Minutes of the 70th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects constituted under the provisions of EIA Notification 2006, held on 10th -11th December, 2013 at Ministry of Environment & Forests (MoEF), C G O Complex, New Delhi.

The 70th Meeting of the Expert Appraisal Committee (EAC) for River Valley and Hydropower Projects was held during 10th – 11th December, 2013 at MoEF, CGO Complex, Lodhi Road, New Delhi. The meeting was chaired by Shri Alok Perti, Chairman. Shri C. Achalender Reddy, Member, Shri S. K. Mishra EAC could not attend the meeting due to pre-occupation. The list of EAC Members and officials/consultants associated with various projects who attended the meeting is annexed.

The following Agenda items were taken-up in that order for discussions:-

1st Day (10.12.2013)

1. **Agenda Item No.1 :** Welcome by Chairman and Confirmation of Minutes of the 69th EAC Meeting held on 11th – 12th November, 2013.

The minutes of the meeting of the 69th EAC Meeting held on 11th – 12th November, 2013 was confirmed. Thereafter, main agenda items were taken up for discussion.

2. **Agenda Item No.2 :** Consideration of Project proposals for Scoping and Environmental Clearance.

The following project proposals were considered:

Agenda Item No. 2.1 **Chhatru HEP (120MW) in Lahaul & Spiti District of Himachal Pradesh by M/s. DCM Shriram Infrastructure Limited - For reconsideration of Environment Clearance (EC).**

Was not considered.

Agenda Item No. 2.2 **Krishna Marathwada Lift Irrigation Project at Osmanabad, Maharashtra by M/s. KMIDC, Government of Maharashtra - For consideration of Environmental Clearance (EC).**

One of the main objectives of Godavari Marathwada Irrigation Development Corporation (GMIDC) is to provide water to scarcity areas. The corporation has therefore taken up major lift

irrigation schemes envisaging lifting of water from existing reservoirs/tributaries having ample water potential and taking it to Drought Prone Areas (DPA). Krishna Marathwada Lift Irrigation Scheme is one of such schemes. The scheme is administratively approved by the resolution no. 2004/1413(385/04) (Marathi) dated 23rd August, 2007.

The proposed scheme intends to use 15.32 TMC of water from existing Ujani reservoir and 2.66 TMC water from free catchment of downstream of Sina Kolegaon Project in two parts viz LIS-1 and LIS-2.

The project envisages irrigating the 87188 ha area of Bhoom, Paranda, Lohara, Vashi, Kalamb, Osmanabad, Tuljapur, & Omarga Taluka of Osmanabad District. The area has slightly hilly topography with an undulating terrain; most of it falls under the drought prone area.

In a lift Irrigation scheme I and II, there is no independent catchment and submergence area for the project and acquisition of land is only for various components of the project such as, pump houses, rising main and distribution network.

A. Lift Irrigation Scheme I (LIS I): It is proposed to utilize 10.41 TMC of water in five stages from Ujani reservoir for LIS-I

B. Lift Irrigation Scheme II (LIS II): It is proposed to divert 4.91 TMC water through Bhima Sina Link existing Tunnel in Sina River for LIS-II. Remaining 2.66 TMC water is to be utilized from free catchment below Sina Kolegaon project up to Ghatne barrage on Sina River.

The Project Comprises of the following Lift Irrigation Schemes:

Land requirement: The total 4559.6 ha private land will be required for the following components of the project

Category	**LIS I in ha**	**LIS II in ha**	**Total in ha**
Tunnel	19.20	-	19.20
Rising main & Pump house	70.50	53.00	227.7
Canals	1232.00	870.00	2680
Storage	188.00	387.00	1633
Total land required in ha	1509.70	1310.00	4559.9

Proposed Cropping Pattern

Sr. No.	**Name of the season & crop**	**Area (%)**
A)	Perennial	
	Sugarcane	2
	Grape	3
	Chikoo	2

B)	Two Seasonal i) Chilies ii) Turmeric	 7
C)	Kharif seasonal (Irrigated) i) Pulses iii) Vegetables	 30 10
D)	Rabi seasonal i) Wheat ii) Sunflower iii) Jowar iv) Vegetables v) Gram	 5 15 15 5 16
	Total	110%

Source: Reference No. IRR/Vipra-6/crop pattern/296/05 dated 3rd August, 2005

Power: 248 MW (185MW for LIS-I and LIS-II of electricity will be made available at the time of commencement of the scheme. (Source: Maharashtra State Electricity Distribution Corporation Limited (MSEDCL)) as Scheme is planned to lift water in 11 stages.

Cost: The overall cost of the project works out to Rs 4845.05 Crores based on separate estimates for each link consisting of barrage two lift irrigation schemes and augmentation of existing storages and new storages.

A detailed baseline survey is carried out to assess the environmental conditions in the project area through review of secondary data and primary field surveys covering aspects related to land use, micro-meteorology, ambient air quality, water quality, soil quality, noise levels, aquatic and terrestrial ecology, socio-economic conditions of people, healthcare facilities and infrastructure development along with the Biodiversity Conservation and Wildlife Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna in the study area.

The command area represents variable Black soil cover and highly degraded vegetation and species like Acacia nilotica (L) Willd, Ziziphus mauritiana Lamk, Prosopis juliflora (SW.), Leucaena leucocephala (Lam.) and Azadirachta indica Linn are typical representative of water scarce region of command area. Trees are observed only along the borders of the agricultural areas, roadside and along the already existing water bodies. The vegetation predominantly is dry deciduous scrub with many xerophytic elements. Total number of Mammals -16, Birds -184, Reptiles-13 & 66 of fish species are recorded in the project area during the study period.

A detailed EMP covering various aspects, e.g. biodiversity conservation and management plan, environmental management during construction and operational phase of environment components, public health, restoration and landscaping of construction sites, greenbelt development

plan, energy conservation measures, public awareness programme, Rehabilitation & Resettlement Plan, Solid Waste Management Plan and Command Area Development Plan, etc. has been prepared.

The total cost computed for Implementing Environmental Management Plan as per the general guidelines of the Ministry of Environment and Forests, Government of India, provision for Environment Management Plan and Monitoring is 20053.72 lakhs.

Thus the overall impact of the project will be positive as Overall, 849 villages from Paranda, Bhoom, Kallam, Washi, Osmanabad, Tuljapur, Lohara, Omerga talukas from Osmanabad will be benefited with increase in employment and economic aspects.

The EAC, after going through the presentation, observed the following:

- Details of other projects have not been provided which will use the same source of water. A water budgeting has to be provided accordingly.

- Flow to be considered on 75% dependable year basis and not 50% dependable year basis as has been considered.

- Works on a number of components have already commenced and therefore, this is a violation case.

- Sugarcane being luxurious in respect of water consumption, crop pattern may be judiciously selected as this a water scarce area .

- MoEF may deal the matter as a violation case as per its relevant OMs.

Agenda Item No. 2.3 **Attulni HEP (500 MW) in Dibang Valley District of Arunachal Pradesh by M/s. Jindal Hydro Pvt. Ltd - For Extension of Validity of ToR.**

The project proponent presented the details for the extension of the validity of TOR and requested the EAC for one-year extension.

The committee noted that the Government of Arunachal Pradesh allotted Attunli Hydroelectric Project (500 MW) to Hydro Power Development Corporation of Arunachal Pradesh Limited (HPDCAPL), a Govt. of Arunachal Pradesh Enterprise, on 1-Dec-2008 for implementation of the project in JV with Jindal Power Limited (JPL).MoEF accorded scoping clearance on 30.11.2009 for 500 MW (04 x 125 MW).

The proponent informed that due to blockade of main access road for over nine months (Mar' 2010 to Dec' 2010), mobilization of manpower & machinery could be done only after March' 2011 for exploratory investigation works (drifts) at Project site. Later approach to Project site remained cut off due to collapse of Deopani bridge near Roing, totally disrupting the road communication and also the monsoons of 2012 remained active almost till early Oct' 2012 in Dibang Valley District when incessant rains, resulted in road blockades at various locations en-route. These were the main reasons for delay in completion of Survey and Investigation work and thereofre, EIA EMP studies could not be completed during the validity of scoping period. Proponent informed that field survey for environmental base data collection has been completed for all three seasons, however, socio-economic survey can only be taken up on finalziation of land requirement. Keeping this in view, one year extension was sought to complete pending activities.

The committee noted that scoping clearance was accorded in 2009 and as per MoEF's OMs dated March 22, 2010 EIA/EMP reports, should be submitted after Public Consultation, not later than four years from the date of grant of TORs, with primary data not older than 3 years. Therefore, no further extension is possible in this case.

Committee recommended that project proponent should apply for seeking fresh scoping clearance with the latest data and completing all the documentation required for applying for fresh scoping.

Agenda Item No. 2.4 **Thana Plaun HEP (191 MW) of Mandi District of Himachal Pradesh by M/s. Himaachal Pradesh Power Corporation Limited - For revision of the capacity from 141 MW to 191 MW and extension of the validity of TOR.**

Thana Plaun Hydro-electric Project is conceived as storage cum run-of–the-river scheme proposed on Beas river in the Mandi district of Himachal Pradesh by Government of Himachal. This project has been allocated to Himachal Pradesh Power Corporation Limited (hereinafter called HPPCL) for implementation and development. Live storage capacity of the project is 44.93 MCM to enhance the peaking benefits during the lean months. The live storage is sufficient to provide a minimum peaking of 3 hours during lean months when the flows in the river are very low. The live storage capacity is proposed to be created up by constructing a 106.70 m high (from deepest foundation level) and 224.62 m long Concrete Gravity Dam near village Thana. The head works are located approximately 40 km downstream of existing Pandoh Dam (of Beas-Sutlej Link Project) in Mandi District of Himachal Pradesh and about 1 km downstream of Kunkatar bridge on river Beas.

The Terms of Reference for carrying out the EIA studies and preparation of EMP as per the provisions of Environmental Impact Assessment Notification 2006 and subsequent Notification 2009 was approved and permission for pre-construction activities was accorded vide letter No. J-12011/12/2011-IA-I dated 29.11.2012.

HPPCL submitted that they have undertaken EIA studies on ground with parallel technical studies towards preparation of DPR besides some pre-construction activities. While carrying out

technical studies, it was found that with some modifications in the project layout, not only the environment can be better safeguarded but also its capacity can be enhanced in view of seasonally adjusted Environmental Flow Release (EFR) as directed by the Expert Appraisal Committee (EAC) for River Valley and Hydro Electric Power Projects (RV& HEP) while recommending approval of the ToR.

Following detailed studies carried out by HPPCL on the various alternatives based on the techno-commercial and techno-economical aspects, the earlier proposed 6500 m long HRT has now been dropped in favour of twin parallel HRTs of only 124 m and 164 m length, besides reducing the likely affected stretch of river from 7500 m to only 300 m. In the process, project proponent has examined the possibility to release of the Environmental Flow Regime via toe of the dam generation units located in the same power house and found it feasible. This has also increased the generation capacity from 367.50 GWh to 668.07 GWh with 95% machine availability during 90 % dependable year and installed capacity from initial 141 MW to 191 MW in tune with environmentally sustainable optimization of Power Potential considering EFR and water availability approved by CWC/CEA. On the basis of firmed up data the enhanced power generation capacity has in principle been approved by CEA.

In conformity with the above, HPPCL submitted application vide letter No. 2207-16 dated 12.09.2013 for revalidation of approved ToR for the enhanced capacity for the project from earlier (proposed) 141 MW to now (proposed) 191 MW which entails change in layout also. Case was considered in 69th Meeting of EAC (RV & HEP) held on 12.11.2013. EAC deliberated on the issues involved and also took note of the fact that even after modifications in project layout and design, the quarry site, submergence area remain the same which are away from the dam location and submergence. As such there is no possibility of reducing the area of study and hence, the study area for EIA i.e. 10 Km radius from centre of project area shall remain unchanged. But, scope, location of power house etc changed although diverted stretch length reduced.

The committee noted that the capacity of the project has been enhanced from 141 MW to 191 MW and it is not a case of merely extension of the validity of TOR. The scope of the project has been changed as the capacity has been substantially revised to 191 MW. Therefore, the project will be considered & examined afresh. The project proponent informed that the parameters have not been changed except a few. However, the EAC mentioned that fresh Form-1 has to be submitted to the Ministry giving all the details including a comparative table of original vis-à-vis revised proposal for re-consideration of the during the next EAC.

