000/-
2	Command area development	45,00,000/-
3	Local area development plan	33,80,000/-
4	Maintenance of green belt plan	24,24,000/-
5	Fisheries conservation and management plan	8,00,000/-
6	Environmental monitoring programme	1,24,945/-
	Sub Total (B)	58,22,28,945/-
	Grand Total (A+B)	416,73,14,525/-

As far as project benefit is concerned, project will improve the biological diversity. Project improves yields through reduced crop loss due to erratic, unreliable or insufficient rainfall. Further, extensive agricultural production supplies raw materials to the nearby small scale industries thereby increasing the economy in the region. Altogether 14,015 households in the command area will be benefitted directly under the scheme. Direct employment opportunities for 350 peoples (50 technical and 300 construction labourers) have been provided. Budgetary provision of Rs 8.93 crores is proposed for CER activities.

Further, as it is expansion project, the Scientist of the concerned Regional office of MoEF&CC monitored project site and during the inspection non-compliances to EC conditions,

stipulated vide Environmental Clearance letter No. J-11011/5/2015-IA.I dated 31.07.2017, were noted.

The EAC in the present meeting deliberated on the information submitted by the PP (EIA/EMP report, Form 2, R.O compliance report etc.). EAC observed that as per the R.O report, PP had commenced the construction activities like Intake canal, Delivery Chamber- 1 and 2 and Pipeline from Intake canal to DC-1 and from DC-1 to DC-2 prior to the grant of the Environmental Clearance hence violation of EIA Notification 2006 and as amended thereof. Ministry may take up the violation matter as per the existing provisions and law.

EAC further observed that in the instant project, PP proposed for drip to flood irrigation as the farmers are demanding for recharge the ground water. EAC is of the view that reasons for flood irrigation is not convincing and change in technology from drip to flood is against the Government policy i.e. per Drop more Crop. Therefore, EAC opined that instant proposal involving flood irrigation shall be revised. EAC after detailed deliberation **deferred** the proposal for want of following information:

- 1. Revised proposal involving drip irrigation shall be submitted.
- 2. Seasonal variation of the base line data for air, water, soil, etc. in tabular form be submitted.
- 3. Clarification from the Divisional Forest Officer that only 0.73 Ha of forest land is involved in the total 2419 ha of land.
- 4. Approval from CWC regarding total availability of 6.273 TMC of water for the instant project.
- 5. Action taken report on the non-compliances of earlier EC conditions be submitted to the Regional office of the MoEF&CC and closing/status report from Regional office of the MoEF&CC of the non-compliance shall be submitted to the Ministry.
- 6. NABET accreditation certificate for the period of base line data collection.
- 7. Conservation plan for Schedule I species shall be submitted to the Chief Wildlife Warden and proof of the same to be submitted to the Ministry.
- 8. Table EMP cost shall be revised as suggested.

Item No. 30.3 Maa Ratangarh Multipurpose Project erstwhile Sindh (Seondha) Barrage project (CCA: 78,484 ha) in Datia District of Madhya Pradesh, Madhya Pradesh–reg. consideration of fresh EC F. No. J-12011/21/2016-IA. I (R), Proposal No. IA/MP/RIV/62833/2017

The project proponent along with Consultant M/s Enviro Infra Solutions Pvt. Ltd. Ghaziabad, NABET accredited, presented the proposal and *inter alia* provided the following information:

The Maa Ratangarh Multipurpose Project site is proposed near village Dangdiroli which comes in Tehsil Seondha of District Datiya (Madhya Pradesh). Latitude and Longitude at Dam site 260 8'-29" and 780 -44'- 20" respectively which is covered by toposheet no. 54J/12.Project is proposed on river Sindh in Seondha Block of Datia District of Madhya Pradesh. The project envisages construction of 31.0 m high and 1162 m long earthen dam & 578 Concrete Dam including 464 m long spillway on river Sindh near village Dangdiroli of tehsil Seondha Distt. Datia, M.P. which is a tributary of Yamuna River to store 246.95 MCM live storage of water to provide irrigation to command area of 78484 ha. (CCA). Total land requirement is 3337.63 ha, out of which 799.59 ha forestland is, 1235.25 ha is revenue land and 1302.79 ha is private land. Total submergence area is about 3149.63 ha. An underground/surface powerhouse is proposed with 03

units of 9 MW capacity each. About 766 families consisting of 3830 persons in 16 villages are likely to be affected by this project. The total cost of project is about Rs. 2244.97 crores and proposed to be completed in three years.

MoEF & CC issued the Term of Reference (TOR) vide letter No. J- 12011/21/2016 dated 15.05.2017. The amended TOR was issued vide letter dated 15.10.2018 with the change in the name from Sindh (Seondha Barrage to Maa Ratangarh Multipurpose project. The public hearing has been successfully conducted on 14.01.2019 in Bhind district, 17.01.2019 in Datiya district and 31.01.2019 in Gwalior district as per EIA Notification 2006 and its subsequent amendment. The major issues raised during the public hearing were adequate land compensation should be granted for their loss of land.

The baseline study and primary data collection has been carried out during Winter (2017), pre monsoon (2018) and monsoon (2018). Ambient air quality monitoring has been done at 06 locations. Specific station-wise Ambient Air Quality (AAQ) data for PM₁₀, PM_{2.5}, SO₂ and NOx as recorded during the study period i.e. Winter (2017), pre-monsoon (2018) and monsoon (2018). The maximum concentration of PM₁₀, PM_{2.5} and NOx was 50.4 μ g/m³, 25.6 μ g/m³ and 18.8 μ g/m³, respectively, while maximum concentration of SO₂ was 8.5 μ g/m³. Thus, it was found that concentration of pollutants was within the limits of standards prescribed by CPCB. Ambient noise level monitoring has been done at 06 locations. The noise monitoring shows the day and night time noise level at Seondha recorded are 61.8 dB (A) Leq during day time and 43.8 dB (A) Leq during night time and were within the prescribed limit. The noise levels for the rest of 5 stations are within the prescribed limits. The major source of the noise in the study area is vehicular movement as well as rural activity.

The development of any region is based on the availability of sufficient water resources, as developmental activities require water for irrigation, domestic and other purposes. Ground water sampling has been taken for 05 locations. The pH values of all analyzed samples ranged between 6.70-8.0 and were within the permissible limit (6.5-8.5). Total hardness was recorded to range from 150.40 to 285.20 mg/l, which is within the permissible limits of 600 mg/l at all locations. The TDS levels ranged from 322.80 to 462.40 mg/l and were well below the desirable limit of 500 mg/l. The chlorides levels in surface water samples ranged from 19.30 to 45.0 mg/l and are below the desirable limits of 250 mg/l. The fluorides level ranged between 0.23 to 0.82 mg/l was lower than the desirable limit of 45 mg/l. Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable limits. All physical and general parameters were observed within the desirable limit at all sampling locations as per IS10500:2012.

Surface water samples have been taken for 05 locations. The pH values of all analyzed samples ranged between 7.6-8.1 and were within the permissible limit (6.5-8.5). The TDS levels ranged from 244.75 to 382.12 mg/l and were well below the permissible limit of 1500 mg/l. The chlorides levels in surface water samples ranged from 20.10 to 32.30 mg/l and were below the permissible limit of 600 mg/l. The Sulphates level ranged from 45.5 to 53.6 mg/l and were below the permissible limit of 400 mg/l. The fluorides level was marginally lower than the permissible limit of 0.30 to 0.58 mg/l. The BOD values exceeded the permissible limit, which indicates the presence of organic pollution loading. The concentration of various heavy metals was below the detectable limits, indicating the suitability of water for meeting domestic requirements. The concentration of cyanides and phenolic compounds were also below the detectable limits. The Total Coliform level was within the limits specified for Class C water i.e. the water is suitable for meeting drinking water requirements after conventional treatment and disinfection.

During the whole study period, a total of 130 plant species were recorded inhabiting land. Asteraceae, Fabaceae and Poaceae were recorded as dominant family. The total floral diversity (83 species) was dominated by tree species (37); the other species recorded are shrub (09), climber (04), herb (20), parasitic angiosperm (01), grass (13) species. During the study period 2017-18, a total of 127 fauna species were recorded in the project site. These include 88 non-aquatic species, 02 amphibians and 37 aquatic species. The total terrestrial faunal species recorded in the project area includes: butterfly 09 species, insect 11 species, amphibian 02 species, reptile 13 species, avifauna 27 species and mammal 16 species. A total of 30aquatic species were recorded inhabiting aquatic sites during monsoon season, 2018. These include 18 species of phytoplankton and 12 species of other plant species.

The environmental impacts before the construction are identified during planning phase. This happens due to identification of the project in a location, which may be susceptible to adverse impacts due to natural environment conditions. Impacts of the project due to its location are as follows: (i) Displacement of People (ii) Loss of land (iii) Geological Risk and (iv) Risk due to seismicity and earthquake. To ameliorate the negative effects of the project construction and overall improvement of the environment management plans are formulated for implementation concurrent to the project construction.

For the project, like any other development / infrastructure project for the public purpose, land (Private) is to be acquired by the appropriate government. The total private land required for the project is 1302.79 ha which is spread over 24 villages in project district, Madhya Pradesh. Though the project has been conceived with the sole objective of minimal displacement of people and their property in the project affected area, the acquisition of land for public purpose has been necessitated. In the preset case, the proposed Irrigation project is essentially an infra-structure project included in the Notification of the Govt. of India, Department of Economic Affairs (Infrastructure Section) No. 13/6/2009-INF dated 27 March, 2012 and even No. amendment dated 1st April 2013. Thus, the provisions of "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013" applies in respect of all activities related to land acquisition for the project.

