Minutes of the 19th Meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects held on 26.10.2018 at Teesta Meeting Hall, FirstFloor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–3.

The 19th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 26.10.2018 with the Chairmanship Dr. S.K. Jain in the Ministry of Environment, Forest & Climate Change at Teesta Meeting Hall, FirstFloor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–3. The following members were present:

1.	Dr. S.K. Jain	-	Chairman
2.	Shri Sharvan Kumar	-	Representative of CEA
3.	Shri N.N. Rai	-	Representative of CWC
4.	Dr. A.K. Sahoo	-	Representative of CIFRI
5.	Dr. Vijay Kumar	-	Representative of IMD
6.	Shri T.P. Singh	-	Member
7.	Dr. D.M. More	-	Member
8.	Dr. J.P. Shukla	-	Member
9.	Prof. Govind Chakrapani	-	Member
10.	Prof. S.K. Kohli	-	Member
11.	Dr. S. Kerketta	-	Member Secretary

Shri Chetan Pandit, Prof. S.R. Yadav, Dr. J.A. Johnson and Dr. (Mrs.) Poonam Kumria could not be present due to pre-occupation.

The deliberations held and the decisions taken are as under:

Item No. 19.0 Confirmation of minutes of 18th EAC meeting.

The Minutes of the 18th EAC (River Valley & Hydroelectric Projects) meeting held on 27.09.2018 were confirmed.

Item No. 19.1 Koshi-Mechi Intrastate Link Project (Construction of Canal of 76.20 km long) on the existing barrage beyond existing Eastern Koshi Main Canal (41.30 km) for irrigation purpose under Koshi-Mechi Intrastate Link Project in the State of Bihar. Discussion on the site visit of the Sub-committee (File No.J-12011/22/2016-IA.I& Online No.IA/BR/RIV/57622/2016)

The site visit report of the Sub-committee was deliberated in detail; Chairman of the Sub-committee briefed the main observations/ recommendations to the EAC. A copy of the site visit report is annexed as **Annexure-I**. The following are the recommendations for the project:

1. There appears to be no problem from the design and construction point of view in taking up of the works of canal system in the extended portion. The activity seems to be conventional one.

2. Fisheries activities were observed in the proposed canal just downstream of the Lock gate. Indigenous fish species were collected through different fishing gears as shown in the pictures. This indicates livelihood of poor fishermen is dependent on this canal. Further, during site visit, it was noticed that freshwater prawn forms major catch in the upstream of the canal which has not been reported in the EIA report submitted for EC clearance consideration. During market survey, it was recorded that migratory fish species such as *Tor* sp. (Mahseer) distant migrant, *Eutropiichthysvacha* local migrant and other commercial important fish species such as *Bagarius* Sp. list were not mentioned.

3. The existing canal is unlined one and passes through soft soil (may be sandy silt) mostly in cutting. The excavated stuff is dumped on both sides of the canal just adjacent. The carrying capacity of the canal is to be increased from 425 cumecs to 573 cumecs in the head reaches. At RD 41.3 km, carrying capacity is to be enhanced to 235 cumecs. From the information given in the booklet and the discussions with the field officers, it was learnt that the capacity was proposed to be enhanced by widening the canal section. For such a venture, the problems to be faced at full cutting, partial cutting and full banking canal sections will be different.
4. By providing lining to the existing canal section over the entire length, the carrying capacity of the canal section could be enhanced sizably. If required, FSD of the canal could be raised by raising the bank work suitably. For sections in cutting, there may not be any problem. For better operation of the canal, the FSD could be regulated through the intervention of cross regulators. The extended canal for its entire length of 76.2 km is going to be lined one.
5. The critical issue will be of increasing the carrying capacities of the existing siphon conduits. This has to be dealt with very carefully.
6. It would be advisable to observe the performance of the remodelled section with various alternatives on a hydraulic model.
7. The excavated muck from the canal section is dumped on either side in a haphazard way. It is anormal practice. A proper shape to the spoil banks/ landscaping improves the surroundings and environment. This is to be taken care of.
8. The up-keeping of the canal portion was not to the expected level. Bushes and shrubs were seen growing at rampant on the canal sides.
9. The average rainfall in the area is around 1,500 mm and therefore,the proposed irrigation during kharif is going to remain as protective irrigation only. There is no dearth of groundwater. There are shallow bamboo tube wells (of 10 to 15 feet) and groundwater could be utilized for rabi and summer crops. The river Koshi carries sizable discharge even during summer season. The existing irrigation (up to RD 41.3 km) is practiced for Kharif and rabi seasons. It was not understood as to why they have put ban on Rabi irrigation for the extended command. Alternatively small village tanks, farm ponds could be developed in the entire command of the EKMC and Koshi-Mechi canal and decentralized storages could be created in the kharif season with canal water. This stored water could be used for doing irrigation in rabi and hot weather seasons with micro irrigation method. There is ample groundwater at the