Agenda Item No. 2.5 **Shongtong-Karcham HEP (450 MW) Project in Kinnaur District of Himachal Pradesh by M/s. Himaachal Pradesh Power Corporation Limited - For enhanced capacity of the Environmental Clearance from 402 MW to 450 MW and validation of EC.**

Shongtong-Karchham HEP (402 MW) project proposed on River Sutlej in Kinnaur District of Himachal Pradesh is being constructed by Himachal Pradesh Power Corporation Ltd. (HPPCL) - a State Public Sector Undertaking. This is a run-of-the-river scheme. The barrage site is located near village Powari and the powerhouse is proposed to be located near village Ralli on left bank of river Sutlej upstream of confluence of River Baspa with River Sutlej. MoEF granted Environment Clearance for the project vide letter no. J-12011/58/2007-IA-I, dated 19/05/2011. Earlier, installed capacity of the project was estimated at 402 MW, for which Environment Clearance has been granted by MoEF. Later on, the installed capacity of the project was increased from 402 MW to 450 MW. In consonance with the directions laid down by MoEF, the project proponent i.e. HPPCL, applied for the revalidation of Environment Clearance from 402 MW to 450 MW vide its letter no. HPPCL/GM-SKHEP/EC-Vol.-I /2013-2374-85, dated 29/07/2013.

Accordingly, the case was listed in 70th Meeting of EAC held on 10th December, 2013 wherein the project proponent presented the details and reasons for the capacity enhancement, and also addressed the observation raised by the Committee. The project proponent, made a detailed presentation and delineated various aspects and features of the project.

After, going through the details and reasons provided by the Project Proponent, the committee noted that, due to firming up of hydrological data (i.e. design head and design discharge), from Central Water Commission the installed capacity of the project has increased from 402MW to 450 MW. The TEC (Techno-Economic Clearance) for the enhanced capacity of the project has been granted by Central Electricity Authority (CEA), Govt. of India; vide its letter no. 2/HP/CEA/07-PAC/5066-97, dated 8/08/2012. It was observed by the committee that due to increase in installed capacity from 402 MW to 450 MW marginal changes have resulted in size of some components of the project to accommodate the firmed up design head and design discharge, which, however, do not significantly alter the impacts already assessed in the EIA of the project.

However, due to change in respect of some underground components sizes to accommodate the revised design head and discharge, the muck generation of the project will increase from the earlier estimated quantity. The project proponent, on the advice of the EAC and taking into consideration the environment impacts of the additional muck generation, have revised the muck management plan of the project to accommodate the additional muck generation. The abstract of revised Muck Management Plan is given as below:

- Muck (to be) generated : Quantity = 3.37 Mm^3
- With Swell factor 40% Quantity* = 4.72 $Mm^{3.}$
- Muck to be utilized by Project* = 1.22 Mm^3
- Muck to be used as backfill* = 0.47Mm^3
- Muck in protection works+PAFs etc = 0.90Mm^3
- Compaction of dumped muck* = by 15 %
- Balance to be disposed = 2.13 Mm^3

- Area for muck disposal = 10.0944 ha

- Eight disposal sites of capacity = 2.20 Mm^3
  * Swell factor is highest possible (40%) & consumption and compaction (15%) is conservatively assessed.

The muck generated will be reutilized as backfill; construction works etc. the detail of abstractive use of muck for 450 MW is as under:

S. No.	Components	Quantity of Muck generated I/C 40% swelling factor (cum)	Quantity to be used as backfill (cum)	Quantity to be used in construction works (cum)	Quantity to be used in construction or protection works in benches for colonies (cum) of HPPCL and Contractor	Quantity to be used for providing aggregate to 797 PAF's of the project (cum)	Quantity to be used in protection works along NH-5 and PWD Road in Project area and reservoir rim treatment along with backfill (cum)	Proposed Quantity to be used in development of school ground, army area and private land (cum)
1	River diversion works	434189	64342	87413	22002.7	Aggregate per family= 28.19 cum Sand per family = 21.81 cum	398986	50000
2	Diversion Barrage	603645	181293	157000				
3	Intake, Sedimentation chambers & flushing conduits	1582137	150470	188652				
4	HRT & Construction Adits	1451761	0	592287				
5	Surge Shaft	154770	0	81421				
6	Pressure Shaft & Valve Chamber	41860	0	24955				
7	Power House Complex	343723.8	47601	65000				
8	TRT & outfall works	31123.4	4868	11585				
9	Road	84000	29400	16800				
	Total	**4727209**	**477974**	**1225113**	**22002.7**	**39850**	**398986**	**50000**

***Grand Total of Muck to be reutilized = 2513284 cubic meters**

****Muck left to be disposed off in dumping sites = 2136291cubic meters**

The total of 2136291 cubic meter of muck left will be dumped in the dumping yards already acquired by the project proponent. The comparative statement of the earlier and the revised distribution and dumping of muck in the dumping yards is as under:

S.no	Location	Capacity (CuM)	Qty. of muck debris to be dumped for 402 MW	Qty. of muck debris to be dumped for 450 MW
1	Powari village	3,49,000	3,30,000	3,25,590
2	Tangling village	7,61,645	7,00,000	7,56,780
3	Near Shongtong bridge	2,37,300	2,25,000	2,31,100
4	Lal Dhank	4,17,900	4,00,000	4,01,851
5	Ralli Det	1,15,750	95,000	1,09,870
6	Ralli Det (I), Utilization of muck	25,750	20,000	24400
7	Ralli Det (II), Utilization of muck	1,11,600	96,000	1,07,000
8	P/H Site	1,87,300	1,75,000	1,79,700
	Total	**22,06,245**	**20,41,000**	**21,36,291**

It was appraised by the project proponent that even though the rock to be encountered in the project length is competent, the swelling factor of 40% has been taken instead of 27% (max. swelling factor which will be applicable), taking into account the worst case scenario and even taking 40% swelling factor, 69954 cubic meter of dumping capacity in the dumping yards will still be left.

Also, the Environment Management Plan (EMP) has also been revised from Rs. 88.5 crore to Rs. 123.1 crore to mitigate any environmental impacts of the project due to enhancement of the installed capacity. The comparative statement of the earlier and the revised budgetary layout of EMP are as under:

S.no.	Item	Cost for 402 MW (Rs. lakhs)	Cost for 450 MW (Rs. lakhs)	Remarks
1.	Compensatory Afforestation, NPV, Cost of Trees and Bio-diversity conservation	740.0	786.17	Same as Previous. Already Deposited. Additional notional forestland to be added for increased size of HRT and other underground components.
2.	Catchment Area Treatment	3770.0	7019.50	2.5% of total project cost fixed. Rs. 604.4 million has been deposited.

3.	Fisheries Management	226.0	226.0	Same as Previous.
4.	Public health delivery system	623.0	623.0	Same as Previous. Some typing error in the previous EMP but amount remains the same.
5.	Environmental Management in labor camp	603.1	603.1	Same as Previous.
6.	Muck Management	1847.1	1847.1	Same as Previous. The muck dumping sites remain the same and the restoration measures also remain same.
7.	Restoration and Landscaping of construction sites	155.0	155.0	Same as Previous. Some typing error in the previous EMP but amount remains the same.
8.	Environmental management in road construction	71.2	71.2	Same as Previous.
9.	Greenbelt Development	40.00	40.00	Same as Previous.
10.	Air pollution Control	127.2	127.2	Same as Previous.
11.	Noise Control	11.0	11.0	Same as Previous.
12.	Water Pollution Control	30.00	30.00	Same as Previous.
13.	Resettlement and	393.0	393.0	Same as Previous.
14.	Compensation for loss of agriculture produce	0.00	10.00	Same as Previous.
15.	Environmental Monitoring during construction phase	163.70	280.8	0.1% of total project cost fixed.
16	Provision for consultancy services for CDM	50.00	50.00	Same as Previous.
17	Consent to Establish from HPSPCB and its renewal every year.	0.00	45.0	Left over in 402MW EMP
	Total	**8850.3**	**12318.07**	

The committee also noted that there are no changes in the environmental impacts of the project already assessed during EIA studies carried out for the project and all conditions under Environment Clearance (earlier granted by MoEF, GOI) are being complied with. As such, the EC already granted holds good for the enhanced capacity also.

Accordingly, Expert Appraisal Committee recommended to revalidate Environment Clearance granted vide MoEF, letter no. F. Nos. J-12011/58/2007-IA-I, dated 19/05/2011 for enhanced capacity of 450 MW in favour of Shongtong-Karchham (450 MW) Hydroelectric Power Project in District Kinnaur of Himachal Pradesh being executed by M/s Himachal Pradesh Power Corporation Limited subject to the revised EMP.

Agenda Item No. 2.6 **Teesta River Basin Study In West Bengal by M/s. West Bengal State Electricity Distribution Company Limited (WBSEDC Ltd) - For consideration of TOR.**

The Teesta Intermediate Hydro-Electric Project located on river Teesta, near Melli village of Darjeeling District in West Bengal was considered for Terms of Reference (TOR) Clearance in 68th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects, held on 23rd- 24th September, 2013. During the meeting, inter alia , observed that project proponents need to conduct a proper carrying capacity impact assessment study on West Bengal portion of Teesta Basin, as the study for Sikkim portion has already been conducted. The WBSEDCL informed that they would propose a study and bring draft ToR to EAC for approval. As committeed, the WBSEDCL submitted the draft TOR for appraisal by EAC. The Terms of Reference for Teesta Basin Study for West Bengal portion, as proposed is described in the following paragraphs:

STUDY AREA

The study area to be covered as a part of the Basin Study is for Teesta within West Bengal Portion and where the earlier study boundary ends. The study should be based on secondary as well as primary data collection. A total of 7 (seven) projects are envisaged in the study area to be covered in the Teesta basin study area. The details of the same are given below :

S.No.	Name of the project	Instaled Capacity (MW)
1	Teesta HEP Stage-VI	500
2	Teesta Intermediate HEP	84
3	Teesta Low Dam –I and II HEP	81
4	Teesta Low Dam –III HEP	132
5	Teesta Low Dam –IV HEP	40
6	Teesta Low Dam –V HEP	80
7	Jorthang Loop HEP	96
	Total	**1013**

However, if any HEP with capacity below 25 MW exist, the list has to be brought out.

DATA COLLECTION

In the present study emphasis should be laid on terrestrial and aquatic ecology. The estimation of supportive capacity of the basin should involve the preparation of the existing scenario i.e., the preparation of detailed data base of the basins. This should be accomplished through the steps outlined in following sections.

i) Meteorology

The information on various meteorological aspects is to be collected from India Meteorological Department (IMD) for meteorological stations located within the basin area or in vicinity to the basin boundary. The information on various aspects such as rainfall, temperature wind, humidity, etc. will be collected.

ii) Water Resources

The information on following aspects should be collected:

- Review of drainage characteristics of the basin, including various surface water bodies like rivers and lakes.
- Data collection and review of past studies/reports/data etc.
- Review of existing water sharing agreements for meeting various need-based existing and future demands viz. municipal, irrigation, power generation and industrial.
- Analysis of all, past assessment of the water availability and assessing the water availability, as per updated data for the system as a whole and at existing ongoing/proposed project locations on annual/monsoon/non-monsoon and monthly basis.
- Estimation of sediment load at various points in the basin based on available secondary data.
- Identification of perennial sources of water and their designated usages.

ii) Water Quality

As a part of the study, primary/secondary data is to be collected for water quality in the study area. In addition to above, information on human settlement, sewage generated and mode of collection, conveyance treatment and disposal of sewage should also be collected.

The water quality monitoring shall be conducted at 14 (fourteen locations @ (2 locations per project) in the study area. The frequency of sampling shall be once per month for 12 months. The various parameters include pH, Dissolved Oxygen (DO), Electrical conductivity (EC), Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Alkalinity, Total Hardness, Biochemical Oxygen Demand(BOD), Chemical Oxygen Demand(COD), Nitrates, Chlorides, Sulphates, Phosphates, Sodium, Calcium, Magnesium, Potassium, Iron, Manganese, Zinc, Cadmium, Lead, Copper, Mercury, Total Chromium.

iv) Flora

The following data should be collected from various primary/secondary sources for river Teesta and its tributaries in the basin area **:**

- Characterization of forest types in the study area and extent of each forest type.
- Information on general vegetation pattern and floral diversity.
- Presence of economically important species in the study area.
- Presence of Rare, Endangered and Threatened floral species as per the categorization Botanical Survey of India's Red Data list in the basin area.
- Presence of endemic floral species found in the study area, if any should be assessed as a part of the study.
- Location of wild life sanctuaries, national parks, biosphere reserves if any, in the study area

The field studies should be conducted for sampling 14 (fourteen locations @ (2 locations per project) to collect primary data on terrestrial ecology in the study area. The monitoring should be conducted for three seasons namely pre-monsoon, monsoon and post-monsoon. The following should be covered as a part of the EIA study.

