

Minutes of the 94th Meeting of the Expert Appraisal Committee (EAC) for River Valley and Hydroelectric Projects held on 2nd – 3rd June 2016 at Indus Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110003.

The 94th Meeting of the EAC for River Valley and Hydroelectric Projects (RV &HEPs) was held on 2nd – 3rd June 2016 at Indus Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110003. The meeting was chaired by Shri Alok Perti, Chairman, RV&HEPs. The list of EAC members and officials/consultants associated with various projects and who attended the meeting is at Appendix.

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

Agenda Item No.1: Welcome by Chairman and confirmation of Minutes of the 93rd Meeting of EAC held on 2nd May, 2016. Thereafter, following agenda items were taken-up:

Agenda Item No 2.1: Mawphu HE Project (85 MW), Stage-II on river Umiew in East Khasi Hills, Meghalaya submitted by Shri N.K. Mao -for consideration of TOR

Mawphu Hydro Electric Project, Stage - II is proposed as a run-of-river scheme on the river Umiew in East Khasi Hills District of Meghalaya. The proposed dam site is located at about 3.17kms downstream of Umduna HEP (90 MW), Power House site is located at about 2km downstream of Thieddieng village on the rightbank of the river. The proposed dam site is located at latitude 25°18'32"N and longitude 91°38'19"E. The project area can be accessed from Guwahati airport, which is at about 120km from Shillong, the capital of Meghalaya. The nearest rail head is located at Guwahati. State Highway is available from Shillong to reach Mawsynram, which is a small town at about 60kms from Shillong. Mawsynram is connected with Thieddieng village through a 6km foot track. Road is also existing from Mawsynram towards Thieddieng for about 4km and the same is under construction. The dam site can be accessed from Thieddieng (at about 2km) through footpath. The power house site is also accessed from Thieddieng village (at about 2km) through footpath.

The project is being implemented by North Eastern Electric Power Corporation Ltd, a Government of India enterprise. The TOR was accorded by MoEF&CC in May 2014 for installed capacity of 75MW. In the meantime, installed capacity of the project has

undergone upward revision to 85MW as per recommendation of CEA. The Project parameters for the original proposal of 75 MW and modified proposal of 85 MW are given below:

Parameters	Original	Modified
Installed capacity	2 x 37.50 MW	2 x 42.5 MW
Catchment Area at Dam site	320 Sq km	308 Sq km
Minimum Drawdown Level (MDDL)	El. 460.00 m	El. 464.00 m
Live Storage	0.8 MCM	0.5 MCM
Submergence Area at FRL	10 ha	13 ha
PMF (Design Flood)	6000 cumecs	9970 cumecs
Spillway Crest Elevation	El. 444.00 m	El. 443.00 m
Spillway bays	5 nos.	6 nos.
Spillway Radial Gates	8 m x 11.5 m	9 m x 12 m
Length of Spillway	62.00 m	79.00 m
HRT Design discharge	37.22 cumec	40.80 cumec
Main Pressure Shaft (PS)	3.50 m dia and 864 m long	3.50 m dia and 869 m long
Top Horizontal of PS	45.00 m	69.00 m
Vertical of PS	171.00 m	127.00 m
Bottom Horizontal of PS	648.00 m	673.00 m
Power House size	54 x 14.50 x 32 m	66x 18x 30.50 m
Rated Net Head	223.00 m	230.50 m
Plant Load Factor	43.61%	45.12 %
Length of TRC	35 m	51 m
Minimum River bed level at TRC outfall	EL. 230.00 m	EL. 230.20 m
Maximum TWL	EL. 236.00 m	EL. 239.50 m
Annual Energy Generation in 90% dependable year	286.52 MU (1996-97)	335.96 MU (1990-91)
Annual Energy Generation in 50% dependable year	290.02 MU (2002-03)	267.42 MU (1982-83)
Design Energy in 90% dependable year (with 95% plant availability)	278.24 MU	331.09 MU

It was clarified to the EAC that the changes in the various parameters mentioned above were due to the actual measurements in the field, which earlier were based on the SOI toposheets, which were approximate and not accurate.

After detailed deliberations, EAC urged the project proponents not to delay the project further. EAC recommended the enhanced installed capacity of 85 MW for Mawphu H.E Project with the same TOR approved by 74th EAC Meeting. The validity of TOR shall also remain the same i.e till September, 2017.

Agenda Item No 2.2: Jeera Irrigation Project in Odisha by M/s Water Resources Department, Government of Odisha– For Environment Clearance.

The project proponent made a detailed presentation on the project. This is a medium irrigation project which will provide irrigation facility to 6000 ha of G.C.A and 4800 ha of CCA with annual irrigation of 5840 ha in drought prone area of Bargarh district of Odisha.

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 2742.10 Ha m. As per calculation of silt load by Khosla's formula, the dead storage level comes to 202 m. The length of Left Main Canal is 13.25 km and that of Right Main Canal is 7.25 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 socioeconomic condition of the people of the area.