command of the farmers. The area at places was seen water logged. This will take care of water requirement of perennial crops like banana, sugarcane and so on. With this background in the days to come the system could be converted to perennial one.

10. In the extended command, about 20% area has been proposed to be developed under micro irrigation system. It is basically for enhancing the productivity and quality of the agri-produce, in addition, it saves plenty of water. More and more area canbe planned to be brought under micro irrigation in the days to come and water could be saved. The water stored in the secondary storages in the command, use of groundwater and also the water saved in micro irrigation could help to transform the entire command into a perennial farming. Additional area from the Mahananda basin (left over as un-irrigated) could also be brought under irrigation with the help of the increased water availability as explained above. The land holding in this area is very small and therefore, it will be very much necessary to support farmers with irrigation facility.
11. The project involves remodeling of existing EKMC upto R.D. 41.30 km and construction of new canal upto RD 117.50 km.The discharge of canal will increase from present 425 cumecs to 573 cumecs.This will also involve remodeling of existing structure like canal siphons and head regulators of the branch canal, distributaries with cross regulators and escapes. PP (WRD, Govt. of Bihar) shall submit their programme to undertake such remodeling work.
12. The maintenance of canal needs improvement. Particular attention should immediately be given in head reaches where the canal needs proper re-sectioning as well as proper dumping of excavated silt with landscaping wherever.
13. Water quality particularly variation of water temp., DO, pH, TS and alkalinity, Phosphate, Nitrate, Silicates and Carbon (soil) at the site of joining of Kosi with Mechi (Upstream and downstream of joining point). E.coli data to be provided.
14. Fish species available upstream and downstream of joining point in Mechi river to be provided.
15. Possibility of fish pass in the Kosi canal (if possible) for efficient migration of Tor sp. to be explored.
16. Inventorization of fish species available in the Kosi canal to be revisited.

After detailed deliberations as per the presentation including the facts presented by the Sub-committee,the Committee agreed on all the suggestionsmade by the Sub-committee and opined that let the PP submitall the information as per the site visit report and then the **proposal will be again reconsidered for recommendation of grant of EC in the subsequent EAC meeting.**

Item No. 19.2 Cumulative Impact Assessment and Carrying Capacity Study of Beas River Basin, Himachal Pradesh - Re-consideration of the Study Report before the EAC

The Directorate of Energy, Government of Himachal Pradesh hadmade a presentation in the 15th EAC meeting and discussed their response to the

recommendations of Beas Basin Study. EAC deliberated in detail and sought further information from Directorate of Energy to which they have responded vide their letter dated 23.10.2018 and made presentation before EAC. As per the presentation including the facts presented by the Director of Energy, **the Committee** discussed each project as given below:

1. **Jobrie HEP (12 MW)** - Beas Basin Study has recommended this project for dropping as the project falls in Inderkilla Wildlife Sanctuary. EAC has taken a note of it and accepted the recommendation of the study in its13thEAC meeting. GoHP has claimed that some of the projects components are on the boundary of the protected areaand they need some more time to ascertain that all project components should fall outside the protected area. GoHP submitted that Jobri Nalla is falling within the wildlife sanctuary and therefore they are not diverting the water of Jobri Nalla. Whereas another diversion of the project in on Allan Nalla, which is outside the protected area and therefore, they should be allowed to utilize the water of Allan Nalla for developing an HEP with reduced capacity of 6 MW. As up to 2 MW projects are permitted in the Eco-Sensitive Zone.GoHP may be allowed to develop an HEP of 2 MW IC in ESZ of Inderkilla WLS on Jobrie Nalla. **EAC accepted the GoHP request** with regard to Jobrie HEP.

