



सत्यमेव जयते

**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**IA Division**  
**(River Valley and Hydroelectric Projects)**

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**Minutes of 2ND MEETING OF THE EXPERT APPRAISAL COMMITTEE**  
**meeting River Valley and Hydroelectric Projects held from 26/10/2023 to**  
**26/10/2023**

**Date:** 14/11/2023

**MoM ID:** EC/MOM/EAC/522623/10/2023  
**Agenda ID:** EC/AGENDA/EAC/522623/10/2023  
**Meeting Venue:** N/A  
**Meeting Mode:** Virtual  
**Date & Time:**

26/10/2023	10:30 AM	05:30 PM
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### 1. Opening remarks

The 2nd meeting (online mode) of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 26th October, 2023 under the Chairmanship of Prof. G. J. Chakrapani.

### 2. Confirmation of the minutes of previous meeting

The EAC while confirming the Minutes of the 1st EAC meeting held on 17-18 October, 2023 and recommended for addition of following para after completion of para no. 1.5.1 of Agenda Item No. 1.5 regarding grant of amendment in TOR issued on 09.11.2022 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited, [Proposal No. IA/MH/RIV/443150/2023; F. No. J-12011/52/2023-IA.I (R)] : "...Shri Janardan Choudhary is presently working as Advisor in M/s Adani Green Energy Ltd; so, to avoid any conflict of Interest he had not participated in the deliberations on Agenda item No. 1.5 regarding grant of amendment in TOR issued by the Ministry on 09.11.2023 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited of M/s Adani Green Energy Limited...." With the above corrections the EAC confirmed the Minutes of the 1st EAC meeting held on 17-18 October, 2023.

### 3. Details of proposals considered by the committee

**Day 1 -26/10/2023**

#### 3.1. Agenda Item No 1:

##### 3.1.1. Details of the proposal

<b>Gandikota Pumped Storage Project (1000 MW) by NEW AND RENEWABLE ENERGY DEVELOPMENT CORPORATION OF ANDHRA PRADESH LTD (NREDCAP) located at Y.S.R.,ANDHRA PRADESH</b>			
<b>Proposal For</b>		Fresh EC	
<b>Proposal No</b>	<b>File No</b>	<b>Submission Date</b>	<b>Activity (Schedule Item)</b>
IA/AP/RIV/447249/2023	J-12011/16/2021-IA.I (R)	09/10/2023	River Valley/Irrigation projects (1(c))

### 3.1.2. Project Salient Features

**2.2.1** The proposal is for grant of Environmental Clearance to the Gandikota Pumped Storage Hydro-electric Project (1000MW), in an area of 190 ha. (469.5 acre) located at village Kondapuram village, Tehsil Muddanur, District Kadapa, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP).

**2.2.2:** The Project Proponent and the accredited Consultant M/s WAPCOS, New Delhi, made a detailed presentation on the salient features of the project and informed that:

- 1. Location:** The proposed Gandikota Pumped Storage Project is located near K Bommepalli & Nenanuthala Villages, Kondapuram mandal of YSR Kadapa district of Andhra Pradesh. The project area falls in the toposheet number 57J/1 and bounded by North latitudes 14°46' to 14°50' and East longitudes 77°10' to 78°16'.
- The proposed project planned by using the existing Gandikota Reservoir as lower reservoir for the Pumped storage scheme with Full Reservoir Level of 212 m and Minimum draw down level of 202.9 m. A new upper reservoir of composite bund and pit type will be developed. The optimum possible live storage capacity for pumped storage scheme required is 8.592 MCM, which has been finalised based on the topography and geology of the upper dam. The proposed project will generate 1000 MW of power. The Gandikota reservoir with a Gross Storage of 26.85 TMC (760.02 MCM) acts as a balancing reservoir on Pennar river. It receives water from self-catchment together with water from Chitravathi River.
- 3. Land requirement:** The total land to be acquired for the project is 270.11 ha. The forest land and private land to be acquired is 151.18 ha and 20.38 ha. About 98.55 ha of revenue land shall also be acquired.
- 4. Hydrology:** The lower reservoir is existing as Gandikota Reservoir which is the primary source of one time water requirement for proposed upper reservoir during daily pumping and generation cycle. Assessment for availability of water in lower existing reservoir has been done and concurrence on Hydrological aspects of the project has been obtained from Hydrology (south) Directorate vide CWC U.O. 7/AP-106/2021-Hyd(S)/221 Dated 16.12.2021.
- 5. Ecologically Sensitive Areas:** There is no wildlife sanctuary, Biosphere reserve or any Ecological Sensitive Zone identified within the 10 km radius of the project areas
- 6. Public Hearing: 18.08.2023 at Tirumalayyapalli (Village) by** Joint collector and Addl. Dist. Magistrate. Main issued was Employment and Infrastructure development
- 7. The salient features of the project are as under: -**

#### 1. Project Details

Name of the Proposal	Gandikota Pumped Storage Project (1000 MW)
Proposal No.	IA/AP/RIV/447249/2023
Location (Including Coordinates)	Kondapuram (M), YSR District Lat. N 14° 48' 38" and Long. E 78° 15' 30"
Company's Name	New & Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP)
Accredited Consultant and certificate no.	WAPCOS LIMITED,

	NABET/EIA/21124/RA0222
Project location (Coordinates /River/Reservoir)	Lat. N 14° 48' 38" and Long. E 78° 15' 30".
Inter- state issue involved	No
Proposed on River/ Reservoir	Reservoir

### 1. Category details:

Category of the project	A
Capacity / Cultural command area (CCA)	1000 MW
Attracts the General Conditions (Yes/No)	No

### 1. ToR/EC Details:

ToR Proposal No.	IA/AP/RIV/235841/2021
EAC meeting date	15.11.2021
ToR Letter No.	F.No. J-12011/16/2021-IA.I(R)
ToR grant Date	04.01.2022
Cost of project	5017.48 Crore (Incl. IDC)
Total area of Project	270.11 ha.,
Height of Dam from Bed (EL)	21.5m
Details of submergence area	NA, as proposed upper reservoir is not on any nala
District to provide irrigation facility (if applicable)	Nil
Details of tunnels on upper level & lower level and length of canal (if applicable)	Two Underground water conductor system in the form of Tunnel <b>Details of WCS:</b> Intake Tunnel: 2 No. x 8.90m dia. X 51m (L) Inclined Pressure Shaft: 2 No. x 7.00m dia. X 443m (L) Unit Pressure Shaft: 4 No. x 5.50m dia. X 73m (L) Tail Race Tunnel: 2 No. x 8.90m dia. X 1267m (L)
No. of affected Village.	02
No. of Affected Families	07
Project Benefits	Power Generation of 1872.5 MU annually, Up-liftment of Socio economic condition of Study area villages
R&R details	Yes, Yet to start
Catchment area/ Command area	Upper Reservoir is proposed as a table top artificial pond fed by lower reservoir does not have regulated flow of water and no catchment area is being intercepted. Hence, for upper reservoir no catchment area treatment is required. Lower reservoir is existing and in operation since 2013.
Types of Waste and quantity of generation during construction/ Operation	Waste water: 0.17 MLD Solid waste: 0.57 t/day

Material used for blasting and its Composition as per DGMS standards.	Will be finalised during pre-construction market survey
E-Flows for the Project	NA
Is Project earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If yes then  a) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA
Details on provision of fish pass	NA
Project benefit including employment details (no of employee)	During construction phase: 1600 During operation phase: 100
Area of Compensatory Afforestation (CA) with tentative no of plantation.	156.62 ha
Previous EC details	NA
EC Compliance Report by R.O, MOEF&CC	NA

### 1. Electricity Generation capacity

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	1872.49 MU
No. of Units	04 of 250 MW each

### 1. Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt land)	Government land – 57.37 Ha., Forest land – 6.80Ha.,
Cross section of proposed muck area, Height of muck with slope.	MA 1: 10m height in trapezoidal shape and 45 degree slope  MA 2A; Deposition on natural slope upto 12 height  MA 2B: Deposition on natural slope upto 10 height MA 3: Deposition on natural slope with varying height from 15m to 0m
Distance of muck disposal area (location), from muck generation sources (project area)/River, HFL of proposed muck	MA1: Approx. 1 km. MA2A&B: Approx. 05 km. MA3: Approx. 8 km.
Total Muck Disposal Area	64.17 ha.,
Estimate Muck to be generated	6.99MCM (actual quantity will be less depending upon usage during construction activities) Considering 30% expansion during transportation and dumping)
Transportation	By road
Monitoring mechanism for Muck Disposal	Enclosed in EIA/EMP report

### 1. Land Area Breakup:

Private land	20.38Ha.,
Government land/Forest Land	151.18 Ha., Forest- 98.55 Ha., Government land
Submergence area/Reservoir area	Reservoir area in reserve forest land
Land required for project components	143.42Ha.,