- Identification of forest type and density, bio-diversity in the study area.
- Preparation of comprehensive checklist of flora (Angiosperms, Gymnosperms, Lichens, Orchids, Pteridophytes, Bryophytes, Fungi, Algae etc.) with Botanical and local names.
- Importance Value Index of the dominant vegetation at various sampling locations.
- Frequency, Abundance and density of each species of Trees, Shrubs and Herbs at representative sampling sites should be estimated.
- Identification and listing of plants of genetically, biologically, economical and medicinal importance.
- Details on presence of Endemics and RET species in the Study Area
- Major forest produce, if any, and dependence of locals on the same in the forests observed in the study area.
- Standard survey method for sampling methodology needs to be adopted for Flora.

In addition, based on the published literature including various research papers, the information on forest types, presence of various species, biological diversity etc. should be collected for the study area.

v) Fauna

The following data to be collected from primary and secondary sources for the study area:

- Inventory of Birds (resident, migratory), land animals including mammals, reptiles, amphibians, fishes etc reported & surveyed in the basin area should be prepared.
- Presence of RET faunal species as per the categorization of IUCN Red Data list and as per different schedules of Indian Wildlife Protection Act, 1972 in the Study Area.

- Presence of endemic faunal species found in the basin area, if any should be assessed as a part of the Study.
- Existence of barriers and corridors for wild animals, if any in the basin area should be covered as a part of the study.
- Identification of threats to wildlife in the Study Area.
- Presence of National Park, Sanctuary, Biosphere, Reserve Forest etc. in the basin area should be assessed.

During ecological survey, identification of faunal species shall be carried out simultaneously. Indirect observations of mammals should be carried out by identification of tracks, droppings (scal), claw marks and calls, etc. The listing of faunal species by direct observation techniques should be carried out. The detailed list of faunal species should be formulated based on forest records and published literature.

vi) Aquatic Flora and Fauna

The field studies should be conducted for sampling at 14 (fourteen locations @ (2 locations per project) in the study area to collect primary data on aquatic ecology & fisheries in the study area In addition, primary productivity should be monitored at various locations to be covered as a part of the study.

The diversion of water for hydropower generation leads to reduction in flow downstream to the dam site up to disposal of tail race outfall. This leads to diverse impacts on riverine ecology. The dam could also act as a barrier for migration of fishes. The data on prevailing fish species should be collected from the Fisheries Department. To augment the existing data, experimental fishing should be conducted with different fishing gears in vogue in the region at 14 (fourteen locations @ (2 locations per project) in the study area. The survey should be conducted once per month for 12 months. The details of the monitoring work should be carried out as per the following:

- Qualitative and quantitative assessment of total coliform, plankton, periphyton, benthic organisms,
- Diversity indices of above ecological groups should also be calculated separately,
- Inventory of total fish diversity in the river
- Composition of major fish species
- Inventory of migratory fish species & migratory routes of various fish species
- Assessment of fish spawning grounds.

IMPACTS DUE TO HYDROPOWER DEVELOPMENT

The impacts on terrestrial and aquatic ecology should be studied. The scenario to be considered for assessment in the present study should be based on the hydropower projects proposed in the study area. The key aspects to be covered are listed as below:

- Modification in hydrologic regime due to diversion of water for hydropower generation.
- Depth of water available in river stretches during lean season and its assessment of its adequacy vis-a-vis various fish species.
- Length of river stretches with normal flow due to commissioning of various hydroelectric projects due to diversion of flow for hydropower generation.
- Impacts on discharge in river stretches during monsoon and lean seasons due to diversion of flow for hydropower generation.
- Impacts on water users in terms of water availability and quality
- Impacts on aquatic ecology including riverine fisheries as a result of diversion of flow for hydropower generation.
- Assessment of maintaining minimum releases of water during lean season to sustain riverine ecology, maintain water quality and meet water requirement of downstream users.
- Impact due to loss of forests
- Impact on RET species & impacts on economically important plant species.
- Impacts due to increased human interference
- Impacts due to agricultural practices.
- Study the impact of cascade development and make recommendations on the requirement of free flowing stretch between two projects. Ecological inventory and geomorphology for different stretches of river to be delineated.
- Information on river stretch affected and forest area affected by each project needs to be modified to include additional details of catchment area; total forest area of the sub basin and the area getting affected and total river length, stretch affected and free flowing.
- Undertake environmental flow release assessment for the entire year i.e. covering lean, non-lean non- monsoon and monsoon periods, based on methodology such as BBM and make recommendations for each stretch.
- Hydro Dynamic Study for assessment of Environmental flow release should be linked with the fauna, habitat requirement for assessment of environmental flow releases for entire year.
- Modeling study carried out to assess the impact of peaking discharge should be concluded with recommendations for mitigation of such impacts.
- Impacts of peaking discharge on aquatic ecology and fisheries should be assessed with appropriate mitigation measures,
- Sampling sites, forest cover and forest type should be listed and illustrated sub basin wise. Endemic species of fishes in Teesta basin shall be tabulated.
- The main objective of the study is to bring out the impacts of dams being planned on the main river and its tributaries. At the end of the Report there should be a separate Chapter

synthesizing the results of each component so that a holistic picture of impacts could be emerged which should lead to Recommendations

- Impact on overall balance of sediment due to construction of a number of projects needs to be included in the report.
- Impact of sand mining, boulder mining, etc need to be included in the study
- Impact assessment should also include "Impacts due to construction of approach roads for the HEPs".
- Source of secondary information used in the report/to be used in the report should be revealed and credit given accordingly.
- Detailed maps of each Sub-Basin have to be provided separately for each parameter such as forest cover, forest type, vegetation, location of sampling sites, etc. For each forest type it will be appropriate to give altitudinal range (for some itis given), its location in the study area in separate maps.
- For betterment of analysis, it may be appropriate to categorize dams as Operational/ Under Construction/ EC, Scoping, Not Allotted yet, This will facilitate decision making on dropping of any dam, if it is required from environmental angle.

OUTCOMES OF THE STUDY

The key outcomes of the study should be to**:**

- Provide sustainable and optimal ways of hydropower development of Teesta river in the Study Area, keeping in view of the environmental setting of the basin
- Assess requirement of environmental flow for the entire year i.e. covering lean, non-lean non- monsoon and monsoon periods with actual flow, depth and velocity at different level.

The study may be linked as Cumulative Impact Assessment on account of development of various hydropower projects in the Study Area and should cover the following aspects:

- Flow regime
- Flood plain including wetlands
- Aquatic ecology
- River morphology
- Sediment transport/erosion and deposition
- Impact on human activities and livelihood
- Considering the total length of the main river in the basin and the HEPs already existing and planned for future development, how many more HEPs may be allowed
- to come up. In other words, how much of the total length of the river that may be tunneled inclusive of the tunneling requirement of all the projects that have been planned for development so that the integrity of the river is not grossly undermined.

- What may be criteria for downstream impact study in terms of length of the river downstream to the tail water discharge point and what may be the parameters of such a study. Currently the norm is 10 km radius area, which is inadequate for major projects.

- If the states do not change their policy of allotting elevation-wise river reaches for hydropower development, what criteria the EAC may adopt in restricting the river reach for hydropower development. Alternatively, what should be the clear river length of uninterrupted flow between the reservoir tip at FRL of a downstream project and the tail water discharge point of the immediate upstream project.

- What will be the scientific procedure to decide on the minimum lean season flow that must be maintained in the downstream of a dam/barrage and based on such a procedure, what minimum lean season flow must be ensured by the hydropower developer in various reaches of a long river in relation to the aquatic lives and downstream water use.

- For peaking stations, what extent of diurnal flow variation may be considered safe for the aquatic life? There are examples where the release is drastically reduced during the long time for reservoir filling and the huge discharge flows through the river during the few hours of peak power generation. This is detrimental to the aquatic environment of the downstream stretch of the river.

The key outcomes of the study should be to**:**

- Provide sustainable and optimal ways of hydropower development of Teesta river in the Study Area of the river, keeping in view of the environmental setting of the Study Area.

- Assess requirement of environmental flow for the entire year i.e. covering lean, non-lean non- monsoon and monsoon periods with actual flow, depth and velocity at different levels.

- The study must come out with optimal number of HEPs that could be developed in the study area of basin, their likely locations, capacity, with physical parameters such as height of dam/barrage, submergence etc with minimum environmental disturbance to the basin.

INTERIM REPORT

An interim report on the study should be submitted after 6 months for the purpose of review. The Expert Appraisal Committee after examining the same, would suggest, mid-course corrections, if any.

The EAC recommended the TOR Clearance with the following additional points:

- Study area to be extended upto Gajaldoba (Teesta Barrage) in West Bengal
- Consultant should assess the depth of flow, velocity and top flow width on well established software like HEC-RAS etc for various scenario of flow releases namely 10%, 15%, 20%, 25%, 30%, 40%, 50% and 100% in 90% dependable year considering lean, monsoon and other four months. The estimated depth of flow, velocity and top flow width should be correlated with riverine fauna for environmental flow recommendations.
- Suitable institutions/agency to be engaged by the West Bengal Power Development Corporation Ltd to conduct the study.

Agenda Item No. 2.7 Kundaliya Major Irrigation Project in Rajgarh District of Madhya Pradesh –For Environment Clearance (EC).

The Kundalia project is a new major multipurpose project proposed on river Kalisindh along with diversion of water from its tributary i.e. river Lakhundar by MPWRD which is also a left bank tributary of river Kalisindh. The river Chambal is a right bank principal tributary of the river Yamuna. The proponent made a detailed presentation and explained as below:

The proposed Kundalia dam site is located in Balaheda village of Zirapur tehsil of Rajgarh district in Madhya Pradesh. Its latitudes and longitudes are $23^0$55'41''N and $76^0$18' 15''E respectively. The project envisages providing irrigation downstream of the proposed Kundalia dam on left and right flank of Kalisindh river in approximately 58040 ha of CCA. The irrigation will be provided by a composite canal system over an area of 19000 ha in Kharif season and 54,500 in Rabi season. About 1500 ha will be irrigated under perennial crops. The proposed Kundalia dam is the last dam to be constructed on river Kalisindh in the state of Madhya Pradesh and its reservoir with suitable absorption of incoming floods will greatly help in reducing the magnitude of flood devastation on downstream of dam.

The dam will also meet the domestic and industrial water supply demand to the adjoining towns situated on the periphery of reservoir and just downstream of dam in Madhya Pradesh. About 18 Mm^3 of water is earmarked for drinking water purposes. Besides other fringe benefits of ground water recharge, flood control, pisciculture and tourism, construction of Kundalia dam is also essential for reducing the effect of likely flood damage in Kalisindh sub basin to a great extent.
The project comprises of the following main components: -

- Construction of earthen dam for 2355m.This will consist of left earthen dam in 1613m length and right earthen dam in 268m length and subsidiary saddle dam in a length of 2130m.
- Construction of a central gated spillway in 321m length which will consist of 18 no's of 15m x12m size radial gates and 17 piers of 3m thickness each.
- Construction of right and left NOF in 150m length wherein 6 blocks of 15m each will be provided in left flank and 4 blocks of 15m each will provide in right flank.
- Two nos. of head sluice on left & right flank from dam to provide irrigation on d/s of dam to approximately 58040 ha of CCA.
- Construction of a diversion barrage on river Lakhunder to divert water this sub basin through a channel into main sub basin of river Kalisindh.
- Two nos. of under sluice to provide drinking water facility and release of water to d/s for maintaining ecological requirements.
- 324m long 7.50 m wide T-beam Type double Lane Bridge over the spillway.
- 15m long key wall on left earthen dam site at junction between earth dam and spillway.
- Construction of complete left & right bank canal system including main canals, distributaries, minors sub minors right up to 40ha chak including construction of all the canal structure required therein.

The Gross and Live Storage Capacities of the project are 582.75 MCM and 495.20 MCM respectively. 75% dependable yield for Kundaliya dam site is worked out as 679.128 MCM for the gross catchment area of 3850 sq.km and for Lakhundar Diversion Barrage it is worked out as

201.63 MCM for the gross catchment area of 1075 sq.km. To meet out the requirement at Kundalia dam site, 105 MCM is proposed to be diverted from Lakhundar sub-basin to Kundalia dam site through proposed lakhundar diversion barrage.

The land required for various project components is of about 8155 ha. About 5001 ha of private land and 2474 ha of Revenue land accounts is to be acquired. The quantum of forest land to be acquired is 680 ha.