2. **Manalsu HEP (21.9 MW)–**In the 13th EAC meeting held on 28.06.2018, the Consultant informed that Manalsu HEP (21.9 MW) is a newly identified and yet to be allotted project. It is a run-of-the river scheme utilizing the water of Manalsu Nallah which is a tributary of River Beas in Kullu district of Himachal Pradesh. The Project envisages a diversion weir with HFL at El 2500 m proposed to be constructed to divert water of Manalsu Nallah to a2.8 km long water conductor system to carry a design discharge of 6.2 cumecs to the power house with TWL at El 2100 m, located on left bank of stream to generate an estimated annual energy 87 Gwh utilizing a gross head of 400m. Based on the above information, the basin study report has mapped the location of proposed Manalsu HEP and found it to be falling within the Manali WLS. Accordingly, the project was recommended for dropping. This recommendation was accepted by the EAC and also by the State Government of Himachal Pradesh.

   However, the Member Secretary informed that a representation from a prospective developer has been received. The representation was discussed in the meeting and the Member Secretary informed the major project features viz., the powerhouse, forebay, penstock, switchyard and transmission lines will be located outside the sanctuary area. It involves an intake in a deep gorge and an underground tunnel of 2.5 km which will be excavated from one end that is out of the WLS boundary. No adit is proposed in between the tunneling excavation, ensuring no interference with the Sanctuary. However, the representation is silent on the locations of the dam/ barrage/diversion structure and the intake structure to HRT.EAC noted that as per the RBS report, the diversion structure, intake structure, etc.were falling within the Manali Wildlife Sanctuary. Further, it was clarified that the underground component (tunnelling, etc.) of the project is a part of forestland and Manali WLS and accordingly as per the guidelines

permissions underForest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972 to be obtained.

After detailed deliberation, it has been decided that let the State Govt. shall submit the details of the locations of the project features of the Manalsu HEP *vis-a-vis* the boundary of the Manali WLS for further consideration of the EAC.

3. **Bujling HEP (20 MW) -**Beas Basin Study has recommended this project for dropping as the project falls in Dhauladhar Wildlife Sanctuary. GoHP was asked to re-plan the project to ensure that revised project should be completely outside the protected area as well as proposed eco-sensitive zone. GoHP has requested more time, as the ESZ of Dhauladhar Wildlife Sanctuary has not been finalized as yet. EAC accepted the request and observed that basin study should record that all the components of revised Bujling project should be outside the protected area as well as ESZ.

4. **Makori HEP (20.8 MW) -** Beas Basin Study has recommended this project for dropping as the project falls in Dhauladhar Wildlife Sanctuary. EAC has taken a note of it and accepted the recommendation in 13th meeting. GoHP agreed with the recommendation of the report and confirmed that the allotment of project will be cancelled.

5. **Palchan Bhang HEP (9 MW) and Bhang HEP (9 MW) -** Beas basin study has recommended that Palchan Bhang HEP is located at 2246m to2035m and Bhang HEP levels are2240m to2104m. Due to conflicts in levels, only one project is possible. However, GoHP has mentioned that these are two parallel schemes, one on Kothi Khad, a tributary of river Beas and another on Beas river and there is no level conflicts between these two schemes. Therefore, as such GoHP may be allowed to go ahead with both the schemes.EAC discussed the matter and concluded that if there is no level conflict, both the schemes can be developed, as they are independent schemes. EAC asked the GoHP to submit a clear location map showing the layouts of both the projects components and levels.GoHP presenteda map.However, it was not very clear. EAC asked the GoHP to submit a clear location map produced by a GIS showing contours in the region. This map may be included in the basin study report.