### 1. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/ letter/Remarks
Reserve Forest/Protected Forest Land	Yes, Reserve Forest	Application submitted for FC, In progress Proposal No. FP/AP/OTHERS/407446/ 2022, Dated: 23.11.2022
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites monuments/historical temples etc	No	
Additional information (if any)	No	

Availability of Schedule-I species in study area: Yes

### 1. Public Hearing (PH) Details

Advertisement for PH with date	17.07.2023
Date of PH	18.08.2023
Venue	Tirumalayyapalli (Village)
Chaired by	Joint collector and Addl. Dist. Magistrate
Main issues raised during PH	Employment and Infrastructure development

### 1. Brief of base line Environment

Particulars	Details
Period of baseline data collection/ Sampling period.	26/01/2022 To 28/10/2022, All three seasons.
(Air, noise, water, land)	<b>Air: PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>2</sub></b>  Parameter Pre-monsoon season (g/m <sup>3</sup> )

	Monsoon season ( $\mu\text{g}/\text{m}^3$ )
	Post-monsoon season ( $\mu\text{g}/\text{m}^3$ )
	Permissible Standards ( $\mu\text{g}/\text{m}^3$ )
	PM <sub>10</sub>
	71.63 - 76.63
	65.86 - 70.06
	70.01 - 76.13
	100
	PM <sub>2.5</sub>
	37 - 38.5
	33.41 - 44.0
	34.76 - 40.66
	60
	NO <sub>2</sub>
	21.25 - 23.5
	16.41 - 17.19
	21.98 - 23.7
	80
	SO <sub>2</sub>
	7.7 - 8.03
	6.83 - 7.16
	7.73 - 9.15
	80
	<b>Noise: Equivalent day time and night time noise level</b>
	Season
	Day Time Equivalent Noise level dB(A)
	Permissible Standards dB(A)
	Pre-monsoon
	42.47 – 43.42

	55
	Monsoon
	42.71 – 45.62
	55
	Post-monsoon
	42.61 – 44.37
	55
	<b>Surface Water: Physico-chemical and biological parameters</b>
	Parameter
	Pre-monsoon season
	Monsoon season
	Post-monsoon season
	Drinking Water Quality Standards
	pH
	7.72 - 8.22
	7.12 - 7.64
	7.32 - 7.8
	7.0 - 8.5
	Electrical Conductivity (µ/cm)
	610 - 694
	637 - 860
	462 - 710
	-
	Total Hardness (mg/l)
	142 - 156
	106 - 158
	130 - 172
	200
	BOD (mg/l)

	1.8 - 2.7
	1.2 - 1.8
	1.8 - 2.6
	-
	COD (mg/l)
	14 - 22
	15 - 24
	6 - 10
	-
	<ul style="list-style-type: none"> <li>The heavy metal concentration in the study area is below the permissible limit used for drinking purposes</li> </ul>
	<b>Ground Water: Physico-chemical and biological parameters</b>
	Parameter
	Pre-monsoon season
	Monsoon season
	Post-monsoon season
	Drinking Water Quality Standards
	pH
	6.68 – 7.96
	6.57 - 7.85
	6.52 - 7.78
	7.0 - 8.5
	Electrical Conductivity (µ/cm)
	156.7 – 964
	233 - 1411
	126.2 - 713
	-
	Total Hardness (mg/l)
	126 - 420



	<p>90 - 760</p> <p>80 - 840</p> <p>200</p> <ul style="list-style-type: none"> <li>• The heavy metal concentration in the study area is below the permissible limit used for drinking purposes</li> <li>• Total Coliform was absent in ground water samples making it fit for drinking water purposes</li> </ul> <p>Soil Quality:</p> <p>Parameter</p> <p>Pre-monsoon season</p> <p>Monsoon season</p> <p>Post-monsoon season</p> <p>pH</p> <p>7.35 – 8.36</p> <p>7.02 – 8.02</p> <p>7.22 – 7.85</p> <p>Electrical Conductivity (µ/cm)</p> <p>305 – 526</p> <p>212 – 412</p> <p>392 - 592</p> <p>Texture</p> <p>Sandy clay loam</p> <p>Sandy clay loam</p> <p>Sandy clay loam</p>
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1. Court cases details: nil

1. Status of other statutory clearances

Particulars	Letter no. and date
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Status of Stage- I FC	Application submitted, In progress Proposal No. FP/AP/OTHERS/407446/ 2022, Dated: 23.11.2022
Approval of Central Water Commission	<p style="text-align: center;">Aspect Concerned Dte.</p> <p style="text-align: center;">Status</p> <p>General layout</p> <p>Hydrology (South) HSO, CWC</p> <p>Concurrence received on 30.03.2022 from HCD</p> <p>Hydrological studies</p> <p>Hydrology Directorate , CWC</p> <p>Concurrence received on 14.12.2021 from Hydrology (South)</p>
Approval of Central Electricity Authority	<p>Power Potential Studies</p> <p>Hydro Project Appraisal Division , CEA</p> <p>Concurrence received on 18.05.202 from HPAD</p> <p>Transmission System (up to Pooling point)</p> <p>PSP&amp;A Division, CEA</p> <p>Concurrence received on 21.02.2023 with comments</p> <p>Transmission System (up to Pooling point)</p> <p>PSP&amp;A Division, CEA</p> <p>Concurrence received on 21.02.2023 with comments</p>

### 1. Details of the Environment Management Plan

S. No.	Item	Capital Expenditure (Rs. lakh)	Recurring Expenditure (Rs. lakh)
1.	Restoration of Quarries	475.0	
2.	Construction of Settling Tank	70.0	
3.	Stabilization of Muck Disposal Sites	514.43	
4.	Solid waste Management (including Hazardous and e waste)	191.42	
5.	Environmental Management in Road Construction	365.0	
6.	Control of Water Pollution	95.0	
7.	Control of Air Pollution	134.3	
8.	Control for Noise Pollution	60.0	
9.	Provision of Free Fuel	430.34	
10.	Compensatory Afforestation	665.19	
11.	Biodiversity Conservation Plan	140.0	
12.	Conservation Plan for Avi-fauna	241.0	
13.	Fisheries Management Plan	146.48	
14.	Public Health Delivery System	236.31	
	<b>Sub-Total (A)</b>	<b>3764.47</b>	
<b>B.</b>	<b>Additional Measures</b>		
15.	Rehabilitation and Resettlement Plan	291.37	
16.	Local Area Development Plan	2081.27	
	<b>Sub-Total (B)</b>	<b>2372.64</b>	
<b>C.</b>	<b>Environmental Management Plan</b>		
17.	Greenbelt Development Plan	25.0	
18.	Disaster Management Plan	270.0	
19.	Energy Conservation Measures	40.0	
20.	Public Awareness Programme	50.0	
	<b>Sub-Total (C)</b>	<b>385.0</b>	
	<b>D. Environmental Monitoring Programme</b>		
21.	Implementation of Environmental Monitoring Programme during construction stage	<b>117.0</b>	
22.	Implementation of Environmental Monitoring Programme during Operation stage	-	<b>49.32/Year</b>
	<b>Sub-Total (D)</b>	<b>117.0</b>	<b>49.32/Year</b>
	<b>Grand Total (A+B+C+D)</b>	<b>6856.40</b>	<b>49.32/Year</b>

### 3.1.3. Deliberations by the committee in previous meetings

N/A

### 3.1.4. Deliberations by the EAC in current meetings

2.2.3 The EAC during deliberations noted the following:

The proposal is for grant of Environmental Clearance to the project for Gandikota Pumped Storage Hydro-electric Project (1000 MW) in an area of 190 ha. (469.5 acre) located at Village Kondapuram village, Tehsil Muddanur, District

Kadapa, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP). The MoEF&CC granted Terms of References vide letter dated 4<sup>th</sup> January, 2022 for conducting EIA study under the provisions of the EIA Notification, 2006, as amended.

The project/activity is covered under category 'A' of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006, as amended and requires appraisal at Central level by the sectoral EAC in the Ministry.

The details of land area and other components of the project mentioned in the EIA report are not matching with the ToR granted. The EAC also noted that the EIA report not consisting details of base line data and analysis of Impacts such as aquatic ecosystem and its impact analysis, watershed management, identification of impact zone, its analysis and management.

**2.2.3** The EAC after detailed deliberations *deferred* the proposal for want of following additional information: -

1. Submit comparative chart of salient features of proposed project at the time of ToR and presented during EC presentation in 2<sup>nd</sup> EAC meeting along with likely environmental impact due to changes.
2. Submit specific activities to be undertaken during implementation of Water Shed Management plan.
3. Submit baseline data regarding underground water level and quality, annual rain fall, category of plant species, topography of the area where the watershed management plan will be implemented.
4. Aquatic ecosystem analysis and proper Mitigation plan.
5. Types of forest land/ classification of forest with nos. of tress to be felled due to diversion of forest land for proposed project.
6. Pre-DPR Chapters viz., Layout Map and Hydrology duly approved by CWC/ CEA shall be submitted.