Environmental Management Plan with budget breakup: The cost estimates for implementation of EMP is as follows:

Sr. No.	Environmental	Capital	Recurring Cost	Total
	Management Plan	Cost (Rs.	(Rs In lakhs)	(Rs. In
		In lakhs)		lakhs.)
1.	CAT Plan	364.40	240.80 per year for	2050.00
	CATTIan		period of 7 years	2030.00
2.	CA Sahama	2610.00	320.00 per year for	5810.00
	CA Scheme		period of 10 years	3810.00
3.	Wildlife and Bio-diversity	-	10.00 per year for	50.00
	Management plan		period of 5 years	30.00
4.	Figheriag Management Plan	275.00	29.40 per year for a	422.00
	Fishenes Management Fian		period of 5 years	422.00
5.	D & D Dlan	24307.52	1936.16 per year for	20116.00
	K & K Flaii		period of 3 years	50110.00
6.	Green Belt Development Blen	104.80	2.40 per year for period	112.00
	Green Bent Development Plan		of 3 years	112.00
7.	Reservoir Rim Treatment Plan	20.00	-	20.00
8.	Muck Management Plan	25.00	-	25.00

9.	Landscape and Restoration	2.40	0.80 per year for period	4.00
	Plan		of 2 years	
10.	Restoration Plan for Quarry	28.00	1.60 per year for period	26.00
	Sites		of 5 years	36.00
11.	Disastan Managamant Dlan	6.00	2.00 per year for a	16.00
	Disaster Management Plan		period of 5 years	16.00
12.	Water, Air and Noise	7.51	2.83 per year for a	16.00
	Management Plan		period of 3 years	16.00
13.	Delta II. alth Dellerant Dien	17.26	20.58 per year for a	70.00
	Public Health Delivery Plan		period of 3 years	/9.00
14.	Labora Managara Dian	13.50	8.50 per year for a	20.00
	Labour Management Plan		period of 3 years	39.00
15.	Sanitation and Solid Waste	45.03	2.99 per year for a	54.00
	Management Plan		period of 3 years	54.00
16.	CER For Local Area		74.00 per year for a	1125.00
	Management	385.00	period of 10 years	1123.00
17.	Environmental Safeguards	5.00	5.00 per year for a	20.00
	During Construction Activities		period of 3 years	20.00
18.	Energy Conservation	21.01	9.57 per year for a	10 72
	Measures		period of 3 years	47.72
19.	Environmental Monitoring		6.00 per year for a	30.00
	Environmental wontoring		period of 5 years	50.00
		28237.43	11836.29	40073.72

Project benefit:

There will be number of positive changes on the socio-economic conditions of the people in the surrounding area. There will be obvious change in the scenario leading into the Socio-economic development of the area. (i)Increased Irrigation Potential (ii) Better Living Standards (iii) Improved Market Facilities (iv) Employment Potential / Fisheries (v) Tourism / Recreation Facilities (vi) Sustained Water Availability for Agriculture and Cattle rearing (vii) Increased Green cover (viii) Improvement in Ground Water Level (ix) Improvement in Life Style, Status and Confidence-building (x) Command Area Development (xi) Solution of the problem of migration (xii) Social Forestry

Status of other statutory clearances:

The proposal for Forest Clearance has been uploaded on MoEF&CC portal via Proposal No. FP/MP/IRRIG/40397/2019 dated 18/06/2019.

The EAC in the present meeting deliberated on the information submitted by the PP (EIA/EMP report, Form 2 etc.). EAC after detailed deliberation **deferred** the proposal for want of following information:

- 1. Recent Met data from the IMD shall be used in preparing EIA report.
- 2. Water availability studies/hydrological studies needs to be revised as the average yield considering the catchment area (12739 sq. m), average rainfall and run off factor is less than the 75% dependable yield of 4113.55 MCM and should be approved by the Central Water Commission.
- 3. As the project site is 6.8 km from the National Chambal Sanctuary and ESZ of the said sanctuary is not notified therefore application seeking permission from the Standing Committee of NBWL clearance shall be submitted.

- 4. ToR has been granted for construction of barrage (31 m high) however in the presentation made before the committee, project envisages construction of Earthen and Concrete Dam. Justification in this regard shall be submitted.
- 5. Clarification regarding Chairing of Public Hearing at Gwalior by the officer (SDM) not authorized as per the EIA Notification 2006 shall be submitted from the concerned State PCB and District Magistrate/Additional District Magistrate.
- 6. Status of Stage I FC shall be submitted.
- 7. Seasonal variability of all the environmental attributes including biological environment.
- 8. Environment flow shall be revisited as per the hydrological studies approved by the CWC.
- 9. Environmental matrix for construction as well operational phase.
- 10. Compliance of additional ToR stipulated in the amendment ToR dated 15th October, 2018.
- 11. QCI/NABET certificate of the consultant for the period during which the base line data was collected.
- 12. Revised form 2.
- 13. Revised budgetary provision for EMP excluding CER plan shall be submitted.

Item No. 30.4 Modikunta Vagu Irrigation Project in Jayashankar Bhoopalpally District of Telangana by Irrigation & CAD Department, Government of Telangana – reg. consideration of fresh EC File No. J-12011/24/2017-IA-I(R), Proposal No. IA/TG/RIV/67158/2017

Project proponent along with the consultant (M/s Environmental Health and Safety Consultants Pvt. Ltd (QCI-NABET Accreditation No. NABET/EIA/1821/RA 0107 dated 19.11.2018) made the detailed presentation and *inter alia* provided the following information:

The project envisages construction of a 1,359 m high earthen dam across Modikunta Vagu (tributary of Godavari River) near village Krishnapuram in Wazeedu Mandal of Jayashankar Bhupalapally District of Telangana to store 2.142 TMC of water for providing irrigation facility to 5,500 ha of area along with supply of 0.12 TMC drinking water to 35 benefitting tribal villages. Total land requirement is 574.99 ha, out of which 499 ha is forestland (13.15 Ha for dam site, 427.80 Ha for submergence at FRL 124 m and 58.05 Ha for construction of canals), 75.99 ha is non forest land. Total submergence area is about 427.80 ha. Based on the monthly inflow yield series for the years 1941-2015, 3.716 TMC of water is available in Modikunta Vagu. Out of which, 2.142 TMC of water will be utilized for the project. Remaining 1.574 TMC of water will flow downstream for ecological purpose. The total cost of the project is about Rs. 425.16 Crores and proposed to be completed in 3 years.

As the CCA of the project is less than 50,000 ha, it therefore comes under Category B project but as the Eturnagaram Wildlife Sanctuary and interstate boundary of Chhattisgarh is located within 10km of the project boundary hence qualifies for appraisal as Category A project at the central level. ToR to the project was granted vide Ministry letter dated 29.11.2017. Proposal for environmental clearance was submitted on 16.12.2019 after conducting Public Hearing. Public hearing was conducted at Govt. Junior College Grounds, Wazeedu Village and Mandal, Jayashankar Bhupalapally District on 29.09.2018 as per the provisions of the EIA Notification, 2006. All the issues raised during the public hearing were regarding the implementation the

Environmental Management Plan such as, Public health, Command Area Development and compensatory afforestation. Majority of the public supported the project for early implementation.

In order to predict the magnitude of impact likely to be caused by the proposed project, base line environmental status, 10 km of the project boundary was considered. Base line data was collected during August 2017 to April 2018. Ambient Air Quality Monitoring was carried out at 2 locations as per NAAQ guidelines. The results of ambient air quality reveal that, PM_{10} was in the range between 47 to 69 µg/m³ and whereas $PM_{2.5}$ was in the range between 13 to 24 µg/m³. SO₂ and NO₂ are in the range between 5.49 to 9.18 µg/m³ and 18.86 to 25.28 µg/m³ respectively. The air quality index in the study area is found to be satisfactory for PM_{10} and good for $PM_{2.5}$ and gases (SO₂ and NO₂).

The Ambient Noise Level Monitoring was carried out at 2 locations as per CPCB guidelines. The results of ambient noise levels were compared with Residential standards and results reveal that, the noise levels in the study area ranging from 40.56 to 44.14 dB(A) for day time and 33.94 to 36.28 dB(A) for night time. Overall, the noise levels in all the seasons were observed to be well within the CPCB standards.

The surface water samples were collected in 2 locations as per CPCB guidelines and the results were compared with CPCB water quality criteria. The ground water samples were collected at 3 locations as per CPCB guidelines and the results were compared with BIS 10500:2012 drinking water quality standards.

Land use and land cover studies reveal that the study area includes Agriculture plantation (0.16%), Built-up (1.51%), Cropland (24.72%), Forest blank (0.58%), Forest land (58.33%), Forest plantation (0.80%), Mixed Forest plantation (2.79%), Scrub forest (1.64%) and Water bodies (9.47%). Soil samples were collected from 5 locations including project site and the study area. From the overall results of Physico-chemical analysis of the soil samples, it is noticed that the pH values range between 4.92 and 7.73 and most of the values belong to soil reaction index I and II, which shows that the soils of the study area are under the acidic to neutral range. The electrical conductivity of the soil samples were observed to be in the range between 21.4 and 357 μ mhos/cm. Based on the rating chart of soil tests, all the soil samples belong to normal i.e., salt index I, whereas organic carbon content of soil samples were observed to range from 0.12 to 0.78 percent. As per the nutrient index, the organic carbon in soil samples was at all levels from low to medium level. Similarly, the available phosphorus values are in high range in all seasons and soil samples.

The project area is located along River Modikunta Vagu within the Forest area. The project site is located at a distance of 7.5 Km from the Eturnagaram WLS boundary and the interstate boundary of Chhattisgarh lies at a distance of 9.13 Km. The command area includes a good number of forest areas, agro-ecosystems and water bodies including minor streams. Baseline studies was carried out at 6 locations including project site and command area. Species composition around proposed earthen dam is *Terminalia arjuna, Strychnospotatorum, Ailanthus excelsa, Chloroxylonswietenia, Vitexnegundo, Madhucalongifolia*, etc. Species composition in command area / agro-ecosystem is *Dalbergialatifolia, Chloroxylonswietenia, Borassusflabellifer, Terminalia bellerica, Anacardiumoccidentale, Ficusvirens, Phyllanthusemblica, Ziziphusmauritiana, Strychnospotatorum, Bombax ceiba, Eucalyptus citriodora, etc.*

As per Forest Department, wildlife population includes Gaur, Chital, Sambar deer, Nilgai, Indian Fox, Indian giant squirrel, Indian wolf, Hanuman langur, Dhole, Wild sheep, Leopard, spotted hyena, etc. are commonly recorded near the project site and command area of the project. No RET floral species recorded in the project site and study area. However, endemic species namely *Cleome viscosa* (herb) was recorded in the command area. Avifaunal species such as Common buzzard; butterfly namely Common pierrot; mammals such as Gaur, Indian wolf, Indian antelope, Pangolin, mouse deer; and Reptiles namely Indian Rock python were recorded during the study in the project site as well as in the command area which belongs to Schedule I of Wildlife (Protection) Act, 1972.

About 38 fish species were recorded in River Modikunta Vagu during the study period. Of which, 81.58% of species belongs to Least Concern category, 7.89% of species belongs to Near Threatened category, 2.63% species belongs to Vulnerable category, 5.26% species belongs to Critically Endangered category of IUCN Conservation status, 2019. Rest of the species (2.63%) is common to the region. *Cyprinus carpio* (Linnaeus, 1758) and *Hypselobarbus pulchellus* (Day, 1870) belongs to Critically Endangered category; *Ompokbimaculatus* (Bleck, 1794), *Wallago attu* (Blech & Schneider, 1801) and *Oreochromis mossambicus* (Peters, 1852) belongs to Near Threatened category and *Hypselobarbus kolus* (Sykes, 1939) belongs to Vulnerable category of IUCN Conservation status, 2019.