The annual benefit due to agriculture after the project would be Rs. 3313.21 lakhs. The man days to be generated due to creation of this project would be 17,64,416 man days. There is no displacement of any families due to this project. Only 505.43 Ha of private land without any population will be submerged and only 5.391 Ha Forestland is getting affected. Government of Odisha submitted to MoEF&CC that Chhattisgarh is within 10 Km of the proposed project area. Therefore, the project was considered by EAC at that time as per EIA Notification, 2006 (Inter State Boundary).

The Project Proponent and Visiontek Consultancy Services Pvt. Ltd had presented the case in 87th Meeting of the Expert Appraisal Committee for River Valley

and Hydroelectric Projects held on 23-24th September, 2015. After detailed examination and discussion, the committee observations, the EAC had recommended for environmental clearance for the project subject to submission of the following information:

- i. Finalization of the Forest Diversion Proposal/ Forest Clearance.
- ii. Submission of Bio-diversity chapter of EIA/EMP report after rectification by a Biological Expert / Botany expert.

The information on the above issues were detailed out by the project proponent to the EAC.

i) Forest proposal

The project has a forestland involvement of 5.391 ha for its canal distribution system and for the submergence of reservoir. As intimated by Project Proponent the Status of Forest Diversion proposals on 31.05.2016 is as follows

1. Forest Clearance application of Jeera Irrigation project (e-filing of Form A: Part 1) was completed with all necessary details such as Geo-referenced forest land map prepared using DGPS, DGPS survey of Compensatory Afforestation Land, Catchment Area Treatment Plan, etc. And e-filing was done on 14.09.2015 (Part I).
2. The proposal was scrutinized by Nodal Officer (FC Act), Odisha and was transmitted to DFO on 19.09.2015.
3. All activities at DFO level such as field inspection, tree enumeration. Forest and CAF land demarcation, NPV computation, CAF scheme formulation, approval of CATP has been completed and the proposal has been sent to RCCF on 19.11.2015(Part II)
4. The proposal was transmitted to Nodal Office with comments of RCCF on 21.11.2015 (Part III) .
5. Essential Details Sought (EDS) by Nodal Office on 08.02.2016 .
6. Compliance to EDS submitted to Nodal Office through DFO & RCCF on 03.05.2016 .

ii) Biodiversity Chapter of EIA report

Biodiversity Expert of Visiontek consultancy services briefly presented the

details sought on Biodiversity portion of EIA EMP report to the EAC.

After considering the details of the EMPs as brought out in the 87th EAC meeting held on 23-24 Sep. 2015, the EAC recommended for environmental clearance for the project, however, the issuance of the EC shall be subject to Forest clearance.

Agenda Item No 2.3: Ken Betwa Link Project Phase I in District Panna & Chhatarpur, Madhya Pradesh by M/s. Water Resource Department, Government of Madhya Pradesh & M/s National Water Development Agency (NWDA), Government of India for consideration of Environmental Clearance.

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

The project envisages of 77 m high and 2031 m long composite dam across river Ken near village Daudhan in the District Chhatarpur in Madhya Pradesh to irrigate 6.35 lakh ha area of land, drinking water purposes and generation of 78 MW hydropower. The project comprises of two powerhouse of 3x30 MW & 3x6 MW each, two tunnels of 1.9 Km long upper level, 1.1 Km long tunnel lower level & a 221 Km long Ken-Betwa link canal has been proposed on the left bank of the river. The Project will provide irrigation facilities for 635661 ha of area in Panna, Chhatarpur, Tikamgarh District, Madhya Pradesh and Banda, Mahoba and Jhansi Dist in Uttar Pradesh. The CCA is 5,15,215 ha. Total submergence area is 9000 ha out of which 5258 ha is forest land (includes 4141 ha Panna Tiger Reserve). A total of 10 villages consisting of 1585 families are likely to be affected by this project. Panna Tiger Reserve falls within 10 Km radius of the project. The total cost of the project is about Rs.9393 Crores and likely to be completed in 9 years.

The Committee noted that based on the approved monthly flow series for the 75% dependable year, the e-flows have been calculated. The Ken River is a non-perennial river and the 75% dependable year (1988-89) 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 no run-off during lean season from February to May. Out of the total run-off at Daudhan dam site is 2266 MCM of water is earmarked for proposed upstream utilization and the monthly distribution pro-rata basis. The total regeneration from upstream uses has been assessed is 442 MCM. On the basis of this, month-wise 75% dependable net flow has been estimated. The 75% net dependable run-off during monsoon season is 4348.96 MCM out of this 30% monsoon run-off is 1304.69 MCM. The average non-monsoon/non-lean season runoff is 368.54 MCM and 30% of non-monsoon run-off is 110.56 MCM and this will be ensured during operation

of the project. The average lean season run-off is 36.51 MCM and 20% of this lean season run-off is 7.30 MCM and this will be ensured through releases from reservoir. The outlets in the dam body for maintaining e-flows will be provided in the middle of the structure below MDDL. These outlets will be provided with control gates/valves to maintain the required releases of water (e-flows) during different seasons. The system will be connected to a sensor/flow meter for online measurement/verification through a display board. Proper instrumentation will be undertaken to accomplish this. The e-flow are presented below:

Table: Environmental Flows for Daudhan Dam

Sl. No	Season	Average flow (MCM) in	% of inflow	Average EF to the downstream (MCM)
1	Lean Season (February - May)	36.51	20	7.30
2	Non-monsoon and Non-lean season (October - January)	368.54	30	110.56
3	Monsoon season (June - September)	4348.96	30	1304.69

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

Sl. No.	Environmental Management Plan	Cost (Rs. Lakhs)
1	Catchment Area Treatment Plan	27258.52
2	Command Area Development	31180.74
3	Compensatory Afforestation, 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	Rehabilitation and Resettlement 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	5073.00 Crores

The committee was informed that the Ministry while granting TOR, clearly mentioned that the project site is within the Panna Tiger Reserve and therefore, NWDA is required

to obtain necessary clearance from NBWL & National Tiger Conservation Authority for the Ken Betwa Link Phase-I project. The project proponent requested NTCA for clearance for the Ken-Betwa Link Project Phase-I. NTCA suggested for a detailed study for assessing the impact of the project due to habitat change having effect like corridor loss and loss of migratory path for wildlife including birds, impacts on breeding grounds of species and on access of animals to food and shelter and impact on animal distribution. Accordingly, 4 member committee was constituted consisting 1 member each from NTCA, WII, NWDA and Director, Panna Tiger Reserve (Deptt. of Forests, GOMP). The committee carried out a detailed study and suggested the following:

- The committee constituted by NTCA has recommended that WII will prepare Landscape Management Plan (LMP) as a mitigation measures in Panna Tiger Reserve.
- As per recommendations, Four Satellite Core areas will be developed, consisting of two Wild Life sanctuaries each in UP (Ranipur & Mahavir Swami) and MP (Nauradehi & Rani Durgawati). Apart from this MP has agreed to convert 60 sq km of Buffer Area of Panna Tiger Reserve to core area and required Budget provision will be made in the project.
- Govt. of UP has agreed in principle for the inclusion of above two Wild Life Sanctuaries.
- Only about 41.4 sq km which is 7.5% of the Panna Tiger Reserve area (576 sq km) will be submerged in one corner of protected area however dam/reservoir will create new avenues for betterment of Wildlife.
- Panna Tiger Reserve (PTR) is facing acute shortage of water and due to creation of reservoir, its water regime will improve to a great extent.
- This will create new pasture land in submergence area after water is receded.
- 40% of the submerged area will be open for pasture land in the month of December and 60% open area will be available in the month of February.
- Herbivores population will be greatly improved, which will help in increase of Tiger Population.
- Increase in Herbivores population will also be helpful for Vulture population.
- There is no threat to Vulture population because only 3% habitat of vulture will be submerged and 97% of habitat will be more than 100 m above HFL.
- Construction of dam will help Ken Ghariyal sanctuary situated in the downstream because of more ecological flow of water round the year from this dam. Otherwise at present, Ken river is dry for more than six months in downstream.

- Due to heavy flood in Ken River, smaller Ghariyal used to be washed away. But due to dam, these will be conserved in a better way. The project proponent informed that the State Wildlife Board considered the K-B link project for clearance in its meetings held on 11.8.2015 and sought additional information.

Dr. Amarjit Singh, Special Secretary (WR, RD&GR) made a presentation on the Ken-Betwa Link Project Phase-I covering Project Background, its necessity over drought prone Bundelkhand region and mitigation measures proposed for adverse impact on wildlife due to Daudhan Reservoir and in reference to the observations of the EAC on its 91st meeting, the following points have been discussed and recommended:

1. Site Visit & Report of the 4 member committee constituted by NBWL: It was informed to the EAC that the 4 member committee of NBWL had already visited the project area and the study report has been submitted. The copy of the report was asked to be submitted.
2. Submergence of 4141 ha area of the Panna Tiger Reserve (PTR): It was clarified by the project proponent that the submergence of the 4141 ha of PTR includes 1277 ha of land already submerged in the reservoir of the already existing Gangau dam. As such the actual area effective under the PTR shall be only $(4141-1277) = 2864$ ha. which comes to about 5% of the total PTR area.
3. It was also intimated by the project proponent that in lieu of submergence area of 4141 ha. of the PTR area, an additional 8000 ha. of buffer area adjacent to PTR as proposed by Madhya Pradesh State Wild Life Board and duly accepted by National Board for Wild Life is being added to PTR core area at Project cost. In addition, the Resettlement and Rehabilitation of villages coming under buffer area will also be considered at Project cost.
4. Landscape Management Plan (LMP): The project proponent informed that the Wild life Institute of India (WII) has sought a time period of minimum 3 years for the formulation of the proposed LMP for the PTR being affected by Ken Betwa link project.

The EAC took a cognizance of the matter and decided that the matter be expedited to 3-4 months for completion of the LMP as already many detailed studies concerning PTR have been taken up by various Institute/ Agencies.

Therefore, it was proposed that a meeting may be convened by NWDA with Director, WII, Dehradun, MoEF&CC officials and EAC Vice Chairman, Sh. H.S. Kingra for expedition in the matter.