*The proposal was therefore deferred on the above lines.*

### 3.1.5. Recommendation of EAC

Deferred for ADS

## 3.2. Agenda Item No 2:

### 3.2.1. Details of the proposal

**Sharavathy Pumped Storage Project (2000 MW) by KARNATAKA POWER CORPORATION LIMITED**  
located at **UTTARA KANNADA, KARNATAKA**

Proposal For		Fresh ToR	
Proposal No	File No	Submission Date	Activity (Schedule Item)
IA/KA/RIV/447282/2023	J-12011/19/2017-IA.I (R)	21/10/2023	River Valley/Irrigation projects (1(c))

### 3.2.2. Project Salient Features

**2.3.1:** The proposal is for grant of ToR to the project for Sharavathy Pumped Storage Project (2000 MW) in an area of 153 ha located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka by M/s Karnataka Power Corporation Limited.

**2.3.2:** The Project Proponent and the accredited Consultant M/s WAPCOS, made a detailed presentation on the salient features of the project and informed that:

- Background of the Project:** The Sharavathy Pumped Storage project envisages to utilize the existing Talakalale dam as upper dam and Gerusoppa as lower dam without any modification in these structures. The project envisages to utilize the Sharavathy system to generate additional energy from the same water before outflow of water from Gerusoppa Dam to Arabian Sea. The Sharavathy Pumped Storage Project which lie in the Shimoga & Uttara Kannada of Karnataka State between two existing reservoirs namely **Talakalale reservoir** (Upper reservoir) and **Gerusoppa reservoir (Lower reservoir for SPSP)** near the highest waterfalls in India on **Sharavathy River**.
- The proposed project is planned between existing Talakalale and Gerusoppa reservoir which are situated downstream of Liganamakki reservoir on Sharavathy river.
- Project is located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary. Therefore, Wildlife Clearance from National Board of Wildlife will be required.
- The project site is near the village of **Gerusoppa in Shivamogga & Uttara Kannada Districts of Karnataka** to install 2,000 MW of hydropower.
- Sharavathy Pumped Storage project envisages to utilize the balance storage water for Pumped storage project installation of 2,000 MW for 6 hours peaking. It is an underground powerhouse proposed with 8 units of 250 MW capacities each.
- This project site is located 3.4 km from Sharavathi Wildlife Sanctuary. The total estimated cost of the project is about Rs. 4,862.89 Crores.
- Earlier, based on recommendation of the EAC ToR was granted by the Ministry vide letter dated 9.08.2017. The project proponent informed that due to non completion of EIA&EMP studies in stipulated time, a fresh proposal for grant of ToR has been submitted.
- Salient features of the project as under:

#### Project details:

Name of the Proposal	Sharavathy Pumped Storage Project, (8 x 250 MW), Karnataka
Location (Including coordinates)	<b>Upper Reservoir</b> – Talakalale Latitude 14°10'38" (N) Longitude 74°50'54" (E) <b>District:</b> Shivamogga <b>Lower Reservoir</b> – Talakalale Latitude 14°14'30" (N) Longitude 74°37'15" (E) <b>District:</b> Uttara Kannada
Inter- state issue involved	N/A
Seismic zone	III

#### Category details:

Category of the project	A
Provisions	Peak hours generation
Capacity /Cultural command area (CCA)	2000 MW
Attracts the General Conditions (Yes/No)	Yes

#### Electricity generation capacity:

Powerhouse Installed Capacity	2000 MW
Generation of Electricity Annually	4380 GWH
No. of Units	8 units

**ToR Details:**

Cost of project	6709.61 Cr
Total areaof Project	153 Ha
Height of Dam from River Bed (EL)	Both dams are existing. Talakalale (Upper Dam) – 62.48 m Gerusoppa (Lower Dam) – 64.00 m
Length of Tunnel/Channel	11.63 KM (approx.)
Details of Submergence area	Both reservoirs are existing. Talakalale (Upper Reservoir) – 7.77 Km <sup>2</sup> Gerusoppa (Lower Reservoir) – 6.00 Km <sup>2</sup>
Types of Waste and quantity of generation during construction/ Operation	Municipal Solid Waste – 0.67 TPA
E-Flows for the Project	N/A
Is Projects earlier studied in Cumulative Impact Assessment & Carrying Capacity studies (CIA & CC) for River in which project located. If yes, then  1. E-flow with TOR/ Recommendation by EAC as per CIA & CC study of River Basin 2. If not the E-Flows maintain criteria for sustaining river ecosystem.	

**Muck Management Details:**

No. of proposed disposal area/(type of land-Forest/Pvt. land)	Muck disposal area – 48 Ha Forest Land – 0.00 Ha Pvt. Land – 48 Ha
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**Land Area Breakup:**

Private land	113.21 Ha
Government land/Forest Land	39.79 Ha
Submergence area/Reservoir area	Nil
Land required for project components	46.69 Ha

**Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details Certificate/letter/Remarks
Reserve Forest/Protected Forest Land		<b>Located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary</b>
National Park		
Wildlife Sanctuary	Yes	

**Court case details:**

Court Case	No
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**Affidavit/Undertaking details: nil****Miscellaneous**

Particulars	Details
Details of consultant	WAPCOS LIMITED
Project Benefits	<p><b>Social Benefits:</b></p> <ol style="list-style-type: none"> <li>Jobs will be available for locals during construction stage.</li> <li>Local area Development works will be taken up.</li> </ol> <p><b>Financial Benefit:</b> The cost per MW has been calculated i.e. Rs 3.35/MW and levelised tariff is 4.68/MW considering cost of pumping @ 1.00/ kWh.</p>
R&R details	No. of Villages affected: 4 nos. No. of project displaced families: 4 nos.

	No. of project affected families: 130 nos.
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### 3.2.3. Deliberations by the committee in previous meetings

N/A

### 3.2.4. Deliberations by the EAC in current meetings

#### 2.3.3: The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) to the project for Sharavathy Pumped Storage Project (2000 MW) in an area of 153 ha located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka by M/s Karnataka Power Corporation Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

EAC observed that project is located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary and proposed project is falling under ESA of Western Ghats.

### 3.2.5. Recommendation of EAC

Recommended

### 3.2.6. Details of Terms of Reference

#### 3.2.6.1. Specific

#### Environmental Management and Biodiversity Conservation\*\*

1. The site visit of the EAC will be conducted before considering proposal for grant of EC.
2. Wildlife Clearance from National Board of Wildlife(NBWL) shall be obtained.
3. If salient features of project changed, the same shall be intimated to MOEF&CC by the project proponent.
4. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / dueto tapping of water for filling reservoir.
5. Alternative sites forvarious components shall be identified in terms ofloss of forest area and other environmental aspects.
6. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentionedin Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons
7. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
8. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.



	<ol style="list-style-type: none"> <li>9. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.</li> <li>10. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.</li> <li>11. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.</li> <li>12. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR) and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.</li> <li>13. Impact on aquatic ecosystem due to withdrawal of water from <b>Sharavathy River</b>.</li> <li>14. Explore the possibilities to reduce Forest area for the construction of proposed project.</li> <li>15. MoU for water uses for the project shall be signed and approved by concerned authority.</li> <li>16. Environmental matrix during construction and operational phase needs to be submitted.</li> <li>17. Matrix formulated on the basis of detailed study and field survey of flora and fauna methodology used shall be mentioned in the EIA report.</li> <li>18. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.</li> <li>19. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.</li> <li>20. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.</li> <li>21. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.</li> <li>22. Stage-I Forest Clearance shall be obtained.</li> </ol>
<b>Miscellaneous**</b>	
1.	<ol style="list-style-type: none"> <li>1. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.</li> <li>2. Undertaking need to be submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.</li> <li>3. Both capital and recurring expenditure under EMP shall be submitted.</li> <li>4. The photograph should bear the date, time, latitude &amp; longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.</li> <li>5. Aerial view video of project site shall be recorded and to be submitted.</li> <li>6. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.</li> </ol>
<b>Muck Management/Disaster Management..</b>	
1.	<ol style="list-style-type: none"> <li>1. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.</li> <li>2. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.</li> <li>3. Techno-economic viability of the project must be recommended from CEA/ CWC</li> </ol>
<b>Socio-economic Study</b>	
1.	<ol style="list-style-type: none"> <li>1. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.</li> <li>2. 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.</li> <li>3. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on</li> </ol>

	<p>the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.</p> <p>4. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation &amp; Resettlement plan shall be prepared.</p> <p>5. Details of settlement in 10 km area shall be submitted.</p>
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### 3.2.6.2. Standard

1(c)	<b>River Valley/Irrigation projects</b>
<b>Scope of EIA Study</b>	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
<b>Details of the Project and Site</b>	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.

12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats like rapids, pools, side pools and variations in the river substratum bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study

#### Description of Environment and Baseline Data

1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.