The proposed cropping pattern and mode of irrigation is given as below:

Season	**Type of Crop**	**Mode & Command Area (ha)**		
		Pressure	**Gravity**	**Total**
Kharif	Soyabean-2KH	900	8100	9000
	Maize 2 KH (American)	200	1800	2000
	Maize 1 KH (Ordinary)	100	900	1000
	Groundnut – 2 KH	250	2250	2500
	Pulses 2KH	250	2250	2500
	Vegetables 1KH	200	1800	2000
	Total (A)	**1900**	**17100**	**19000**
Rabi	Wheat-OLV (Ordinary)	1150	10350	11500
	Wheat-1MV (High yield)	3000	27000	30000
	Gram - N2RA	1200	10800	12000
	Oil Seeds (Til, Alsi)	100	900	1000
	Total (B)	**5450**	**49050**	**54500**
Perennial	Orange (Orchard)	1500	0	1500
	Total (C)	**1500**	**0**	**1500**
	Total (A+B+C)	**8850**	**66150**	**75000**

The project will store water in the months of August to October to meet the irrigation water requirements from October to February and in the months of July and September. The river carries flow only during monsoon season. It is proposed to release 30% of flows in monsoon season in

both Kalisindh and Lakhunder rivers as Environmental Flows to meet the downstream water requirements and sustenance of aquatic ecology.

A detailed Social Impact Assessment (SIA) report has been submitted as a separate volume. The report states that a total of 1781 families will be losing homesteads and 2861 families will be losing land. The SIA report presents a detailed R&R plan based on National Resettlement and Rehabilitation Policy 2007. During the presentation, details of R&R Plan and livelihood plan for PAFs were covered.

The following measures have been given for Resettlement

- Any affected family whose house has been acquired or lost, may be allotted free of cost house site to the extent of actual loss of area of the acquired house but not more than 250 sqm of land in rural areas. In addition, about 25% of the plot size would be required for providing civic amenities and about 25% of the plot size for providing infrastructure facilities.
- Sensitized conscious effort needs to be put-in to ensure entire population of the village or area is shifted and resettled as far as possible en-masse so that communities, kinship ties, socio-cultural relations and social harmony is not disturbed.
- Conscious effort needs to be put-in to ensure the Scheduled Caste affected families are resettled in the areas close to the villages, so that they are not marginalized in the new relocation sites.
- All PAFs losing homestead would be provided with House Building assistance of Rs. 150,000.
- In case of a project involving land acquisition on behalf of a requiring body, the stamp duty and other fees payable for registration of the land or house allotted to the affected families shall be borne by the requiring body.
- The land or house allotted to the affected families under this policy shall be free from all encumbrances
- The land or house allotted to the affected families under this policy may be in the joint names of wife and husband of the affected family.

- Each affected family that is displaced and has cattle, shall get financial assistance of such amount as the appropriate Government may decide but not less than Rs. 15,000 for construction of cattle shed.
- Each affected family that is displaced shall get a one-time financial assistance of such amount as the appropriate Government may decide but not less than Rs. 10,000, for shifting of the family, building materials, belongings and cattle.
- Each affected person who is a rural artisan, small trader or self-employed person and who has been displaced shall get a one-time financial assistance of such amount as the appropriate Government may decide but not less than Rs. 25,000 for construction of working shed or shop.
- In case of a project involving land acquisition on behalf of a requiring body, each affected family which is involuntarily displaced shall get a monthly subsistence allowance equivalent to 25 days minimum agricultural wages per month for a period of 1 year from the date of displacement.
- Amenities and Infrastructural facilities to be provided at Resettlement Areas. Such facilities and amenities shall, inter alia, include Internal Village Road Network, drainage Network within the Resettlement site, sanitation Network within the Resettlement site, safe drinking water, footpath, public transport, drinking water trough for cattle, Place of Worship, Cremation grounds, Fair Price shops and other shops, Post Office, Panchayat Ghar, Community Hall, Health Care Facility, Garden and children's playground, Educational institutions (schools) in resettlement sites, Space for weekly market,

The following measures are suggested to be extended as rehabilitation measures to the PAFs losing land:

- PAFs will be getting compensation in lieu of land to be acquired for the project The compensation rate will be decided by the district collector..
- A rehabilitation grant equivalent to 750 days minimum agricultural wages shall be paid to each PAF.
- A provision of Rs. 10,000 per PAF is being kept for a one-time financial assistance to each khatedar in the affected family for agricultural production

- Preference to given to at least one person per affected family in providing employment in the project, subject to the availability of vacancies and suitability of the affected person for the employment.
- A provision of Rs. 500/month for 6 months for one person per PAF shall be given for training.
- Scholarship @ Rs. 500 per month to at least 1 child per PAF for a period of 1 year.
- A provision of Rs. 500/month for 6 months for one person per PAF shall be given to extend other skill development opportunities to eligible persons.
- Requiring body shall give preference to willing landless labourers and unemployed affected persons while engaging labour in the project during the construction phase.
- One person from each affected family shall be offered necessary training facilities for development of entrepreneurship, technical and professional skills for self-employment.

In addition to R&R Plan, the project proponents will implement *a* livelihood plan for PAFs losing lands. As a part of this plan, following Income generating activities are proposed:

- Reservoir fisheries
- Agriculture in fringe reservoir area
- Livestock rearing
- Training for skill development
- Eco-tourism

An amount of Rs. 35.0 crore has been earmarked for implementation of plan for income generating activities, which is in addition to the cost earmarked for implementation of Resettlement and Rehabilitation Plan.

The project developers have also presented a detailed Local Area Development Plan with an expenditure of 0.5% of project cost.

In the submergence area and the dam site, *Acacia catechu, Phoenix acaulis, Butea monospermum, Acacia nilotica* were the dominant tree species. Amongst shrubs, *Vitex nugundo, Butea parviflora, Cassia tora* were the dominant shrub species. The dominant herbaceous species in

the submergence area were *Cynodon dactylon, Cassia tora, Paspalum conjugatum, Cymbopogon martini, Xanthium strumarium, Andrographis paniculata Argemone mexicana*. The tree density ranged from 76 to 108 per ha, which is quite low. No Rare, Endangered or Threatened species are reported in the project area.

The introduction of irrigation in the area will increase the agriculture production of the area, leading to the increased availability of fodder as a result of increased agricultural by products and residues. The increased level of fodder availability would reduce the pressure on existing pasture and vegetal cover, which is a significant positive impact.

Various features of Environmental Management Plan (EMP) were presented during the EAC meeting. The issues covered in the EMP were biodiversity conservation and management plan, fisheries management plan, environmental management in labour camps, public health delivery system, restoration and landscaping of construction sites, greenbelt development plan, energy conservation measures, public awareness programme, agriculture improvement plan, etc.

A Catchment Area Treatment Plan, using Silt Index (SYI) Method for prioritization of watersheds has also been prepared.

The EAC found the project to be generally satisfactory from environmental point of views and the safeguard/environment management plan as proposed including R&R plan. The EAC, however, sought response of the state government on a representation was received from SANDRP. The project proponent replied to the issues raised therein. Although a number of issues have been covered in the report and presentations, EAC asked the proponent to provide a detailed reply. On receipt of detailed response, the EAC will take a view on the same along with clarification/views from the CWC on the issue of inter-linking projects whether the EC could be granted before the inter-linking project is formulated in its entirety.

Agenda Item No. 2.8 **Satara Minor Drinking Water Project by raising height of existing Kas Dam at Kas Villety , Tal Jawali, District of Satara, Maharashtra by M/s. Government of Maharashtra-For ToR**

This is a Drinking Water Scheme for Satara City and 15 nearby villages by Satara Municipal Council, Satara. The SEIAA, Maharashtra in their letters NOSEAC-2013/CR-166/TC-2 dt. June 27, 2013 as well as during the presentation before the EAC mentioned the following:

- The Kas dam is owned by Satara Municipal Council and is the main drinking water supply source by gravity for Satara city & nearby 15 villages.
- The dam site is located 1 K.M. U/S of village Kas Tal- Jaoli, Dist Satara and approachable from Satara-Bamnoli state highway. It is 27 K.M. away from Satara city.
- The lake is the main drinking water supply source for Satara city & nearby 15 villages. At present it provides water to the population of 56847.
- The average water usages of this population is 140 MCft. However existing capacity of the Kas dam is 107 MCft. Due to this there is scarcity of water in the month of April & May.
- Considering the population up to the year 2040, which will be approximately 208000 which require about 500MCft.of water. To overcome this problem there is need to increase the storage capacity of the existing Kas dam.
- Due to rise in height of dam from 17.19 m to 29.61 M [ToP R.L. 1125.58 mts to 1138.00 m] (i.e. about 12.42 mtr.) 500 MCft. water storage can be obtained. Thus the drinking water need of Satara city & nearby 15 villages can be meet till year 2040.
- The total land requirement for entire project area is approx. 23.6 ha which includes 2.67 ha forest land.
- There are no human settlements/household issues nearby and thus, R&R issues are not involved in the project.

- The project is administratively approved by the Govt. of Maharashtra, Water Supply & Sanitation Dept. for Rs. 4289.00 lakhs vide their Resolution dated 03-03-2011.
- World heritage site declared by UNESCO is at 600-900 m away from dam site.
- The project neither proposes any hydro electric power generation component nor comprises any irrigation component and thus, has no command area

The Committee observed the following:

 The proposed scheme is a Drinking Water Supply to Satara City and nearby 15 villages. The drinking water supply scheme/component is not covered in EIA Notification, 2006 and the committee is mandated to appraise River Valley and Hydro Power Projects which are listed at item 1(c) of the Schedule to the Environment Impact Assessment Notification dated September, 14, 2006 (EIA Notification, 2006). As per this Notification, Hydro Power Projects with capacity ≥ 50 MW are of category „A" and < 50 MW ≥ 25 MW are category „B" projects. The Irrigation Projects having a Culturable Command Area of ≥ 10,000 ha are of „A" Category and below this are of „B" Category. The „A" Category projects are appraised at the Central level by Ministry of Environment and Forests through Expert Appraisal Committees (EACs) and the „B" Category projects are appraised at State level through State Level Environment Impact Assessment Authorities (SEIAAs). As per the amendment of EIA Notification in 2009, the Irrigation Projects having a Culturable Command Area of ≥ 10,000 ha having no submergence are categorized as „B" Category and shall be considered by SEIAAs. However, if a "B" category project is located in whole or in part within 10 km from the boundary of (i) Protected Ares notified under the Wild Life (Protection) Act, 1972; (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time; (iii) Notified Eco-sensitive areas; and (iv) Inter-State boundaries and international boundaries, it will be treated as category „A" category and shall be considered at Central level.

In view of the above, the EAC expressed its inability to consider the project for the purpose of TOR/EIA/EMP etc as this does not fall within the purview and mandate of the EAC. However, there are some environmental issues which may be appropriately addressed by the project proponent. The drinking water schemes in fact do not attract the provisions of EIA Notification, 2006 and its subsequent amendment, 2009.

 The Ministry of Environment & Forests may write to SEIAA stating that the instant

project does not attract the provisions of EIA Notification, 2006 and its subsequent amendment, 2009. The State Government may be requested to take the following steps:

 Necessary clearance for diversion of forest land for the project to be obtained from the designated authority.

 Any other mandatory clearance/statutory permission from any other organization/department to be obtained by the project proponent

 Environmental safeguard measures/management plans, Resettlement & Rehabilitation Plan may be implemented appropriately and in a timely manner.

 Structural safety of dam is to be ensured by appropriate/designated Authority.

 However, Report of Shri Kasturirangan Committee on Western Ghat has to be visited to examine it such works are permitted in the area. Also permission from UNESCO may be required.

 SEIAA may accordingly take a view in the matter.

Agenda Item No. 2.9 Kalai-II HEP (1200 MW) Project in Anjaw Arunachal Pradesh By M/s. Reliance HydroLtd – For Extension of Validity of ToR.