Anticipated impacts includes air, noise, soil, surface water and ground water pollution caused due to various construction activities which affects the biodiversity. Major activities includes excavation, improper disposal of muck, emission of air pollutants, generation of noise due to blasting, movement of vehicles and construction activities, improper disposal of municipal solid wastes, entry of waste/sewage from labour camps into water bodies, affect in ground water table, improper usage of pesticides, etc. in the nearby settlements. Mitigation measures such as frequent watering of roads, usage of barriers, provision of PPE's, following proper disposal methods of muck, solid waste, sewage, etc. will help in reduction of the extent of the anticipated impacts.

Floods are a regular phenomenon in the basin. Bhadrachalam, Kunavaram and the deltaic portion of the river are prone to floods frequently. Perur and Koida gauge stations are the main base stations of the Central Water Commission for flood forecasting in the basin. From the analysis of previous years of NDMA, proposed earthen dam and command area is not prone to floods. Further, as per the hydrology studies, Modikunta Vagu Project is having capacity of more than 60 MCM and Hydraulic head of more than 30 m. As per the classification given in IS -11223-1985, this project falls in the category of intermediate dam and hence the project is to be designed for Probable Maximum flood. The project site involving the proposed earthen dam falls in zone-III (Moderate Damage Risk Zone) as per the seismic map of India. From the landslide zone map given by NDMA, GoI, it is noted that Himalayas of Northwest and Northeast India and the Western Ghats are two regions of high vulnerability and are prone to landslides. The project site in Telangana state falls under "Very Low Hazard Zone".

Further, it was appraised to EAC that water availability for the project was studied based on the inflow yield. The monthly yield series was developed. Based on the study, 3.716 of TMC of water is available and out of which, 2142 TMC of water will be utilized for the project. Remaining 1.574 TMC of water will flow downstream for ecological purpose.

Sl. No.	Particulars	Cost in Rs.
1	Catchment area treatment plan	8,87,50,000/-
2	Command area development	55,00,000/-
3	Compensatory tree plantation	25,51,250/-

Environmental Management Plan with budget breakup:

4	Conservation of RET and endemic species	10,00,000/-
5	Emergency Action Plan	25,00,000/-
6	Energy conservation measures	5,00,000/-
7	Environmental monitoring programme	39,01,360/-
8	Environmental safeguard measures to control air, noise and water pollution	15,60,000/-
9	Fisheries conservation and management plan including fish ladders	22,00,000/-
10	Land acquisition	2,82,00,000/-
11	Local area development plan	47,00,000/-
12	Muck disposal and Management Plan	3,60,000/-
13	Public health delivery system	5,75,000/-
14	Reservoir RIM Treatment	20,00,000/-
15	Sanitation and Solid waste management plan	4,00,000/-
16	Wildlife Conservation and Management Plan	12,23,000/-
	Total	14,59,20,610/-

Total project cost is 425.16 crores. CER cost as envisages as per the Ministry's OM dated 1st May, 2018 is 6.377 Crores and will be used for the up gradation of hospitals and primary health care centers, providing computer and accessories to tribal hostels at Wazeedu Mandal, Jayashankar Bhupapally district, provision of drinking water supply to Govt. Schools, construction of new toilets in 35 benefitting villages Wazeedu Mandal, Jayashankar Bhupapally district, provision of solar stand post etc.

Project benefits includes compensatory tree plantation to improve the ecological activities of faunal species, supports proliferation of fish species, providing drinking water facilities, improvement of agricultural linkages, improvement of total farm output, raise in farm income, increase in yield, improves the economy in the region, provides health benefits to the people, benefits 35 naxal affected tribal villages under the scheme and provides employment opportunities for 150 members during construction phase.

The EAC in the present meeting deliberated on the information submitted by the PP (EIA/EMP report, Form 2, Public hearing issues etc.). EAC after detailed deliberation **deferred** the proposal for want of following information:

- 1. Details of submergence and Rehabilitation and Resettlement involved in the project.
- 2. Letter dated 05.06.2015 of CWC, referred as approval from CWC on hydrology, is in fact clarification sought by the CWC on the two yield figures for the same project. Justification in this regard to be submitted i.e. why the clarification sought by the CWC is still pending.
- 3. Hydrological studies approved by the CWC especially regarding availability of water for the proposed project shall be submitted.
- 4. Declaration by the project proponent by way of affidavit that "No" Interstate issue is involved with any state in the project.
- 5. Map duly authenticated by the Chief Wildlife Warden (CWLW) regarding distance of the project boundary from the Eturnagaram Sanctuary and Ecosensitive zone of the said sanctuary shall be submitted.
- 6. Certificate from the divisional forest officer that total involvement of forestland in the proposed project is 499 ha.
- 7. Conservation Plan of Schedule I species shall be submitted to CWLW for approval.
- 8. Revised form 2 as under air quality prediction (S. No 18) base line concentration of PM_{2.5},

 SO_2 and NO_x is mentioned zero, further details of R&R in S. No 27 is mentioned Nil.

- 9. QCI NABET certificate of the consultant for the period of collection of base line data (August 217 to August 2018) shall be submitted.
- 10. Cost of management plans are mentioned under recurring expenditure instead of Capital, therefore revised cost estimates for implementation of EMP shall be submitted.
- 11. Endemic plant species found in the area concerned shall be provided instead listing entire endemic species found in the State.

Item No. 30.5 Sondur Reservoir Project (12,260 ha) in Dhamtari, Chhattisgarh by Water Management Division, Government of Chhattisgarh – reg. consideration of fresh EC File No. J-12011/23/2017-IA-I, Proposal No. IA/CG/RIV/131439/2017

The Project Proponent (PP) along with Consultant M/s Enviro Infra Solutions Pvt. Ltd. Ghaziabad, NABET accredited, presented the proposal and *inter alia* provided the following information:

The project is basically a major irrigation project, construction of which commenced in 1978 and the major component like composite dam, feeder canal and distributaries, subdistributary, minors and sub minors were constructed were completed by June,1997. The project has been constructed on Sondur river near Mechka village in Nagri tehsil, district Dhamtari.

PP informed that 3231.25 m long and 26.70 m maximum height composite dam with 3231.25 m long homogeneous earthen section having FRL, MWL and TBL as 471.065 mamsl (meters above mean sea level), 472.995 mamsl and 474.265 mamsl has been constructed to store 198.10 MCM of water at FRL. Central masonry dam section of length 173.75 m with 5 bays of spillway, crest level 461.07 mamsl fitted radial gates (15x10 m) to pass the probable maximum flood of 5163 cumees, with a maximum height of 37.70 m and top width of 4.57 m. To the left and right of the spillway section of 10 m length each concrete non-overflow section has been constructed.

On left flank of Sondur dam a head regulator with two bays (1.75x2.50 m) has been provided for diverting 28.3 cumecs of head discharge into Sondur Feeder Canal. The stored water from dam shall be conducted through 15 km long Sondur Feeder Canal with bed width of 4.60 m and full supply depth of 3.05 m, side slope 2:1 and canal bed slope 1:5600 to pass head discharge of 28.30 cumec with 1.025 m velocity of flow.

Under the project three distributaries viz., Nagri Distributary (30.48 km); Sihawa Distributary (22.31 km) and Sankra Sub-Distributary (6.43 km). Nagri distributary, authorized head discharge of 5.57 cumec, takes off from RD 12.5 km of SFC and with 18 minors (34.625 km) serves 6100 ha CCA in CD Block Sihawa (Nagri). Sihawa distributary, authorized head discharge of 5.84 cumec, takes off from RD 13.60 km of SFC and with 15minors (48.425 km) serves 6160 ha CCA in CD Block Sihawa (Nagri). Sankra sub- distributary takes off from RD 14.07 km of SFC and serves command under CCA Sihawa (Nagri) block.

The command area (12260 ha) is being benefited from the project through Sondur Feeder canal through Nagri Distributary and Sihawa Distributary entirely covered in district Dhamtari under 66 villages of Tehsil Nagri in CD Block Sihawa (Nagri). Besides this, Sondur Feeder Canal also augments supplies in RSP reservoir enroute Dudhawa reservoir and RSP.

In command area during Kharif major crops grown are paddy, Jowar, groundnut and cotton. During Rabi, the prominent crops are pulses and oilseeds (36%) followed by cereals. The canal runs during Kharif as the reservoir gets discharge from Sondur during monsoon. In the exigency when due to good monsoon the stored water in Sondur reservoir is available in ample volume, the SFC shall be run during Rabi to meet crop requirement during Rabi. Therefore, the project basically aims at providing assured irrigation support to command area under Kharif and if water in reservoir is available in plenty, irrigation facility is extended to command during Rabi, too.

By substituting open main canal /distributaries/minors/field channel by piped canal system part length the conveyance and field channel losses from bed and side of canal can be eliminated. By replacing free flooding system of irrigation application by sprinkler system the field application losses due to seepage and wastage can be drastically reduced. Thus, in command area 10% micro irrigation by sprinkler system shall be adopted.

The project construction activities started in 1978, prior to EIA Notification 1994 came into existence and by 1988 the dam was completed as per original design for FRL 471.065 mamsl and that by 1996 the construction of Sondur Feeder Canal and distributaries was completed. The work of feeder canal and excavation of the distributaries and sub - distributary was completed by June, 1997. However, the cement concrete lining in Nagri and Sihawa distributaries was completed 52% and 88%, respectively by June, 1997.

Under the project the following components were completed: -

- 3360 m long composite dam of homogeneous earthen section.
- central masonry dam section with "ogee" shaped spillway with 5 bays fitted with radial gates
- 15x10 m) having non-overflow section to its left and right; Head regulator with two bays for conveying authorized head discharge of 28.3 cumecs;
- 15 km long Sondur Feeder Canal (SFC);
- Two distributaries viz., Nagri and Sihawa distributaries off-taking at RD 12.5 km and 13.6 km, respectively of SFC has been completed,
- Total length of distributaries and minors (159.78 km).

The balance Civil works under the project are mainly Remodelling, lining, renovation of structures of Sondur Feeder Canal and distributaries, Construction of 10 km long B K Minor and Epoxy mortar treatment of Sondur Dam.

ToR issued by MoEF&CC vide letter No. J-12011/23/2017-IA-I, dated 06.09.2017. In consonance with the EIA Notification, 2006, vide section 7(i) related to public hearing, the public hearing has been successfully conducted on 21.06.2019 in Dhamtari district. The major issues raised during the public hearing were adequate land compensation should be granted for their loss of land. The project falls under category 1(c), being major irrigation project, shall require prior environmental clearance. The total cost of the project is about Rs. 429.95 Crores and to be completed in two years.