#### Details of the Methodology

1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
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#### Methodology for Collection of Biodiversity Data

1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even

	<p>literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports. The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.</p>
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
<p><b>Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follows:</b></p>	
1.	null
2.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
3.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
4.	Landslide zone or area prone to landslide existing in the study area should be examined.
5.	Presence of important economic mineral deposit, if any.
6.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
7.	Impact of project on geological environment.
8.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
9.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO <sub>2</sub> ) and Oxides of Nitrogen (NO <sub>x</sub> ) in the study area at 5-6 Locations.
10.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
11.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.

12.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
13.	History of the ground water table fluctuation in the study area.
14.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO <sub>2</sub> , PO <sub>4</sub> , Cl, SO <sub>4</sub> , Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
15.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
16.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
17.	Run off, discharge, water availability for the project, sedimentation rate, etc.
18.	Basin characteristics
19.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
20.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km <sup>2</sup> year <sup>-1</sup> .
21.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
22.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
23.	Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
24.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
25.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
26.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
27.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
28.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
29.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
30.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteridophytes, Bryophytes (all groups).

31.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
32.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
33.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
34.	Economically important species like medicinal plants, timber, fuel wood etc.
35.	Details of endemic species found in the project area.
36.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
37.	Cropping pattern and Horticultural Practices in the study area.
38.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
39.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
40.	Information (authenticated) on Avi-fauna and wildlife in the study area.
41.	Status of avifauna their resident/ migratory/ passage migrants etc.
42.	Documentation of butterflies, if any, found in the area.
43.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
44.	Existence of barriers and corridors, if any, for wild animals.
45.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
46.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
47.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
48.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
49.	Fish and fisheries, their migration and breeding grounds.
50.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
51.	Conservation status of aquatic fauna.

52.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
53.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
54.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
55.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
56.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
57.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
58.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
59.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
60.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
61.	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.

#### **Impact Prediction and Mitigation Measures**

1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.

12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.

### **Environmental Management Plan**

1.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan
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	and the areas where such conservation is proposed will be marked on a project layout map.
2.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
3.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
4.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
5.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
6.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
7.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
8.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
9.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
10.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Detailed muck transportation plan delineating the path ways, number of trucks, quantity of muck to be transported along with monitoring mechanism using latest technology, shall be prepared.
11.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for

	their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
12.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
13.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
14.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
15.	Labour Management Plan for their Health and Safety.
16.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
17.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
18.	Environmental safeguards during construction activities including Road Construction.
19.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
20.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

### 3.3. Agenda Item No 3:

#### 3.3.1. Details of the proposal

<b>Lower Kopili HEP (120MW) in Karbi Anglong &amp; Dima Hasao, Assam, by M/s Assam Power Generation Corporation Ltd. by APGCL located at DIMA HASAO, ASSAM</b>			
<b>Proposal For</b>		Amendment in EC	
<b>Proposal No</b>	<b>File No</b>	<b>Submission Date</b>	<b>Activity (Schedule Item)</b>
IA/AS/RIV/441844/2023	J-12011/26/2012-IA.I	23/10/2023	River Valley/Irrigation projects (1(c))

#### 3.3.2. Project Salient Features

<p><b>2.4.1:</b> The proposal is for grant of amendment in Environmental Clearance to the Lower Kopili HEP (120 MW) in Karbi Anglong &amp; Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.</p> <p><b>2.4.2:</b> The Project Proponent and the accredited Consultant made a detailed presentation on the salient features of the project and informed that:</p>
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1. The Lower Kopili HEP (120 MW) is downstream development of existing Kopili HEP stage I and is located in east of Karbi Anglong and west of Dima Hasao districts of Assam.
2. The project is situated in the West Karbi Anglong and Dima Hasao (also known as North Cachar Hills) Autonomous District Council (ADC) areas of Central Assam. The Project location (dam site) is defined by 25°39'57.39"N latitude and 92°46'53.62"E longitude
3. The dam structure is located on Kopili River (a major tributary of the Brahmaputra River) and the main powerhouse and auxiliary power house structures are located on right bank of Kopili River.
4. The project envisages utilization of the regulated discharge from Kopili HEP, spills of Khandong and Umrong Dam and the discharge from the intermediate catchment by creation of a reservoir and utilizing a gross head of about 114m.
5. This is a run-of-the-river scheme.
6. The scheme has been conceived to run at full potential in monsoon season and operate as a peaking station in non-monsoon season.
7. **Land requirement:** The total land requirement of the project is **1577** ha. The forest land to be acquired for the project is 523 ha. The private land to be acquired for the project is 1054 ha.
8. **Forest Clearance:** In principle approval of Stage 1 Forest Clearance for the diversion of 523.046 ha of forest land was accorded on 27.03.2019.
9. **Environment clearance** for the project was accorded on **04.09.2019**
10. **E flow** will be maintained as per stipulation of EC.
11. **Salient features of the project:**

1. Land Area: 1577 Ha (Forest land 523.0 Ha, Revenue land 1054.0 Ha)
2. Power generation capacity: 120 MW (MPH – 2 X 55 MW; APH – 2 X 2.5 + 1 X 5 MW)
3. Location of Dam Axis: 25°39'57.39"N; 92°46'53.62"E
4. Location of MPH: 25°41'54.02"N; 92°48'15.98"E
5. Concrete Gravity Dam: Across the river Kopili at Longku
6. Dam Height 66.5 m
7. water conductor system comprising of an intake structure, head race tunnel along with surge shaft and pen stock.
8. **Project cost: 1031.58 Cr excluding the R&R land cost 84.33 Cr.**
9. **EMP cost: 26147.5077 lakh**
10. **CER cost: 5.81 Cr**

1. **The details of amendment sought is as under: -**

S. No.	Para/ details of EC issued by MoEF&CC	Details as per EC	To be revised/ read as	Justification/ reasons
1	Dam Height (m)	70.13	66.5	El. 228.00 m – El. 162.50 m = 66.50m. Change in dam design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site.
2	Length of the Dam (m) Total width of dam structure including overflow & non overflow blocks	345.05	335.0	As per revised arrangement of NOF and OF section.
3	No of Spillways	8	6	10 m x 12.50 m. The discharging capacity of proposed spillway arrangement is verified on the physical hydraulic model study carried out in IRI, Roorkee and gate opening was found adequate to pass the PMF at N-1 condition.

				Same is approved by CEA
4	HRT Diameter (m)	6.65	7.0	Diameter of HRT is increased to ensure CEA approved head losses of 6m.
5	HRT length (m)	3619.62	3641.22	As per revised arrangement.
6	Tail Race Channel width (m)	26.3	26.0	Arrangement is revised to provide better hydraulic condition at the outlet of tail race.
7	Tail Race Channel length (m)	52.0	40.0	
8	Submergence area with the Reservoir spread (Ha)	552 submergence area	552 submergence area with reservoir spread of 620 Ha	Submergence area remains same i.e. 552 Ha within the reservoir spread of 620 Ha to accommodate plantation area as per EC and FC stipulation, Reservoir rim treatment, safety area for human and wildlife, within the existing land area of 1577 ha.

### 3.3.3. Deliberations by the committee in previous meetings

N/A

### 3.3.4. Deliberations by the EAC in current meetings

The EAC deliberated on the information and as presented in the meeting and observed that the proposal is for Amendment in Environmental Clearance to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

### 3.3.5. Recommendation of EAC

Recommended

### 3.3.6. Details of Environment Conditions

#### 3.3.6.1. Specific

##### Additional Condition

1. Aquatic study specially, migratory aquatic species concerning occurrence of fishes /habitat impact studies shall be carried out from recognised govt. Institutes and prepared mitigation measures, with provision of financial budget revised in the EMP. The outcome of the said study shall be implemented.
2. Submit undertaking that R&R scenario /habitat of flora and fauna of project are not change due to modification of the project components.

3. All the conditions mentioned in the EC dated 4.09.2019 shall remain unchanged.

#### 4. Any Other Item(s)

N/A

#### 5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof. G. J. Chakrapani	Chairman	gov*****@es.iitr.ac.in	
2	Shri Ajay Kumar Lal	Member	akl*****@gmail.com	
3	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	
4	Dr Uday Kumar R Y	Member (EAC)	uda*****@yahoo.com	
5	Shri Sharvan Kumar	Member (EAC)	Dir*****@gmail.com	
6	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
7	Dr B K Das	Member (EAC)	ami*****@icar.gov.in	
8	Shri Janardan Choudhary	Member	jan*****@gmail.com	
9	Dr. J V Tyagi	Member	jvt*****@gmail.com	Absent
10	Shri Kartik Sapre	Member	kar*****@gmail.com	
11	Alok Paul Kalsi	Member	emo***@nic.in	
12	Yogendra Pal Singh	Scientist E	yog*****@nic.in	

**MINUTES OF THE 2<sup>ND</sup> MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 26<sup>TH</sup> OCTOBER, 2023 FROM 10:30 AM – 05.30 PM THROUGH VIDEO CONFERENCE (ONLINE MODE).**

The 2<sup>nd</sup> meeting (online mode) of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 26<sup>th</sup> October, 2023 under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is shown in the Annexure.

