Minutes of the 1st Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects held on 30th December, 2016 at Narmada Meeting Hall, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.

The 1st meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held with the Chairmanship of Dr. Sharad Kumar Jain on 30th December, 2016 in the Ministry of Environment, Forest & Climate Change at Narmada Meeting Hall, Jal Wing, Ground Floor, Indira Paryavaran Bhawan, Jorbagh Road, New Delhi. The following members were present:

1.	Dr. Sharad Kumar Jain	-	Chairman
2.	Shri Sharvan Kumar	-	Representative of CEA
3.	Shri N.N. Rai	-	Representative of CWC
4.	Dr. J.A. Johnson	-	Representative of WII
5.	Dr. A.K. Sahoo	-	Representative of CIFRI
6.	Dr. Vijay Das	-	Representative of Ministry of Earth Science
7.	Shri Chetan Pandit	-	Member
8.	Dr. Dinakar Madhavrao More	-	Member
9.	Dr. R. Vasudeva	-	Member
10.	Dr. Jai Prakash Shukla	-	Member
11.	Dr. S. Kerketta	-	Member Secretary

Prof. Pradeep P. Mujumdar, Prof. Govind Chakrapani and Prof. S.R. Yadav could not be present.

Shri Gyanesh Bharti, Joint Secretary welcomed the Chairman and the Members of the newly re-constituted Expert Appraisal Committee for River Valley and Hydroelectric Projects. Then, a presentation was made about the salient features of the provisions of the EIA Notification, 2006 and its amendments and the procedures adopted for appraisal of project proposals. Further, briefing was also made to the Committee regarding various policy decisions taken by the Ministry and issued through various OM w.r.t River Valley and Hydroelectric Projects.

The Chairman in his address highlighted the requirement of maintaining true spirit of neutrality while appraising a project proposal placed before the Committee and felt that in doing so, merit of the case shall be the sole criteria for recommendations by the Committee.

The deliberations held and the decisions taken are as under:

Agenda Item No. 2.1 Chela HEP (75 MW) in District Kurung Kumey, Arunachal Pradesh by M/s Adveta Power Private Limited - for ToR.

The Project Proponent (PP) made a detailed presentation of the project, and *inter-alia* provided the following information.

Chela HEP (75 MW) is proposed on River Kurung in Kurung-Kumey District of Arunachal Pradesh. This is a run-of-the-river scheme. This project envisages construction of 20 m high barrage across Kurung River near Tyang village to generate 75 MW of hydropower. Total land requirement for the project is about 39.94 ha which is forestland. Out of this, 5.7 ha land will be submerged. Total catchment area of the project is about 1194 km^2. A surface powerhouse is proposed on the right bank of the river with 3 units of 25 MW each. No National Park/Wildlife Sanctuary/Biosphere Reserve/Historical Monuments are present

within 10 km radius of the project. Total estimated cost of the project is about Rs. 543.31 Crores and it is proposed to be completed in 7 years.

Kurung river is a major tributary to Subhansiri river. The EAC was informed that as per OM dated 28.5.2013, river basin study is a mandatory requirement for taking up any project in the river basin. The EAC was also informed that the Carrying Capacity Studies & Cumulative Impact Assessment (CCS & CIA) of Subansiri River basin has been completed and the Ministry has approved the report after duly recommended by the EAC. The outcome and recommendations have been circulated to all authorities concerned. Therefore, this project should also abide by the recommendation of Subansiri RBS.

The Committee enquired about the hydrology series for the project and noted that just one-year data from the proponents' own gauging station appears to be inadequate. Data from the nearest gauging station(s) including the CWC sites may be used for calculating water availability for the project. The project proponent informed that during the EIA study, the hydrological series will be worked out and water availability and environmental flow requirements will be calculated for the project.

The EAC mentioned that the environmental flow (E-flow) requirement for the project should take care of the recommendations of Subansiri RBS. The E-flow recommended by Subansiri RBS for this project is presented in the following table:

E-flow release for the Project

Capacity	**Lean Season**	**Monsoon Season**	**Non-Lean/ Non-Monsoon**
Chela (75 MW)	20%	20%	20%

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for scoping clearance*** for the project with the following additional TORs in addition to the standard TORs (as applicable) for undertaking detailed EIA study and preparation of EMP:

i. The Committee noted that one-year data from the proponents' own gauging station appears to be inadequate. Data from the nearest gauging station(s) including the CWC sites may be used to prepare data series of adequate length for calculating water availability for the project.
ii. Detailed information on species composition, in particular fish species, from any previous study/literature should also be included.
iii. All the projects in the upstream/downstream along with capacity and the L-section of the river should be indicated on the map while preparing the EIA report.
iv. Provision of e-flow requirement of the project should be ensured in line with the recommended in the Subhansiri River Basin Study.
v. As the project site is unexplored area, inventorization on flora and fauna should be carried out based on the primary data collection instead of relying on secondary data.
vi. Solid waste management should be explained in details. Landfilling of plastic waste shall be avoided and instead proposal for recycling for various uses may be proposed in the EMP report.
vii. Information regarding NABET Accredited Consultants for carrying out EIA Studies is yet to be provided to the Ministry.

Agenda Item No. 2.2 Chomi HEP (80 MW) in District Kurung Kumey, Arunachal Pradesh by M/s Adveta Power Private Limited - for ToR

The Project Proponent (PP) made a detailed presentation of the project, and *inter-alia* provided the following information:

Chomi HEP (80 MW) is proposed on River Kurung in Kurung-Kumey District of Arunachal Pradesh. This is a run-of-the-river scheme. This project envisages construction of 20 m high barrage across Kurung River near Serli village to generate 80 MW of hydropower. Total land requirement for the project is about 40.60 ha which is a forestland. Out of this, a total of 7 ha forest area will be submerged. Total catchment area of the project is about 1,194 km^2. A surface powerhouse is proposed on the river with 3 units of 26.67 MW each. No National Park/Wildlife Sanctuary/Biosphere Reserve/Historical Monuments are present within 10 km radius of the project. Total estimated cost of the project is about Rs. 553.08 Crores and it is proposed to be completed in 7 years.

Kurung river is a major tributary to Subhansiri river. The EAC was informed that as per OM dated 28.5.2013, river basin study is a mandatory requirement for taking up any project in the river basin. The EAC was also informed that the Carrying Capacity Studies & Cumulative Impact Assessment (CCS & CIA) of Subansiri River basin Study has been completed and the Ministry has approved the report after duly recommended by the EAC. The outcome and recommendations have been circulated to all authorities concerned. Therefore, this project should also abide by the recommendation of Subansiri RBS.

The committee asked about the hydrology series for the project and noted that just one-year data from the proponents' own gauging station appears to be inadequate. Data from the nearest gauging station(s) including the CWC sites may be used for calculating water availability for the project. The project proponent informed that during the EIA study, the hydrological series will be worked-out and accordingly water availability and environmental flow requirements will be calculated.

The EAC mentioned that the environmental flow (E-flow) requirement for the project should be followed based on the recommendations of Subansiri RBS. The E-flow recommended by Subansiri RBS for this project is presented in the following table:

E-flow release for the Project

Capacity	**Lean Season**	**Monsoon Season**	**Non-Lean/ Non Monsoon**
Chomi (80 MW)	20%	20%	20%

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for scoping clearance*** for the project with the following additional TORs in addition to the standard TORs (as applicable) for undertaking detailed EIA study and preparation of EMP:

i. The Committee noted that one-year data from the proponents' own gauging station appears to be inadequate. Data from the nearest gauging station(s) including the CWC sites may be used to prepare data series of adequate length for calculating water availability for the project.

ii. Detailed information on species composition in particular to fish species from any previous study/literature should be included.
iii. All the projects in the upstream/downstream along with the L-section of the river should be indicated on the map with capacity while preparing the EIA report.
iv. Provision of e-flow requirement of the project should be ensured in line with the recommended in the Subhansiri River Basin Study.
v. As the project site is unexplored area, inventorization on flora and fauna should be carried out based on the primary data collection instead of relying on secondary data.
vi. Solid waste management should be carried out in details. Land filling of plastic waste shall be avoided and instead proposal for recycling for various uses may be proposed in the EMP report.
vii. Information regarding NABET Accredited Consultants for carrying out EIA Studies is yet to be provided to the Ministry.

Agenda Item No. 2.3 Ken Betwa Link Project Phase-I in Districts Panna & Chhatarpur, Madhya Pradesh by M/s Water Resource Department, Govt. of M.P. & M/s National Water Development Agency (NWDA), Govt. of India – for reconsideration of Environment Clearance.