After the finalization of the LMP, the same shall be appraised by the EAC during Environmental Clearance. It will be monitored closely in all Phases of the Project. It was also intimated to the committee in the present scenario / condition i.e. before project, the travel route of Tigers is from two places i.e. (i) from downstream of existing Gangau weir which is more than 100 years old and (ii) from Gaharighat passage and that will not be affected due to submergence of dam. It was also assured by Project proponent that the additional passages of Tigers like bridges / passages as may be suggested by National Tiger Conservation Authority, WII, Dehradun in the LMP shall be developed.

5. Reduction of FRL by 10 m: The issue of reduction of water level at FRL by 10 m i.e from 288 m to 278 m was also deliberated at length. Project proponent informed that the reduction of 10 m in the FRL shall compromise irrigation benefits to about 2.4 lakhs ha of the area. It was also conveyed that the level of 275 m shall be attained by October every year due to release of water in the canal. EAC sought clarifications from Project proponent on this issue, as the water availability above 278 m of FRL shall be only for monsoon months (3 months).
6. EAC suggested to explore the dropping of the hydropower generation component in the Project, including Infrastructure from planning of Ken-Betwa Link Project in view of likely ecological disturbances on wild life. Project proponent assured the committee to review the hydropower component.
7. Constitution of committee as decided in the 91st EAC meeting
As observed in the 91st EAC meeting regarding constitution of committee by Ministry of Environment, Forest & Climate Change in consultation with the EAC to give specific recommendations related to submergence of PTR Core area and the habitat loss for breeding of vultures, it was informed by Member Secretary – EAC that NBWL has already constituted a committee which is having some independent experts also. The EAC has asked that the copy of report of this committee be placed before them, for further deliberations.

8. The EAC took note of the statement made by the PM on 12th April 2016 during the 3rd Asia Ministerial Conference on Tiger Conservation. He had mentioned the following - “I strongly believe that Tiger conservation, or conservation of nature is not a drag on development.”

“Considering the eco-system value of tiger conservation areas, we need to consider them as “natural capital”. Our institutions have done an economic valuation of a few tiger reserves. This has highlighted the fact that besides conserving tiger, these reserves, also provide a range of economic, social, cultural and spiritual benefits. I would like to emphasize that conservation of tigers is not a choice. It is an imperative. In this conference let us resolve to work together to protect the tiger and its space.”

9. The EAC further noted that government of Madhya Pradesh is already engaged in the shifting of several villages to create more space for the tiger reserve both in Panna and elsewhere in the state.

Agenda Item No 2.4: Climate Adaptation in Vennar Sub-Basin in Cauvery Delta Project (CAVSCDP) submitted by Public Works Department, Water Resources Department, Government of Tamil Nadu -for consideration of ToR

The project proponent made a detailed presentation along with videography of the project area and the damaged structures which has to be repaired and rehabilitated as part of this project. The Climate Adaptation through Sub-Basin Development Programme (CASDP) supports the implementation of the Government of India National Action Plan on Climate Change and its National Water Mission. The technical assistance is supported by Asian Development Bank. The CASDP is implemented through a sequence of projects in the Cauvery Delta starting with selected rivers in the Vennar irrigation system, which is the worst affected system by flooding and is the most in need of improvement. The project includes six rivers/drains namely Harichandara river, Adappar river, Pandavayar river, Vellaiyar river, Valavanar drain and Vedaraniyam Canal in the Vennar irrigation system in Thiruvarur and Nagapattinam District of Tamil Nadu where multiple interventions are proposed.

The proposed activities, includes repair and rehabilitation of the existing damaged structures like Regulators, Irrigation head sluices, Drainage Sluices, Drainage inlets,

Drainage Syphons, Bed Dams, Grade walls etc. Other proposed activities to be undertaken includes:

- Re-sectioning and Re-grading/desilting of river channels,
- Fluming in the selected reaches of river/drains and river training work in the curved portion of the river/drains, standardization of river embankment, dredging of silted up earth in the portion of the straight cut area of each river/drain nearer to the sea mouth.
- Re installation of existing damaged pumps and repairs of the pump rooms
- Existing earthen bund to be improved as inspection tract by providing BT road
- No additional command is envisaged due to the above work.

After detailed deliberations, the EAC recommended that as the proposed activities being undertaken is only for improvement and modernization and therefore does not fall under the purview of EIA notification and its subsequent amendments. Hence, the project does not require Environmental Clearance. However, project proponent has to obtain CRZ Clearance as some of the existing structures to be repaired and rehabilitated falls in CRZ area.

Agenda Item No 3.1: Turga Pumped Storage Project (1000MW), in Purulia District, West Bengal by West Bengal State Electricity Distribution Company Limited- for consideration of EC.

Turga Pumped Storage Project on Turganala is located in Purulia district of West Bengal. The Turga Pumped Storage Scheme envisages utilization of the waters of the river Turga in Ayodhya hills for peak power generation on a Pumped storage type development. The coordinates of Upper Dam site are 23°12'47"N and 86°04'20"E. Likewise, coordinates of the lower Dam site are 23°11'49"N and 86°04'13"E. The project site is approachable by a jeepable road taking off from Balarampur – Baghmundi state highway. The nearest rail head is located at Barabhum and nearest airport is located at Ranchi.