The 1200 MW Kalai-II H.E. Project envisages run of the river with pondage scheme on river Lohit, a tributary of river Brahmaputra, in the Anjaw District of Arunachal Pradesh. River Lohit is the farthest eastern major tributary of river Brahmaputra which originates at an elevation of about 6190 m from the snow clad peaks in the Eastern Tibet. The Kalai-II HE Project envisages utilization of a gross head of about 125m for power generation with an installed capacity of 1200MW. The coordinates of Kalai-II HE Project are Latitude $27^{o}54'$ 20" N and Longitude 96^{o} 48' 16" E. The catchment area up to the proposed dam site including the Tibet region is estimated to be about 15,654 sq. km. The full reservoir level (FRL) is at EL 904.80m. The project involves construction of a concrete gravity dam, upstream & downstream coffer dam, diversion tunnel, intake tunnel, pressure Shafts, underground Powerhouse complex, surge chamber and Tail Race Tunnel etc. The total optimized land requirement for the project including underground structures is 1100 ha. The project proponent submitted the following:

The Ministry of Environment & Forests (MOEF) had approved the Terms of Reference (TOR) for detailed EIA study and accorded the pre construction activity clearance for the 1200MW Kalai-II HEP vide letter no. J-12011/40/2009-IA.I dated 9th December 2009. Subsequently, field survey and investigations were conducted at site for preparation of the Detailed Project Report

(DPR) for the project. The DPR has been submitted to Central Electricity Authority for examination & concurrence and the same is in an advanced stage of examination.

Concurrently, various studies under the Environment Impact Assessment were conducted including the three season primary data collection (during January 2011, May 2011 and August 2011) and the socio economic survey was done during December 2012 to March 2013.

In the mean while, MOEF issued an Office Memorandum dated 22-Mar-10 which stipulates that the proposals which were granted TORs prior to the issue of this OM, the EIA / EMP reports should be submitted after public consultation no later than four years from the date of the grant of the TORs with primary data not older than three years. Thus the TOR issued to the project on 9th December 2009 is valid up to 8th December 2013.

With the completion of all the studies, the draft EIA/EMP report for 1200MW Kalai-II HEP was prepared and submitted by the developer to Arunachal Pradesh State Pollution Control Board (APSPCB) vide letter dated 31st July 2013, more than four months prior to the expiry of the validity of TOR, for conducting Public Hearing as per the provisions of EIA Notification, 2006 and subsequent amendments. Thus the draft EIA study was submitted well in time to enable the submission of the Final EIA report after Public Consultation.

Arunachal Pradesh Pollution Control Board (APSPCB) could not hold public consultation within the validity period due to administrative reasons which are beyond the control of the developer and thus not attributable to them. The Arunachal Pradesh Pollution Control Board (APSPCB) has initiated the process of notifying the date, time and exact venue for the conduct of public hearing and the Deputy Commissioner has confirmed that 15th January 2014 as the date for conduct the public hearing. Since the validity of TORs expires before the intended date of public hearing, APSPCB is insisting for the revalidation of the ToR.

In view of the above, the proponent requested that the validity of the TOR may be extended for a period of one year which shall enable APSPCB to hold the public hearing on the said date and submit the final EIA/EMP report to MOEF for Environmental Clearance.

The EAC was of the view that the delay is purely on account of delay on the part of APPCB in holding public hearing and the proponent has submitted the draft report to them well in time.

Accordingly, EAC recommended extension of validity of TOR for a period of one year w.e.f 09.12.13 to facilitate submission of EIA/EMP reports within this extended period.

Agenda Item No. 2.10 **Anjaw HEP (280 MW) Project in Anjaw Arunachal Pradesh By M/s. Lohit Urja Pvt. Ltd – For Extension of Validity of ToR.**

The project proponent presented the details for the extension of the validity of TOR and requested the EAC for **two** years extension.

The committee noted that the Scoping approval along-with Terms of Reference (TOR) for preparation of EIA/EMP Report was granted by MoEF in November, 2011 for 280 MW Anjaw HEP in Anjaw District of Arunachal Pradesh.

The proponent informed that Survey and Investigation work is under progress along with EIA/EMP studies. Substantial progress has been made in last two years. CEA/CWC has approved the Water Availability Series in December 2011.Power Potential Studies has been approved in July, 2012 for installed capacity of 270 MW. Change in installed capacity from 280 MW to 270 MW had not resulted in change in any of the project components' location and therefore no change in the study area.Topographical Survey & Property survey completed; Geo-mapping survey, construction material survey, design of project component and layout finalization are under progress.

The proponent further informed that substantial progress has been made by Environmental Consultants in the preparation of Comprehensive EIA/EMP Report. Two season baseline data collected for various environmental aspects like soil, air, water sampling, aquatic ecology, flora, fauna etc. during year 2013. Third season baseline study is under progress. The Socio-economic studies shall be taken up upon finalization of the Project Layout Plan by CEA/CWC as a part of Detailed Project Report.

The proponent requested that as the project layout is being finalized, the land acquisition details required for undertaking socio-economic surveys of affected families, finalization of the EIA/EMP Report and thereafter, holding of Public hearing will take some more time; therefore, the TOR validity may kindly be extended for a period of additional two years with the reduced installed capacity of 270 MW.

The committee noted that scoping clearance was accorded in 2011 and as per MoEF's OMs dated March 22, 2010, EIA/EMP reports, should be submitted after Public Consultation, not later than three years from the date of grant of TORs, with primary data not older than 3 years. Therefore, another one year's extension is recommended. Committee also noted that change in capacity of the project from 280 MW to 270 MW is purely due to power potential approval by CEA, therefore, committee also noted the revised capacity of 270 MW for Anjaw HEP.

Agenda Item No. 2.11 **Jameri HEP (50 MW) in West Kameng District, Arunachal Pradesh by M/s. KSK Jameri Hydro Power Pvt. Ltd. – For Extension of the Validity of ToR**

The project proponent presented the details for the extension of the validity of TOR and requested the EAC for one year extension.

The committee noted that the Scoping approval along-with Terms of Reference (TOR) for preparation of EIA/EMP Report was granted by MoEF in 25.10.2010 for 50 MW Jameri HEP in West Kameng District, Arunachal Pradesh. Scoping approval was valid for two years and on expiry of the two years period, one-year extension was granted on March 20, 2013.

Proponent informed that Collection of 3 seasons field data along with related Geotechnical investigation & Power Potential studies are completed. Land & Socio-Economic survey remains incomplete due to certain issues linked to review of the project location by CEA. However, these are expected to be completed in next few months. Therefore, another year extension is requested.

The committee noted that scoping clearance was accorded on 25.10.2010 and as per MoEF's OM dated March 22, 2010 EIA/EMP reports should be submitted after Public Consultation, not later than three years from the date of grant of TORs, with primary data not older than 3 years. Therefore, one year extension can be given to complete the remaining activities only if MoEF considers through such office order. Therefore, committee recommended extension of scoping clearance for 50 MW Jhameri HEP till 24.10.2014 subject to relevant order/OM of the MOEF.

Agenda Item No. 2.12 **Simang–I HEP in East Siang District of Arunachal Pradesh being implemented by M/s. Lower Simang Power Pvt. Ltd. an SPV of M/s Adishankar Power Private – For consideration of Environment Clearance (EC).**

Project proponents made a detailed presentation about the project and its background. It was informed by them that at the time of initial agreement between M/s Adishankar Power Pvt. Ltd. and Govt of Arunachal Pradesh (GoAP), projects were in cascade development on Simang River in three stages i.e Simang-I (67 MW), Simang-II (39 MW) and Simang-III (44 MW) for total capacity of 150 MW. Company decided to revise the project into a two-stage development of 133 MW of total capacity viz. Simang-I (67 MW) and Simang-II (66 MW) as per the suggestions given by Expert Appraisal Committee (EAC), MoEF at the time of issuing TOR for three stage development. EAC enquired about the status of new MOUs with state government. It was clarified that the signing of MOU for combined Simang II and Simang III which is Simang II now is in advanced stages.

Simang-I Hydro Electric Project (HEP) has been awarded by the Government of Arunachal Pradesh (GoAP) to M/s Adishankar Power Pvt. Ltd. (APPL) on 6th Feb 2008. As per provisions of

MoA, Lower Simang Power Private Limited (LSPPL) has been incorporated as the Special Purpose Vehicle (SPV) for the implementation of Simang-I HEP. It is a 67MW run-of-the-river project, located on Simang River, a right bank tributary of Siang River, in East Siang district of Arunachal Pradesh. The project envisages a 18 m high barrage and a surface power house on the right bank of Simang River. The FRL and TWL are 339m and 247m respectively. The project received Techno-economical Clearance (TEC) from Government ofArunachal Pradesh on 10th of June, 2013 after AHEC, IIT Roorkee's review and recommendation for TEC.

The total cost of the project as per the Techno-Economic Clearance issued by GoAP is Rs. 476.45 Crores which is inclusive of Interest During Construction (IDC) cost of Rs. 64.43 Crores.

Even though the initial agreement between M/s Adishankar Power Pvt. Ltd. and GoAP was for cascade development on Simang River in three stages i.e Simang-I (67 MW), Simang-II (39 MW) and Simang-III (44 MW) for total capacity of 150 MW, the Company decided to revise the project into a two-stage development of 133MW of total capacity viz. Simang-I (67 MW) and Simang-II (66 MW) as per the suggestions of Expert Appraisal Committee (EAC), MoEF. Despite the loss of 17 MW of total capacity, a two-stage development would be beneficial to the environment by:

- Maximizing the free-flow stretch of the river
- Significant reduction in the submergence area
- Reduction in the total land required for the project

MoEF issued the TOR of Simang-I HEP while issuing TOR for two-stage development on 12th of May, 2010. As the validity of TOR expired on 11th of May, 2012 it was re-validated and extended by MoEF for a period of one year till 11th of May, 2013 on 10th of January, 2013 and further extended to May 11, 2014 by the MoEF on 7th of August, 2013.

Simang River is a right bank tributary of Siang River, which is one of the major tributaries of Brahmaputra River. The catchment area of Simang River up to its confluence with Siang River is 554 sq. km. It is a rain-fed river, originating at an elevation of about 2900m, and then flows for about 43 km up to its confluence with Siang at elevation of 204m.The river is joined with several perennial and intermittent nalas in its course. The catchment receives rainfall during monsoon period of June to September. There are only two planned HEPs on this river viz. Simang-I HEP and Simang-II HEP. Simang-II is the upstream project and river flows for approximately 23 Km upstream of Simang-II HEP. Simang-II takes approximately 8.75 km stretch of the river between its barrage and the power house. Then there is approximately 1 km of free flowing stretch, followed by Simang-I HEP. The catchment area of the project Simang-I HEP is 494 Sq.km and takes approximately 7.0 Km of the river stretch between FRL and TWL. Free flowing river stretch between TWL (247 m) of Simang-I and FRL (230 m) of Lower Siang HEP along Simang river is approximately 1.4 Km.

The main components of the project are described below:

- A 18 m high barrage across Simang river from the river bed.
- Two intake structures with trash rack arrangement on the right bank just upstream of the barrage axis
- One number Head Race Tunnel comprising of 6.1 m diameter, horse shoe shaped concrete lined tunnel having a length of 4.1 km with construction adits at intake end and at upstream end of surge shaft.
- Restricted orifice Surge Shaft with a diameter 21 m and a height of 36.4 m is provided
- One number steel lined pressure shaft of 4.4 m diameter, Circular shaped, having a length of 200 m. trifurcating into three steel penstocks of 2.5 m diameter each.
- A surface power house of size 67.0 m (L) X 19.2 m (W) X 30.8 m (H) with three units of 22.33 MW each and a tail race channel discharging into the river.
- A switch yard of size 127 m x 90 m for evacuation of power.

The reservoir created by the barrage will have submergence of 15.49 Ha at FRL of 339 m. The rated head of the scheme is 81.83 m and the design discharge is 90.72 cumec. The design energy at 95% plant availability is 273.85 MU.

Total land requirement for the project has been assessed as 54.58 Ha. Ownership of land is a mix of community owned, private land and forestland. Out of this 54.58 Ha of land, 32.74 Ha is forestland that includes 2.88 Ha of land for underground works and 21.84 Ha of non-forest land. Keeping in view of the rights of community over forestland in the state of Arunachal Pradesh, the entire surface land 51.70 Ha has been considered as private land. Total submergence area is 15.49 Ha including 5.12 Ha of riverbed.

The Arunachal Pradesh State Pollution Control Board conducted the Public Hearing for the project at Football ground, Rengo Village in East Siang District of Arunachal Pradesh on 19th of September, 2013. The main issues raised by the public were: compensation, employment and contracts to locals, detailed property survey, aquatic life management plan, separate agreement between the company and locals, economic benefits to locals, safety during and after construction and others. A total of 50 families have been identified as Project Affected Families (PAFs) of which 3 are residing in Dosing, 13 in Lileng, 20 in Pareng, 9 in Rengo and 5 in Boleng. No family would be relocated.

The following are key economic benefits from the project. More comprehensive list of benefits is shown in EMP report. Company shall adhere to the terms of the MoA, State's R&R policy 2008, NRRP 2007 and other norms.