The Project Proponent (PP) and M/s NWDA, New Delhi, made a detailed presentation of the project and *inter-alia* provided the following information:

It was noted that the project envisages construction of 77 m high and 2,031 m long composite dam across Ken river near village Daudhan in Chhatarpur District of Madhya Pradesh to provide irrigation facility to 6.35 lakh ha area of land, drinking water facility and generation of 78 MW hydropower. Two (2) powerhouses, viz., (i) 2 units of 30 MW capacity each, and (ii) 3 units of 6 MW capacity each are proposed to be constructed. Two (2) tunnels of 1.9 km long upper level and 1.1 km long lower level tunnel and 221 km long Ken-Betwa link Canal Phase-I on the left bank of the river are proposed to constructed. It is proposed to provide irrigation facility in 6,35,661 ha of area in Panna, Chhatarpur, Tikamgarh District of Madhya Pradesh and Banda, Mahoba and Jhansi Districts in Uttar Pradesh. Total submergence area is 9,000 ha, out of which 5,258 ha is forestland (it includes 4,141 ha in Panna Tiger Reserve). A total of 10 villages consisting of 1,585 families are likely to be affected by this project. Panna Tiger Reserve falls within the 10 km radius of the project. The total cost of the project is about Rs.9,393 Crores and it is likely to be completed in 9 years.

The project was earlier considered by the EAC in its meetings held on 24-25th August, 2015, 26-27th October, 2015 and 8-9th February, 2016.

The EAC noted that the e-flows have been calculated on the basis of approved monthly flow series for the 75% dependable year (1988-89). Ken River is a non-perennial river and the 75% dependable year i.e. monsoon season (June-September) run-off is 6541.56 MCM. The average non-monsoon/non-lean season (October-January) run-off is 9.11 MCM, whereas there is negligible run off during the lean season from February to May. Out of the total run off at Daudhan dam site, 2,266 MCM of water is earmarked for proposed upstream utilization and the monthly distribution on pro-rata basis. The e-flow are presented below:

Table: Environmental Flows for Daudhan Dam

Sl. No	Season	Average in flow (MCM)	Percentage (%) of average inflow	Average E-flow to the downstream (MCM)
1	Lean (Feb. - May)	36.51	20	7.30
2	Non-monsoon and Non-lean (Oct.– Jan.)	368.54	30	110.56
3	Monsoon (Jun.– Sept.)	4348.96	30	1304.69

The committee was informed that while considering the project by EAC in its meeting held on 24-25th August, 2015, the EAC had noted that the Panna Tiger Reserve was being affected very significantly and that all aspects of this project in relation to this disturbance to the reserve need to be studied and assessed more carefully. EAC had also noted that the Landscape Management Plan (LSMP) is being prepared by WII for the mitigation measures to be taken up in the Panna Tiger Reserve/ Ghariyal Sanctuary. Since, many of the members of the EAC are from expert organizations, which are responsible for the preparation of the LSMP there could be some conflict of interest. In fact one of the members had sought opinion on this and he was advised to recluse himself when this project is discussed. Under the circumstances it will be appropriate that a second opinion from a non-government expert is obtained. EAC should dwell on this in the next meeting and select the external expert for the purpose.

The PP submitted the additional information based on queries raised in the EAC meeting held during August, 2015 and the same was reconsidered by EAC, in its meeting held on 26-27th October, 2015. The PP informed that the State Wildlife Board (SWLB), Government of Madhya Pradesh, has decided to recommend the proposal to NBWL for wildlife clearance. The matter of preparation of Landscape Management Plan (LMP) by WII, Dehradun and its implementation & monitoring has been considered by State Wildlife Board (SWLB), Government of Madhya Pradesh on 22.9.2015 and also approved by NTCA of MoEF&CC. EAC noted that the above landscape plan is being prepared by WII, Dehradun. Therefore, in the absence of such plan, the committee cannot examine the proposal in totality.

The EAC had mentioned that after completion of the plan, and obtaining a second opinion on the LMP from an external expert, the project will be reviewed and will be reconsidered again for appraisal for grant of Environmental Clearance.

The PP submitted additional information again based on the EAC meeting held in October, 2015 and the same was reconsidered by EAC in its meeting held on 8-9th February, 2016. Apart from the reply on few queries, the details on LMP could not be submitted and the Committee once again asked the PP to submit the LMP.

The project proponent submitted compliance report and additional information and the same was again reconsidered by EAC, in its meeting held on 2-3rdJune, 2016. The project was discussed in detailed and issues raised in earlier meetings were clarified by the project proponent. It was also informed that the Environmental Management Plan (EMP) has been prepared and predicted impact on actual requirement and incorporating suggestions of people, etc. therein. The detailed budget estimated in the EMP are presented below:

Table: Budget Estimated of EMP

Sl. No.	Environmental Management Plan	Cost (Rs. Lakhs)
1	Catchment Area Treatment Plan	27258.52
2	Command Area Development	31180.74
3	CA, NPV for territorial forest & National Park	306096.08
4	5 Bio-diversity Management Plan	2747.44
5	Fisheries Conservation and Management Plan	1409.72
6	Surface and Ground Water Management Plan	6340.00
7	R&R Plan including Land Cost, Land Compensation and LADP/ TDP	125768.00
8	Tourism Development Plan	577.50
9	Muck Disposal Plan	2953.00
10	Disaster Management Plan	140.00
11	Public Health Delivery System	2160.00
12	Environment Monitoring Plan	688.50
Total (Rs. in crores)		**5073.0**

The project proponent also informed that the WII, Dehradun has sought minimum 3-year time for formulation of the Landscape Management Plan for the Panna Tiger Reserve which will be affected by the project. The EAC mentioned that the matter be expedited to 3-4 months for completion of LMP and after finalizing LMP, the same will be appraised by the EAC for EC.

The project proponent submitted the compliance report and the same has been considered by the newly reconstituted EAC in its meeting held on 30.12.2016. The project proponent made a detailed presentation. NTCA has made a detailed presentation on Landscape Management Plan. In the presentation, it was mentioned that the LMP shall be an exhaustive document to be prepared considering various factors and it cannot be completed in a shorter period of time. It was also mentioned that while preparing LMP, monitoring is to be carried-out at the pre-project stage, during construction phase and post-construction phase. The LMP mainly envisages the accommodation of the movement of tigers from the PTR to nearby forest conservation areas/wildlife sanctuaries. It would also consider up-gradation of these conservation areas/wildlife sanctuaries to Tiger Reserves. Therefore, the LMP issue is to be delinked from the issue of EC for the Ken-Betwa Link Project Phase-I as it is a long-term management plan for Tiger conservation in the PTR area.

The new EAC was also informed that it was decided in the 2-3rd June, 2016 of EAC meeting that a meeting be convened by NWDA among Shri H.S. Kingra, Vice Chairman of the then EAC, MoEF&CC officials with Director, WII, Dehradun for expediting the finalization of the LMP within 3-4 months instead of 3 years. It was intimated by NWDA that the said meeting could not be convened due to paucity of time among the above officials and subsequently, the tenure of EAC ended on 03.09.2016. As the EAC couldn't be re-constituted immediately after validity period, the Competent Authority in the MoEF&CC approved to convene the aforesaid meeting which was convened on 30.11.2016. In the said meeting, Dr. H.S. Negi, IG (Forest), NTCA, Dr. S. Kerketta, Director (River Valley), MoEF&CC, Dr. K. Ramesh, Scientist 'D', WII, Dehradun and Officials from NWDA attended. WII gave a detailed presentation on the preparation of LMP. *A consensus was arrived among the officials present in the meeting and it was decided that i) NTCA to give a brief presentation before the EAC in its next immediate meeting to appraise the*

preparation of LMP and ii) As the scope of the LMP was different and covers beyond the study area of EIA/EMP report of Ken-Betwa Inter-Linking Project, it should be delinked from the perspective of the Environmental Clearance.

The NWDA further informed that the Standing Committee of National Wildlife Board in its 39th meeting held on 23.8.2016 has recommended the project for clearance. The Ministry issued wildlife clearance for Ken-Betwa Project in Madhya Pradesh on 21.9.2016 with the following conditions:

i. the conditions prescribed by site inspection team and NCTA, as agreed by MoWR and that the resultant reservoir area shall be retained as core area with minimum activities for management purpose under close consultation with the Tiger Reserve Management. The landscape based plan for the area will be finalized with NCTA in lead, assisted by WII, State Forest department and project proponents.
ii. the effort to integrate the said 3 wildlife sanctuaries within the PTR will be undertaken simultaneously and the management objective of these areas will be in context of treatment of the area as a part of tiger landscape. Requirement of all extant statues related to environment and forest including EC and FC shall be met as applicable.