The Project is a Close Loop type Pumped Storage Scheme. It comprises of two reservoirs at two different levels (the difference of water levels of the reservoirs will represent the effective “head” of the Project) and water conductor system will

connect the two reservoir through an underground power house. During peak hours power will be generated by depleting the water reserve of the upper reservoir which will pass through the waterway and the generator and turbines installed at the power house and will be stored in the Lower Reservoir. During off peak hours the excess power from thermal stations will be fed back to pump the water from Lower Reservoir to Upper reservoir through power house where generators and turbines will then act as motors and pumps respectively. The same cycle of operation will be repeated during peak and lean period.

Since the Upper and Lower reservoirs of Turga Pumped Storage Project (Turga PSP) has limited effective storage capacity equivalent to five (5) hours of generation at full rated output, it is not possible for Turga PSP to operate on weekly or seasonal basis. Therefore, the Project is deemed to be operational on daily basis.

The Turga Pumped Storage Project envisages utilization of hydro potentiality of Ajodhya Plateau, an extension of Chhota Nagpur Plateau. The project envisages construction of Upper Dam (C.A. 8.29 Sq. Km) across Turganala, a tributary of Subarnarekha river and a water conductor system with an underground Power House on the downstream of Upper Dam and a Lower Dam having intermediate catchment of 4.37 sq. km (total C.A. 12.66 sq. km).

The total land required for the project is 292.0 ha. The details are given in Table-1.

Table-1: Land requirement for proposed project

S.No.	Component	Area (ha)
1.	Upper Reservoir submergence at FRL	87.10
2.	Lower Reservoir submergence at FRL	49.00
3.	Dam site and other structure	13.90
4.	Quarry Site	32.00
5.	Construction facility	15.00
6.	Clay core Area	20.00
7.	Roads	10.00
8.	Stockpile area for construction material, etc.	30.00
9.	Other miscellaneous requirement	35.00
	Total	292.00

About 234 ha of land is Forest land and the remaining (58 ha) is non-forest government land and /or Private Land. Out of 58 ha of non-forest government land and /or Private Land, 34 ha of land will be transferred from I& W Directorate, Government of West Bengal to Turga Pumped Storage Project. Remaining 24 ha of land to be arranged temporarily on leased basis.

As a part of the EIA study, primary data has been collected for three seasons. The details are given in Table-2.

Table-2: Details of field studies conducted as a part of CEIA studies

Season	Months
Winter	December 2013 – January 2014
Summer	April 2014
Monsoon	August-September 2014

The list of clearances received as given in Table-3.

Table-3: List of clearances received

Aspects	Cleared by/Date
Hydrology & Design Flood	Cleared by CWC vide No 1/5/WB/2014/Hyd(N)/97-99 dated 30/04/2015 & No 1/5/WB/2014/Hyd(N)/154-56 dated 17/06/2015
Geological Aspects	Cleared by GSI vide No 1491- 94/144/EPE/GSI/ND/2015 dated 16/09/2015
FE & SA	Cleared by CWC vide No 11/04/TE/2015/FE & SA/554-556 dated 21/08/2015 & No 2/2/2014(vol-II)/FE & SA/677 dated 12/10/2015
Power Potential	Cleared by CEA Vide No ER/502/20/2015-HPA/73-75 dated 14/08/2015
Project General Layout and Planning	Cleared by CEA & CWC vide No 10/209(15)/HETD/2015/1018-1020 dated 13/08/2015 & No 6/10/2014-HCD(NW&S)/2115-2116 dated 12/08/2015
Construction Material & Geotechnical	Cleared by CSMRS vide No 29/36/Turga Pumped Storage/RM-1/CSMRS/2014 dated 05/10/2015

Environmental Flows for Upper and Lower Reservoir are given in Tables-4 and 5.

Table-4: Recommended Environmental Flows for Upper Reservoir

Month/Season	Flow in 90% DY (MCM)	Percentage of inflow as Environmental Flow	Environmental Release (MCM)
June	0.11	30%	0.03
July	0.38	30%	0.11

Month/Season	Flow in 90% DY (MCM)	Percentage of inflow as Environmental Flow	Environmental Release (MCM)
August	0.02	30%	0.006
September	1.55	30%	0.47
October	0.56	30%	0.17
Monsoon (Total)- (A)	2.63	30%	0.786
Non-Monsoon (Total)- (B)	0.29	25%	0.0725
Annual (A+B)	2.92 MCM		0.8585, say 0.86 MCM

Table-5: Recommended Environmental Flows for Lower Reservoir

Month/Season	Flow in 90% DY (MCM)	Percentage of inflow as Environmental Flow	Environmental Release (MCM)
June	0.17	30%	0.05
July	0.58	30%	0.17
August	0.04	30%	0.01
September	2.37	30%	0.71
October	0.86	30%	0.26
Monsoon (Total)- (A)	4.01	30%	1.20
Non-Monsoon (Total)- (B)	0.44	25%	0.11
Annual (A+B)	4.45 MCM		1.31 MCM

It is proposed to release the environmental flow from the construction phase, when the dam achieve a certain height to enhance, that environmental and ecological aspects can be maintained properly in that area.