6. **Four projects on Parbati River viz.Parbati HEP (12 MW), Sharni HEP (9.6 MW), Sarsadi HEP (9.60 MW) & Sarsadi-II HEP (9 MW) –** Beas basin study has flagged these projects as these projects are proposed on Parbati river in Cascade in about 15 km of river stretch without any significant inter project free flow stretch. Further this river stretch is rich in fish fauna and trout is known to migrate upstream in Parbati riverfrom Beas along this stretch. Development of this stretch would hamper trout's movementsand also during construction phase the road to Manikaran Sahib will be severely affected. GoHP has submitted that they will redefine the projects to ensure the free flowing river stretch is maintained between projects in cascade and shall also ensure fish movement by provisions of well-designed fish passages. Further location of fish passages should be studied well to ensure proper migration of the fish species.In addition, a

member urged that the breeding grounds of trouts must be identified in the proposed river stretch and conservation of these sites should be ensured. The client also confirmed that project construction will be taken up in phased manner. EAC accepted the submission and recommended that GoHP will redefine these projects by ensuring minimum 1 km of free flowing river stretch between FRL and TWL of projects in cascade. GoHP presented that they have revised the project configurations and now only two projects are being planned on this stretch to ensure adequate free stretch between these two projects.

7. **Nakhtan HEP (460 MW) –** Beas Basin study has flagged the project on two counts viz. the proposed Nakthan HE project is located on the boundary of Khirganga National Park and falls within the proposed notification declaring ESZ of Great Himalayan National Park Conservation Area (Khirganga National Park is a part). The project falls within the proposedESZ as it is just touching the boundary of the National Park, ESZ is about 1.8 km wide on this part of the park. Second, the matter related to diversion of Tosh Nalla for Nakthan HEP is sub-judice. Therefore, report recommended that whenever the project is considered by EAC for appraisal after court order, it is to ensure that all the project components and pondage, up to the tip of submergence should be well outside the ESZ of Great Himalayan National Park Conservation Area.

   GoHP submitted that an out of court settlement is being done with the developer of Tosh project under which Nakhtan HEPs Tosh diversion will be dropped altogether. Instead, capacity of the existing projects on Tosh will be increased as follows:

   Tosh I HEP from 10 MW to 20 MW
   Tosh II HEP from 5 MW to 25 MW
   Tosh III HEP from 5 MW to 25 MW

   EAC asked the GoHP to provide the details of revised capacities of projects alongwith agreement on Tosh projects so that they can be included in the basin study report.

8. **Kanda Pattan HEP** - GoHP submitted that a new project has been conceived in Beas basin and it was earlier not covered in the study. This falls between Thana Plaun HEP and Triveni Mahadev HEP and will have an installed capacity of about 40 MW. EAC asked the GoHP to provide the details so that they can be appropriately included in the basin study report.

9. **Environment Flow Release Recommendations**

   EAC noted that regarding environment flow recommendations, GoHP was asked to submit the energy calculation and tariff loss for existing/under construction projects where environment flow has been recommended to be increased from the present releases. GoHP has submitted calculations for 4 operational projects only and remaining data is yet to be submitted. EAC noted that data submitted is not legible and incomplete and therefore

asked GoHP to provide full detail as requested for all the projects which are under construction and under operation.

Recommendations of e-flows release of Dhaulasidh HEP

In earlier meeting, EAC asked consultant to review the E-flow release recommendation with respect to Dhaulasidh HEP (66 MW), because 90% dependable year as per the approved DPR and as taken in Beas basin study appears to be different. Consultant presented that the recommendation was reviewed and 90% DY is not found to be different in basin study from that of EIA study/DPR of Dhaulasidh HEP. Difference is in seasons, how they were considered in EIA study and in basin study and data was re-examined to re-represent the seasons as –

- Monsoon – June to September
- Lean Season – November to April
- Other Months – May and October

This has resulted in slight change in the recommendation and the revised e-flows recommendation for Dhaulasidh HEP are:

- Monsoon (June to September) – 30% (90.80 cumecs)
- Lean Season (November to April) – 20% (6.24 cumecs)
- Other Months (May and October) – 20% (8.30 cumecs)

Being a dam toe powerhouse based project, e-flows can be released from the turbines as long as continuity of release can be maintained. EAC accepted the revised e-flow recommendation for Dhaulasidh HEP.