After detailed deliberation, discussion and considering all the relevant facts of the project as presented by NWDA, the EAC noted that the scope of the LMP is quite large. There is a wide perspective in regards to the implementation of LMP beyond the affected areas of the proposed project. Hence, EAC agreed to delink the same from this proposed project for EC purposes and ***recommended the project for grant of EC*** with the following conditions:

i. As the submergence area is very large (about 9,000 ha), micro-climatic change conditions in the project area during construction/post-construction period to be brought-out/reported at regular intervals.
ii. Impact due to habitat change having effect like corridor and loss of migratory path for wildlife including birds and impact on the breeding ground of species should be recorded during pre-construction/post - construction stages.
iii. Plans for greenbelt development and reservoir rim treatment plan have to be made in consultation with State Forest Department. Preference shall also be given to plant local indigenous species. If possible, transplantation of trees from the submergence area of the project be taken up and these may be re-planted in the affected area of the project as a part of LMP.
iv. The PTR is facing acute shortage of water and due to creation of reservoir, the water regime will improve to a great extent. The extent of creation of pasture land due to receding of submergence, increase of herbivorous population, growth in vulture population as well as increase in Tiger population be recorded in the project area.
v. *While implementing the LMP for PTR, EAC suggested that as and when the Land Management Plan, etc. are taken up in the affected areas of the Ken-Betwa Link Project Phase-I, status of implementation of the same shall be submitted to the Ministry and Regional Office, MoEF&CC, Bhopal for its monitoring on six monthly basis.*
vi. All conditions stipulated in the NBWL clearance should also be included in EC letter.
vii. Solid waste generated, especially plastic waste, should not be disposed of as landfill material. It should be treated with scientific approach and recycled.
viii. An e-mail was received by the Chairman and the Members of EAC, drawing attention to a notification dated Oct. 2016 from MOWR, RD&GR that

prohibits any construction within the larger Ganga basin rivers. When clarification was sought from NWDA, it was informed that this notification applies to only those constructions that cause pollution because otherwise, it may mean that even a bridge cannot be constructed across any river in the Ganga basin. After deliberating over the matter, the EAC directed the Member – Secretary to clarify this point with the Director General, NMCG, MOWR, RD&GR before taking approval of the competent authority for issue of EC.

ix. Six monthly compliance reports shall be submitted to Regional Office, MoEF & CC, Bhopal without fail until completion of the modernization works.

Agenda Item No. 2.4 Kwar HEP (540 MW) in District Kishtwar, Jammu and Kashmir by M/s Chenab Valley Power Project Pvt. Ltd. – for Environment Clearance

The Project Proponent (PP) and the Consultant, M/s R.S. Environlink Technologies Pvt. Ltd, Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information:

Chenab Valley Power Project Pvt. Limited, a Joint Venture Company (NHPC, JKSPDC and PTC) has been formed to harness the vast hydro potential of river Chenab by development of Pakal Dul, Kiru and Kwar Hydroelectric Projects. Kwar HEP is planned on Chenab River, near village Padyarna, District Kishtwar, J&K state.

Scoping clearance of Kwar HEP (IC of 520 MW) was accorded by Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India on 17.03.2010 and was valid till 16.03.2014.

Later on, installed capacity of the project was enhanced from 520 MW (at the time of Scoping Clearance) to 560 MW (during DPR stage) for which a draft EIA/EMP reports was prepared, Public Hearing was conducted on 28.10.2013 and report submitted on 15.03.2014 to MoEF&CC for final appraisal.

As the final installed capacity approved by CWC was 540 MW, a fresh TOR for 540 MW was recommended by EAC in its meeting held during 5-6th May, 2014 and also recommended that same baseline data may be used for updating EIA/EMP study. Subsequently, scoping clearance was re-validated by MoEF&CC for installed capacity of 540 MW on 26.08.2015.The total estimated cost of the project is Rs. 4949.24 crores at April, 2016 Base Price level. The levelised tariff would be Rs. 5.77 per unit. The project is to be completed in a period of 54 months after accordance of all the Government sanctions.

Salient Features

Kwar HEP envisages utilization of 115 m head of Chenab river by constructing a concrete gravity dam near Padyarna village, an underground power station of 540 MW (4x135 MW) on the right abutment of the dam adjacent to dam axis and 2 nos. tail race tunnels of lengths of 2,786 m and 2,963 m, respectively.

Main components of the project are as under:

- One Concrete Gravity dam of 109 m high (above deepest foundation) and 195 m long (at top).
- River diversion works comprising of a Diversion Tunnel of 9.5 m diameter horseshoe shaped with upstream and downstream cofferdams.

- Four Orifice type spillways with discharging capacity of 3,221 cumec each (opening size is 9.5x13.8 m) and one crest spillway with discharging capacity of 884 cumec (opening size of 9.5x17 m) and corresponding gate control structures for control flood release.
- One outlet for environmental releases, having discharging capacity of 16.49 cumec to 74.09 cumec and opening size of 2.6x2.0 m.
- Four Construction sluices, each 3.1 m wide and 5.0 m high with crest at EL 1,300 m to serve for diversion of flood during construction stage.
- Water conductor system consisting of:

  i. Four Power Dam Intakes with gate arrangement.
  ii. Four 5.65 m diameter circular penstocks/pressure shafts, with vertical length varying from 54.0 m to 93.0 m, and total length (excluding vertical) varying from 108.0 m to 182.0 m.
  iii. Two 9.5 m diameter horseshoe shaped tailrace tunnels of length 2,786 m and 2,963 m, respectively.
  iv. Two downstream surge galleries of each 10.4 m diameter and length 750 m.

- Underground powerhouse will be located on right bank of river Chenab near village Padyarna. Water from the reservoir would be taken to powerhouse through pressure shafts/ penstocks and discharged through tailrace tunnels (TRT) back into the river course. It will have an installed capacity of 540 MW (4x135 MW) and will consist of:

  i. A machine hall cavern with MIV of size 140x23.3x50 m.
  ii. A control room cavern of size 40x15x28.8 m.
  iii. A transformer cavern of size 116x17x16 m.
  iv. A GIS cavern of size 65x15x16 m.

- An outdoor Pothead Yard of size 150x35 m at EL 1,315 m.

The average riverbed level at dam site is about EL 1,290 m. Corresponding to an FRL of 1,385 m, the gross storage of the reservoir is 27.167 million m^3 and area under submergence is 0.8 km^2.

Land requirement

The proposed project requires 136.35 ha land, out of this 29.75 ha falls under the category of forestland. Of the rest, 89.57 ha is state land and 17.03 ha is private land. Five villages, i.e. Bhagna, Semna Bhata, Ajna, Dichla and Galhar Bhata would be affected due to this proposed project. However, families are being affected from four villages except the families of village Galhar Bhata who are losing only Government land (riverbed land).

Status of Forest Clearance

Forest clearance for diversion of 29.75 ha of forest land has been approved in the 81st meeting of J&K State Forest Advisory Committee (FAC) held on 09.12.2013 and subsequently the forest clearance was accorded vide Govt. Order No. 268-FST of 2014 dated 08.08.2014.

EIA/EMP Studies

The EIA and EMP studies were earlier conducted for the project with respect to 560 MW installed capacity and the reports were finalized and submitted to MoEF&CC in 2014. The EAC in its meeting held during 5-6th May, 2014, recommended issuance

of fresh TOR for revised capacity of 540 MW based on CWC recommendation. As the data collected were just about 3 years old at the time of consideration of project by EAC, it was recommended by the EAC that this same data could be used for updating EIA/EMP study. EAC also recommended to conduct scientific studies for determination of e-flow.

The requisite studies were conducted and presented before EAC in its 85th meeting. Subsequently, MoEF&CC issued the TOR for revised capacity of 540 MW in August, 2015.

Accordingly, based on the recommendations of EAC, EIA and EMP reports have been updated and final reports were submitted to MoEF&CC on 08.12.2016 for consideration of Environment Clearance. Detailed EMP cost earmarked as below:

Sl. No.	Management Plans	Amount (Rs. in lakh)
1	Biodiversity Conservation & Management Plan	140.48
2	Catchment Area Treatment Plan	2930.56
3	Fisheries Development Plan	798.59
4	Solid Waste Management Plan	221.60
5	Public Health Delivery System	385.00
6	Energy Conservation Measures	95.00
7	Muck Disposal Plan	3419.30
8	Landscaping and Restoration Plan	224.04
9	Air & Water Management Plan	40.00
10	Reservoir Rim Treatment	1043.69
11	Compensatory Afforestation Plan	385.03
12	Rehabilitation and Resettlement Plan	3772.04
13	Environmental Monitoring Programme	100.00
14	Dam Break Modelling and DMP	180.00
	Total (Rs. in lakh)	**13735.33**

The PP informed that e-flow provisions have been provided as per the EAC recommendation which were made in the meeting held in May, 2014. The requisite e-flow studies were conducted and presented in the EAC meeting held during 20-21st July, 2015 wherein the EAC stipulated the final environment flow provisions as 16.49 cumec (20%) for lean flow period (December-March), 74.09 cumec (10%) for peak flow period (June-September) and 16.79 cumec (10%) for remaining four months (Oct, November, April and May).

PP further informed that in compliance to recommendations of EAC, the power potential studies were revised and CEA/CWC have approved the final installed capacity of project as 540 MW and annual energy generation to be of 1975.54 MU.

The PP informed that free flow river stretch with upstream Kiru HEP is 325 m and downstream operational Dul Hasti HEP is 350 m approx. Further, it was informed that the study of actual operational reservoir levels of Dul Hasti HEP during 2015-16 shows that reservoir of Dul Hasti HEP is maintained at an average level of 1262.5 m thereby increasing the available free flow stretch to about 500 m. Further, PP informed that the free flow issue was discussed in 85th meeting of EAC (July, 2015), wherein following was recorded:

"Keeping in view that project has got scoping clearance in 2010 without any stipulation of free flow stretch/environment flow and project's limitation under IWT, project can proceed with same parameters and available free flow stretch; However environment flow provisions as recommended needs to be implemented."

Regarding R & R Plan, the PP informed that the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Re-settlement Act, 2013 is not applicable in the state of Jammu & Kashmir and that the R&R plan has been formulated on the basis of the model R&R plan of J&K as already approved by J&K State Government for Kishanganga HEP.