**Agenda Item No. 2.1: Confirmation of Minutes of 1<sup>st</sup> EAC meeting 17-18 October, 2023**

The EAC while confirming the Minutes of the 1<sup>st</sup> EAC meeting held on 17-18 October, 2023 and recommended for addition of following para after completion of para no. 1.5.1 of Agenda Item No. 1.5 regarding grant of amendment in TOR issued on 09.11.2022 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited, [Proposal No. IA/MH/RIV/443150/2023; F. No. J-12011/52/2023-IA.I (R)] :

*“...Shri Janardan Choudhary is presently working as Advisor in M/s Adani Green Energy Ltd; so, to avoid any conflict of Interest he had not participated in the deliberations on Agenda item No. 1.5 regarding grant of amendment in TOR issued by the Ministry on 09.11.2023 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited of M/s Adani Green Energy Limited....”*

With the above corrections the EAC confirmed the Minutes of the 1<sup>st</sup> EAC meeting held on 17-18 October, 2023.

**Agenda Item 2.2**

**Gandikota Pumped Storage Hydro-electric Project (1000 MW), in an area of 190 ha. (469.5 acre) located at Village Kondapuram village, Tehsil Muddanur, District Kadapa, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP) – Environmental Clearance (EC) - Reg.**

**[Proposal No. IA/AP/RIV/447249/2023; F. No. J-12011/16/2021-IA.I (R)]**

**2.2.1** The proposal is for grant of Environmental Clearance to the Gandikota Pumped Storage Hydro-electric Project (1000MW), in an area of 190 ha. (469.5 acre) located at village Kondapuram village, Tehsil Muddanur, District Kadapa, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP).

**2.2.2:** The Project Proponent and the accredited Consultant M/s WAPCOS, New Delhi, made a detailed presentation on the salient features of the project and informed that:

- i. **Location:** The proposed Gandikota Pumped Storage Project is located near K Bommepalli & Nenanuthala Villages, Kondapuram mandal of YSR Kadapa district of Andhra Pradesh. The project area falls in the toposheet number 57J/1 and bounded by North latitudes 14°46' to 14°50' and East longitudes 77°10' to 78°16'.
- ii. The proposed project planned by using the existing Gandikota Reservoir as lower reservoir for the Pumped storage scheme with Full Reservoir Level of 212 m and Minimum draw down level of 202.9 m. A new upper reservoir of composite bund and pit type will be developed. The optimum possible live storage capacity for pumped storage scheme required is 8.592 MCM, which has been finalised based on the topography and geology of the upper dam. The proposed project will generate 1000 MW of power. The Gandikota reservoir with a Gross Storage of 26.85 TMC (760.02 MCM) acts as a balancing reservoir on Pennar river. It receives water from self-catchment together with water from Chitravathi River.
- iii. **Land requirement:** The total land to be acquired for the project is 270.11 ha. The forest land and private land to be acquired is 151.18 ha and 20.38 ha. About 98.55 ha of revenue land shall also be acquired.
- iv. **Hydrology:** The lower reservoir is existing as Gandikota Reservoir which is the primary source of one time water requirement for proposed upper reservoir during daily pumping and generation cycle. Assessment for availability of water in lower existing reservoir has been done and concurrence on Hydrological aspects of the project has been obtained from Hydrology (south) Directorate vide CWC U.O. 7/AP-106/2021-Hyd(S)/221 Dated 16.12.2021.
- v. **Ecologically Sensitive Areas:** There is no wildlife sanctuary, Biosphere reserve or any Ecological Sensitive Zone identified within the 10 km radius of the project areas
- vi. **Public Hearing: 18.08.2023 at Tirumalayyapalli (Village) by** Joint collector and Addl. Dist. Magistrate. Main issued was Employment and Infrastructure development
- vii. **The salient features of the project are as under: -**

### 1. Project Details

Name of the Proposal	Gandikota Pumped Storage Project (1000 MW)
Proposal No.	IA/AP/RIV/447249/2023
Location (Including Coordinates)	Kondapuram (M), YSR District Lat. N 14° 48' 38" and Long. E 78° 15' 30".
Company's Name	New & Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP)
Accredited Consultant and certificate no.	WAPCOS LIMITED, NABET/EIA/21124/RA0222
Project location (Coordinates /River/Reservoir)	Lat. N 14° 48' 38" and Long. E 78° 15' 30".
Inter- state issue involved	No
Proposed on River/ Reservoir	Reservoir

## 2. Category details:

Category of the project	A
Capacity / Cultural command area (CCA)	1000 MW
Attracts the General Conditions (Yes/No)	No

## 3. ToR/EC Details:

ToR Proposal No.	IA/AP/RIV/235841/2021
EAC meeting date	15.11.2021
ToR Letter No.	F.No. J-12011/16/2021-IA.I(R)
ToR grant Date	04.01.2022
Cost of project	5017.48 Crore (Incl. IDC)
Total area of Project	270.11 ha.,
Height of Dam from Bed (EL)	21.5m
Details of submergence area	NA, as proposed upper reservoir is not on any nala
District to provide irrigation facility (if applicable)	Nil
Details of tunnels on upper level & lower level and length of canal (if applicable)	Two Underground water conductor system in the form of Tunnel <b>Details of WCS:</b> Intake Tunnel: 2 No. x 8.90m dia. X 51m (L) Inclined Pressure Shaft: 2 No. x 7.00m dia. X 443m (L) Unit Pressure Shaft: 4 No. x 5.50m dia. X 73m (L) Tail Race Tunnel: 2 No. x 8.90m dia. X 1267m (L)
No. of affected Village.	02
No. of Affected Families	07
Project Benefits	Power Generation of 1872.5 MU annually, Up-liftment of Socio economic condition of Study area villages
R&R details	Yes, Yet to start
Catchment area/ Command area	Upper Reservoir is proposed as a table top artificial pond fed by lower reservoir does not have regulated flow of water and no catchment area is being intercepted. Hence, for upper reservoir no catchment area treatment is required. Lower reservoir is existing and in operation since 2013.



Types of Waste and quantity of generation during construction/ Operation	Waste water: 0.17 MLD Solid waste: 0.57 t/day
Material used for blasting and its Composition as per DGMS standards.	Will be finalised during pre-construction market survey
E-Flows for the Project	NA
Is Project earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If yes then  a) E-flow with TOR/Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	NA
Details on provision of fish pass	NA
Project benefit including employment details (no of employee)	During construction phase: 1600 During operation phase: 100
Area of Compensatory Afforestation (CA) with tentative no of plantation.	156.62 ha
Previous EC details	NA
EC Compliance Report by R.O, MOEF&CC	NA

#### 4. Electricity Generation capacity

Powerhouse Installed Capacity	1000MW
Generation of Electricity Annually	1872.49 MU
No. of Units	04 of 250 MW each

#### 5. Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt land)	Government land – 57.37 Ha., Forest land – 6.80Ha.,
Cross section of proposed muck area, Height of muck with slope.	MA 1: 10m height in trapezoidal shape and 45 degree slope  MA 2A; Deposition on natural slope upto 12 height  MA 2B: Deposition on natural slope upto 10 height MA 3: Deposition on natural slope with varying height from 15m to 0m
Distance of muck disposal area (location), from muck generation	MA1: Approx. 1 km. MA2A&B: Approx. 05 km.

sources (project area)/River, HFL of proposed muck	MA3: Approx. 8 km.
Total Muck Disposal Area	64.17 ha.,
Estimate Muck to be generated	6.99MCM (actual quantity will be less depending upon usage during construction activities) Considering 30% expansion during transportation and dumping)
Transportation	By road
Monitoring mechanism for Muck Disposal	Enclosed in EIA/EMP report

## 6. Land Area Breakup:

Private land	20.38Ha.,
Government land/Forest Land	151.18 Ha., Forest- 98.55 Ha., Government land
Submergence area/Reservoir area	Reservoir area in reserve forest land
Land required for project components	143.42Ha.,

## 7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/ letter/Remarks
Reserve Forest/Protected Forest Land	Yes, Reserve Forest	Application submitted for FC, In progress Proposal No. FP/AP/OTHERS/407446/ 2022, Dated: 23.11.2022
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites monuments/historical temples etc	No	
Additional information (if any)	No	

**Availability of Schedule-I species in study area:** Yes

## 8. Public Hearing (PH) Details

Advertisement for PH with date	17.07.2023
Date of PH	18.08.2023
Venue	Tirumalayyapalli (Village)
Chaired by	Joint collector and Addl. Dist. Magistrate
Main issues raised during PH	Employment and Infrastructure development