Total land requirement is 2329.57 ha, out of which 2025.14 ha is forestland and 304.43 ha is private land. Irrigation Department demanded for transfer of total forestland (2025.14 ha) up to FRL 471.065 m in Feb. 1977, before Forest (Conservation) Act, 1980 was enacted. Forest Department, Government of M.P. has transferred 944.92 ha of forestland in Nov. 1979. Compensation for 944.92 ha of forestland has been paid in Nov. 1979 and Feb. 1984.

Revised proposal as per the conditions of Forest (Conservation) Act, 1980, for transfer of balance forest area 1080.22 ha (529.70 under Sitanadi WLS and 550.52 ha of territorial forest) was submitted to MoEF New Delhi on 17.07.1991. The Government filed an application on 05.02.2005 to the Honorable Apex Court seeking permission for the use of 529.70 ha of the forest land falling within Sitanadi wild life sanctuary for the Project, The Honorable Supreme Court by its order dated 25th November 2005 asked the Central Empowered Committee (CEC) to file its response within four weeks. Hon. Supreme Court granted permission on dated 5.7.12 for IA Nos.1370-1370A for the diversification / denotification of 529.70 ha of Sitanadi Wild life sanctuary and for compensating the forest area coming under the said sanctuary by the forest area adjacent to the sanctuary of the same ecology.

The baseline studies were conducted during post monsoon 2017, pre monsoon 2018 and monsoon 2018. Ambient air quality monitoring has been done at 06 locations. Specific station-wise Ambient Air Quality (AAQ) data for PM₁₀, PM_{2.5}, SO₂ and NOx as recorded during the study period i.e. Post Monsoon 2017, Pre Monsoon 2018 and Monsoon 2018. The maximum concentration of PM₁₀, PM_{2.5} and NO_X was 44.5 μ g/m³, 35.3 μ g/m³ and 15.5 μ g/m³, respectively, while concentration of SO₂ was 7.2 μ g/m³. Thus, it was found that concentration of pollutants was within the limits of standards prescribed by CPCB.

Ambient noise level monitoring has been done at 06 locations. The noise monitoring shows the day and night time noise level at Nagri (commercial) recorded are 58.4 dB (A) Leq during day time and 46.3 dB (A) Leq during night time and were within the prescribed limit. The noise levels for the rest of the stations were within the prescribed limits. The major source of the noise in the study area is vehicular movement as well as rural activity.

Surface water sampling has been taken for 06locations. The pH values of all analyzed samples ranged between 7.5-8.15 and were within the permissible limit (6.5-8.5). The pH values of all analyzed samples ranged between 7.6-8.2 and were within the permissible limit (6.5-8.5). The TDS levels ranged from 191.0 to 298.30 mg/l and were well below the desirable limit of 500 mg/l. The chlorides levels in surface water samples ranged from 23.45 to 33.5 mg/l and were below the desirable limit of 250 mg/l. The Sulphates level ranged from 11.8 to 33.5 mg/l and were below the desirable limit of 200 mg/l. The fluorides level ranged between 0.35 to 0.60 mg/l was lower than the desirable limit of 1.0 mg/l. The nitrate level ranged between 1.0 to 2.2 mg/l and was lower than the desirable limit of 45 mg/l. The concentration of various heavy metals was below the detectable limits, indicating the suitability of water for meeting domestic requirements. The Total Coliform level was within the limits specified for Class C water i.e. the water is suitable for meeting drinking water requirements after conventional treatment and disinfection.

Ground water sampling has been taken for 29 locations. The analysis results indicate that the pH ranged between 6.70 to7.94, which is well within the specified standard of 6.5 to 8.5 limit. Total hardness was recorded to range from 146.3 to 285.20 mg/l, which is within the permissible limits of 600 mg/l at all locations. The Total Dissolved Solids (TDS) concentration recorded ranged between 322.80 to 462.40mg/l and was within the permissible limits (2000mg/l). Chlorides at all the locations were within the desirable limits (200 mg/l) as it ranged between 45.0 to 70.35 mg/l. Sulphates at all the locations were within the permissible limits (400 mg/l) as it ranged between19.3-34.80 mg/l. Fluorides recorded ranged between 0.23 to 0.82 mg/l and were within the desirable limit (1.0 mg/l). Nitrates were recorded to be ranging in between 23.8 to 42.2 mg/l and are found to be within the desirable limit (45 mg/l). Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable limits. All physical and general parameters were observed within the desirable/permissible limit at all the sampling locations as per IS 10500:2012.

A total of 53 tree species were found/recorded from the study area during the survey. The most dominant family was Moraceae, followed by Combetaceae and Mimosaceae and a total of 14 species of shrub species recorded/observed in the study area during the study period. The dominant family of shrub belongs to Apocynaceae and Verbenaceae, comprising 3 species of shrub each.

A maximum total of 114 terrestrial fauna were recorded during the study period. This includes 28 species of mammals, 27 species of birds, 2 amphibian species, 10 reptile species, 31 bird species and 16 insect species. A total of 46aquatic species were recorded inhabiting aquatic sites during monsoon season, 2018. These include 24 species of phytoplankton and 22 species of other plant species.

The river is a seasonal river and flows during monsoon from June to September and sometime in October also. Thus, from November to May there is no flow in the river in natural course. The proposed dam across it has been conceived to conserve monsoon discharge for consumptive use for irrigation and drinking water use. The average utilization of water shall be 160.60 MCM, which shall be met from live storage of the reservoir. There is practically no inflow during lean and non-monsoon period (November to May) in Sondur river. Therefore, it is recommended that 0.40 MCM flow may be released during each of these months. This quantity shall be met from the storage of the reservoir. This implies that a minimum of 0.15 cumecs discharge shall regularly flow d/s of dam in these months. In rest months 20% of the inflow (June-July) & 30% of the inflow (August-October) will be released.

Environmental impacts before the construction are identified during planning phase. This happens due to identification of the project in a location which may be susceptible to adverse impacts due to natural environment conditions. Impacts of the project due to its location are as follows: (i) Displacement of People (ii) Loss of land (iii) Geological Risk and (iv) Risk due to seismicity & earthquake

For the project, like any other development / infrastructure project for the public purpose, land (Private) is to be acquired by the appropriate government. 304.43 ha private land under the project covered under five revenue villages was acquired for the project. Besides this, the forest land requirement of the forest land upto FRL (El. 471.065 mamsl) in respect of Sondur Reservoir Project was assessed as 2025.14 ha of which the Forest Department transferred only 944.92 ha. Diversion of balance 1080.22 ha forest land (529.70 ha under Sitanadi WLS and 550.52 under territorial forest) is still to be executed. Besides this diversion of 8.887 ha forest land is contemplated for construction of B.K. Minor at tail of Nagri distributary. The acquisition of the land shall be by mutual consent with the stake holders in consonance with Section 46 of "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013", (RFCTLARRA 2013) which has come into force from 1-1-2014, notified by Government of India. A total of 08 villages consisting of 302 families are likely to be affected by this project. All the compensation and rehabilitation/resettlement shalll be as per the Act.

Environmental Management Plan with budget breakup: The summary of the EMP Cost to Capital and Recurring is shown below:

Sr.	Environmental	Capital	Recurring Cost	Total
No.	Management Plan	Cost	(Rs in lakhs)	

		(Rs. in lakhs)		(Rs. in lakhs.)
1.	Catchment Area Treatment Plan	77.23	54.11 per year for period of 7 years	456.00
2.	Compensatory Afforestation Scheme	50.00	2153.14 per year for period of 7 years	15122.00
3.	Wildlife and Bio-diversity Management plan	200.00	196.00 per year for period of 10 years	2160.00
4.	Fisheries Management Plan		10.00 per year for a period of 5 years	50.00
5.	GB Development Plan20.003.33 per year for period of 3 years		30.00	
6.	Reservoir Rim Treatment Plan		00.00	
7.	Muck Management Plan	14.00	-	14.00
8.	Landscape and Restoration Plan	2.60	0.70 per year for period of 2 years	4.00
9.	Restoration Plan for Quarry Sites	1.60	1.20 per year for period of 2 years	4.00
10.	Disaster Management Plan	3.00	1.40 per year for a period of 5 years	10.00
11.	Water, Air and Noise Management Plan	4.90	1.70 per year for a period of 3 years	10.00
12.	Public Health Delivery Plan	5.00	6.00 per year for a period of 2 years	17.00
13.	Labour Management Plan	3.00	2.00 per year for a period of 2 years	7.00
14.	Sanitation and Solid Waste Management Plan	13.50	4.25 per year for a period of 2 years	22.00
15.	Local Area Management Plan	22.50	2.25 per year for a period of 10 years	45.00
16.	Environmental Safeguards During Construction Activities		2.50 per year for a period of 2 years	5.00
17.	Energy Conservation Measures	4.69	3.27 per year for a period of 3 years	14.50
18.	Environmental Monitoring Plan		4.00 per year for a period of 2 years	8.00
	Total	422.02	17556.48	17978.50

As far as project benefit is concerned, there will be number of positive changes on the socioeconomic conditions of the people in the surrounding area. There will be obvious change in the scenario leading into the Socio-economic development of the area. (i) Increased Irrigation Potential (ii) Better Living Standards (iii) Improved Market Facilities (iv) Employment Potential / Fisheries (v) Tourism / Recreation Facilities (vi) Improvement in livestock (vii) Increased in green cover (viii) Improvement in groundwater level (ix) Improvement in lifestyle, social status and confidence building (x) Command Area Development (xi) Solution of the problem of migration (xii) Conservation of forest and fuel (xiii) Social Forestry.