It was also explained the logic to introduce fish species like *Mahseer* and *Garra* spp. in the river and reservoir. These fish species existed in the river Chenab in earlier times when the Salal, Dul Hasti and Baghlihar dam were not constructed. However, the migration of *Mahseer* stopped to the upstream areas above Salal after the construction of Salal HE Project and other projects. Therefore, it has been proposed to introduce these species in the upstream and downstream areas of Kwar HEP along with other native fish species available in the area. Further, the plan for development of fish hatchery has been formulated in consultation with J&K Fisheries Department.

Regarding, Dam Break analysis studies covering up to 2,840 m downstream reach of Kwar HEP, Consultant explained that due to constraints like already constructed Dul Hasti dam just downstream of Kwar Dam (which is an operational project), dam break modelling studies have been restricted up to the reservoir of Dul Hasti HEP. It was also explained that the reservoir of Kwar and the river downstream is in deep gorge and there are no permanent structures in the likely affected area. Habitations are much above the river and reservoir areas.

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for grant of Environmental Clearance*** for the project with the following conditions:

i. On-line monitoring system for the e-flow releases to be installed.
ii. The plastic waste shall be disposed of by recycling and not by land filling.
iii. Local indigenous varieties of plants to be grown and maintained till their full growth including gap filling.
iv. Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping, the trainings to the youths be incorporated for their appropriate engagements in the Project.
v. Land acquired for the project shall be suitably compensated with the prevailing guidelines and all commitments made during the public hearing shall be fulfilled.
vi. The project-affected population should be resettled and rehabilitated with land-to-land and house-to-house to compensate the losses. The affected families should be provided with employment.
vii. Six monthly compliance reports shall be submitted to Regional Office, MoEF& CC, Chandigarh without fail until completion of the modernization works.
viii. All the recommendations based on the CIA &CCS of the Chenab River Basin for Kwar HEP shall be followed in Toto during the development of Kwar HEP.

Agenda Item No. 2.5 Bina Complex Multipurpose Project (32 MW) in Sagar District, Madhya Pradesh M/s Water Resources Department, Government of Madhya Pradesh - For Environment Clearance

The Project Proponent (PP) and the Consultant, M/s R.S. Environlink Technologies Pvt. Ltd, Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information.

The project envisages construction of 4 dams on Bina & Dhassan Rivers (both are tributaries to Betwa river) to provide irrigation facility in 84,200 ha of land in Sagar District of Madhya Pradesh. Water flow from Bina River will be stored in an earthen dam (known as Madia dam) near Madia in Rahatgarh Tehsil of Sagar District of Madhya Pradesh. An underground powerhouse is also proposed on the left bank of the river downstream of the Madia dam for generation of 22 MW (2x11 MW) of hydropower & Dehra dam for generation of 10 MW (2x5 MW) of hydropower. The gross command (GCA) area is 1,02,500 ha and irrigable command area is 90,747 ha. The total land requirement for project is 12,671.18 ha out of which 1,024.44 ha is forest land; 10,652.59 ha is private land and other type/waste land is 994.15 ha. Total submergence area is 10,391.88 ha. About 69 villages consisting of about 2957 families are likely to be affected due to this project. The total cost of the project is about Rs. 3249.627 Crores and proposed to be completed in 36 months.

The scoping/TOR clearance was granted on 21.1.2015. The Public Hearings were conducted in 3 Districts namely Raisen, Vidhisa and Sagar in Madhya Pradesh on 18.5.2016, 20.5.2016 and 27.5.2016, respectively. All the issues discussed during the Public Consultation were considered in the EIA/EMP report. A socio-economic impact assessment was carried-out separately and report was also submitted. Thereafter, final EIA/EMP reports were submitted for environmental clearance.

The environmental aspects covering catchment area, submergence area and project influence area i.e. area within 10 km radius from main project components have been considered. The baseline data has been collected covering Physico-chemical aspects, biological aspects and socio-economic aspects. Three seasons data have been collected for air, noise, water, soil and ecological aspects. Impacts during construction and operation phases have been assessed and mitigation measures suggested minimizing the anticipated impacts.

The other salient features of the project and the EIA/EMP were reported as under:

i. The Public Hearings were conducted in 3 Districts namely Raisen, Vidhisa and Sagar in Madhya Pradesh on 18.5.2016, 20.5.2016 and 27.5.2016, respectively. The major concerns expressed during the Public Consultation were on submergence of land, major water crisis, etc. Therefore, the dam should be constructed for irrigation, land compensation should be as per market value/appropriate compensation, early commencement of project, land in lieu of land, job for affected families, etc. The PP has complied all the issues raised by the public pertaining with the local people.
ii. The project is likely to generate 7.33 lakhs m^3 of muck due to excavation. Out of which, 1.81 lakh m^3 is to be utilized for construction purpose and remaining 5.52 lakh m^3 to be dumped in 11.75 ha of area at 4 designated disposal sites. The muck disposal sites should be reclaimed/ restored with vegetation once capacity is utilized. A grant of Rs.1.76 crores has been allocated for this purpose.
iii. The compensatory afforestation programme is proposed in 2,048.88 ha of forestland which is double the forestland diverted for the project and will be implemented in consultation with State Forest Department. Biodiversity Conservation and Management Plan is also proposed in consultation with State Forest department. A total grant of Rs. 16.60 crores has been allocated for this purpose.

iv. Greenbelt will be developed around the reservoir, boundaries of the project colony, approach roads and various project components in 1068.12 ha and is proposed with 14 different local plant species. A grant of Rs. 72 lakhs has been allocated for this purpose.

v. Fishery development and management plan is proposed for the conservation of fish in river and reservoir. Under this programme, development of Indian major carps viz., Catla, Rohu and Mrigal is proposed. A stocking rate of 300 fingerlings (>100 mm size) per ha for reservoir has been proposed in the initial year of development. The stocking of reservoir, upstream/ downstream of the river will be done. The plan will be implemented in consultation with the State Fisheries Department.

vi. The EMP has been prepared based on predicted impact, actual requirement and incorporating suggestions of local people, stakeholders with the details as under:

Table: Cost estimates for EMP in the project

Sl. No.	**Environmental Management Plan**	**Cost (Rs. in crores)**
1	CA and Biodiversity conservation	16.06
2	Fisheries Management	3.34
3	Environmental Management in labour camp	4.96
4	Public health delivery system	4.96
5	Restoration and Landscaping of construction sites	2.91
6	Environmental management in road construction	9.18
7	Muck management	1.76
8	Greenbelt development	0.72
9	Air Pollution Control	0.66
10	Water pollution control	0.20
11	Energy Conservation measures	0.50
12	Public Awareness Programme	0.50
13	Resettlement and Rehabilitation Plan	1609.28
14	Local Area Development Plan	7.52
15	Livelihood Plan	36.44
16	Monitoring and Evaluation Aspects	0.30
17	Catchment Area Treatment	30.50
18	Disaster Management Plan	4.40
19	Environmental Monitoring during construction phase	0.61
20	Purchase of noise meter	0.15
21	Purchase of meteorological instruments	0.10
	Total	**1735.05**

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for grant of Environmental Clearance*** for the project with the following conditions:

i. Solid waste generated especially plastic waste should not be disposed of as landfill material. It should be treated with scientific approach and recycled.

ii. Benefits of tank-bed irrigation should be assessed properly and accounted for at the project formulation stage.
iii. The post project yield of the crops should be assessed realistically.
iv. Under the fisheries management plan, stocking of fish seed should be ensured from the river originally. Fish breeding ground should be identified and impact analysis must be studied.
v. Six monthly compliance reports shall be submitted to Regional Office, MoEF & CC, Bhopal without fail until completion of the modernization works.
vi. As committed during appraisal by the PP, the project-displaced people should be rehabilitated with human angle. Rehabilitation plan should include –

1. Land for Land, to the extent feasible, should be provided.
2. One-time financial assistance needs to be increased substantially.
3. The people who are poor, their land should be considered very compassionately.
4. R&R plan should have all possible provisions to provide livelihood option/cash compensation.

Agenda Item No. 2.6 Lower Vansadhara Irrigation Project in District Rayagada, Odisha by Department of Water Resources, Government of Odisha - for ToR

The Project Proponent (PP) and the Consultant, M/s WAPCOS Limited, Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information.

The project proponent presented the details on the project. It was noted that the Culturable command area (CCA) of the project is 9,204 ha and is a Category "B" project as per the application submitted by the Government of Odisha. The project boundary is 3 km away from Chhattisgarh State and it is an interstate project. General Condition is applicable in the present case. Hence, the project has been considered at Central level as Category "A" project.

The PP while presenting the case mentioned that the Lower Vansadhara Irrigation Project consists of 2 irrigation projects envisages viz., i) Lower Vansadhara Irrigation Project Stage-I, constructing a barrage on Vansadhara River of length 366 m at Paninagar of Rayagada District & ii) A dam on Sana Nadi, tributary of Vansadhara river near village Khaira in Rayagada District of Odisha. The gross command area (GCA) two linked projects combined together is 32,091 ha and Culturable command area is 22,150 ha. The total land requirement for the project is about 3,236 ha, out of which 651 ha of forestland and 2,585 ha is government land and private land. Total cost of the project is Rs. 611.40 Crores.