Item No. 19.3 Eastern Rajasthan Canal Project (ERCP) at Sawai Madhopur, Rajasthan by M/s ACE WR Zone Jaipur, Rajasthan- reg. Fresh ToR (File No.J-12011/23/2018-IA.I(R)& online No.IA/RJ/RIV/80561/2018)

The project proponent made a detailed presentation of the project and *inter-alia* provided the following information:

The project envisages construction of 6 barrages and 1 dam, viz. Kunnu barrage on river Kunnu, Ramgarh barrage on river Kul, Mahalpur barrage on river Parbati, Navnera barrage on river Kalisindh. Mez barrage on river Mez and Dongri dam on river Banas to provide irrigation facility in 2,02,500 ha of land in Dholpur (72,500 ha) and Sawai Madhopur (1,30,000 ha) Districts of Rajasthan with an irrigation intensity of 120%. About 2.81 crores population will be provided drinking water facility. About 80,000 ha of command area in 13 districts will be stabilized. Total length of the water conductor system is about 1268 km consisting of gravity canal, pumping main and tunnels. The main canal from proposed Dongri dam in Sawai Madhopur Command area is located at a distance of 1 km from Ranthambhore Wildlife Sanctuary. Total submergence of forest area is about 9081.40 ha, out of which 3,703 ha is

coming under Ranthambhore Wildlife sanctuary. The total land requirement for project is 67,615 ha out of which 5378.4 ha is forest land; 29.422.5 ha is private land, 29,111.1 government land and wildlife land is 3703 ha. Total submergence area is 40,886 ha. The total cost of the project is about Rs. 37,247.12 Crores.

The Committee suggested for asite visit of the proposed project by a Sub-committee. The Sub-committee will consist of the following members:

1.	Dr. S.K. Jain	-	Chairman
2.	Shri Sharvan Kumar	-	Member
3.	Shri N.N. Rai	-	Member
4.	Dr. J.A. Johnson	-	Member
5.	Dr. S.R. Yadav	-	Member
6.	Dr. D.M. More	-	Member
7.	Dr. S. Kerketta	-	Member Secretary

The following are the ToR of the Sub-Committee:

1. The command area is falling in Ranthambore Wildlife Sanctuary. Any likely adverse impact on wildlife due to the proposed project, if any, be ascertained.
2. Meeting with local stakeholders to discuss the beneficial drawn due to this project.
3. Any other issues as raised by any general public during the site visit.

The EAC also sought the following additional information from the PP:

1. The proposed cropping pattern (Sawai Madhopur) includes sugarcane, a perennial crop over an area of 0.02%. For such small area the canal-system is required to be run during summer season also. This entails huge losses in terms of percolation and evaporation and therefore, it appears impracticable to run the system from the view point of irrigation management. It would be advisable to make the system as eight monthly one, by deleting the perennial crop.
2. The entire command is proposed to be irrigated with micro irrigation system. The water saved on account of micro irritation could be utilized for increasing the command area. The scope of the project will be changed and so also the economics. The use of micro irrigation system enhances the yield and quality of the crops and accrues more benefits. If the system is to be run on flow irrigation, then aspect of conjunctive irrigation needs to be considered.
3. The project involves "lift" component. The likely static head may be mentioned in the salient features.
4. The cropping pattern should include a component of horticultural crops that cansustain on groundwater alone during summer season. This will benefit the farmers as cash crops andwill improve the BC ratio of the project.