The EAC in the present meeting deliberated on the information submitted by the PP (EIA/EMP report, Form 2, Public hearing issues etc). EAC after detailed deliberation **recommended** the

proposal for grant of Environmental Clearance subject to compliance of applicable Standard EC with the following additional conditions:

- i. Stage I Forest clearance for 2025 ha forest land and 8.8 ha of forest land (required for construction of B.K Minor at tail Nagri distributary) involved in the project shall be submitted prior to grant of Environmental Clearance.
- ii. Wildlife Conservation plan for all Schedule I species shall be submitted to Chief Wildlife warden (CWLW) for approval.
- Details regarding budgetary allocation for CER as per the Ministry O.M dated 01st May 2018 shall be submitted along with the activities proposed with time plan for implementation prior to grant of Environmental Clearance.
- iv. The project falls in Udanti &Sitanadi Sanctuary, status of Wildlife Clearance from the Standing committee of NBWL shall be submitted prior to grant of Environmental Clearance.
- v. QCI/NABET certificate for the period of base line data collection shall be submitted prior to grant of Environmental Clearance.
- vi. Component wise status of construction of the project including balance work should be submitted along with the timeline for the construction of balance work prior to grant of Environmental Clearance.
- vii. ToR compliance of additional conditions shall be submitted prior to grant of Environmental Clearance
- viii. Wildlife Conservation plan shall be implemented as approved by the CWLW.
- ix. Land acquired for the project shall be suitably compensated 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.
- x. Necessary permission/clearance to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and subsequent amendments thereof.
- xi. Solid waste generated, especially plastic waste, etc. should not be disposed of as landfill material. Use of single-use plastics may be discouraged.
- xii. Eflow shall be maintained as per the ToR conditions or minimum 15% of the average flow of four consecutive leanest months or as submitted in the EIA/EMP report, whichever value is higher, for sustenance of aquatic life in the downstream river
- xiii. Possibility of fish passages should be explored in consultation with the reputed institute having work experience in the fields.
- *xiv.* Sitanadi sanctuary along with contiguous Udanti WLS have been notified as Tiger Reserve, therefore "*No Objection Certificate*" shall be obtained from Nation Tiger Conservation Authority (NTCA).

Item No. 30.6 Gunjawani Irrigation Project in Pune District, Maharashtra by Water Resources Department, Govt. of Maharashtra-reg. amendment in EC File No. J-12011/20/2003-IA-I, Proposal No. IA/MH/RIV/9870/2005

Project proponent along with the consultant (M/s MITCON Consultancy and Engineering Services Ltd) made the detailed presentation and *inter alia* provided the following information:

Gunjawani irrigation project is located in village Dhanep, Tehsil Velhe, District Pune. Environmental Clearance to the said project was granted vide Letter F.No. J-12011/20/2003-IA-I dated 29/04/2005. Project envisage construction of earthen dam across river Kanadi a left bank tributary of Gunjawani river. Cultural Command Area as per the EC dated 29.04.2005 is 19,484 ha. The project consists of gross storage of 104.69 MCM (3.69 TMC) & annual utilization of 118.063 MCM (4.17 TMC). The catchment area up to the dam site is 50.613 km² and it lies in the Velhe Taluka of Pune District. The rainfall in the catchment varies from 6100 mm to 2510 mm. The work of dam is almost completed. Forest Clearance granted vide F. No. 8-85/2000-FC dated 29th March, 2016 for 50.08 ha of land. Cost of project is Rs. 1313.73 Crores.

As per the initial approval project involve open canal system for irrigation. However, now the pipe canal instead of open canal is proposed. While shifting from open canal system into closed conduit system there is saving of water quantity. The saved water is to be utilized for irrigation of high level area through lift named as Narayanpur lift irrigation Scheme. Work of canal is not initiated yet. The closed conduit system (pipe canal) is passing within the 10 km radial distance from draft Eco Sensitive Zone (ESZ). Hence, the proposal for amendment in environmental clearance was submitted.

Submergence Area is 848 ha, out of which for 835 ha of land, compensation is paid and land is in possession with WRD department. Fully Submerged Villages are 4: Kanand, Chapet, Vaghdara and Gevhande. Partially Submerged Villages are 5: Vihir, Antroli, Nivi, Bopalghar and Dhanep.

SI.	Details	Original	Revised			
No						
1	Gross Command	31424 ha	34502 ha			
	Area (GCA)		3078 ha GCA increased due Proposed pip			
			canal instead of open canal			
2	Culturable	19484 ha	21392 ha			
	Command Area		1908 ha CCA increased due Proposed pipe			
	(CCA)		canal instead of open canal			
3	Irrigable Command	16500 ha	21392 ha			
	Area (ICA)		4892 ha ICA increased due Proposed pipe			
			canal instead of open canal			
4	Narayanpur lift	N/A	Approx. 45 km			
	irrigation Scheme		The saved water is proposed to be utilized for			
	-		irrigation of high level area through lift named			
			as Narayanpur lift irrigation Scheme			

Command Area:

The comparative statement with reference to earlier proposal and revised proposal is to be given in table format:

SI.	Details	Original	Revised
No.			
1	Dam	3.69 TMC	No change in configuration. The work of dam
			is almost Completed
2	Power	3 MW	0 MW (No Change)
3	Gross Command	31424 ha	34502 ha (3078 ha GCA increased due
	Area		Proposed pipe canal instead of open canal)
4	Culturable	19484 ha	21392 ha (1908 ha CCA increased due
	Command Area		Proposed pipe canal instead of open canal)
5	Irrigable	16500 ha	21392 ha (4892 Ha ICA increased due

	Command Area		Proposed pipe canal instead of open canal)		
6	Open Canal	LBC-144 km	Proposed pipe canal instead of open canal		
	(Length in km)	RBC-22 km	The Open Canal system is now PDN		
7	Pipe canal	0	LBC- 83.698KM		
	(Length in km)		RBC- 20.378KM		
8	Narayanpur Lift	N/A	Approx. 45 km (The saved water is proposed		
	Irrigation Scheme		to be utilized for irrigation of high level area		
			through lift named as Narayanpur lift		
			irrigation Scheme)		
9	Pump House	0	Addition of 2 nos. of Power House		
10	Transmission	0	Addition of 33 KV Transmission Line		
	Line				
11	Power	Nil	5.6 MW		
	requirement				

The EAC in the present meeting deliberated on the information submitted by the PP (Form 4 etc.) and observed that present proposal involves increase in the CCA because of the proposed pipe canal in place of open canal without change in configuration of the Dam. EAC after detailed deliberation **recommended** the proposal for grant of **amendment** in Environmental Clearance subject to compliance of Environmental Conditions stipulated vide letter dated 29.04.2005. Further, as the closed conduit system (pipe canal) is passing within 10 km radius from draft Ecosensitive Zone (ESZ), permission from the concerned Competent Authority shall be obtained.

Item No. 30.7 Kelo Major Irrigation Project (CCA: 22,800 ha) village: Lakha, Raigarh district in Chhatisgarh by Water Management Division, Government of Chhattisgarh – reg. amendment in EC File No. J-12011/9/2007-IA.I, Proposal No. IA/CG/RIV/96743/2008

Project proponent made the detailed presentation and inter alia provided the following information:

The Kelo Major Irrigation Project is located near village Danote of district Raigarh in Chhattisgarh. The total land requirement for the project is about 2243.92 ha. Out of which 361.90 ha is forest land; 1604.08 ha private land and 277.94 ha Government land. Total submergence area is 1334.76 ha. A 24.22 m high earthen dam across river Kelo (a tributary of river Mahanadi) with gross storage capacity of 76.07 MCM is being constructed for providing irrigation to 22810 ha CCA spread in the districts of Raigarh and Janjgir Champa and for providing drinking water at the tune of 4.44 TMC. Catchment area of the project is 920.21 Sq.km. The total estimated cost is about Rs. 972.22 Crores.

The Environmental Clearance to the above project was granted by the Ministry vide letter No. J12011/28/2008-IA. I dated 21.10.2008. Environmental Clearance was valid for a period of 10 years. At present, dam work is almost completed and 85 % of canal work is completed. To complete the balance work of project, extension of validity of Environmental clearance for 5 years is required. Accordingly, application for extension of EC validity period was filed online by the PP on 21.02.2019.

Project Proponent further informed that project had started irrigation facility in the year 2014 to some extent, within the 10 years limit of Environment Clearance obtained in 2008. By this, irrigation facility provided to the farmers resulted in the additional production of crops.

EAC deliberated on the information submitted by the PP for extension of validity of EC dated 21.10.2008 and provisions of EIA Notification 2006 and as amended thereof, regarding extension of validity of EC. EAC opined since the irrigation facility is already extended to some extent by the PP within 10 years, *extension of validity of EC may not be required in the instant case*.

However, as PP did not submit any document, which proves that irrigation facility was started in the year 2014 to some extent, which had resulted in the additional production of crops, therefore committee is of the view that, if Project Proponent submit the following to the Ministry, *extension of validity of EC may not be required*. Further, environmental conditions stipulated in the Environmental Clearance dated 21.10.2008, shall be followed in *toto* during construction of balance work and operation phase:

- 1. Documentary evidences for the irrigation started along with the affidavit *inter alia* stating the details of irrigation extended (CCA) to the agricultural area, number of villages benefitted, quantum of additional crop production.
- 2. Details of statutory clearances obtained for the project.
- 3. Component wise status (%) of construction of project work.
- 4. Six monthly compliance report.

Item No. 30.8 Any other item with the permission of the Chair

Item No. 30.8 (a) Discussion on the site visit of the Sub-committee to Kundah Pumped Storage HEP (4x125 MW) in tehsil Udhagamandalam, district of Nilgiris, Tamil Nadu to be implemented by M/s Tamil Nadu Generation and Distribution Corporation

The Sub-committee visited the proposed site on 06.12.2019 and held discussion on 07.12.2019 with the project officials at the project site. Due to pre-occupation, Shri Sharvan Kumar, Member could not accompany the Sub-committee. During site visit, various site viz., HRT, TRT, Switch Yard, Muck Disposal Site, etc. were visited. The site visit report was presented before the EAC. The sub-committee recommended that the whatever be the solution, it should be ensured that work at the project does not stop. Any stop-work could result in further delays; cost over-run; increased cost of electricity; idle plant and labor charges by the contractor; and any delay in hydropower commissioning means more thermal electricity, more coal burning, and more environmental damage. The site visit report was presented before the EAC and the recommendation of the Sub-Committee have been discussed and the EAC agreed the recommendation of the Sub-committee. The site visit report is enclosed as Annexures-II (a). The signed report of the sub-committee is enclosed as Annexure II (b).

Item No. 30.8 (b) Discussion on the site visit of the Sub-committee to Sillahalla Pumped Storage HEP (4x250 MW) in tehsil Udhagamandalam district of Nilgiris,

Tamil Nadu to be implemented by M/s Tamil Nadu Generation and Distribution Corporation (TANGEDCO)

The Sub-committee visited the proposed site on 06.12.2019 and held discussion on 07.12.2019 with the project officials at the project site. Due to pre-occupation, Shri Sharvan Kumar, Member could not accompany the Sub-committee. The site visit report was presented before the EAC and the recommendation of the Sub-Committee have been discussed and the EAC agreed the recommendation of the Sub-committee. The site visit report is enclosed as Annexure-III.