The EAC was informed that as per application submitted through on-line was indicating 9,204 ha as Culturable Command Area (CCA). The total land requirements are presented wrongly and annual irrigation is presented as 14,819 ha. The committee observed that the figures are not presented properly and thus, anomaly in the statistical data. The application should reflect all the details of the combined project and the same should be submitted again for consideration by the EAC. Therefore, the committee asked the project proponent to submit the on-line application as per the extant rule and come for next meeting. **Hence, the Committee deferred the project.**

Agenda Item No. 2.7 Middle Kolab Multipurpose Project (300 MW and CCA of 25,543 ha) in District Koraput, Odisha by M/s Koraput Investigation Division, Government of Odisha - for ToR

The Project Proponent (PP) and the Consultant, M/s WAPCOS Ltd., Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information:

The project is proposed on river Kolab about 5 km downstream of confluence of Joura Nala with Kolab River near Dumajori Village in Koraput District of Odisha. The project envisages construction of 21 m high diversion barrage across river Kolab and a 94 m high earthen dam on Kerajodi Nallah to generate 300 MW HEP (3x100 MW) and provide irrigation facility to 25,543 ha of area. The gross command area (GCA) is 35,053 ha and Culturable command area is 24,543 ha. The catchment area of the project is 1,473 km^2. The total land requirement for the project is about 2,075 ha, out of which 1,025 ha is forestland, 600 ha is private land and 450 ha is Government land. Total submergence area is about 462 ha, which is a forestland. A surface powerhouse proposed near Kodukudurah village with IC of 300 MW. No National Park/Wildlife Sanctuary/Biosphere Reserve/ Historical Monuments are present within 10 km radius of the project. The estimated project cost is about Rs. 1512.67 Crores.

It was informed that a balancing reservoir with gross capacity of 13,500 ha at Kerajodi for storage purposes, which is about 24 km downstream of the Kasabal Moulijori Nallah is available to regularize flows to the powerhouse with tailrace tunnel (TRT) leading to the main river. Two canals one 77.1 km long (to the left bank of Kolab river) and another 27.4 km long (to the right bank of the Kolab river) are to be constructed.

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for scoping clearance*** for the project with the following additional TORs in addition to the standard TORs (as applicable) for undertaking detailed EIA study and preparation of EMP:

i. Water availability and hydrological series should be studied carefully.
ii. Water availability during summer and irrigation details should be presented in EIA study. The groundwater availability during summer should be estimated and presented in EIA report.
iii. The cropping intensity of perennial crops is only 3%. The cropping pattern has Kharif intensity as 94.2% and Rabi 65.8%. The management of the canal system during summer season (3% intensity) should be discussed properly. The possibility of doing the irrigation project purely as eight monthly one may be assessed. The perennial crops during summer season may be allowed to sustain on groundwater alone.
iv. Detailed fish species diversity, abundance and composition study on the river should be carried out. Furthermore, fish migration, breeding ground and its impact due to proposed barrage must be studied and included.
v. The disaster management plan (dam break situation) should identify the areas at higher altitudes to take care of evacuation of people affected by floods.
vi. Site Specific study should be conducted for environmental flow/downstream ecology requirement, since hydropower generation for 300 MW Installed Capacity is proposed with a high dam.

Agenda Item No. 2.8 Upper Indravati Pumped Storage HEP (600 MW) Project in Kalahandi District, Odisha by M/s Odisha Hydro Power Corporation Ltd, Government of Odisha - For ToR

The Project Proponent (PP) and the Consultant, M/s WAPCOS Ltd., Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information:

The PP had made a detailed presentation on the project. It was noted that the Upper Indravati Pumped Storage Project is located in Kalahandi District of Odisha State. The project envisages re-utilisation of water of the Upper Indravati Reservoir that is being released from existing Hydroelectric Power Station. This water shall be stored in downstream reservoir by constructing a lower dam. The project with a proposed installation of 600 MW (4x150 MW) installed capacity would generate an additional annual energy of 918.97 MU in a 90% dependable year.

The project envisages construction of 18 m high earthen dam for the formation of lower reservoir at the foothill of the Mukhiguda town for storing water. This pond will act as a downstream reservoir and will be operated as a balancing reservoir so as to enable Upper Indravait Pumped Storage Plant to operate as peak station. Live storage capacity of this reservoir has been proposed to be 5 MCM. An underground powerhouse is proposed in the adjoining area of existing HEP with 4 units of 150 MW capacity each. A 1600 m long tailrace tunnel is proposed to be constructed which will connect to Lower Reservoir to carry the powerhouse release back to reservoir

The total land required for the project is about 85 ha which includes forest/ private land. There are no National Park/Wildlife Sanctuary/Biosphere Reserve within 10 km radius of the project. Total cost of the project is Rs. 1,600 Crores.

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended for scoping clearance*** for the project with the following additional TORs in addition to the standard TORs (as applicable) for undertaking detailed EIA study and preparation of EMP:

i. Economic viability of the project may be worked-out and copies of CEA & CWC clearance to be submitted before issue of TOR.
ii. The data in regard to the surplus off peak power and the commercial market to substantiate the demand for the costly peak power was not covered in the report presented. The same is to be submitted.
iii. Detailed fish species diversity, abundance and composition study on the rivers should be carried out. Furthermore, fish migration, breeding ground and its impact due to proposed dam must be studied and included in the report.

Agenda Item No. 2.9 Doimukh HEP (80 MW) Project in Papumpare District, Arunachal Pradesh by M/s SJVN Ltd - revision in the capacity from 80 MW to 52 MW for ToR

The Project Proponent (PP) and the Consultant, M/s R.S. Environlink Technologies Pvt. Ltd., Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information:

The project had been earlier envisaged for construction of 17m high barrage across Dikrong river near Chiputa village in Papumpare district of Arunachal

Pradesh with an installed capacity of 80 MW and total project cost of Rs. 739.58 Crores to be completed in 4 years.

The scoping /ToR clearance for this project was granted on 09.04.16 for 80 MW installed capacity. It was noted that at the time of TOR approval, project PFR was prepared based on SOI toposheets and after site investigations and actual field survey undertaken during preparation of DPR, the project components were optimized. Furthermore, as per requirement of TOR approval, the minimum environment flow was modified from 10% throughout the year to 20% during lean months, 30% during monsoon and 25% in remaining months. As a result, design discharge got reduced from 209 cumecs to 156.35 cumecs. Additionally, the barrage height was also got reduced from 17 m to 14.20 m for maintaining a minimum distance of 1 km between tip of reservoir and Tail Water Level of existing upstream project. Consequently, project installed capacity got revised from 80 MW to 52 MW. It was further informed that there is no change in location of Barrage, Power House site, Surge Shaft, etc.

The original and modified proposal details are presented below:

Parameters	**Original Proposal**	**Revised Proposal**
Installed capacity	2x40 MW	2x26 MW
Full Reservoir Level	EL 168 m	EL 163 m
Min. Drawdown Level	EL 163 m	EL 161 m
Gross storage at FRL	5.60 MCM	5.30 MCM
Top of Dam	EL 170 m	EL 164.70 m
Height of Barrage above river bed	17 m	14.20 m
HRT Shape and size	7.75m Φ Circular shaped of 4800 m length	7m Φ Horseshoe shaped of 5685.8 m length
Design discharge	209 cumecs	156.35 cumecs
Surge Shaft type	1 No. Restricted orifice type open to sky (4.3m Φ)	1 No. Restricted orifice type open-to-sky (6.0m Φ)
Surge Shaft shape & size	Circular 44.1m Φ and 48.4m depth	Circular 41.5m Φ and 38m depth
Surge Shaft top level	EL 185	EL 175
Pressure shaft shape and size	2 Nos. 4.3 m **Φ** Circular shaped of 329m and 341m length	2 Nos. 5 m **Φ** Circular shaped each of 92.36m length.
Power House Size (m)	Surface 78(L)x23.5(W)x45.21(H)	Surface 61(L)x35(W)x39(H)
Transformer Yard	Surface 46.5(L) x 19.26(W)	Surface 40.43(L) x 8(W)
Outfall weir crest level	EL 112.50 m	EL 113.30 m
Tail Race channel length	433 m	583.86 m
Min. Tail Water Level	EL 112.86 m	EL 113.67 m
Net Design Head	42.4 m	36.8 m
90% dependable year	1982-83	1980-81
Energy generation in 90% dependable year	294.54 MU (Annually)	217.79 MU (Annually)
Land requirement	104.33 ha	223 ha
Submergence area	55.83 ha	119 ha
Project Cost	Rs.739.58 Crores (At May-2012 price level)	Rs.1508.35 Crores (At Oct-2016 price level)

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC ***recommended*** **for change in size of installed capacity** of HEP from 80 MW to 52 MW.

EAC also observed that the project was originally designed for an installed capacity of 80 MW by keeping an environment flow of 10% throughout the year which has now been revised as per the norms of MoEF&CC. The height of the barrage has also got reduced from 17 m to 14.20 m to maintain 1 km river stretch between tip of reservoir and TWL of upstream project. However, there are no changes in location of project components and as such EAC recommended for modification/changes in the scoping/ TOR clearance issued to the project.