- LADP Fund: As per the Hydro Power Policy 2003/2008 of Govt of India, Company has to give 12% free power to the Govt of Arunachal Pradesh. In addition to above 12% free power, company shall also give 1 % addition free power towards Local Area Development Fund. Out of the 12% free power given to the GoAP, GoAP shall also allocate funds equivalent to 1% free power towards Local Area Development Fund.

- Free Power to PAFs: Further, 100 units of free power per month shall be provided to PAF's for 10 years. PAFs would receive cash disbursement towards any unutilized portion of the 100 units of free power.

- Job Opportunities: Company shall give job preference to the local people in the following categories subject to the candidate fulfilling the qualification and experience as per the criteria: i) Managerial professional position 25% ii) Clerical Post – 50% iii) Skilled Job – 25% iv) unskilled Jobs – 75%

- Medical Benefits: Health Related Facilities such as health check-up camps, strengthening of existing health centers, provision for two ambulances shall be provided as per the EMP Report.

- Education facilities: Project proponent has proposed enhancement of educational facilities under Local Area Development Plan of EMP.

- Scholarships: Merit Scholarship shall also be provided to the eligible students in consultation with District administration and Villagers. These measures have been provided under EMP report and separate fund has been allocated for this purpose.

- Fishing Rights: Project affected families will be given fishing rights to the river and the reservoir.

The proposed Simang-I HEP, like any other major development activity, would lead to a number of environmental impacts owing to the activities that would be undertaken during the construction and operation phase. Impacts from migration of construction workers, construction and quarrying operations, muck disposal, infrastructure development, operating the plant, change in land use patterns and other key activities on the air and water quality, local population, wildlife and environment have been studied in detail and mitigation measures have been proposed for each of the impacts.

Based on the findings of the Environmental Impact Assessment study, various Environmental Management Plans viz. Biodiversity Conservation & Management, Catchment Area Treatment, Fisheries Development, Solid Waste Management, Public Health Delivery System, Energy Conservation Measures, Muck Disposal, Landscaping and Restoration of Quarry and Construction Areas, Compensatory Afforestation, etc. have been proposed.

No significant wildlife population is found in the immediate vicinity of project sites in the influence zone. The habitats of the mammals will not be significantly influenced by the project development, as they rarely frequent the project area and found in the dense forests, which are located in higher reaches away from settlements. The proposed submergence area is not the migratory route of wild animals. Simang River comprises of 19 species of fish. In order to mitigate the adverse impact of Simang-I HE project on the aquatic ecology of the area fishes in particular the following measures shall be adopted to protect and preserve existing aquatic life: development of reservoir fishery and nurseries, releasing/ensuring minimum Environment flow in the river, providing fish ladders near intake point, providing check dams to avoid silting of main channel and release of silt free water from tailrace tunnel into the Simang river.

An amount of Rs.1708.11 lakh has been allocated for the implementation of different environmental management plans such as Biodiversity Conservation & Management Plan, Catchment Area Treatment Plan, Fisheries Conservation & Management Plan, Solid Waste

Management Plan, Public Health Delivery System, Energy Conservation Measures, Muck Disposal Plan, Landscaping and Restoration of Construction Areas & Quarry Sites, Air & Water Environment Management Plan, Rehabilitation & Resettlement Plan, Environmental Monitoring Programme and Disaster Management Plan. In order to implement as well as monitor the impact and efficacy of these plans a committee consisting of District Commissioner, elected officials, local leaders etc. would be constituted.

During the presentation, it was informed that there are only two projects proposed on 43 km long Simang river: Simang I and Simang II. No other project is proposed on this river. As advised by EAC, a clear distance of approximately one km has been maintained between tailrace outfall of upstream project and reservoir tip of downstream project. Longitudinal profile highlighting these distances was also presented. The following observations were made by EAC and clarified by project proponents/consultant:

- EAC inquired about the water availability series, which appears to be on higher side. Developer clarified that water availability series is constructed based on discharge data available in the Siang basin (Raying and Pangin sites) and DPR has already been approved by AHEC, IIT Roorkee where they have concurred on the water availability as estimated.

- It was highlighted that project is beyond 10 km boundary of nearest protected area which is Mouling National Park. The closest distance is 11.46 km and hence it shall not require NBWL clearance.

- EAC enquired about the status of forest clearance. Developer clarified that the process is already on and it is in advance stage as the proposal for diversion of forest land has been recommended and forwarded by GoAP to Regional MoEF, Shillong. In the total land requirement of 54.58 ha, 32.74 ha is forest land.

- It was observed that the area is very rich in biodiversity, but the reports listed comparatively less number of species for fauna. There were errors in avifauna list such as listing woodpeckers under Phasianidae (pheasants) which was clarified. Also they enquired for Indian hare not reported and no direct sighting of reptiles. All these aspects were clarified. Although RET species were listed in Tables, the impact statements mentions that there were no impacts on RET species.

- It was observed by EAC that swell factor considered as 30% while working out the total muck quantity or disposal is on lower side. Instead swell factor should be considered as 40% and accordingly total muck quantity needs to be calculated and disposal area to be worked out.It merits mention that with 40% swell factor, muck quantity would increase and accordingly disposal plan is to be formulated. Proponent confirmed that adequate provision is available to accommodate muck even if the quantity is calculated with 40% swell factor.

- Environmental flow study carried out to ascertain environmental flows was presented which is primarily based on habitat simulation and hydraulic modeling. It was informed that the TOR issued by MoEF for the project does not specify any specific percentage for environment flow, however, based on the site specific study, a release of 20% of average of

four leanest months of 90% dependable year has considered. However, EAC recommended project proponents to follow the environmental flows as per the Siang Basin Study. EAC noted that in ToR stage, environmental flow was not specified in this case.

- EAC observed that costs proposed to implement Catchment Area Treatment Measures appear to be on lower side. It was clarified that since catchment area is thickly vegetated, there is hardly any scope for earmarking CAT measures and hence CAT cost is justified. Secondly, free draining catchment is only 72.73 sq km for which a provision of Rs 122.37 lakh has been kept. However, it was suggested by EAC that few engineering measures in the nalas joining in the catchment as well as some biological measures like enrichment plantation etc should also be suggested and CAT cost should be adequately and substantially increased.

- Adequacy of fish ladder was discussed. In the fisheries development plan, it was enquired by the committee as to how much provisions have been earmarked for recurring and non-recurring components which was clarified but EAC observed that non-recurring cost ie capital cost is on lower side and should be increased by at least Rs 50 lakh. Also an increase in recurring cost was suggested.

- In solid waste management, EAC suggested to include conservation measures so as to make site/area plastic free. It was though clarified that provision for segregating bio-degradable and non degradable waste has already been made in the plan.

- In public health management, two ambulances have been proposed during construction phase to which EAC advised to continue keeping the same provision of two ambulances during operation phase as well.

- EAC enquired about the mechanism for energy conservation measures. It was clarified that suitable measures have been taken in this regard.

- In Rehabilitation & Resettlement plan, it was informed that there are 50 PAFs (Project affected families). No PAF is getting displaced, only land is to be acquired. Plan has been prepared based on NPRR 2007 and Arunachal Pradesh state R & R policy of 2008. EAC enquired about LADA breakup which was presented.

- It was enquired about the people working during construction as well as operation phases. It was insisted by EAC that local people should be provided skill development trainings etc and should be accordingly employed preferably.

- Labour colony shall be located at suitable distances from nearby tribal villages.

- Regarding query about environmental monitoring mechanism, it was clarified that there a provision of an environmental monitoring committee in the plan.

- Concerns raised in public hearing especially like land compensation, economic benefits from project and employment and petty contracts and various other comments received on the reports were discussed point-wise and explained how these have been addressed.

- EAC opined that overall cost earmarked towards Environmental Management Plan is on the lower side, so it needs to be updated and suitably increased. EMP should in such case be at least 5% of project cost.

- EAC asked the project developer to submit the point-wise written response to various other miscellaneous observations of EAC on EIA/EMP reports. The same has been submitted by the project developer.

After critically examining all environmental aspects and taking into consideration the discussions and clarifications given by the project developer, the EAC recommended the project for grant of environmental clearance for the project subject to the fulfillment/compliance of the conditions stated below:

- As the overall cost earmarked towards Environmental Management Plan is found to be on lower side, revised estimated cost of EMP with adequate provisions is to be prepared and submitted. Detailed break-up of costs may also be provided.

- Environmental flows release is to be as per the recommendations of Siang Basin study Report for winter/lean, monsoon and non-lean and non-monsoon seasons.

- Point-wise response to various other comments and representation received be submitted.

- Free riverine free flow stretch between TWL of Simang II HEP and tip of Reservoir of Simang I HEP is to be minimum one kilometer.

- Distance of Mouling National Park is to be ascertained to decide if NBWL permission would be necessary.

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- Whether there are habitations along the proposed alignment of HRT and in that case the PAFs to be reworked out accordingly.

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Agenda Item No. 2.13 **Simang-II HEP in East Siang District of Arunachal Pradesh being implemented by M/s. Upper Simang Power Pvt. Ltd. an SPV of M/s Adishankar Power Private – For consideration of Environment Clearance (EC).**

Project proponents made a detailed presentation about the project and its background. It was informed by them that at the time of initial agreement between M/s Adishankar Power Pvt. Ltd. and Govt of Arunachal Pradesh (GoAP), projects were in cascade development on Simang River in three stages i.e Simang-I (67 MW), Simang-II (39 MW) and Simang-III (44 MW) for total capacity

of 150 MW. Company decided to revise the project into a two-stage development of 133 MW of total capacity viz. Simang-I (67 MW) and Simang-II (66 MW) as per the suggestions given by Expert Appraisal Committee (EAC), MoEF at the time of issuing TOR for three stage development.

Simang-II Hydro Electric Project (HEP) has been awarded by the Government of Arunachal Pradesh (GoAP) to M/s Adishankar Power Pvt. Ltd. (APPL) on 6th Feb 2008. As per provisions of MoA, Upper Simang Power Private Limited (USPPL) has been incorporated as the Special Purpose Vehicle (SPV) for the implementation of Simang-II HEP. It is a 66MW run-of-the-river project, located on Simang River, a right bank tributary of Siang River, in East Siang district of Arunachal Pradesh. The project envisages a 18 m high barrage and a surface power house on the right bank of Simang River. The FRL and TWL are 458m and 351m respectively. The project received Techno-economical Clearance (TEC) from Government of Arunachal Pradesh on 28th of June, 2013 after AHEC, IIT Roorkee's review and recommendation for TEC.

The total cost of the project as per the Techno-Economic Clearance issued by GoAP is Rs. 484.32 Crores which is inclusive of Interest During Construction (IDC) cost of Rs. 74.22 Crores.

Even though the initial agreement between M/s Adishankar Power Pvt. Ltd. and GoAP was for cascade development on Simang River in three stages i.e Simang-I (67 MW), Simang-II (39 MW) and Simang-III (44 MW) for total capacity of 150 MW, the Company decided to revise the project into a two-stage development of 133MW of total capacity viz. Simang-I (67 MW) and Simang-II (66 MW) as per the suggestions of Expert Appraisal Committee (EAC), MoEF. Despite the loss of 17 MW of total capacity, a two-stage development would be beneficial to the environment by:

- Maximizing the free-flow stretch of the river
- Significant reduction in the submergence area
- Reduction in the total land required for the project

MoEF issued the TOR of Simang-I HEP while issuing TOR for two-stage development on 20th of May, 2010. As the validity of TOR expired on 19th of May, 2012 it was re-validated and extended by MoEF for a period of one year till 19th of May, 2013 on 10th of January, 2013 and further extended to 18th May, 2014 by the MoEF on 7th of August, 2013.

Simang River is a right bank tributary of Siang River, which is one of the major tributaries of Brahmaputra River. The catchment area of Simang River up to its confluence with Siang River is 554 sq. km. It is a rain-fed river, originating at an elevation of about 2900m, and then flows for about 43 km up to its confluence with Siang at elevation of 204m.The river is joined with several perennial and intermittent nalas in its course. The catchment receives rainfall during monsoon period of June to September. There are only two planned HEPs on this river viz. Simang-I HEP and Simang-II HEP. Simang-II is the upstream project and river flows for approximately 23 Km upstream of Simang-II HEP. The catchment area of the project Simang-II HEP is 422 Sq.km and takes approximately 8.75 km stretch of the river between its barrage and the power house. Then there is approximately 1 km of free flowing stretch, followed by Simang-I HEP. Simang-I HEP takes approximately 7.0 Km of the river stretch between FRL and TWL. Free flowing river stretch between TWL (247 m) of Simang-I and FRL (230 m) of Lower Siang HEP along Simang river is approximately 1.4 Km.