Annexure- I

S.		Water Depth and EFR recommended						Calculation of Water Depth for corresponding EFR calculated through river cross sections			
	Name of Project	Fish availability	Recommended Depth Range for fish movement Table 5.46(m)	Recommended Minimum Depth Table 5.46 Dec- Mar(m)	EFR calculated from discharge data(m ³ /s)	% of 3 monthly average (Dec-Jan- Feb) Inflow	River	Discharge obtained from cross section Q=AV(m ³ /s)	Depth from corresponding discharge (D)(m) (During Dec-Jan- Feb)		
1	Jangi Thopan Powari	Nil	NA	NA	6.63 be replaced with 6.64	20	Sutlej	10.40 be replaced with 6.74	1.35 be replaced with 1.25		
2	Karchham Wangtoo	Rare	0.20-0.30	0.15	12.13	20	Sutlej	12.16	0.46		
3	Nathpa Jhakri	Occasional	0.20-0.30	0.15	12.40	20	Sutlej	12.65	0.50		
4	Rampur	Frequent	030-0.40	0.30	14.55	20	Sutlej	14.25	0.33		
5	Luhri-I	Frequent	030-0.40	0.30	14.76	20	Sutlej	14.90	0.27		
6	Luhri-II	Frequent	0.30-0.40	0.30	14.93	20	Sutlej	14.88 be replaced with 15.02	1.27 be replaced with 0.78		
7	Luhri-III	Frequent	0.30-0.40	0.30	15.14	20	Sutlej	15.29 be replaced with 15.24	0.97 be replaced with 2.10		
8	Koldam	Abundant	0.30-0.40	0.30	25.03	20	Sutlej	25.01	0.70		
9	Shongtong Karcham	Nil	NA	NA	11.52	20	Sutlej	11.66	0.12		
10	Baspa-II	Frequent	0.20-0.30	0.20	1.86	20	Baspa	1.82	0.76		
11	Tidong-I	Rare	0.20-0.30	0.15	0.99	20	Tidong Khad	0.99	0.20		
12	Tidong II*	Nil	NA	NA	0.64	20 be replaced with 15	Tidong Khad	0.84 be replaced with 0.64	0.22 be replaced with 0.19		
13	Wanger Homte	Nil	NA	NA	0.50	20 be replaced with 15	Wanger Gad	0.67 be replaced with 0.50	0.09 be replaced with 0.08		
14	Masrang Selti	Nil	NA	NA	0.51	20 be replaced with 15	Kashang Khad	0.75	0.11 be replaced with 0.09		
15	Kashang-I*	Nil	NA	NA	0.35	20 be replaced with 15	Kashang Khad	0.49 be replaced with 0.36	0.03		
16	Rakshad	Nil	NA	NA	0.17	20 be replaced with 15	Salring Khad	0.19	0.07		
17	Jeori	Nil	NA	NA	0.16	20 be replaced with 15	Manglad Khad	0.23 be replaced with 0.16	0.03 be replaced with 0.02		
18	Nanti	Nil	NA	NA	0.32	20 be replaced with 15	Nanti Khad	0.45 be replaced with 0.33	0.12 be replaced with 0.10		

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Name of Project	Fish	I December 1 1				calculate	ed through river c	ross sections
	availability	Recommended Depth Range for fish movement Table 5.46(m)	Recommended Minimum Depth Table 5.46 Dec- Mar(m)	EFR calculated from discharge data(m ³ /s)	% of 3 monthly average (Dec-Jan- Feb) Inflow	River	Discharge obtained from cross section Q=AV(m ³ /s)	Depth from corresponding discharge (D)(m (During Dec-Jan Feb)
ogni	. Nil	NA	NA	0.45	20 be replaced with 15	Nogli Gad	0.6 be replaced with 0.45	0.13 be replaced with 0.11
ala*	Nil	NA	NA	0.22	20 be replaced with 15	Panwi Khad	0.29 be replaced with 0.22	0.05 be replaced with 0.04
langlad	Nil	NA	NA	0.25	20	Manglad Khad	0.26	0.03
oura-II*	Nil	NA	NA	0.21	20 be replaced with 15	Raura Gad	0.28 be replaced with 0.22	0.06 be replaced with 0.05
ebna I	Occasional	0.20-0.30	0.20	0.80	20	Anni Gad	0.83	0.15
mli	NIL	NA	NA	0.31	20 be replaced with 15	Kurpan Khad	0.42 be replaced with 0.32	0.08 be replaced with 0.07
umei*	NIL	NA	NA	0.09	20	Sechi Khad	0.09	0.06
urmi	NIL	NA	NA	0.32	20 be replaced with 15	Nanti Khad	0.30	0.03
			*(steep	slope 1:6 or steep)				
	anglad ura-11* bha I nli mej* armi	anglad Nil Nil- Nil- Nil Nil- Nil- Nil- Nil- Nil- Nil- Nil- Nil-	anglad Nil NA Nura-11 ⁹ Nil NA hma I Occasional 0.20-0.30 nil NIL NA mej* NIL NA mrni NIL NA	anglad Nil NA NA Num-II* Nil NA NA hna I Occasional 0.20-0.30 0.20 nil NIL NA NA mej* NIL NA NA mmi NIL NA NA *(steep	anglad Nil NA NA 0.25 Nura-11* Nil NA NA 0.21 hna I Occasional 0.20-0.30 0.20 0.80 nil NiL NA NA 0.31 mej* NIL NA NA 0.31 mej* NIL NA NA 0.32 rmi NIL NA NA 0.32 *(steep slope 1.6 or steep)	Anglad Nil NA NA 0.25 20 Jurar-1* Nil NA NA 0.21 20 be replaced with 15 Jonar 10 Occasional 0.20-0.30 0.20 0.80 20 Inli NIL NA NA 0.31 20 be replaced with 15 mej* NIL NA NA 0.31 20 be replaced with 15 mej* NIL NA NA 0.32 20 be replaced with 15 mej* NIL NA NA 0.32 20 be replaced with 15 rmi NIL NA NA 0.32 20 be replaced with 15 rmi NIL NA NA 0.32 20 be replaced with 15	anglad Nil NA NA 0.25 20 Manglad Khad Nura-11* Nil NA NA 0.21 20 be replaced with 16 Raura Gad han I Occasional 0.20-0.30 0.20 0.80 20 Anni Gad nil NiL NA NA 0.31 20 be replaced with 15 Kurpan Khad mej* NIL NA NA 0.09 20 Sechi Khad mrni NIL NA NA 0.32 20 be replaced with 15 Nami Khad *(steep slope 1.6 or steep)	anglad Nil NA NA NA 0.25 20 Manglad Khad 0.26 20 Jan Section 19 Na NA NA 0.21 20 be replaced with 9 Rawa Gad 0.28 0.26 0.20 Anni Gad 0.28 0.20 Na NA NA 0.31 20 be replaced with 9 Carbon 1 NIL NA NA 0.31 20 be replaced with 18 Kurpan Khad 0.42 be replaced mit 18 NIL NA NA 0.009 20 Secti Khat 0.42 be replaced with 0.32 mit NIL NA NA 0.32 20 be replaced with 15 Nanti Khad 0.30 mit NIL NA NA 0.32 20 be replaced with 15 Nanti Khad 0.30 *(steep slope 1.6 or steep)

Annexure-II (a)

CEIA study for additional HEPs in Sutlei river basin. Himachal Pradesh

Site visit of the Sub-committee to Kundah Pumped Storage HEP (4x125 MW) in tehsil Udhagamandalam, district of Nilgiris, Tamil Nadu to be implemented by M/s Tamil Nadu Generation and Distribution Corporation

In 28th meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects was held on 31.10.2018. In the meeting, it was decided that a 5 Member Sub-Committee shall visit the proposed project site and to submit report on the viability of the project for appraisal before the next EAC meeting. The Sub Committee was constituted vide Ministry's letter No. J-12011/17/2019-IA.I (R) dated 02.12.2019. Based on the site visit, this Sub-committee shall submit a report on the viability of the project on the basis of environmental sensitivity, etc. for grant of fresh ToR. The following are the Members:

1.	Shri Chetan Pandit	-	Chairman
2.	Prof. S.R. Yadav	-	Member
3.	Shri N.N. Rai	-	Member
4.	Dr. J.A. Johnson	-	Member
5.	Dr. S. Kerketta	-	Member Secretary

Subsequently, Shri Chetan Pandit and Shri N.N. Rai opted out of the site visit due to pre-occupation and in their places, Dr. D.K. More and Shri Sharvan Kumar were nominated, respectively.

The Sub-committee visited the proposed site on 06.12.2019 and held discussion on 07.12.2019 with the project officials. Due to pre-occupation, Shri Sharvan Kumar, Member could not accompany the Sub-committee. During site visit, various site viz., HRT, TRT, Switch Yard, Muck Disposal Site, etc. were visited. The following officials and other senior officers were present from the project site:

1.	Shri P. Dandapani	:	Chief Engineer
2.	Shri M. Thirumal	:	S.E.
3.	Ms. A. Munavar Sultana	:	S.E., H.O., Chennai
4.	Shri V. Saravanan	:	S.E.
5.	Shri S. Ponnu Seshan	:	E.E.
6.	Shri A. Arputha Raj	:	A.E.E.

Discussion was held with the PP and *inter-alia*, informed the Sub-committee the following:

The Kundah Pumped Storage HEP (4x125 MW) project is being implemented in Nilgiris District of Tamil Nadu, was given Environmental Clearance by the Ministry on 08.05.2007 for a period of 5 years for commencement of construction work. Stage-I Forest Clearance was obtained on 27.11.2008 from the Ministry and Stage-II forest Clearance was accorded on 21.08.2013. As construction work could not be commenced on or before 07.05.2007, the validity of EC was again extended up to 07.05.2020. As the project shall not be commissioned within the validity period of EC i.e. on or before 07.05.2020, Ministry vide letter dated 17.10.2019,informed the PP to initiate the process of obtaining EC *de-novo*. Subsequently, fresh ToR was applied by the PP as per the extant guidelines of EIA Notification, 2006 and its subsequent amendments.

Brief Summary of the project:

This proposed project is to meet the peak power demands of the State Grid with a view to provide quality and reliable power supply by flexible operation of State Grid which will facilitate continuous supply of electricity in the state of Tamil Nadu. Under this scheme, the existing TNEB's Porthimund and Avalanche Emerald reservoirs in Nilgiris district will be used as Upper and Lower reservoirs, respectively. The Upper (Porthimund) reservoir formed during 1966 and the lower (Avalanche Emerald) reservoir formed during 1961. No new reservoirs are to be constructed.