Agenda Item No. 2.10 Expansion of Upper Bhadra Lift Irrigation Scheme in Chikkamagalur District, Karnataka by M/s Karnataka Neeravari Nigam Ltd, Government of Karnataka - For Environment Clearance

The Project Proponent (PP) along with the Consultant, M/s Environmental Health & Safety Consultants Pvt. Ltd., Bengaluru, made a presentation of the project and *inter-alia* provided the following information:

The Upper Bhadra Lift Irrigation Project Stage-I was accorded environmental clearance on 5.1.2010. The project neither involved submergence nor construction of new dams/weirs. The project involves lifting of water from Tunga river to Bhadra reservoirs in 2 stages. The dam has already been constructed for Bhadra reservoir and now, it is proposed to construct the canal from Bhadra reservoir to delivery chamber including 3 lifts and 6.90 km long tunnel and canal network. This canal would convey water to the drought-prone areas of Chikkamagalur and Chitradurga districts utilizing 21.5 TMC of water (Lifting of 10 TMC of water from Tunga river and 21.5 TMC from Bhadra reservoir) to provide irrigation facility to 1,07,265 ha of dry-land through flow irrigation system. The project also involves filling up of 156 MI tanks to cater the needs of drinking water supply in Chitradurga, Tumkur and Kolar Districts.

It was informed that considering the availability of water for the project and needs of the farmers of Davanagere and Tumkur Districts, it was decided to provide irrigation facility to these Districts within the availability of water. Therefore, it was proposed that the project (Stage-2) utilizes the same infrastructure (of Stage-I) to irrigate additional 1,18,250 ha of drought prone area and fill up additional 367 MI tanks in command area, thus improving water table and providing a major source of drinking water. Further, to achieve water conservation, the entire command (existing 1,07,265 ha + proposed 1,18,250 ha) area is proposed for drip irrigation system by utilizing 29.9 TMC of water. After tunneling, it is planned to irrigate an extent of 2,25,515 ha of irrigation in the Districts of Chikkamagalur, Chitradurga, Tumkur and Davanagere benefitting 787 villages. Taking into account all these things, the Karnataka Neeravari Nigam Ltd, Government of Karnataka submitted an expansion proposal to the Ministry. The proposal was considered by EAC in its meeting held on 23-24thApril, 2015 and while appraising the project, the committee noted that the project neither got wildlife clearance nor FC. Further, the scope of the project has been changed due to increase in command area, therefore a fresh scoping/TOR clearance recommended. The public hearings should also to be conducted in Davanagere and Tumkur Districts. The committee allowed that the data collected for compliance to the EC conditions could be utilized for preparation of EIA/EMP report. However, at least three season data need to be collected.

Accordingly, a fresh scoping/ToR clearance for the expansion of Upper Bhadra project was issued on 26.5.2015.

It was also informed that the Public Hearing was conducted at Huliyar Village, Chikkanayakanahalli Taluk, Tumkur District on 19.10.2016 and at Jagalur Village, Davanagere District on 8.11.2016 of Karnataka state. The major concerns expressed during the Public Consultation were to extend the irrigation facilities to other areas and to complete the project in a time bound manner. All the issues discussed during the public consultation were considered in the EIA/EMP report. Thereafter, final EIA/EMP reports were submitted for environmental clearance.

The EAC was informed that the Upper Bhadra lift irrigation Scheme envisages lifting of 17.40 TMC of water in Stage-I from Tunga river to existing Bhadra reservoir & lifting of 29.90 TMC of water in Stage-II from Bhadra reservoir to tunnel near Ajjampura in Tungabhadra sub-basin of Krishna basin. After tunnel, through Chitradurga Branch Canal and Tumkur Branch Canal, it is planned to irrigate 2,25,515 ha area by drip irrigation in the districts of Chikkamagalur, Chitradurga, Tumkur and Davanagere. Out of 29.90 TMC of water, 19.04 TMC of water is earmarked for irrigation and remaining 10.86 TMC is allocated for filling of 367 MI tanks. The entire water distribution will be automated and controlled by SCADA system. About 787 villages are likely to be benefitted under this scheme. The proposed project requires 2,114 ha area and there is no forestland required for implementation of this project. The land required is only for construction of main canal and delivery chambers. The land will be acquired as per the Right to Fair Compensation and Transparency in Land Acquisition Act, 2014.

The environmental aspects covering expansion command area have been considered. The baseline data has been collected covering Physico-chemical, biological and socio-economic aspects. The 3 season data has been collected for air, noise, water, soil and ecological aspects in the expansion area. Impacts during construction and operation phases have been assessed and mitigation measures are suggested to minimize the anticipated impacts.

The CAT Plan in 15,000 ha has been proposed with biological and engineering measures. A total grant of 2936.50 lakhs has been allocated for this purpose. The R&R plan, CAD plan, bio-diversity and wildlife conservation plan, greenbelt development, etc. along with funds allocated in individual scheme have been presented. The detailed of cost estimates for Environmental management Plan (EMP) is given below:

Table: Cost estimates for EMP in the project

Sl. No.	Environmental Management Plan	Cost (Rs. in lakh)
1	Catchment Area Treatment (CAT) and Soil Conservation Measures	2,936.50
2	Canal Bank Plantation & Agro-forestry Development	1,466.51
3	Socio-economic Environment	38,383.00
4	Fisheries Development	30.00
5	Pollution Control	199.00
6	Solid and Hazardous Waste Management	15.00
7	Environmental Monitoring	219.68
8	Awareness and Training for farmers on soil and drip irrigation issues	50.00
	Total	**43,299.69**

The project proponent informed that Stage-I FC clearance has been accorded on 4.3.2016 (No. 4-KRA1035/2014-BAN/8084 dated 4.3.2016). The State Government recommended wildlife clearance and submitted to Regional Office, MoEF& CC, Bengaluru for final clearance.

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC observed the following:

i. Lifting of water is sizable. The economic viability of the lift irrigation project should be reassessed based on the guidelines issued by Central Board of Irrigation & Power (**CBIP**), Delhi. The project's viability should be based on the actual cost of the energy at the consumers point (LIS). The cost of lifting per unit of water (cum) may also be worked out.
ii. The high-density crops like groundnut has been proposed with drip irrigation method. Its suitability may be re ascertained.
iii. Land acquired for the project should be suitably compensated with the prevailing guidelines and all commitments made during the Public Hearing should be fulfilled.
iv. Certified compliance report of the EC conditions of the existing scheme should be obtained from RO, MoEF&CC, Bengaluru should be submitted.
v. The EAC is of the opinion that a sub-committee should visit the project site before finally considering the grant of environmental clearance for the project.
vi. The EAC suggested the following members shall visit the site and submit a report on the viability of the scheme, etc.:

1. Dr. Dinkar Madhavrao More - Member
2. Dr. R. Vasudeva - Member
3. Dr. Jai Prakash Shukla - Member

Therefore, the committee **deferred** the proposal and it shall be reconsidered during the next EAC meeting.

Agenda Item No. 2.11 Etalin (3,097 MW) in Dibang Valley District of Arunachal Pradesh by M/s Etalin Hydro Electric Power Company Limited - reconsideration for Environment Clearance

The Project Proponent (PP) and the Consultant, M/s R.S. Environlink Technologies Pvt. Ltd, Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information.

This project (3,097 MW) is located in Dibang Valley District of Arunachal Pradesh. The project envisages construction of 2 dams namely: (i) 101.5 m high dam in case of Dir river near Yuron village about 22 km from Etalin and (ii) 80 m high dam in case of Tangon river about 800 m downstream of Anon Pani confluence with Tangon river (from the deepest foundation) to generate an 3,097 MW HEP. The total land requirement for the project is 1149.85 ha. The submergence area is 119.44 ha. An underground powerhouse is proposed with 10 units of 307 MW each. In order to utilize the releases of flow for sustenance of aquatic life, a dam-toe powerhouse with 19.62 MW capacity on Dri diversion and dam-toe powerhouse with 7.40 MW capacity on Tangon diversion have been proposed.

The project was earlier considered 4 times by EAC in its meetings held on 26-27th February, 2015; 23-24th April, 2015; 3-4th June, 2015 and 24-25th August, 2015. The project proponent mentioned that all technical issues, clarification &

compliance to issues raised in the representation were clarified to EAC in its meeting held in August, 2016.

The EAC was informed that as per OM dated 28.5.2013, has been mentioned that river basin study is mandatory requirement for taking-up any project in the river basin. The EAC was also informed that the Carrying Capacity Studies &Cumulative Impact Assessment (CCS & CIA) of Dibang River Basin Study (RBS) in Arunachal Pradesh has been completed and the Ministry has accepted the report. The outcome and recommendations have been circulated to all authorities concerned. Therefore, this project should also abide by the recommendation of Dibang River Basin Study.