5. The non-irrigation water shall be routed through closed pipelines (not through river / canal).

After detailed deliberations on the presentation made including the facts presented by the PP, the Committee opined that let the sub-committee visit the site andsubmit itsreport. This report alongwiththe reply of the additional information from the PP will be considered in the subsequent meeting.Accordingly,**the proposal has been deferred.**

Item No. 19.4 Sita Rama Lift Irrigation Project (Phase I) in Bhadradri Khammam district of Telangana by Irrigation and CAD Department, Government of Telangana-reg. for fresh Environmental Clearance.
File No. J 12011/16/2017 –IA.I(R)and Proposal No. IA/TG/RIV/82147/2017

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

The proposed Lift Irrigation project is to divert Godavari River water from upstream of existing Dummugudem Anicut to irrigate 2,72,921 ha (new Ayacut 1,33,085 ha and stabilization 1,39,836 ha) of Bhadradri Kothagudem and Mahaboobabad Districts of Telangana. The Dummugudem Anicut is located at Dummugudem village in Bhadradri Kothagudem District of Telangana.The project is likely to benefit 180 villages in 3 districts of Telangana state. The project is to provide water for irrigation for new command as well as en-route tanks, villages, towns and supplement some of the existing/proposed irrigation schemes. The total land requirement for the project is 8,476.84 ha, out of which 1531.06 ha is forestland, private land is 4818.15 ha and government land is 2127.63 ha. Stage-I forest clearance has been accorded vide letter dated 4-TSA113/2017-CHN/0188 dated 02.02.2018. Recommendation for NBWLclearance has been given vide letter No. 6-26/2018WL dated 18.04.2018. The total submergence area is 1,930 ha. About 157 villages consisting of 9,696 families are likely to be affected due to this project. The total cost of the project is about Rs. 13,384.80 Crores and it is proposed to be completed in 3 years. Rs. 1643.52 crores have been estimated towards EMP cost. A total amount of Rs. 986.90 crores has been earmarked for R & R implementation.

The Scoping/TOR clearance for the project was accorded on 04.08.2017.

The project proponent informed that net water availability at Dummugudem anicut in75% dependable year is about 1609 TMC of water onprorata basis. After utilizing (i) 180 TMC water for Kaleswaram, (ii) 50 TMC of water for Devadula, (iii) proposed utilization of 364.2 TMC of water for ongoing projects and (iv) proposed utilization of 762.9 TMC of water for future projects, the net availability at Dummugudem in75% dependable year is about 251.8 TMC of water, out of which 70 TMC of water would be needed for the proposed project. A provision of 3 TMC of water made available for providing drinking water facility in the command area for about 58.18 lakh people.The project envisages construction of Head Regulators only at Dummugudem Anicut to

draw water from Godavari river through approach channel with CBL at EL 45 m. No construction of dam and barrage is involved in this project. Main components of the project are as follows:

i. construction of Head Regulators only at Dummugudem Anicut on River Godavari,
ii. construction of lined canal of about 372 km,
iii. construction of 4 pump houses and delivery cisterns,
iv. laying of pumping main of about 9 km,
v. cross drainage works across main canal, and
vi. construction of tunnels and cross regulators and off-take, etc.

The project has been granted Stage-I FC clearancevide letter No. 4-TSA113/2017-CHN/0188 dated 2.2.2018 and has been recommended for NBWL clearance vide letter No. 6-26/2018 WL dated 18.4.2018.

Public Hearings were conducted in all the three districts of Telangana i.e. (i) at Zilla Parishad High School, Patwarigudem (V), Dammapeta (M) in Bhadradri-Kothagudem on 25.8.2018, (ii) at Zilla Parishad High School, Village Manchukonda, Raghunadhapalem in Khammam on 29.8.2018 and (iii) at Agriculture Market committee, Garla (V&M) in Mehabubabad on 6.9.2018 as per the provisions of EIA Notification, 2006.