An underground powerhouse is proposed to house 4 units of 125 MW each, which can be reached by means of an Access Tunnel. The water conductor system shall comprise one Head Race Tunnel (HRT), 2 numbers pressure shafts, 4 numbers penstocks, one Tail Race Surge Shaft and one Tail Race Tunnel (TRT). The HRT will be 1,279 m long, 8.5 m diameter circular shape with peak discharge of 240 cumecs. Similarly, Head Race Surge Shaft (Restricted Orifice) shall be 64.94 m high, 16 diameter (lower) and 24 m diameter (upper). Adit to Head Race Surge Shaft shall be410 m long and 6.5x7.5 m D-shape. Two Nos. Pressure Shafts shall be each 458 m long, 5.5 m diameter with peak discharge of 120cumecs each. Four penstocks of each having 59.9 m long, 3.9 m diameter with peak discharge of 60 cumecs. Tail Race Tunnel (TRT) shall be 915 m long 8.5 m diameter circular shape with peak discharge of 240 cumecs. Tail Race Surge Shaft shall be471 m long and 6.5x6.5 m diameter of D-Shape. Cable Cum Ventilation Tunnel shall be 827 m long and 6.5x6.5 m diameter of D-Shape.

Present Construction status:

- **1.** The brief status of work under progress (Civil and Hydro Mechanical Works) is as follows:
 - 100% Excavation works in the following components have been completed:
 - a. Main Access Tunnel
 - b. Cable Cum Ventilation Tunnel
 - c. Additionally Driven Inspection Tunnel (ADIT) to Tail Race Surge Chamber.
 - d. Adit to Tail Surge Chamber crown top
 - e. Adit to Tail Race Tunnel
 - f. Adit to Power House Top
 - g. Adit to pressure shaft bottom
 - h. Adit to Power House Bottom
 - i. Pilot Tunnel for Transformer Cavern
 - j. Pilot Tunnel for Power House Cavern
 - k. Unit TRT I & II.
 - 1. Pressure Shafts PS-1 & PS-2 Lower horizontal portion (84 m)
 - Excavation works in the following components are under progress:
 - a. Transformer Cavern Benching work is in progress
 - b. Main Power House Cavern Benching work is in progress
 - c. Tail Race Tunnel (895 m) 785 m (88%) completed and further excavation is under progress
 - d. Tail Race Tunnel Benching (895 m) 445 m (50%) completed and further benching work is under progress.
 - e. Escape Tunnel (56 m) 40 m (70%) completed and further excavation is under progress
 - f. Inclined portion pilot tunnel in Pressure shaft PS-1 (299 m) 82 m (28%) completed and further excavation is under progress.
 - g. Inclined portion pilot tunnel in Pressure shaft PS-2 (299 m) 9 m (3%) completed and further excavation is under progress.
 - h. Head Race Surge Chamber (dia. 32 m & 64 m depth)- 21.8 m Excavation completed & further excavation under progress.
 - i. Adit to HRT Excavation completed for 372 m (85%) and further excavation is under progress

Over all physical Progress is 19% and total financial progress of 16% has been achieved till 31st December, 2019 with total payment made to the tune of Rs. 282.47 crores

The total cost of the project is Rs. 1,832 crores including IDC at 2014-15 PL, of which Rs. 282.47 crores have been spent till December, 2019. The tentative commissioning schedule of the project is 2023-24 (May, 2023). Main reason of delay in execution of works are due to paucity of funds during 2007-08 and 2912-13, non-availability of surplus power for pumping from 08.05.2007 to 07.05.2012, announcement of GST forced for re-evaluation of the bids and pending court cases. No additional land will be acquired for this on-going project. The total land requirement is 77.89 ha, of which 47.89 ha is private

land required for the execution of the project which has already been acquired and 30 ha forestland has to be diverted for non-forest use for which Stage-I Forest Clearance has been obtained vide letter dated 27.11.2008 and Stage-II Forest Clearance has been obtained vide letter dated 21.08.2013. A total of 36 ha of private land has been handed over to the State Forest Department towards Compensatory Afforestation. Balance land is utilized for project purposes.

Observation of the Sub-committee:

During site visit, the Sub-committee visited the construction sites of Cable Cum Ventilation Tunnel (CCVT), HRT, Switch Yard, Muck disposal area, crusher, etc. The following are the observation:

- 1. Sub-committee examined the requirement of collection of baseline data based on either one or three seasons for preparation of EIA/EMP report. Further, the Sub-committee noted that as there are no activities above the tunneling work, there is very negligible impact on the surface.
- 2. Necessity of any specific measures to be taken up during construction work as the area falls within proposed Western Ghat Eco-sensitive Areas.
- 3. The muck generated from the Tunnelling work is being dumped at the Muck Disposal site and then taken to the Crusher for making stone aggregates. 90% of the muck will be used for construction work and remaining will be kept at the Muck Disposal sites.
- 4. Over all physical Progress is 19% and total financial progress of 16% has been achieved till 31st December, 2019 with total payment made to the tune of Rs. 282.47 crores
- 5. Further, this project is to be commissioned during 2022-23.
- 6. Some photographs of site visit report are annexed as **Annexure-IV** in the site visit report.

Way Forward:

- 1. As the project is already in construction stage, it has been opined that one season baseline data may be collected and revised the existing EIA/EMP report of this project for which EC was earlier granted.
- 2. Secondary data may also be collected on flora, fauna, aquatic life, etc. from the local sources of the area and may also form part of the modified EIA/EMP report.
- 3. It is a unique case wherein the project had not completed construction activities within the outer limit of EC validity. The procedure to deal with the projects under construction after outer limit of EC validity (13 years for River Valley Projects) has not been provided in the EIA Notification, 2006 and its amendments. Considering the progress of the project and expenditure made in the project activities so far, and the fact that land acquisition had been already completed, the Sub-committee also opined that seeking exemption to conduct Public Hearing by the PP is justified. However, in any case, sufficient opportunity is also to be given to so called affected people and stakeholders for raising concerns on the project, if any.

So that, due process of EIA has to be followed before recommending for grant of EC to this project.

- 4. As there is no change in the scope, no additional land is acquired and also the project has already undertaken more than 19% of physical Progress is 19% and total financial progress of 16% has been achieved till 31st December, 2019 with total payment made to the tune of Rs. 282.47 crores.
- 5. The sub-committee recommended that the whatever be the solution, it should be ensured that work at the project does not stop. Any stop-work could result in further delays; cost over-run; increased cost of electricity; idle plant and labor charges by the contractor; and any delay in hydro-power commissioning means more thermal electricity, more coal burning, and more environmental damage. The site visit report was presented before the EAC and the recommendation of the Sub-Committee have been discussed and the EAC agreed the recommendation of the Sub-committee. The site visit report is enclosed as Annexures-II (a). The signed report of the sub-committee is enclosed as Annexure II (b).
- 6. The Sub-committee recommended that even if the ToR is granted, construction work may not be stopped.
- 7. The Sub-committee once again reiterated the EAC recommendation that a separate call may be taken up by the Ministry for giving exemption of the Public Hearing (PH) of the operational project.
- 8. Once the draft Western Ghat Eco-sensitive (WGE) Area Notification is approved by the Competent Authority, necessary conservation measures shall be taken up in the area that is falling within WGE area in consultation with the Ministry by duly incorporating all the environmental parameters.
- 9. The Regional Office located at Chennai of the Ministry may submit a latest status of point-wise EC conditions issued vide Ministry's letter dated 27.11.2008.

Sd/-(S. Kerketta) Sd/-(J.A. Johnson) Sd/-(S.R. Yadav)

Sd/-(D.K. More)

Pune,26 Jan 2020.

The Kundah Project- Tamil nadu

(Site Visit Report)

The site was visited by the Sub committee on 6th, 7th December 2019.

The Ministry of Environment & Forests (MoE&F), Govt. of India accorded Environmental Clearance for the Kundah Pumped Storage Hydro-Electric Project (4x125 MW) in the Nilgiris District, vide Letter No. J-12011/62/2006- IA-I dated 8.5.2007, with validity for a period of 5 (five) years from the date of issue of the letter for commencement of construction work, as per the provisions of EIA Notification, 1994 & 2006.

The initial Environmental Clearance was accorded as per the provisions of EIA Notification, 2006, EC validity is for a period of 10 years with a provision to extend for a period of 5 more years, for completion of the project works.

TANGEDCO has submitted that due to paucity of funds and power crisis during the period, they could not commence the project work during the initial E.C validity period, except certain works such as purchasing `private land' and diversion of `forest land' for the project, etc. Based on the direction of MOEF while seeking extension of validity of E.C (MoE&F/GOI letter No. J-2011/62/2006-IA-I (Part), dated 09.09.2013), TANGEDCO also commenced the project works on ground. However they couldn't commission the project within the 10 years E.C period.

However, when TANGEDCO approached MOEF seeking extension of validity for 5 more years, as per the provisions of EIA Notification 2006, MOEF has given extension of E.C limited to 3 more years ie., up to 7.5.2020, citing the Amendment to EIA Notification 2016, dt.14.9.2016, which provides validity of E.C for Hydel Project for a maximum of 13 years.

In this regard, it is considered that any new amendments issued to the EIA Notification 2006, should not be applied retrospectively, as the Environmental Clearances issued to projects are based on previous notifications.

TANGEDCO has carried out substantial work on the ground. Major tunnels of water conductor system have been completed and the Power House and transformer caverns, their excavations works have been partially completed. TANGEDCO has also awarded the tender for Electro Mechanical works and are ready to go ahead with the works. A huge amount of public money(Rs.256 crores) has been invested in the project. It is also learnt that, works under three packages(amounting to Rs more than 2000Tcrores) is in progress. The works are likely to be completed by the year 2023.

In view of this, the subcommittee is of the view that the validity of E.C issued to TANGEDCO for the Kundah Pumped Storage HEP (4×125 MW), should be extended up to 7.5.2022 (totally 15 years), as per the provisions of EIA Notification 2006 and should not be reduced retrospectively to 13 years.

However, if the project is not completed within the validity of E.C.i.e. 7.5.2022, TANGEDCO may be permitted to conduct "one season" EIA Study and Public Hearing may be exempted and they may approach MOEF for fresh E.C, within the validity of the existing E.C, so that the Project works are not required to be suspended, causing immence time and cost over run, which will be a gross loss to the public exchequer.

If the works are stopped, there will be huge claims by the contractors., on account of idle labour and idle plants The claims are mostly inflated and the Govt Departments are helpless. The cost of electricity goes up.