The proposal was last considered by the EAC in its meeting held on 24-25thAugust, 2015. The EAC deliberated upon the pending Cumulative Impact Assessment (CIA) study for Dibang Basin & mentioned that the project cannot be delinked with Dibang Basin study with the grant of Environment Clearance of Etalin HEP project and will have to wait the outcome and recommendations of study. Regarding environmental flow requirement and downstream release of water, as recommended in Dibang RBS for Etalin HEP (3,097 MW) project in Arunachal Pradesh is as follows:

Table – E-flow release for Dri Limb & Tangon Limb

Etalin HEP (3,097 MW)	**Lean Season**	**Monsoon Season**	**Non-monsoon/ Non-lean Seasons**
Dri Limb	30.64 cumec (20%)	50 cumec (12.20%)	30.64 cumec (13.30%)
Tangon Limb	19.52 cumec (20%)	26.17 cumec (10%)	19.52 cumec (13.30%)

The EAC deliberated on the different aspects of the project and felt that it will be again deliberated in detail on the issues viz., on Hydro-geological aspects of the project, e-flow determination and downstream free stretches, etc. vis-à-vis recommendation of Dibang River Basin Study Report. Thus, the further appraisal of the project is **deferred for the next EAC meeting**.

Agenda Item No. 2.12 Sawalkote HEP (1,856 MW) on Chenab River in Ramban, Resai & Udhampur districts, Jammu & Kashmir- reconsideration of Environment Clearance

The Project Proponent (PP) along with the Consultant, M/s R.S. Environlink Technologies Pvt. Ltd, Gurgaon, made a detailed presentation of the project and *inter-alia* provided the following information:

Sawalkote Hydroelectric Project is located in Ramban, Reasi & Udhampur Districts of Jammu & Kashmir. It envisages utilization of flow of Chenab River for generation of electrical power in a run-off-the-river scheme. M/s Jammu & Kashmir State Power Development Corporation Limited (JKSPDC) is executing the project.

The Project is on Chenab River and is envisaged as a run-of-the-river scheme. The diversion site is located near Tangar village, around 40 km from Ramban town. A 192.5m high concrete gravity dam and underground powerhouse site will be located at Latitude $33^0$11'N and Longitude $75^0$06'E. The Chenab river has a catchment area of about 19,475 km^2 at the proposed barrage site.

The Sawalkote HE Project envisages construction of:

- A 192.5 m high concrete gravity dam is proposed to divert water of Chenab River. The top level of the dam will be at El 697.5 m. The riverbed level at the dam site is around El 534 m.
- The reservoir to be created by the dam will operate between FRL 695 m & MDDL 692.8 m with rated head of 154.4 m, and storage of 23.84 MCM for diurnal peaking capabilities. The total area of submergence is 1158.75 ha.
- Three headrace tunnel of 200 m length with design discharge of 519.16 m^3/s and 479.19 m^3/s for Stage-I and 319.46 m^3/s for Stage-II
- Eight (8) steel lined pressure shafts (6 for Stage 1 and 2 for Stage 2), each of 6m diameters except PS6 with 6.7 m diameter and 2.75 m diameter size penstock for 56 MW unit.
- An underground Powerhouse is proposed with Vertical Francis turbines at axis level of El. 525 m.
- The installed capacity of the powerhouse will be 1856 MW (6x225 MW & 1 X 56MW for Stage-I and for Stage–II 2x225 MW 3097 MW. The design energy is 8004 MU.
- Tail race tunnel-3 for stage 1 and one for stage 2 (TRT 1-1733 m, TRT 2-1710 m, TRT 3-150 m and TRT Stage 2-1904 m) and 10.5 m diameter

Total land requirement for various project activities is about 1401.35 ha. Total land required for the project is spread over 3 districts (Ramban, Udhampur and Reasi). Out of 1401.35 ha of total land requirement, 175.65 ha of private land proposed to be acquired for the project falls in Ramban district only.

Environment flow of 39.97 cumec (20% of average lean season discharge based on 90% DY data) has to be increased during monsoon and revised net flow to be 30% during monsoon months. The project would yield design energy of 6556 MU for Stage I and 466 MU for Stage II in 90% dependable year flows.Total project cost shall be Rs 18,111.04 crore.

The EAC deliberated on the different aspects of the project and felt that it will be again deliberated in detail on the issues viz., on Hydro-geological aspects of the project, e-flow determination and downstream free stretches, etc. Thus, the further appraisal of the project is **deferred for the next EAC meeting**.

Agenda Item No. 2.13 Kameng river Basin Study in Arunachal Pradesh – Appraisal for Final Report

The Consultant, M/s WAPCOS, Gurgaon made a presentation of the Kameng River Basin Study, and *inter-alia* provided the following information:

The study of Kameng sub-basin in Arunachal Pradesh was initiated at the instance of Ministry of Environment, Forest and Climate Change, Government of India. The EAC had recommended the TOR for conducting Cumulative Impact Assessment & Carrying Capacity Study for Kameng Basin (excluding Bichom Basin) in Arunachal Pradesh, for development of Hydroelectric Projects in Kameng basin in its EAC meeting for River Valley and Hydroelectric Projects held during 23-24th September, 2013. Subsequently, Basin Study for Kameng sub basin was awarded to WAPCOS Limited. The scope of this study covered hydroelectric projects for entire Kameng Basin (excluding Bichom Basin). The scope of the basin study was further revised in its EAC meeting held during 24-25th, August, 2015.

A total of 44 hydroelectric projects have been considered for study, out of which 16 projects are Category "A" and 14 projects are Category "B". The details current status are given in Table-1 and Table-2 below:

Table-1: Current Status of Projects in the Study Area (Category "A")

Sl. No.	Name of Project	River	Allotted capacity (MW)	Revised/ Proposed capacity (MW)	Status
1	Kameng-II	Kameng	600	600	-
2	Khuitam	Digen	29	66	• ToR of 29 MW was accorded in November 2008 • ToR of 66 MW was accorded in January 2010 • EC granted in December 2010.
3	Talong Londa	Kameng	160	225	• ToR for 160 MW was accorded on 23March, 2007 • ToR for 225 MW was given in Jul., 2010 • Extension of validity of ToR was accorded on 12 October, 2012 • Extension of validity of ToR was accorded on 23 September, 2013 • EC granted on 11 December, 2014
4	Kameng Dam	Kameng	600	480	• ToR for 480 MW was considered in 57th EAC meeting in 27-28th April, 2012 • Committee did not accept the proposal • Possibility for site changes to be explored.
5	Papu	Papu	90	90	• Applied for TOR on 01 February 2013, but EAC did not consider • ToR was accorded on 22 March, 2013, in 65thEAC Meeting • Extension of ToR was accorded on 26 October, 2015 in 88th EAC Meeting.
6	Pachuk-I	Pachuk	60	84	• Applied for ToR on 15 July, 2011 but EAC

Sl. No.	Name of Project	River	Allotted capacity (MW)	Revised/ Proposed capacity (MW)	Status
					gave comment for reconsideration • ToR was accorded on 26 December, 2011
7	Pachuk-II	Pachuk	60	60	• Applied for ToR on 15 July, 2011 but EAC gave comment for reconsideration • ToR was accorded on 26 December, 2011
8	Pachuk-II Lower	Pakke Bung	45	51	-
9	Badao	Kameng	70	70	• TOR accorded on 7 October, 2010
10	Kameng-I		600 & 420	1120	-
11	Bichom ST-I			190	Project falls in Gongri/Dogri river, the tributary of Bichom river at downstream of Khuitam HEP (66 MW) & upstream of Dinchang HEP (252 MW). The TWL of Khuitam 1173m and FRL of Dinchang HEP is 1138 m. Thus, there is a level difference of 35m only in between these projects. Therefore, the project location as proposed may not be viable.
12	Bichom-II			205	It is located in Bichom river, at downstream of Nafra HEP (120 MW) & upstream of Bichom Dam of Kameng HEP (600 MW). The TWL of Nafra HEP is 796.20m and FRL of Bichom Dam is 770 m. So, a level difference of 26.2 m is found. Thus, the location as proposed may not be viable.
13	Chanda			110	-
14	Kimi			535	Conceptual Stage
15	Pakke			110	Conceptual Stage
16	Seba			80	Conceptual Stage

Table-2: Status of EC of Category "B" projects in Kameng Basin

Sl. No.	Name of Project	River	Allotted capacity (MW)	Revised/ Proposed capacity (MW)	Status
1	Saskangrong	Saskangrong	7	45	• TOR accorded by SEAC and ToR extended in SEAC meeting Feb., 2014.
2	Digin	Sangti	46	46	• TOR accorded by SEAC and ToR extended in SEAC meeting Feb, 2014
3	Meyong	Tim Kong Rong	38	38	• TOR accorded by SEAC in SEAC meeting September, 2014
4	Phanchung	Pachi	60	45	• Granted for EC by SEAC on the basis of MoM on 19-21 March, 2016
5	Tarang Warang	Pacha	30	36	-
6	Marijingla	Kameng	60	46	• Applied for ToR on 15 July, 2011 but EAC did not considered.
7	Pakke Bung-I	Pakke Bung	15	40	• TOR accorded on 18-20 September, 2014 by SEAC on MoM
8	Marjingla Lower	Kameng	48	48	• TOR accorded on 18-20 September, 2014 by SEAC on MoM
9	Para	Para	55	45	• TOR accorded on 7 October, 2010
10	Rebby	Para	31	31	-
11	Lachung	Pachi	41	41	-
12	Papu Valley	Papu	35	48	• EC accorded from SEIAA on 23.07.2013
13	Pasar			32	Conceptual Stage
14	Satuk			47	Conceptual Stage