The total amount to be spent for implementation of Environmental Management Plan (EMP) is Rs. 4618.85 lakhs (Table-6).

Table-6: Total cost for Implementation of EMP

S.No.	Item	Cost (Rs. Lakh)
1.	Catchment Area Treatment	409.65
2.	Compensatory Afforestation, & Bio-diversity Conservation	483.50
3.	Fisheries Management	88.70

S.No.	Item	Cost (Rs. Lakh)
4.	Greenbelt development	16.80
5.	Water, Air & Noise pollution control	20.00
6.	Environmental Management in labour camps	204.75
7.	Public health delivery system	308.23
8.	Muck management	120.00
9.	Restoration, Stabilization and Landscaping of Quarry sites	60.00
10.	Restoration and Landscaping of construction sites	20.00
11.	Environmental management in roadconstruction	40.00
12.	Energy Conservation measures	312.37
13.	Disaster Management Plan	40.00
14.	Local Area Development Plan	2204.00
15.	Plan to preserve cultural identity of the locals	98.12
16.	Environmental Monitoring during construction phase	187.23
17.	Purchase of meteorological instruments	4.50
18.	Purchase of noise meter	1.00
	Total	4618.85

EAC noted that the EIA and EMP reports have been prepared in accordance to the TOR, and after detailed deliberations; EAC recommended that EMP budget should be raised to Rs.68 Crores, by increasing cost for Local Area Development Plan for Rs.22.04Crores to Rs.44.00 Crores.The increased amount earmarked for improving the infrastructure and creating a corpus fund for operation & maintenance of the infrastructure developed as a part of Local Area Development Plan. The revised LADP finalized during the presentation is given in Table-7 to 12.

Table-7: Break up of cost required for up-gradation of existing primary schools

S. No.	Particular	Amount earmarked /school (Rs. lakh)	Amount earmarked for 40 schools (Rs. lakh)
1	Furniture & fixtures and equipment	6.0	240.0
2	Improvement of drinking water facilities	3.0	120.0
3.	Construction of toilets in schools	5.0	200.0
4.	Improvement of school library/kitchen for mid-day meals	7.0	280.0
	Total	21.0	840.0

Table-8: Details of scholarships

S.No.	Activities	Amount (Rs. lakh)
1	Scholarship for School going students (200 students x	240.0

	10000 per year for 12 years)	
2	Scholarship for meritorious students–College/ higher education Fees/course material (@ Rs.15,000/year x 100 students x 4 years) Hostel expenses (@ Rs. 15,000/years x 100 students x 4 years)	60.0 60.0
	Total	360.0

Table-9: Budget for up-gradation of PHSCs

S.No.	Item	Amount earmarked per PHSC(Rs. lakh)	Amount earmarked for 8 PHSCs (Rs.lakh)
1	Furniture, Beds, lighting, facilities for cold storage, drinking water, etc.	7.0	56.0
2	Up-gradation of Pathological laboratory	20.0	160.0
3	Up-gradation of operation theater (labor room)	25.0	200.0
	Total	52.0	416.0

Table-10: Budget for construction of community toilets

S.No.	Item	Amount earmarked per village(Rs. lakh)	Amount earmarked for 30 villages (Rs.lakh)
1.	Civil Works(Seat, Tap, Walls, Roof etc)	20.00	600.0
2.	Plumbing	4.50	135.0
3.	Tubewell	3.00	90.0
4.	Electrification	2.00	60.0
5.	Sewer Connection	2.50	75.0
6.	Bio-Digesters	8.0	240.0
	Total	40.00	1200.0

Table-11: Budget Allocation for Additional Infrastructural Facilities Sought for During Public Hearing

Description		Budget (Rs. Lakh)
Potable Water facility – Digging of new wells	Total 3 nos: as decided by district administration in consultation with	5.00

Description		Budget (Rs. Lakh)
	local people	
Digging New Pond	Total 3 nos: as decided by district administration in consultation with local people	36.00
Development of Play Ground	Total 3 nos: as decided by district administration in consultation with local people	30.00
Development and Renovation of Temples	2 nos. (as indicated in the Proceedings of Public Hearing)	25.00
Total		96.00

Table-12: Budget for implementation of Local Area Development Plan

S. No.	Items	Budget (Rs. Lakh)
1	Construction/Up-gradation schools in Study Area	840.0
2	Scholarships to students in the Study Area	360.0
3	Improvement of Public Health Facility	416.0
4	Construction of Community Toilets	1200.0
5	Additional Infrastructural Facilities Sought for During Public Hearing	96.0
	Total	2912.0

An amount of Rs.15.0 crore has been earmarked for creating a corpus fund, which will be used for O&M of the infrastructure created under Local Area Development Plan. The total fund for LADP shall be Rs.44.12 crore, as given below:

- Infrastructure Development : Rs.29.12 crore
- Corpus Fund : Rs.15.00 crore
- Total : Rs. 44.12 crore**

The EAC after detailed deliberation recommended the Environmental Clearance for the project, subject to condition that Environmental Clearance for quarries shall be taken separately.

Agenda Item No.3.2 Majhgaon Medium Scheme project on Bada Nalariver in Panna District, Madhya Pradesh by M/S Water Resource Department, Panna – for consideration of TOR.