## 9. Brief of base line Environment

Particulars	Details				
Period of baseline data collection/ Sampling period.	26/01/2022 To 28/10/2022, All three seasons.				
(Air, noise, water, land)	<b>Air: PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>2</sub></b>				
	Parameter	Pre-monsoon season (µg/m <sup>3</sup> )	Monsoon season (µg/m <sup>3</sup> )	Post-monsoon season (µg/m <sup>3</sup> )	Permissible Standards (µg/m <sup>3</sup> )
	PM <sub>10</sub>	71.63 - 76.63	65.86 - 70.06	70.01 - 76.13	100
	PM <sub>2.5</sub>	37 - 38.5	33.41 - 44.0	34.76 - 40.66	60
	NO <sub>2</sub>	21.25 - 23.5	16.41 - 17.19	21.98 - 23.7	80
	SO <sub>2</sub>	7.7 - 8.03	6.83 - 7.16	7.73 - 9.15	80
	<b>Noise: Equivalent day time and night time noise level</b>				
	Season	Day Time Equivalent Noise level dB(A)	Permissible Standards dB(A)		
	Pre-monsoon	42.47 - 43.42	55		
	Monsoon	42.71 - 45.62	55		
	Post-monsoon	42.61 - 44.37	55		
	<b>Surface Water: Physico-chemical and biological parameters</b>				
	Parameter	Pre-monsoon season	Monsoon season	Post-monsoon season	Drinking Water Quality Standards
	pH	7.72 - 8.22	7.12 - 7.64	7.32 - 7.8	7.0 - 8.5

Electrical Conductivity ( $\mu\text{S}/\text{cm}$ )	610 - 694	637 - 860	462 - 710	-
Total Hardness (mg/l)	142 - 156	106 - 158	130 - 172	200
BOD (mg/l)	1.8 - 2.7	1.2 - 1.8	1.8 - 2.6	-
COD (mg/l)	14 - 22	15 - 24	6 - 10	-

- The heavy metal concentration in the study area is below the permissible limit used for drinking purposes

**Ground Water: Physico-chemical and biological parameters**

Parameter	Pre-monsoon season	Monsoon season	Post-monsoon season	Drinking Water Quality Standards
pH	6.68 – 7.96	6.57 - 7.85	6.52 - 7.78	7.0 - 8.5
Electrical Conductivity ( $\mu\text{S}/\text{cm}$ )	156.7 – 964	233 - 1411	126.2 - 713	-
Total Hardness (mg/l)	126 - 420	90 - 760	80 - 840	200

- The heavy metal concentration in the study area is below the permissible limit used for drinking purposes
- Total Coliform was absent in ground water samples making it fit for drinking water purposes

Soil Quality:

Parameter	Pre-monsoon season	Monsoon season	Post-monsoon season

	pH	7.35 – 8.36	7.02 – 8.02	7.22 – 7.85
	Electrical Conductivity (µS/cm)	305 – 526	212 – 412	392 - 592
	Texture	Sandy clay loam	Sandy clay loam	Sandy clay loam

**10. Court cases details: nil**

**11. Status of other statutory clearances**

<b>Particulars</b>	<b>Letter no. and date</b>		
Status of Stage- I FC	Application submitted, In progress  Proposal No. FP/AP/OTHERS/407446/ 2022, Dated: 23.11.2022		
Approval of Central Water Commission	Aspect	Concerned Dte.	Status
	General layout	Hydrology (South) HSO, CWC	Concurrence received on 30.03.2022 from HCD
	Hydrological studies	Hydrology Directorate , CWC	Concurrence received on 14.12.2021 from Hydrology (South)
Approval of Central Electricity Authority	Power Potential Studies	Hydro Project Appraisal Division , CEA	Concurrence received on 18.05.202 from HPAD
	Transmission System (up to Pooling point)	PSP&A Division, CEA	Concurrence received on 21.02.2023 with comments

	Transmission System (up to Pooling point)	PSP&A Division, CEA	Concurrence received on 21.02.2023 with comments
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## 12. Details of the Environment Management Plan

S. No.	Item	Capital Expenditure (Rs. lakh)	Recurring Expenditure (Rs. lakh)
1.	Restoration of Quarries	475.0	
2.	Construction of Settling Tank	70.0	
3.	Stabilization of Muck Disposal Sites	514.43	
4.	Solid waste Management (including Hazardous and e waste)	191.42	
5.	Environmental Management in Road Construction	365.0	
6.	Control of Water Pollution	95.0	
7.	Control of Air Pollution	134.3	
8.	Control for Noise Pollution	60.0	
9.	Provision of Free Fuel	430.34	
10.	Compensatory Afforestation	665.19	
11.	Biodiversity Conservation Plan	140.0	
12.	Conservation Plan for Avi-fauna	241.0	
13.	Fisheries Management Plan	146.48	
14.	Public Health Delivery System	236.31	
	<b>Sub-Total (A)</b>	<b>3764.47</b>	
<b>B.</b>	<b>Additional Measures</b>		
15.	Rehabilitation and Resettlement Plan	291.37	
16.	Local Area Development Plan	2081.27	
	<b>Sub-Total (B)</b>	<b>2372.64</b>	
<b>C.</b>	<b>Environmental Management Plan</b>		
17.	Greenbelt Development Plan	25.0	
18.	Disaster Management Plan	270.0	
19.	Energy Conservation Measures	40.0	
20.	Public Awareness Programme	50.0	
	<b>Sub-Total (C)</b>	<b>385.0</b>	
	<b>D. Environmental Monitoring Programme</b>		
21.	Implementation of Environmental Monitoring Programme during construction stage	<b>117.0</b>	
22.	Implementation of Environmental Monitoring Programme during Operation stage	-	<b>49.32/Year</b>

S. No.	Item	Capital Expenditure (Rs. lakh)	Recurring Expenditure (Rs. lakh)
	<b>Sub-Total (D)</b>	<b>117.0</b>	<b>49.32/Year</b>
	<b>Grand Total (A+B+C+D)</b>	<b>6856.40</b>	<b>49.32/Year</b>

**2.2.3** The EAC during deliberations noted the following:

The proposal is for grant of Environmental Clearance to the project for Gandikota Pumped Storage Hydro-electric Project (1000 MW) in an area of 190 ha. (469.5 acre) located at Village Kondapuram village, Tehsil Muddanur, District Kadapa, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP). The MoEF&CC granted Terms of References vide letter dated 4<sup>th</sup> January, 2022 for conducting EIA study under the provisions of the EIA Notification, 2006, as amended.

The project/activity is covered under category 'A' of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006, as amended and requires appraisal at Central level by the sectoral EAC in the Ministry.

The details of land area and other components of the project mentioned in the EIA report are not matching with the ToR granted. The EAC also noted that the EIA report not consisting details of base line data and analysis of Impacts such as aquatic ecosystem and its impact analysis, watershed management, identification of impact zone, its analysis and management.

**2.2.3** The EAC after detailed deliberations **deferred** the proposal for want of following additional information: -

1. Submit comparative chart of salient features of proposed project at the time of ToR and presented during EC presentation in 2<sup>nd</sup> EAC meeting along with likely environmental impact due to changes.
2. Submit specific activities to be undertaken during implementation of Water Shed Management plan.
3. Submit baseline data regarding underground water level and quality, annual rain fall, category of plant species, topography of the area where the watershed management plan will be implemented.
4. Aquatic ecosystem analysis and proper Mitigation plan.
5. Types of forest land/ classification of forest with nos. of trees to be felled due to diversion of forest land for proposed project.
6. Pre-DPR Chapters viz., Layout Map and Hydrology duly approved by CWC/ CEA shall be submitted.

The proposal was therefore **deferred** on the above lines.

### **Agenda Item 2.3**

**Sharavathy Pumped Storage Project (2000 MW) in an area of 153 ha located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka by M/s Karnataka Power Corporation Limited - Terms of References (ToR) - Reg.**

**[Proposal No. IA/KA/RIV/447282/2023; F. No. J-12011/19/2017-IA.I (R)]**

**2.3.1:** The proposal is for grant of ToR to the project for Sharavathy Pumped Storage Project (2000 MW) in an area of 153 ha located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka by M/s Karnataka Power Corporation Limited.