Table-3: Number of HEPs proposed on Kameng river and its tributaries

Sl. No	Name of the river	Name of the Hydroelectric projects	Total projects
1.	Kameng	Kameng-II, Talong Londa, Kameng Dam, Marjingla, Marjingla Lower, Badao, Kameng-I, Chanda	8
2.	Timkong Rong	Saskangrong, Meyong	2
3.	Phudung	Phudung, Dikshi	2
4.	Sangti	Digin	1
5.	Gang	Khuitam	1
6.	Tenga	Tenga	1
7.	Nargum	Denzi, Lower Ngorgun, Upper Ngorgun, Ankaling	4
8.	Pachi	Pachung, Lachung	2
9.	Papu	Papu, Papu valley, Pasar	3
10.	Kaya	Pichang	1
11.	Pacha	Sepla , Tarang Warang, Pacha	3
12.	Pachuk	Pachuk-I, pachuk-II, Satuk, , Pachuk Lower	4
13.	Pakke Bung	Pakke Bung-I, Pakke Bung-II, Pakke Bung-III, Pakke Bung-IV,	4
14.	Para	Para, Rebby	2
15	Bishum	Debra, Dipre, Ditchi, Dibri	1
16	Gongri	Bichom ST-I	1
17	Bichom	Kimi & Bichom-II	2
18	Pakke	Seba, Pakke	2
	Total		**44**

Three sanctuaries i.e. Eagle Nest, Sesa Orchid and Pakhui are situated in the Kameng river basin area.The findings of HEC-RAS model studies for various scenarios were also covered during the presentation. The scenarios covered are given in Table-4.

Table-4: various scenarios covered as a part of HEC-RAS modeling

Sl. No.	Season	Flow Release (average of months)	Months
1	Monsoon Season	100%	June-September
2	Monsoon Season	30% to 15% at 1% interval	June-September
3	Non-Monsoon non lean season-1	100%	October-November
4	Non-Monsoon non lean season-1	30% to 15% at 1% interval	October-November
5	Lean Season	100%	December-March
6	Lean Season	30% to 15% at 1% interval	December-March
7	Non-Monsoon non lean season-2	100%	April-May
8	Non-Monsoon non lean season-2	30% to 15% at 1% interval	April-May

The recommendation along with recommended Environmental Flows for HEPs in various sub-basins of Kameng river basin were also discussed in the meeting.

Apart from major recommendations of the report, the State Government of Arunachal has dropped 2 nos. of projects namely Bichom Storage-I HEP (190 MW) and Bichom-II HEP (205 MW).

The Bichom Storage-I HEP (190 MW) has been identified by the CEA located at longitude 92^{0}30'30"N & latitude 27^{0}20'22"E. As such the project falls in Gongri/Dogri river, the tributary of Bichom river at downstream of Khuitam HEP (66 MW) and upstream of Dinchang HEP (252 MW). The TWL of Khuitam 1173 m and FRL of Dinchang HEP is 1138m. Thus, there is a level difference of 35m only in between these projects. Therefore, the project location as proposed is not viable.

The Bichom-II HEP (205 MW), a CEA recommended project is located at longitude 92^{0}37'00"N and latitude 27^{0}18'00"E. As such the project falls in Bichom river and located at downstream of Nafra HEP (120 MW) & upstream of Bichom Dam of Kameng HEP (600 MW). The TWL of Nafra HEP is 796.20 m and FRL of Bichom Dam is 770 m. Thus, there is a level difference of 26.2 m only in between these projects. Therefore, the location as proposed may not be viable. The total capacity of projects to be dropped as per the recommendations of the Basin study is (1942+205+190) 2337 MW.

After detailed deliberations and considering all aspects of the presentation of Consultant in regards to the Kameng River Basin Study, EAC observed that projects specific recommendations along with likely mitigation measures, if any, shall be included in the final report. Also, minimum depth requirement for different umbrella fish species to be reviewed and references of available literature and documents shall be included in the report. Accordingly, consultant was advised to submit the modified report for further appraisal by EAC. Thus, the Kameng River Basin Study was **deferred.**

Agenda Item No. 3.0 Any other item with the permission of the Chair

Decision on Public complaints received in the Ministry, the Chairman and Members for EAC RV&HEP.

During EAC meeting, it was brought to the notice of the Chairman by some of the EAC members that just a few days before the meeting, Chairman and members are receiving e-mails from some Civil Action Groups and individuals which try to highlight some lacuna in a particular project that is likely to come before the EAC. Frequently, these mails make sweeping statements, e.g. "there is not enough water in the river", without any supporting calculations or basis. It was opined that it is not appropriate for the EAC to entertain such representations, for the following reasons:

a) The EC process has four distinct steps. Screening; Scoping; Public Consultations; and Appraisal. The Step-3, "Public Consultations" has two parts. A public hearing at the project site is held for ascertaining concerns of the project affected persons and obtaining responses in writing from public at large. Procedure has been prescribed for conducting public consultations, and it has to be followed strictly.
b) The stage of Appraisal starts only after the stage of "Public Consultations" has been completed. Therefore, once a project comes before the EAC, it has crossed the stage of "Public Consultations", and the EAC should not go back in time, and should not reopen it, by entertaining

unsubstantiated representations received from the people. The environmental rules allow, for inputs from the public, for which an opportunity is provided by way of "Public Consultations". Any stakeholder, who wishes to make a representation, has to do so at the time of "Public Consultations" stage. It should not be allowed so that the matter be dragged indefinitely.

c) EAC feels that, if it continues to entertain representations from people, it not only amounts to EAC extending the "Public Consultations" indefinitely, but it also amounts to EAC conducting the consultations by e-mail and post. This is clearly beyond the scope and TORs of the EAC.
d) It was also felt that many of the objections raised are repetitive and these may have been addressed in the past.
e) Many such kind of representations have an anti-development attitude so that the projects are kept on hold or delayed. This has financial implications to the developers in particular and to the nation in general.

After detailed deliberation and discussion held in the EAC meeting, it was decided that:

1. *The stage, at which people can give their inputs on a project proposal, is the Public Consultations as per stipulated procedure. If the EAC is not satisfied that this stage has been completed properly, they have the authority to ask the project promoter to do the needful. If the EAC is satisfied that the "Public Consultations" have been completed as per prescribed procedure, there can be no further "Public Consultations". More so, the Ministry of Environment, Forest and Climate Change and the other relevant ministries scrutinize every aspect of the project and only when all the essential and additional details/information are provided by the project, the proposal is placed for final appraisal for issue of EC.*
2. *Thus, in general the EAC should not take any cognizance of such representations received from the any Civil Action Group during final appraisal.*
3. *An exception can be made to this, when a representation contains some new point, which has not been raised earlier, and which is so important that it may have grave consequences. In such case the Ministry may place the representation before the EAC meeting, and if agreed by the EAC only then, the comments from project proponent may be sought.*
4. *In case of any clarification sought regarding action taken on the representation through RTI, etc., then the reply may be that* ***"action has been taken in accordance with the decisions taken in the 1st meeting of the EAC for River Valley and HEP on 30.12.2016"*** *and should suffice accordingly.*

As, there being no agenda item left, the meeting ended with a vote of thanks to the Chair. The Member Secretary expressed gratitude to the earlier EAC on behalf of the Ministry as the tenure of previous EAC was completed on 03.09.2016.

Approval of Minutes of the 1st Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects by the Chairman

rediffmail Mailbox of suna1466

Subject: Re: Draft MOM of 1st EAC for RV&HEP.

From: Sharad Jain <s_k_jain@yahoo.com> on Thu, 12 Jan 2017 12:47:56

To: Dr S Kerketta <s.kerketta66@gov.in>

Cc: Gyanesh Bharti <gyanesh.bharti@ias.nic.in>, S Kerketta <suna1466@rediffmail.com>

2 attachment(s) - Draft_1st_EAC_Meeting_for_RV_HEP_30.12.2016-clean.pdf (658.96KB) , Draft_1st_EAC_Meeting_for_RV_HEP_30.12.2016-track.docx (119.26KB)

Dear Dr Kerketta,
I have edited the minutes and the approved minutes are attached - track change Word file as well as PDF. Please take care of formatting before issue.
We may devise a numbering system to refer to the items. For example, all the items under the meeting serial X may be numbered sequentially as X.1, X.2, ... Then future reference can be brief.

regards
jain

From: Dr S Kerketta <s.kerketta66@gov.in>
To: Dr Sharad K Jain <s_k_jain@yahoo.com>; Dr Sharad K Jain1 <skj@nih.ernet.in>
Cc: Gyanesh Bharti <gyanesh.bharti@ias.nic.in>; S Kerketta <suna1466@rediffmail.com>
Sent: Wednesday, 11 January 2017 7:11 PM
Subject: Draft MOM of 1st EAC for RV&HEP.

Sir

The draft minutes of 1st EAC meeting for RV&HEP is enclosed after incorporating the comments provided by all the experts. It is requested to kindly approve the minutes and send by return mail for uploading in the Ministry website.
--
regards,

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