The project proponent made a detailed presentation on the project. It is noted that this is a medium irrigation project with a Culturable Command Area (CCA) of 9900 ha. The

project envisages construction of an earthen dam of Bada Nalla a tributary of Ken river. Catchment area at the proposed site is 51.65 sq.km, having 75% dependable yield as 13.36 MCM. The dam is proposed to have a live storage 105.23 MCM and gross storage of 112.62 MCM. Rest of the water will be diverted from Ken river from U/S of existing Bariyarpur pick-up weir through a channel and a tunnel. Diverted quantum of water from Bariyarpur Pick-up weir in monsoon period from share of Madhya Pradesh is 92.44 MCM and 13.36 MCM from the self catchment of Bada Nala. Irrigation potential proposed is 9900 ha. In addition, 40 MCM water is reserved for NTPC power project and 3.93 MCM is allocated for drinking purpose of tehsil Ajaygarh of district Panna. Total land requirement is about 1438.37 ha, out of which 426.76 ha is forest land, 925.49 ha is private agricultural land and 86.12 ha is Revenue land. The total cost of the project Rs. 358.99 crores.

It was explained that the Resettlement & Rehabilitation (R&R) shall be prepared in accordance with guidelines of the 'Right to fair Compensation and Transparency in Land Acquisition Act, 2013'. Environmental flow release 30%, 20% and 20% norms during Monsoon season, Lean season and Non Monsoon Season Non lean season corresponding to 75% Dependable year.

After detailed deliberations, it was noted by the EAC that the project envisaged does not fall for appraisal of this central EAC as the EIA Notification, 2006 modified in June 2014.

The EAC also noted that while examining the Majgoan Medium Scheme Project on Bada Nala(a tributary of Ken river) in Panna district, that several areas of Panna district are water deficient and was not aware whether diverting the river to Betwa has taken this into account. The committee recommends that the Ken / Betwa basin study be first done before any new project is taken in the basin as is the general policy followed by MOEF&CC for other river basins..

Agenda ItemNo.3.3: Wainganga (Gosikhurd)- Nalganga (PurnaTapi) River Link Project on river Wainganga to the Western Vidarba in Nagpur District, Maharashtra by Water Resource Department, Govt. of Maharashtra – for consideration of TOR.

The project proponent made a detailed presentation on the project. It is noted that this is the link project is an intra-state link of Maharashtra envisages diversion of 1912 Mm³ of water from the existing Gosikhurd project across river Wainganga to the Western Vidarbha. Out of this, a quantum of 1767 Mm³ is earmarked for irrigation and 31 Mm³ is planned to be utilized for municipal & industrial purposes in the command areas while the remaining 114 Mm³ would be lost in transmission.

The link canal takes off from the right flank of the ongoing Gosikhurd dam with the FSL of 243 m and traverses for the full length of 469.10 km through Bhandara, Nagpur, Wardha, Amravati, Akola and Buldhana districts of Maharashtra. It is proposed to bring 338500 ha of CCA under irrigation through ten branch canals. In addition, about 17.51 lakh (13.21 lakh as per Census: 2011) human population by 2050 AD will be served with domestic water supply utilizing 31 Mm³.

Since the topography doesn't permit the gravity flow irrigation throughout canal system, lifting arrangements are provided on link canal at RDs 3.3 km, 20.97 km, 40 km & 284.4 km. The total pump capacity required for a total lift of 80 m is about 288 MW with an annual power requirement of 556 MU. The link canal is designed as a lined canal of trapezoidal section with bottom rounded corners. The maximum carrying capacity of the canal is 212.2 cumec with corresponding cross section of 32.5 m of bed width and 5 m full supply depth.

The cost of the project is estimated to be Rs.1493884 lakh, which includes the cost of head works at Rs.5600 lakh, the cost of conveyance system at Rs.1310363 lakh, the cost of lifting arrangements at Rs.164381 lakh and cost of on farm development at Rs.13540 lakh. The annual cost after duly considering the land development and the annual power requirement for lifting works out to Rs.187800 lakh. The direct benefits from the link project due to irrigation & municipal water supply are estimated to be Rs.288748 lakh. The benefit-cost ratio (BCR) of the project works out to 1.54 where as the internal rate of return (IRR) works out to 14.02 %.

About 56 ha of forest land is required to be acquired for the main canal. The extent of forest land, if any, that may come under submergence of enroute storages / tanks will be assessed. However, no timber is expected to be utilized during construction/operation of the project.

The project comprises the following components (as per the Prefeasibility report prepared by NWDA):

- A Link canal of about 470 km length off-taking from existing Gosikhurd reservoir on Wainganga river upto Nalganga project on Nalganga river.
- Lifting arrangements at four locations (RDs 3.3 km, 20.97 km, 40 km & 284.4 km) to accommodate pump-houses, sump wells and cisterns at each of the locations to raise water through a total static lift of 80 m (18 m, 22 m, 20 m and 20 m respectively).
- Command area of about 338500 ha proposed to be catered through about ten branch canals.
- En route storages/tanks – medium size tanks/storages in the command area to get their capacities augmented from Gosikhurd during monsoon in order to meet the demands during the non-monsoon season. The no. of tanks, their locations and extent of land that will get submerged under these storages are being firmed up.