**2.3.2:** The Project Proponent and the accredited Consultant M/s WAPCOS, made a detailed presentation on the salient features of the project and informed that:

- i. **Background of the Project:** The Sharavathy Pumped Storage project envisages to utilize the existing Talakalale dam as upper dam and Gerusoppa as lower dam without any modification in these structures. The project envisages to utilize the Sharavathy system to generate additional energy from the same water before outflow of water form Gerusoppa Dam to Arabian Sea. The Sharavathy Pumped Storage Project which lie in the Shimoga & Uttara Kannada of Karnataka State between two existing reservoirs namely **Talakalale reservoir** (Upper reservoir) and **Gerusoppa reservoir (Lower reservoir for SPSP)** near the highest waterfalls in India on **Sharavathy River**.
- ii. The proposed project is planned between existing Talakalale and Gerusoppa reservoir which are situated downstream of Liganamakki reservoir on Sharavathy river.
- iii. Project is located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary. Therefore, Wildlife Clearance from National Board of Wildlife will be required.
- iv. The project site is near the village of **Gerusappa in Shivamogga & Uttara Kannada Districts of Karnataka** to install 2,000 MW of hydropower.
- v. Sharavathy Pumped Storage project envisages to utilize the balance storage water for Pumped storage project installation of 2,000 MW for 6 hours peaking. It is an underground powerhouse proposed with 8 units of 250 MW capacities each.
- vi. This project site is located 3.4 km form Sharavathi Wildlife Sanctuary. The total estimated cost of the project is about Rs. 4,862.89 Crores.
- vii. Earlier, based on recommendation of the EAC ToR was granted by the Ministry vide letter dated 9.08.2017. The project proponent informed that due to non completion of EIA&EMP studies in stipulated time, a fresh proposal for grant of ToR has been submitted.
- viii. Salient features of the project as under:

#### **Project details:**

Name of the Proposal	Sharavathy Pumped Storage Project, (8 x 250 MW), Karnataka
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Location (Including coordinates)	<b>Upper Reservoir</b> – Talakalale Latitude 14°10'38" (N) Longitude 74°50'54" (E) <b>District:</b> Shivamogga <b>Lower Reservoir</b> – Talakalale Latitude 14°14'30" (N) Longitude 74°37'15" (E) <b>District:</b> Uttara Kannada
Inter- state issue involved	N/A
Seismic zone	III

**Category details:**

Category of the project	A
Provisions	Peak hours generation
Capacity / Cultural command area (CCA)	2000 MW
Attracts the General Conditions (Yes/No)	Yes

**Electricity generation capacity:**

Powerhouse Installed Capacity	2000 MW
Generation of Electricity Annually	4380 GWH
No. of Units	8 units

**ToR Details:**

Cost of project	6709.61 Cr
Total area of Project	153 Ha
Height of Dam from River Bed (EL)	Both dams are existing. Talakalale (Upper Dam) – 62.48 m Gerusoppa (Lower Dam) – 64.00 m
Length of Tunnel/Channel	11.63 KM (approx.)
Details of Submergence area	Both reservoirs are existing. Talakalale (Upper Reservoir) – 7.77 Km <sup>2</sup> Gerusoppa (Lower Reservoir) – 6.00 Km <sup>2</sup>

Types of Waste and quantity of generation during construction/ Operation	Municipal Solid Waste – 0.67 TPA
E-Flows for the Project	N/A
Is Projects earlier studied in Cumulative Impact Assessment & Carrying Capacity studies (CIA & CC) for River in which project located. If yes, then a) E-flow with TOR/ Recommendation by EAC as per CIA & CC study of River Basin b) If not the E-Flows maintain criteria for sustaining river ecosystem.	

#### **Muck Management Details:**

No. of proposed disposal area/(type of land- Forest/Pvt. land)	Muck disposal area – 48 Ha Forest Land – 0.00 Ha Pvt. Land – 48 Ha
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#### **Land Area Breakup:**

Private land	113.21 Ha
Government land/Forest Land	39.79 Ha
Submergence area/Reservoir area	Nil
Land required for project components	46.69 Ha

#### **Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/letter/Remarks
Reserve Forest/Protected Forest Land		<b>Located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary</b>
National Park		
Wildlife Sanctuary	Yes	

**Court case details:**

Court Case	No
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**Affidavit/Undertaking details: nil****Miscellaneous**

Particulars	Details
Details of consultant	WAPCOS LIMITED
Project Benefits	<p><b>Social Benefits:</b></p> <p>i) Jobs will be available for locals during construction stage.</p> <p>ii) Local area Development works will be taken up.</p> <p><b>Financial Benefit:</b></p> <p>The cost per MW has been calculated i.e. Rs 3.35/MW and levelised tariff is 4.68/MW considering cost of pumping @ 1.00/ kWh.</p>
R&R details	<p>No. of Villages affected: 4 nos.</p> <p>No. of project displaced families: 4 nos.</p> <p>No. of project affected families: 130 nos.</p>

**2.3.3: The EAC during deliberations noted the following:**

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Terms of Reference (ToR) to the project for Sharavathy Pumped Storage Project (2000 MW) in an area of 153 ha located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka by M/s Karnataka Power Corporation Limited.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

EAC observed that project is located within Eco-Sensitive Zone of Sharavathy Wildlife Sanctuary and proposed project is falling under ESA of Western Ghats.

**2.3.4:** The EAC after detailed deliberation on the information submitted and as presented during the meeting recommended for grant of Standard ToR for conducting EIA study Sharavathy Pumped Storage Project (2000 MW) located at village Begodi, Tehsil Honavar, District Uttara Kannada, Karnataka under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

**[A] Environmental Management and Biodiversity Conservation:**

- i. The site visit of the EAC will be conducted before considering proposal for grant of EC.
- ii. Wildlife Clearance from National Board of Wildlife(NBWL) shall be obtained.
- iii. If salient features of project changed, the same shall be intimated to MOEF&CC by the project proponent.
- iv. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area / due to tapping of water for filling reservoir.
- v. Alternative sites for various components shall be identified in terms of loss of forest area and other environmental aspects.
- vi. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons
- vii. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
- viii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
- ix. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
- x. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
- xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
- xii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
- xiii. Impact on aquatic ecosystem due to withdrawal of water from **Sharavathy River**.
- xiv. Explore the possibilities to reduce Forest area for the construction of proposed project.
- xv. MoU for water uses for the project shall be signed and approved by concerned authority.
- xvi. Environmental matrix during construction and operational phase needs to be submitted.
- xvii. Matrix formulated on the basis of detailed study and field survey of flora and fauna methodology used shall be mentioned in the EIA report.
- xviii. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
- xix. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

- xx. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
- xxi. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
- xxii. Stage-I Forest Clearance shall be obtained.

#### **[B] Socio-economic Study**

- xxiii. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
- xxiv. 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.
- xxv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22-65/2017- IA.III dated 30th September, 2020 shall be submitted.
- xxvi. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
- xxvii. Details of settlement in 10 km area shall be submitted.

#### **[C] Muck Management/ Disaster Management**

- xxviii. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
- xxix. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
- xxx. Techno-economic viability of the project must be recommended from CEA/ CWC

#### **[D] Miscellaneous.**

- xxxi. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
- xxxii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
- xxxiii. Both capital and recurring expenditure under EMP shall be submitted.
- xxxiv. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
- xxxv. Arial view video of project site shall be recorded and to be submitted.
- xxxvi. Detailed plan to restore wider roads and convert them into narrow upto 10m after construction of the project.

## **Agenda Item 2.4**

### **Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd- Amendment in Environmental Clearance- Reg**

**[Proposal No. IA/AS/RIV/441844/2023; F. No. J-12011/26/2012-IA.I ]**

**2.4.1:** The proposal is for grant of amendment in Environmental Clearance to the Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

**2.4.2:** The Project Proponent and the accredited Consultant made a detailed presentation on the salient features of the project and informed that:

- i. The Lower Kopili HEP (120 MW) is downstream development of existing Kopili HEP stage I and is located in east of Karbi Anglong and west of Dima Hasao districts of Assam.
- ii. The project is situated in the West Karbi Anglong and Dima Hasao (also known as North Cachar Hills) Autonomous District Council (ADC) areas of Central Assam. The Project location (dam site) is defined by 25°39'57.39"N latitude and 92°46'53.62"E longitude
- iii. The dam structure is located on Kopili River (a major tributary of the Brahmaputra River) and the main powerhouse and auxiliary power house structures are located on right bank of Kopili River.
- iv. The project envisages utilization of the regulated discharge from Kopili HEP, spills of Khandong and Umrong Dam and the discharge from the intermediate catchment by creation of a reservoir and utilizing a gross head of about 114m.
- v. This is a run-of-the-river scheme.
- vi. The scheme has been conceived to run at full potential in monsoon season and operate as a peaking station in non-monsoon season.
- vii. **Land requirement:** The total land requirement of the project is **1577** ha. The forest land to be acquired for the project is 523 ha. The private land to be acquired for the project is 1054 ha.
- viii. **Forest Clearance:** In principle approval of Stage 1 Forest Clearance for the diversion of 523.046 ha of forest land was accorded on 27 .03.2019.
- ix. **Environment clearance** for the project was accorded **on 04.09.2019**
- x. **E flow** will be maintained as per stipulation of EC.
- xi. **Salient features of the project:**
  - a. Land Area: 1577 Ha (Forest land 523.0 Ha, Revenue land 1054.0 Ha)
  - b. Power generation capacity: 120 MW (MPH – 2 X 55 MW; APH – 2 X 2.5 + 1 X 5 MW)
  - c. Location of Dam Axis: 25°39'57.39"N; 92°46'53.62"E
  - d. Location of MPH: 25°41'5 4.02"N; 92°48'15.98"E
  - e. Concrete Gravity Dam: Across the river Kopili at Longku
  - f. Dam Height 66.5 m
  - g. water conductor system comprising of an intake structure, head race tunnel along with surge shaft and pen stock.
  - h. **Project cost: 1031.58 Cr excluding the R&R land cost 84.33 Cr.**
  - i. **EMP cost: 26147.5077 lakh**