(Dr. S. Kerketta)

(Dr. J.A. Johnson)

(Dr. D.M. More)

30

Site visit of the Sub-committee to Sillahalla Pumped Storage HEP (4x250 MW) in tehsil Udhagamandalam district of Nilgiris, Tamil Nadu to be implemented by M/s Tamil Nadu Generation and Distribution Corporation (TANGEDCO)

In 28th meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects was held on 31.10.2018. In the meeting, it was decided that a 5 Member Sub-Committee shall visit the proposed project site and to submit report on the viability of the project for appraisal before the next EAC meeting. The Sub Committee was constituted vide Ministry's letter No. J-12011/17/2019-IA.I (R) dated 02.12.2019. Based on the site visit, this Sub-committee shall submit a report on the viability of the project on the basis of environmental sensitivity, etc. for grant of fresh ToR. The following are the Members:

1.	Shri Chetan Pandit	-	Chairman
2.	Prof. S.R. Yadav	-	Member
3.	Shri N.N. Rai	-	Member
4.	Dr. J.A. Johnson	-	Member
5.	Dr. S. Kerketta	-	Member Secretary

Subsequently, Shri Chetan Pandit and Shri N.N. Rai opted out of the site visit due to preoccupation and in their places, Dr. D.K. More and Shri Sharvan Kumar were nominated, respectively.

The Sub-committee visited the proposed site on 06.12.2019 and held discussion on 07.12.2019 with the project officials. Due to pre-occupation, Shri Sharvan Kumar, Member could not accompany the Sub-committee. The following officials and other senior officers were present from the project site:

a. TANGEDCO

Shri P. Dandapani	:	Chief Engineer
Ms. A. Munavar Sultana	:	S.E., H.O., Chennai
Shri P Babu	:	E.E.
Shri C. Ramesh	:	E.E.
	Shri P. Dandapani Ms. A. Munavar Sultana Shri P Babu Shri C. Ramesh	Shri P. Dandapani:Ms. A. Munavar Sultana:Shri P Babu:Shri C. Ramesh:

b. WAPCOS

1.	Shri Amitab Tripathi	:	Senior E.D.
2.	Shri R. Dhinakaran	:	Addl. C.E.
3.	Shri S.M. Dixit	:	Addl. C.E.

Discussion was held with the PP and inter-alia, informed the Sub-committee the following:

The proposed Sillahalla Pumped Storage Project (PSP) (4x250 MW) is located in the Nilgiris district of the state of Tamil Nadu. The upper reservoir shall be constructed near Bembatti village on Sillahalla Stream, tributary of Kundah river and lower reservoir shall be constructed near Manzoor village on Kundah river downstream of existing Kundah Palam Dam, both the

reservoirs are falling in Kundah taluk of the Nilgiris district. The capacity of upper reservoir is 27.836 MCM at FRL. The capacity of lower reservoir is 11.127 MCM at FRL. Similarly, both are Concrete Gravity Dams. The Sillahalla river joins Kundah River in about 1.4 km upstream of Kundah Palam dam of existing Kundah Powerhouse-I (60 MW) project. The inflows of Sillahalla, Kanarhalla and other small tributaries are stored in Kundah Palam dam. The water stored in Kundah Palam dam is discharged to Kundah Powerhouse-II (5x35 MW) through tunnel and 5 Nos. penstocks and let into Pegumbahallah dam across Kundah river. The Kundah River ultimately joins Bhavani River near Pillur in Coimbatore.

Salient Features of the Project:

The proposed project envisages construction of the following main components:

Sl.	Component	Dimensions	Location/shape
1.	Upper Dam	H: 82 m	Lat.: 11º18'53.72" N
		L: 327 m	Lon.: 76º38'56.34" E
2.	Lower Upper Dam	H: 112 m	Lat.: 11 ⁰ 16'25.81" N
		L: 470 m	Lon.: 76º40'13.34" E
3.	Lined Concrete HRT	L: 2,862 m	Circular
		φ: 9 m	
4.	Lined Concrete HRT Surge	H: 70 m	Circular
	Shaft	φ: 20 m	
5.	Inclined Steel Lined Pressure	L: 533 m	Circular
	Shaft (2 Nos.)	φ: 6.5 m	
6.	Steel Lined penstocks	L: 55 m	Circular
	(4 Nos.)	φ: 4.75 m	
7.	Lined Concrete TRT	L: 1,567 m	Circular
		φ: 9.75 m	
8.	U/G Powerhouse Cavern	L: 160 m	2 Fixed and 2 Variable
		W: 24 m	Speed pumps/ turbines
		H: 55 m	
9.	Turbine/Pump (4 Nos.)	Head: 380/420 m	Francis Type, Vertical
		Discharge:	Shaft
		73.62/63.71 m ³ /s	<u> </u>
8.	Main Access Tunnel	L: 1,240 m	D-shape
		W: 8 m	
		H: 8 m	

The total land requirement for the proposed project is 315 ha, of which, about 123.3 ha is forestland, 57 ha Government land and 134.7 ha is private land. About 170 ha of land shall come under submergence at FRL for Upper Reservoir (135 ha) and Lower Reservoir (35 ha). A total of 145 ha as additional land is to be acquired for dam, water conductor system, powerhouse and other project appurtenances. Total Catchment area of the upper reservoir and lower reservoir are 65 km² and 183.48 km², respectively. The cost of the project is Rs. 4,952.17 crores at 2019 PL. About 1,600 labourers and technical staff will be employed during construction phase. The Levelised Tariff is Rs. 5.57 and 1st year Tariff is Rs. 6.20. The project envisaged to be commissioned in 66 months.

EAC observed that as per records available on DSS portal, the instant project is located at a distance of 3.49 km from the Mukurthi National park and 4.18 km from the Mudumalai-Mukurthi

Tiger corridor. EAC proposed that a Sub-committee of EAC to take up a site visit for prescribing the additional Terms of Reference for preparing EIA including necessity of any specific measures to be taken up during construction work as the area also falls within Western Ghat Eco-Sensitive Areas.

Observation of the Sub-committee:

During site visit, various proposed sites viz., Dam site, Upper Reservoir and Lower Reservoir were visited. The following are the observation:

- 1. Necessity of any specific measures to be taken up during construction work as the area falls within proposed Western Ghat Eco-sensitive Areas.
- 2. In all three alternate sites were shown for tunneling and accordingly location of different underground powerhouse caverns were studied to ensure reduction of acquisition of forestland, etc. The details of the alternates are as follows:

Based on the requirement of rock cover for the water conductor system of location of surge shaft, 3 alternate water conductor system routes have been analyzed and after the comparative cost analysis, Alternate-1 has been finalized. The comparison of 3 alternative and cost analysis are furnished below:

Parameters	Alt -1	Alt -2	Alt -3	
Upper Dam	1	•		
Length (m)	327	327	578	
Height (m)	82	82	103	
Lower Dam				
Length (m)	470	470	470	
Height (m)	112	112	112	
Head Race Tunnel (HRT)				
Diameter (m)	9.0	9.0	8.65	
Length (km)	2.86	1.92	2.64	
Inclined Pressure Shafts				
Diameter (m)	6.5	6.5	6.1	
Inclined Length (m)	533	1280	562	
Tail Race Tunnel (TRT)				
Diameter (m)	9.75	9.75	9.4	
Length (km)	1.57	1.62	1.58	

Comparison of Project Layout

Comparison of Project cost

Alternates	Total (Rs. In Crore)		
Alternative 1	4131		
Alternative 2	4515		
Alternative 3	4350		

Concept sketches were made using topographic mapping specifically developed under the PFR- level evaluations, which is shown below. In view of the overall lower estimated project development cost, with further optimization and PFR level study of Alternative-I has been finally proposed.



Alternative project Layouts

Some photographs of site visit report are annexed as **Annexure IV** in the site visit report.

Way Forward:

- 1. As proposed by PP and considering the overall lower project cost, Alternate-1 has been agreed by the Sub-committee.
- 2. Secondary data may also be collected on flora, fauna, aquatic life, etc. from the local sources of the area and may also form part of the modified EIA/EMP report.
- 3. Once the draft Western Ghat Eco-sensitive (WGE) Area Notification is approved by the Competent Authority, necessary conservation measures shall be taken up in the area that is falling within WGE area in consultation with the Ministry by duly incorporating all the environmental parameters.

(S. Kerketta) (J.A. Johnson) (S.R. Yadav)

(D.K. More)

Site visit of the EAC (RV & Hydro) Sub Committee to Kundah & Sillahalla Pumped Storage HEPs, Nilgiris, Tamil Nadu



Bhawani River (Left), near Mulli check post (Right)



Kundah River

Location of the Lower Reservoir – Sillahala PS HEP



Location of the Upper Reservoir – Sillahala PS HEP



Sub Committee at the site of Upper Reservoir – Sillahala PSHEP



Sub Committee at the Power House Cavern site approach via Cable Tunnel – Kundah PSHEP



Muck Dumping Site – Kundah PSHEP

LIST OF MEMBERS

30th MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR RIVER VALLEY & HYDROELECTRIC PROJECTS

DATE	:	27 th January 2020
TIME	:	10:30 am onwards
VENUE	:	Teesta Hall, Vayu Block, Indira Paryavaran Bhawan, New Delhi

.

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Sl.No.	Name of Member	Signature
1.	Prof. Sharad Kumar Jain, Chairman	freem.
2.	Shri. Sharvan Kumar, Member	82-01-2020
3.	Shri N. N. Rai, Member	-Ab-
4.	Dr. J.A.Johnson, Member	J. Anty Throw 27/01/2020
5.	Dr. AK Sahoo, Member	- 46 -
6.	Dr. Vijay Kumar, Member	-Ab-
7.	Prof. Govind Chakrapani, Member	- Ab-
8.	Dr. Chetan Pandit, Member	JM
9.	Dr. Dinkar Madhavrao More, Member	TEmmilie .
10.	Prof. R.K. Kohli, Member	- 45-
11.	Prof. S.R. Yadav, Member	<u>Alfochi</u>
12.	Dr. Jai Prakash Shukla, Member	den .
13.	Dr. Poonam Kumria, Member	Rigues 1.20
14.	Dr. Kerketta, Member Secretary Director (IA-1)	Soler Kan

2 attachments

Sat, Feb 15, 2020 12:27 PM

RE: 30th Draft MoM of RVP- regarding

Dear Dr Kerketta, I have gone through the minutes. Minor editorial corrections are needed. I have deleted pages after 28 – file size was too big and the system was not accepting it.

Thanks.

Sharad Jain Chairman (EAC) and Director NIH

From: Dr S Kerketta [mailto:s.kerketta66@gov.in]
Sent: Friday, February 14, 2020 3:10 PM
To: Sharad K Jain <s_k_jain@yahoo.com>; Sharad Jain <skj.nihr@gov.in>
Cc: Dr. S Kerketta <suna1466@rediffmail.com>
Subject: 30th Draft MoM of RVP- regarding

Sir,

The draft MoM of 30th EAC Meeting of River Valley projects is enclosed. The comments of domain experts have been duly incorporated in the minutes.

It is requested to kindly approve the draft MoM.

regards,

Dr. S. Kerketta Director- IA (Thermal, River Valley & HEP) MoEF&CC, New Delhi Phone: 011-24695314 (O), 26113096 (R)