After detailed deliberations, the EAC asked PP to bring 1983 DPR for surplus water.

Agenda ItemNo.3.4: Jameri HEP (60 MW) in West Kameng District in Arunachal Pradesh by M/S KSK Jameri Hydro Power Private Ltd.– for consideration of TOR.

Jameri Hydro Electric Project (60 MW) is envisaged as a Run of River Scheme (RoR) on River Tenga in West Kameng Dist. of Arunachal Pradesh and identified as an upstream development of Tenga Dam .The project shall be developed between El. 1060 m(FRL) & El. 800m(TWL). The project proponent, i.e. M/s KSK Energy Ventures Ltd , entered into an agreement with the Govt. of Arunachal Pradesh on 27th December 2007 for implementation of the project. Subsequently SPV in the name KSK Jameri

Hydro Power Pvt. Ltd. has been incorporated for implementation of the project. The validity of ToR Dt. 25.10.2010 for EIA/EMP studies as issued earlier with its extensions (total 5 yrs) by MoEF was up to 24.10.2015. The S&I activities including geotechnical investigations of the project are completed and preparation of DPR is in advanced stage. While the base line data collection is completed, the Land & Socio Economic Survey including property survey & Public Hearing is remaining, for which the Project Proponent seeks fresh ToR.

The land & Socio Economic Survey was started after clearance of the project by STC of CEA in May 2014 but the same could not advance for its completion. The project parameter as envisaged earlier remains unchanged. However, based on approved Hydrology (by CWC), the proposed IC has been worked out as 60 MW and with issuance of new ToR, the Developer plans to complete the Land, Property & Socio Economic survey and thereafter the Public Hearing within two years period.

Feasibility Study Report of the project was prepared in April 2010 with proposed Installed capacity (IC) of 90 MW. However with further advancement on study of the project and approved Hydrology (by CWC), the IC is now being proposed as 60 MW (2x30MW) with basic project parameters remaining unchanged. Revised FR with proposed IC as 60 MW has been submitted.

Jameri HE Project shall comprise of a Concrete Gravity Dam having a length of 122.65 m and a maximum height of 68.5 m above the deepest foundation level. There shall be four gated spillway bays having breast wall at the top, size of radial gates being 3 nos 10.3 m (Width) × 12 m (Height) and 1 no. 10.3m × 13m. The reservoir created by the Dam shall have a capacity of 10.04 MCM at the MWL of EL 1060 m. The Head Race Tunnel shall be of modified horse shoe section with 3.9 m finished diameter, concrete lined, having length of about 5.2 km. Design Discharge is 26.39 Cumecs. Two intermediate Adits of 5 m diameter D-shape (one 291 m and the other 157.3 m long) have been provided to facilitate and accelerate the construction activity. The Surge Shaft shall be open-to-air restricted orifice type of 7.5 m diameter, about 36.5 m high, circular, concrete lined, with an orifice of 2.3m x 3.9m. An underground steel-lined penstock of 2.75 m diameter (with 25m in the initial part & 386m after vertical shaft) shall connect the surge shaft to the surface power house. Total requirement of Land is

estimated as 134 Ha out of which Forest & Govt. land shall be approx. 33 Ha. Submergence area is approx. 60 Ha. Annual energy from the Project is estimated as 206.06 GWH .

There is no Wildlife Sanctuary or nature/biosphere reserve within or in close proximity to the Project area of Jameri HEP. Boundary of Orchid Sanctuary is approx 11 Km from the project site. Although trees and shrubs exist in the submergence area, the project proponent shall adequately compensate for the forest to be lost in the submergence area by adhering to the mandatory procedures for ensuring compensatory afforestation. Human settlements containing dwellings, houses or hamlets are scanty in the submergence area and in the location of project components. However, Resettlement & Rehabilitation measures to be adopted by the project proponent shall be in line with the established policies and norms of relevant authorities. As a consequence to the development of the project, the socio economic condition of the local people of villages in and around the Project area shall improve. Local people shall also get employment in the Project, primarily during construction, and also during Operation & Maintenance stages. Implementation of Environmental Management Plan and Catchment Area Treatment plan shall mitigate any adverse impact in the Project area and shall reduce soil erosion, improve forest resources and cause economic uplifting of the project area in general.

The works of developing the requisite infrastructure for the project and of carrying out necessary pre-construction activities shall be undertaken subsequent to the approval of the DPR. Thereafter the completion of project shall take 4 Years. The total cost of the project has been estimated as Rs 540 Cr. based on price level Sept.2015.

After detailed deliberations, EAC on considering the recommendation of Jameri HEP (50 MW) in the Bichom River Basin study report recommended for the TOR with the raised installed capacity of 60 MW for Jameri H.E.

Agenda Item No 3.5: Cumulative Impact assessment & Carrying capacity Study (CIS & CCS) of river & river basin studies in Chenab valley – to discuss the final report.

The Consultant could not attend the meeting. Therefore, the EAC has not considered the project and deferred the project. The matter has been deferred to next EAC meeting.