j. CER cost: 5.81 Cr

xii. The details of amendment sought is as under: -

S. No.	Para/ details of EC issued by MoEF&CC	Details as per EC	To be revised/ read as	Justification/ reasons
1	Dam Height (m)	70.13	66.5	El. 228.00 m – El. 162.50 m = 66.50m. Change in dam design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site.
2	Length of the Dam (m) Total width of dam structure including overflow & non overflow blocks	345.05	335.0	As per revised arrangement of NOF and OF section.
3	No of Spillways	8	6	10 m x 12.50 m. The discharging capacity of proposed spillway arrangement is verified on the physical hydraulic model study carried out in IRI, Roorkee and gate opening was found adequate to pass the PMF at N-1 condition. Same is approved by CEA
4	HRT Diameter (m)	6.65	7.0	Diameter of HRT is increased to ensure CEA approved head losses of 6m.
5	HRT length (m)	3619.62	3641.22	As per revised arrangement.
6	Tail Race Channel width (m)	26.3	26.0	Arrangement is revised to provide better hydraulic condition at the outlet of tail race.
7	Tail Race Channel length (m)	52.0	40.0	
8	Submergence area with the Reservoir spread (Ha)	552 submergence area	552 submergence area with reservoir spread of 620 Ha	Submergence area remains same i.e. 552 Ha within the reservoir spread of 620 Ha to accommodate plantation area as per EC and FC stipulation, Reservoir rim treatment, safety area for human and wildlife,

				within the existing land area of 1577 ha.
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**2.4.3: The EAC during deliberations noted the following:**

The EAC deliberated on the information and as presented in the meeting and observed that the proposal is for Amendment in Environmental Clearance to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

**2.4.4** The EAC after detailed deliberation on the information submitted and as presented during the meeting recommended for amendment in Environmental Clearance dated 4.09.2019 to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd under the provisions of EIA Notification, 2006, as proposed by the project proponent subject to compliance of following additional condition as under: -

- i. Aquatic study specially, migratory aquatic species concerning occurrence of fishes /habitat impact studies shall be carried out from recognised govt. Institutes and prepared mitigation measures, with provision of financial budget revised in the EMP. The outcome of the said study shall be implemented.
- ii. Submit undertaking that R&R scenario /habitat of flora and fauna of project are not change due to modification of the project components.
- iii. All the conditions mentioned in the EC dated 4.09.2019 shall remain unchanged.

**Agenda Item 2.5**

**Requirement of Cumulative Impact Assessment (CIA) & Carrying Capacity Study (CCS) of River Basin for small /Mini/Micro hydro power projects in the country.**

**2.5.1:** The matter related to requirement of Cumulative Impact Assessment (CIA) & Carrying Capacity Study (CCS) of River Basin for Small /Mini/Micro hydro power projects in the country was discussed in EAC meeting held on 18<sup>th</sup> October, 2023. Wherein, the EAC opined that CIA&CCS of river basin provide comprehensive data about capacity of river system to perform biological processes and impact of various factors of hydro power development and other developmental activities on performance of biological processes. Further, the EAC decided to deliberate on the matter in the next EAC meeting to take a balanced view on the matter.

**2.5.2:** The EAC during its 2<sup>nd</sup> meeting held on 26.10.2023 further deliberated on the matter and observed that small/mini HEPs in the river basin are allocated by the State



Government in their State by their own social /techno-economical criteria for development of small Hydel Project (SHEP). They does come under the purview of the EIA Notification, 2006, as amended. However, the small HEPs (<25MW) required Forest clearance in case of diversion of Forest land for project development.

It was also noted by the EAC that the cascade development of small/mini Hydroelectric projects in a basin may leads to various cumulative environmental impacts such as on environmental flow, hydrological flow, bio-diversity, changes in sedimentation at various places within project, release of silt free water into the river downstream from the power house and impact thereof on the geo morphology, erosion, stability of structures etc, deforestation due to various projects and slope stability/increase slides prone areas, aquatic and terrestrial flora and fauna across the basin, mining of various materials required for the projects , muck disposal sites and its transportation and disposal , traffic load in the region, R&R issues etc. In view of above scenario, Cumulative Impact Assessment & Carrying Capacity Study (CIA & CCS) must be required for River Valley Projects for granting Environment Clearance and Forest Clearance, so that we can preserved environmental, ecological and Bio-diversity sustainability of the region for future generation.

It was also noted that the work of “Basin Wise Reassessment of Hydroelectric Potential in the Country” has been taken up by the Central Electricity Authority (CEA) under Ministry of Power, Government of India.

As per the Annual Report (2022-23) of Ministry of New and Renewable Energy Resources (MNRE), Government of India, the estimated potential of 21133 MW from 7133 sites for power generation in the country from small / mini hydel projects was assessed. The hilly States of India mainly Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir and Uttarakhand constitute around half of this potential. Other potential States are Maharashtra, Chhattisgarh, Karnataka and Kerala. North Eastern (NE) States have a fairly good potential to develop small hydro power projects. Among the NE States, Arunachal Pradesh has the highest potential followed by Sikkim, Meghalaya and Mizoram. MNRE has been giving special emphasis for the development of small hydro projects in the NE region. MNRE has launched Jalurjamitra Skill Development Programme with the objective to develop more than 1600 skilled and employable workforce (Jalurjamitras) for Small Hydro Projects by the year 2025-26 for the country. The programme is coordinated and managed by Department of Hydro and Renewable Energy (HRED, IIT Roorkee). The MNRE has also taken various other initiatives to encourage development of small HEPs.

The EAC was of the considered view that Small Hydro Power (SHP) project is a sustainable energy solution because of its low environmental cost in terms of problems of large scale forest land /community land acquisition/deforestation and displacement of human settlements. Such projects are run of the river-based and create minimum hinderance/ disruption to rivers/streams. The small hydro project's construction takes much less time as compared to conventional large hydropower project, which makes it cost effective and favourable to the local community. Small hydro projects are generally set up closer to the demand area, so they are more effective for load-generation management. The SHP play a significant role in social upliftment of remote hilly areas through creating local employment opportunities and restrict population migration from

remote areas to urban areas. In view of nation's growing power demand there is a requirement to encourage development of the SHP sector to achieve the goal of sustainable development. The SHP projects has eligibility to be registered under the clean development mechanism (CDM) mechanism to avail carbon credits.

**The EAC after detailed deliberations recommended that:**

- i. The cumulative impact assessment and carrying capacity studies of the rivers where hydro-electric projects are proposed must be completed in time bound manner.
- ii. The Small Hydro Power Projects (<25 MW) of total 200 MW capacity (cumulative) may be permitted in the river basin, based on Hydro-electric potential studies done by the Ministry of Power, Government of India, without insisting on individual river basin study.
- iii. A committee consisting members from MOEF&CC, MoJS, MOP, State Govt and expert institutions may be constituted for framing Standard Operational Procedure (SOP) for development of Small Hydro Power Projects in eco-friendly manner.
- iv. List of SHPs may be finalized by the State Govt in view of Hydro-electric potential studies done by the Ministry of Power, Government of India keeping in view of any court order/policy w.r.t. construction of SHPs/HEPs in the river basin.
- v. The cumulative impact assessment and carrying capacity of the whole river basin will include the finalized list of SHPs along with all other proposed/existing HEPs in that particular river basin.

**The meeting ended with vote of thanks to the Chair.**

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**ATTENDANCE**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Attendance</b>
1.	Prof. G. J. Chakrapani	<b>Chairman</b>	P
2.	Dr. Udaykumar R. Y.	Member	P
3.	Dr. Mukesh Sharma	Member	P
4.	Shri Janardan Choudhary	Member	P
5.	Dr. J V Tyagi	Member	A
6.	Shri Kartik Sapre	Member	P
7.	Shri Ajay Kumar Lal	Member	P
8.	Shri Sharvan Kumar	Representative of CEA	P
9.	Shri Alok Paul Kalsi	Representative of CWC	P
10.	Dr. J A Johnson	Representative of WII	A
11.	Dr. A.K. Sahoo	Representative of CIFRI	P
12.	Shri Yogendra Pal Singh	Member Secretary	P

**APPROVAL OF THE CHAIRMAN**

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**From:** "govind chakrapani" <govind.chakrapani@es.iitr.ac.in>  
**To:** "Yogendra Pal Singh" <yogendra78@nic.in>  
**Cc:** "Saurabh Upadhyay" <saurabh.upadhyay85@gov.in>  
**Sent:** Tuesday, November 14, 2023 3:33:35 PM  
**Subject:** Re: Draft MoM of the EAC (RV&HEP) meeting held on 26.10.2023-reg

The MoM are approved.  
G.J. Chakrapani