The main components of the project are described below:

- A 18 m high barrage across Simang river from the river bed.
- Two intake structures with trash rack arrangement on the left bank just upstream of the barrage axis
- One number horse shoe shaped concrete lined Head Race Tunnel having a length of 7.4 km with 5.6 m diameter for 50% of length (3.7 km) and 6.2 m diameter for balance 50% length (3.7km),
- Restricted orifice Surge Shaft with a diameter 17 m and a height of 54 m is provided
- One number steel lined pressure shaft of 4.5 m diameter, Circular shaped, having a length of 225 m.
- A surface power house of size 67.0 m (L) X 17.7 m (W) X 33.8 m (H) with three units of 22 MW each and a tail race channel discharging into the river.
- A switch yard of size 127 m x 90 m for evacuation of power.

The reservoir created by the barrage will have submergence of 10.57 Ha at FRL of 458 m. The rated head of the scheme is 93.37m and the design discharge is 78.4 cumec. The design energy at 95% plant availability is 267.59 MU.

Total land requirement for the project has been assessed as 46.14 Ha. Ownership of land is a mix of community owned, private land and forestland. Out of this 46.14 Ha of land, 26.75 Ha is forestland that includes 4.73 Ha of land for underground works and 19.39 Ha of non-forest land. Keeping in view of the rights of community over forestland in the state of Arunachal Pradesh, the entire surface land 41.41 Ha has been considered as private land. Total submergence area is 10.57 Ha including 3.09 Ha of riverbed.

The Arunachal Pradesh State Pollution Control Board conducted the Public Hearing for the project at Playground, Primary School, Pareng Village in East Siang District of Arunachal Pradesh on 18th of September, 2013. The main issues raised by the public were: compensation, employment and contracts to locals, property survey, aquatic life management plan, separate agreement between the company and locals, economic benefits to locals, safety during and after construction and others. A total of 73 families have been identified as Project Affected Families (PAFs) of which 26 are residing in Sine, 2 in Supsing, 5 in Yingku, 39 in Pareng and 1 in Boleng. No family would be relocated.

The following are key economic benefits from the project. More comprehensive list of benefits is shown in EMP report. Company shall adhere to the terms of the MoA, State's R&R policy 2008, NRRP 2007 and other norms.

- LADP Fund: As per the Hydro Power Policy 2003/2008 of Govt of India, Company has to give 12% free power to the Govt of Arunachal Pradesh. In addition to above 12% free power, company shall also give 1 % addition free power towards Local Area Development Fund. Out of the 12% free power given to the GoAP, GoAP shall also allocate funds equivalent to 1% free power towards Local Area Development Fund.

- Free Power to PAFs: Further, 100 units of free power per month shall be provided to PAF's for 10 years. PAFs would receive cash disbursement towards any unutilized portion of the 100 units of free power.

- Job Opportunities: Company shall give job preference to the local people in the following categories subject to the candidate fulfilling the qualification and experience as per the criteria: i) Managerial professional position 25% ii) Clerical Post – 50% iii) Skilled Job – 25% iv) unskilled Jobs – 75%

- Medical Benefits: Health Related Facilities such as health check-up camps, strengthening of existing health centers, provision for two ambulances shall be provided as per the EMP Report.

- Education facilities: Project proponent has proposed enhancement of educational facilities under Local Area Development Plan of EMP.

- Scholarships: Merit Scholarship shall also be provided to the eligible students in consultation with District administration and Villagers. These measures have been provided under EMP report and separate fund has been allocated for this purpose.

- Fishing Rights: Project affected families will be given fishing rights to the river and the reservoir.

The proposed Simang-II HEP, like any other major development activity, would lead to a number of environmental impacts owing to the activities that would be undertaken during the construction and operation phase. Impacts from migration of construction workers, construction and quarrying operations, muck disposal, infrastructure development, operating the plant, change in land use patterns and other key activities on the air and water quality, local population, wildlife and environment have been studied in detail and mitigation measures have been proposed for each of the impacts.

Based on the findings of the Environmental Impact Assessment study, various Environmental Management Plans viz. Biodiversity Conservation & Management, Catchment Area Treatment, Fisheries Development, Solid Waste Management, Public Health Delivery System, Energy Conservation Measures, Muck Disposal, Landscaping and Restoration of Quarry and Construction Areas, Compensatory Afforestation, etc. have been proposed.

No significant wildlife population is found in the immediate vicinity of project sites in the influence zone. The habitats of the mammals will not be significantly influenced by the project development, as they rarely frequent the project area and found in the dense forests, which are located in higher reaches away from settlements. The proposed submergence area is not the migratory route of wild animals. The Mouling National Park is located at a distance of 6.4 km from barrage site of Simang-II HEP and hence would require clearance from the standing committee of National Board for Wildlife (NBWL). Simang River comprises 20 species of fish. In order to mitigate the adverse impact of Simang-I HE project on the aquatic ecology of the area fishes in particular the following measures shall be adopted to protect and preserve existing aquatic life: development of reservoir fishery and nurseries, releasing/ensuring minimum Environment flow in

the river, providing fish ladders near intake point, providing check dams to avoid silting of main channel and release of silt free water from tailrace tunnel into the Simang river.

An amount of Rs.1869.43 lakh has been allocated for the implementation of different environmental management plans such as Biodiversity Conservation & Management Plan, Catchment Area Treatment Plan, Fisheries Conservation & Management Plan, Solid Waste Management Plan, Public Health Delivery System, Energy Conservation Measures, Muck Disposal Plan, Landscaping and Restoration of Construction Areas & Quarry Sites, Air & Water Environment Management Plan, Rehabilitation & Resettlement Plan, Environmental Monitoring Programme and Disaster Management Plan. In order to implement as well as monitor the impact and efficacy of these plans a committee consisting of District Commissioner, elected officials, local leaders etc. would be constituted.

During the presentation, it was informed that there are only two projects proposed on 43 km long Simang river: Simang I and Simang II. No other project is proposed on this river. As advised by EAC, a clear distance of approximately one km has been maintained between tailrace outfall of upstream project and reservoir tip of downstream project. Longitudinal profile highlighting these distances was also presented. The following observations were made by EAC and clarified by project proponents/consultant:

- EAC inquired about the water availability series, which appears to be on higher side. Developer clarified that water availability series is constructed based on discharge data available in the Siang basin (Raying and Pangin sites) and DPR has already been approved by AHEC, IIT Roorkee where they have concurred on the water availability as estimated.

- It was highlighted that project is lying within 10 km boundary of nearest protected area which is Mouling National Park. The distance of Mouling National Park is 6.4 km from barrage site of Simang-II HEP and hence it shall require NBWL clearance.

- EAC enquired about the status of forest clearance. Developer clarified that the process is already on and it is in advance stage as the proposal for diversion of forest land has been recommended and forwarded by GoAP to Regional MoEF, Shillong. In the total land requirement of 46.14 ha, 26.75 ha is forest land.

- It was observed that the area is very rich in biodiversity, but the reports listed comparatively less number of species for fauna. There were errors in avifauna list such as listing woodpeckers under Phasianidae (pheasants) which was clarified. Also they enquired for Indian hare not reported and no direct sighting of reptiles. Although RET species were listed in Tables, the impact statements mentions that there were no impacts on RET species. All these aspects were clarified.

- It was observed by EAC that swell factor considered as 30% while working out the total muck quantity or disposal is on lower side. Instead swell factor should be considered as 40% and accordingly total muck quantity needs to be calculated and disposal area to be worked out. Proponent confirmed that adequate provision is available to accommodate muck even if the quantity is calculated with 40% swell factor.

- Environmental flow study carried out to ascertain environmental flows was presented which is primarily based on habitat simulation and hydraulic modeling. It was informed that the TOR issued by MoEF for the project does not specify any specific percentage for environment flow, however, based on the site specific study, a release of 20% of average of four leanest months of 90% dependable year has considered. However, EAC recommended project proponents to follow the environmental flows as per the Siang Basin Study.

- EAC observed that costs proposed to implement Catchment Area Treatment Measures appear to be on lower side. It was clarified that since catchment area is thickly vegetated, there is hardly any scope for earmarking CAT measures and hence CAT cost is justified. However, it was suggested by EAC that few engineering measures in the nalas joining in the catchment as well as some biological measures like enrichment plantation etc should also be suggested and CAT cost should be adequately and substantially revised.

- Adequacy of fish ladder was discussed. In the fisheries development plan, it was enquired by committee how much provisions have been earmarked for recurring and non-recurring components which was clarified but EAC observed that non-recurring cost i.e. capital cost is on lower side and should be increased by at least Rs 50 lakh. Also an increase in recurring cost was suggested.

- In solid waste management, EAC suggested to include conservation measures so as to make site/area plastic free. It was though clarified that provision for segregating bio-degradable and non degradable waste has already been made in the plan.

- In public health management, two ambulances have been proposed during construction phase to which EAC advised to continue keeping the same provision of two ambulances during operation phase as well.

- EAC enquired about the mechanism for energy conservation measures. It was clarified that suitable measures have been taken in this regard.

- In Rehabilitation & Resettlement plan, it was informed that there are 73 PAFs (Project affected families). No PAF is getting displaced, only land is to be acquired. Plan has been prepared based on NPRR 2007 and Arunachal Pradesh state R & R policy of 2008. EAC enquired about LADA breakup which was presented.

- It was enquired about the people working during construction as well as operation phases. It was insisted by EAC that local should be provided skill development trainings etc and should be accordingly employed preferably.

- Labour colony shall be located at suitable distances from nearby tribal villages.

- Regarding query about environmental monitoring mechanism, it was clarified that there a provision of an environmental monitoring committee in the plan.

- Concerns raised in public hearing especially like land compensation, economic benefits from project and employment and petty contracts and various other comments received on the reports were discussed point-wise and explained how these have been addressed.

- EAC opined that overall cost earmarked towards Environmental Management Plan is on the lower side and it needs to be upwardly and adequately revised. Allocation of EMP should be at least 5% of the project cost.

- EAC asked the project developer to submit the point-wise written response to various other observations of EAC on EIA/EMP reports.

After critically examining all environmental aspects and taking into consideration the discussions and clarifications given by the project developer, the EAC recommended the project for grant of environmental clearance for the project subject to the fulfillment/compliance of the conditions stated below:

- As the overall cost earmarked towards Environmental Management Plan is found to be on lower side, revised estimated cost of EMP with adequate provisions is to be prepared and submitted. Detailed break-up of costs may also be provided.

- Environmental flows release is to be as per the recommendations of Siang Basin study Report for winter/lean, monsoon and non-lean and non-monsoon seasons.

- Point-wise response to various other comments and representation received be submitted.

- Free riverine free flow stretch between TWL of Simang II HEP and tip of Reservoir of Simang I HEP is to be minimum one kilometer.

- Distance of Mouling National Park is to be ascertained to decide if NBWL permission would be necessary.

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- Whether there are habitations along the proposed alignment of HRT and in that case the PAFs to be reworked out accordingly.

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Agenda Item No. 2.14 Jeera Irrigation Project in Odisha by M/s. Water Resources Department, Government of Odisha – For consideration of Environmental Clearance (EC).

The Odisha Government made a detailed presentation and explained as below:

- Jeera Irrigation Project is a reservoir Project proposed in Mahanadi Basin on Jeera river, a tributary to Mahanadi river, at village Duanpali, Bhatli block in Bargarh district of Odisha. The Project envisages construction of a 1958 m long Homogeneous Rolled Earth Fill dam, besides a spillway of length 72m proposed at the central portion of the dam axis.

- This medium irrigation project will provide irrigation facility to 6000 ha. of G.C.A. and 4800 ha of C.C.A. with annual irrigation of 5840 ha in drought prone area of Bargarh district.

- The catchment area intercepted at the proposed Dam site is 124.90 Sq.Km. The 75% dependable yield has been computed to be 4679.40 Ham. By fixing the FRL: at 207.50m. the gross storage of the Project comes to 2742.10Ham. As per calculation of silt load by Khosla's formula, the dead storage level comes to 202.00M. The gross command area proposed for this Poject is 6000 Ha. The length of Left Main Canal is 13.25 Km and that of Right Main Canal is 07.25 Km.

- The inhabitants of the proposed command area are mostly tribal and depend upon agriculture. As there is no irrigation facility at present, the crop production suffers a lot due to erratic rainfall. The Project on completion will provide irrigation to 4320 Ha. of land in Khariff season and 1520 Ha. in Rabi Season, thereby improving the socio economic condition of the people of the area. The block wise benefit due to irrigation are as follows:

1. Sohela Block (1 village) = 7.00 Ha.
2. Bargarh Block(3 villages) = 979.58 Ha.
3. Bhatli Block (21 villages) = 3813.42 Ha.

Total = 4800 Ha

The annual benefit due to agriculture after the project would be Rs.3313.21 lakhs. The mandays to be generated due to creation of this project would be 1764416 mandays. There is no displacement of any families due to the project. Only 505.43 Ha. of private land without any population will be submerged. 8.57 Ha. Forest land is getting affected

2.0 PRESENT STATUS:

The DPR is in principle accepted by CWC. The TOR for prior Environment clearance was obtained. Application for Forest Diversion proposal for 8.57 Ha. has been submitted to Chief Conservator of Forest (Nodal), Odisha and is under active process. Preparation of R&R plan for

505.43 Ha. submerged private land only without any displacement of population has been submitted to Ministry of Tribal Affairs (MOTA), Government of India for approval. The agro economic survey of the project has also been completed. The salient features & Index Map are annexed as Annexure-I & II respectively.

3.0 SALIENT FEATURES OF JEERA IRRIGATION PROJECT

GENERAL.

State	ODISHA
District	Bargarh
Sub-Division	Bargarh
Block	Bhatli
Village	Duanpali (15 Km from Sohela)
Location	Lat. 21^0-23'-11"N.
	Long. 83^0-26'-13" E.
Topo Sheets	64-0/7 and 64-0/11.
Nearest Railway Station	Bargarh

HYDROLOGY.

Catchment area	124.90 Sq. Km.
Max. Mansoon Rainfall	1475.80mm.
Min. Mansoon Rainfall	704.60mm
75% dependable rainfall	874.92mm
75% dependable yield	4679.40 Ham.
Design flood discharge	1696.00 Cumecs.
Average Normal rainfall	1041.07mm.

RESERVOIR

Gross Storage Capacity	2742.10 Ham.
Live Storage Capacity	2343.00 Ham.
Dead Storage Capacity	399.50 Ham.
D.S. L of Dam	202.00 M.
F.R.L of Reservoir	207.50M.

T.B.L. of Dam	210.50 M.
Deepest Bed Level of River	195.07 M.
DAM	
Type of Dam	Homogeneous rolled Earth fill dam.
Total length	1958.00M.
Max. height	17.58M.
Top width	6.00M
SPILLWAY.	
Type	Ogee crested
Effective length	72.00M.
Crest level	202.00M.
Spillway capacity	1696.00 Cumecs
No. of Gates	6Nos (12.00m X 7.00M)
SUBMERGENCE.	
Submergence at F.R.L.	770.00 ha.
Total no of fully affected village	Nil
Totalk no of partially affected village	7 nos.
Total no. of village affected	7 nos.
Forest area affected.	-
(a) Reserve Forest	Nil
(b) Village forest	8.57 Ha (In unit-I).
(c) Govt. land	256.00 Ha.
(d) Private land	505.43.00 Ha.
Total	**770.00 Ha.**
DETAILS OF COMMAND AREA.	
Gross command area	6000 Ha.
Cultivable command area	4800 Ha.
Percentage of GCA to CCA	80%
Area of Khariff	4320.00 Ha.

Area of Rabi	1520.00 Ha.
Intensity of irrigation	122%
No. of villages to be benefited.	25 nos.
CANAL SYSTEM.	
Length of left main canal	13.25 Km.
C.C.A.	3600.00 Ha.
Khariff area	3240.00 Ha.
Rabi area	1140.00 Ha.
Length of Right Main Canal	7.25 Km
C.C.A	1200 Ha.
Khariff Area.	1080 Ha.
Rabi Area.	380 Ha.
Interstate aspect and impact on	124.90/83400=0.0015
Hirakud catchment	Impact of Hirakud catchment is negligible
COST OF THE PROJECT.	
Cost of Head works	Rs.8229.34 lakhs.
Cost of distribution system	Rs.3089.79 lakhs.
Total cost of the project	Rs.12379.00 lakhs.
Cost per hectare of Annual Irrigation	Rs.2,11,969.00
B.C. Ratio	2.09

4.0 It was explained that the project was necessary and would lead to higher yield of crop and thereby improve the economy and living conditions of the farmers.

5.0 EAC noted that the validity of the ToR for the project has expired and public hearing was held after expiry of the validity.

Therefore, EAC advised that MoEF return the proposal and Government of Odisha to submit application seeking extension of validity of ToR and reconsider the proposal. Consultants

engaged are to be NABET. Also Government of Odisha was requested to submit point wise reply to the representation received on the project.

List of EAC members and Project Proponents who attended 70th Meeting of Expert Appraisal Committee for River Valley & Hydro Electric Power Projects held on 10th – 11th December, 2013 in New Delhi

A. Members of EAC

1.	Shri Alok Perthi	-	Chairman
2.	Dr. K. D. Joshi	-	Member
3.	Dr. S. Sathya Kumar	-	Member
4.	Dr. Vijay Kumar	-	Member
5.	Dr. P. K. Choudhuri	-	Member
6.	Shri Hardip Singh Kingra	-	Member
7.	Shri N. N. Rai	-	Member
8.	Shri B. B. Barman	-	Member Secretary & Director, MoEF
9.	Dr. P. V. Subba Rao	-	MoEF

B. Chhatru HEP (120MW) in Lahaul & Spiti District of Himachal Pradesh by M/s. DCM Shriram Infrastructure Limited - For reconsideration of Environment Clearance (EC).

Absent

C. Krishna Marathwada Lift Irrigation Project at Osmanabad, Maharashtra by M/s. KMIDC, Government of Maharashtra - For consideration of Environmental Clearance (EC).

1.	Shri Satish Yewale	-	Project Cordinator
2.	Shri A. D. Kokate	-	Superintending Engineer
3.	Shri G. D. Birajdar	-	Sub Divisional Engineer
4.	Shri V. B. Kotecha	-	Executive Engineer

D. Attulni HEP (500 MW) in Dibang Valley District of Arunachal Pradesh by M/s. Jindal Hydro Pvt. Ltd - For Extension of Validity of ToR.

1.	Dr. J. K. Soni	-	Senior Vice President
2.	Shri Jayant Kawale	-	Managing Director
3.	Shri Satish C. Sharma	-	CEO

4.	Shri Anil Dhar	-	Senior General Manager
5.	Shri Gajendra Sharma	-	Deputy Manager
6.	Dr. Arun Bhaskar	-	Director/RSET
7.	Shri Ravinder Bhatia	-	Consultant

E. Thana Plaun HEP (191 MW) of Mandi District of Himachal Pradesh by M/s. Himaachal Pradesh Power Corporation Limited - For revision of the capacity from 141 MW to 191 MW and extension of the validity of TOR.

1.	Shri Vinod Kumar Tiwari	-	Director
2.	Shri Dhian Singh Verma	-	Additional General Manager
3.	Shri P. K. Kathuria	-	General Manager
4.	Shri J. D. Sharma	-	Additional General Manager
5.	Shri Dinesh Kumar Chaudhary	-	Deputy General Manager
6.	Shri Narinder Pal Jagota	-	Senior Manager
7.	Shri Bhuvnesh Sharma	-	Senior Manager
8.	Dr. A. N. Singh	-	Additional Director
9.	Capt. H. K. Sharma	-	Executive Director

F. Shongtong-Karcham HEP (450 MW) Project in Kinnaur District of Himachal Pradesh by M/s. Himaachal Pradesh Power Corporation Limited - For enhanced capacity of the Environmental Clearance from 402 MW to 450 MW and validation of EC.

1.	Shri Vinod Kumar Tiwari	-	Director
2.	Shri Dhian Singh Verma	-	Additional General Manager
3.	Shri J. D. Sharma	-	Additional General Manager
4.	Shri Yogesh Verma	-	Consultant
5.	Engineer Rahul Sharma	-	Assistant Engineer
6.	Shri Sanjeev Kumar	-	Junior Officer
7.			

G. Teesta River Basin Study In West Bengal by M/s. West Bengal State Electricity Distribution Company Limited (WBSEDC Ltd) - For consideration of TOR

1.	Shri J. P. Bhatt	-	Scientist
2.	Dr. Dorje Dawa	-	Scientist
3.	Dr. Aman Sharma	-	General Manager
4.	Shri R. N. Saha	-	Chief Engineer
5.	Shri Amitava Sen	-	Superintending Engineer

H. Kundaliya Major Irrigation Project in Rajgarh District of Madhya Pradesh –For Environment Clearance (EC).

1.	Shri R. S. Julaniya	-	Principal Secretary

2.	Shri M. S. Dhakad	-	Commissioner
3.	Shri M. G. Choubey	-	Engineer-in-Chief
4.	Dr. Aman Sharma	-	General Manager
5.	Shri S. K. Nigam	-	Superintending Engineer
6.	Shri Anil Singh	-	Executive Engineer

I. Satara Minor Drinking Water Project by raising height of existing Kas Dam at Kas Villety , Tal Jawali, District of Satara, Maharashtra by M/s. Government of Maharashtra-For ToR

1.	Shri Abijeet Bajpai	-	Chief Officer
2.	Shri S. D. Giri	-	Suprintending Engineer
3.	Shri P. P. Kaduskar	-	Executive Engineer
4.	Shri S. S. Gaikwad	-	Sub Divisional Officer
5.	Dr. C. P. Vibhute	-	Consultant

J. Kalai-II HEP (1200 MW) Project in Anjaw Arunachal Pradesh By M/s. Reliance HydroLtd – For Extension of Validity of ToR.

1.	Shri Naveen Alagh	-	Senior Ex. Vice President
2.	Shri P. S. S. Manian	-	Vice President
3.	Shri Manoj Pradhan	-	Additional Vice President
4.	Dr. Aman Sharma	-	General Manager

K. Anjaw HEP (280 MW) Project in Anjaw Arunachal Pradesh By M/s. Lohit Urja Pvt. Ltd – For Extension of Validity of ToR.

1.	K. Seethayya	-	Director
2.	Shari Jaychandra Khandelwal	-	Additional General Manager
3.	Dr. Arun Bhaskar	-	Managing Director
4.	Shri Rajendra Singh	-	Expert (Env. & Mgmt.)
5.	Shri S. C. Sood	-	Expert (Hydrology)
6.	Ms. Sunita Jaswal	-	Senior Executive
7.	Shri R. B. Singh	-	Senior Manager
8.	Shri K. A. Chowdhary	-	Senior Engineer
9.	Shri Manoj Kumar Gupta	-	Liaison Officer
10.	Shri Ravinder Bhatia	-	Consultant

L. Jameri HEP (50 MW) in West Kameng District, Arunachal Pradesh by M/s. KSK Jameri Hydro Power Pvt. Ltd. – For Extension of the Validity of ToR

1.	Shri S. K. Dutta	-	Assistant Vice President
2.	Shri C. S. Kasama	-	Director General Manager

3.	Shri K. Chanda	-	TCE
4.	Dr. M. Goswami	-	TCE
5.	Dr. Acharyulu	-	Manager
6.	Shri Arun Bhaskar	-	Director
7.	Shri Tarakesh Swain	-	Assistant Manager

M. Simang–I HEP in East Siang District of Arunachal Pradesh being implemented by M/s. Lower Simang Power Pvt. Ltd. an SPV of M/s Adishankar Power Private – For consideration of Environment Clearance (EC).

N. Simang-II HEP in East Siang District of Arunachal Pradesh being implemented by M/s. Upper Simang Power Pvt. Ltd. an SPV of M/s Adishankar Power Private – For consideration of Environment Clearance (EC).

1.	Shri Y. V. Rao	-	Director
2.	Shri S. C. Mittal	-	Chief Designer
3.	Shri Vimal Garg	-	Director
4.	Shri Arun Bhaskar	-	Director
5.	Shri S. C. Sud	-	Consultant
6.	Shri Kalyan Kolmala	-	Director
7.	Shri Ravinder P. S. Bhatia	-	Director
8.	Shri Manoj Kumar Gupta	-	President

O. Jeera Irrigation Project in Odisha by M/s. Water Resources Department, Government of Odisha – For consideration of Environmental Clearance (EC).

1.	Shri S. K. Patnayak	-	EIC
2.	Shri V. Vijay Kumar	-	General Manager
3.	Prof. K. C. Patra	-	HOD & Dean
4.	Shri Jitendra Kumar Saha	-	Deputy Manager
5.	Shri Ashutosh Desh	-	Deputy Director

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