The PP informed that all the issues raised during the Public Consultation have been incorporated in the EIA/EMP report. Thereafter, the final EIA/EMP reports were submitted to the Ministry for environmentalclearance. The main issues raised during public hearing are – implement safety measures in blasting operations & use latest technology in carry blasting operations, dust control measures, implement the 1 of 70 ACT and PESA Act to tribes, pattas to tribes for their cultivated lands, compensation for crops, proper land survey because revenue records are having mistakes, tribes are not getting proper information, Bayyaram tank to made as reservoir, employments to the land losers, provide skill development and education to children, etc. The project proponent clarified all the queries/issues pertaining to them. Majority expressed happiness over the implementation of the project.

The various environmental aspects covering catchment area, submergence area and project influence area, i.e. area within 10 km radius from main project components (including canal network and gross command area) have been considered. The baseline data (monsoon season – September, 2017, winter season – January, 2018 and summer season – April, 2018) has been collected covering Physico-chemical aspects, biological aspects and socio-economic aspects. Three (3) 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 project proponent informed that at the preliminary survey i.e. at TOR stage, the tentative figures in land requirements have been presented/ projected. While collecting the data & conducting the study, the figures have been firmed-up and the exact land requirements have been projected in EIA/EMP reports.

Break-up of Land details of Sita Rama Project

Head	At TOR stage (ha)	Study and analysis stage/ firmed-up at EIA/EMP stage (ha)
Total land	4,885	8,476.84
Forest land	1,930	1,531.06
Private land	2,955	4,818.15
Govt./Revenue land	--	2,127.63

The salient features of the project in the EIA/EMP reports are as under:

i. The R&R Plan – Right to fair Compensation and Transparency in land Acquisition, Rehabilitation and resettlement Act, 2013 and modified Telangana Act, 2016 for Government lands and encroachment land shall be followed for project affected families (PAFs). An amount of Rs. 98690 lakhs have been earmarked for this purpose.
ii. Local Area development Plan has been proposed – under this up-gradation of educational facilities in 40 primary schools, improvement of public health facilities, improvement of drinking water facilities, construction of community toilets and development of Industrial Training Institute etc. have been proposed. An amount of Rs. 6895 lakhs have been earmarked for this purpose.
iii. The project is likely to generate 3,46,443 m^3 of muck due to excavation, out of which 1,21,255 m^3 of muck will be utilized for various project components (all along the canals and at the entry & exist points of the tunnel and either side of the canal) and remaining 2,25,188m^3 will be dumped in 2 designated dumping sites covering an area of 13 ha. The sites will be rejuvenated using biological measures and afforestation with suitable local species. An amount of Rs.2.30 crores are allocated for the purpose.
iv. The compensatory afforestation programme will be taken-up in 3062.12 ha of degraded forest land which is double the forest land diverted for the project. An amount of Rs.58.47 crores are allocated for the purpose.
v. The Biodiversity Conservation and Management Plan have been proposed in consultation with State Forest Department. An amount of Rs.8.95 crores are allocated for the purpose.
vi. About 257.1154 ha of area in Manuguru Forest Division and 185.8437 ha of area in Paloncha Forest Division is falling in ESZ of Kinnerasani Wildlife Sanctuary. Some important measures stipulated in NBWL clearance vide letter No. 6-26/2018 WL dated 18.4.2018 are as follows:

    a) Provide water from the pipeline passing through wildlife area for filling-up percolation tanks and saucer pits and locations indicated by Forest department.
    b) Works shall be carried-out manually without disturbing flora and fauna.

c) Debris due to excavation of the work shall be transported out of ESZ area on a daily basis.
d) User agency shall construct masonry pillars to demarcate the proposed area at every 25 m interval.
e) Material for carrying-out the proposed works shall be kept outside the Tiger Reserve only.
f) An amount of Rs.118.216 lakhs are allocated for mitigation measures to minimize the impact on wildlife of the area.
g) Green belt will be developed around various appurtenances of the project, project colony etc. is proposed with local plant species (fruit, ornamental, shade trees, shrubs, climbers etc.) is proposed about 50 ha of area. A grant of Rs.50.00 lakhs has been allocated for this purpose.

Project includes four lifts in series. The calculations made for economicfeasibility for the individual lifts and also for the project as a whole were made available after the EAC meeting.

For running the lifts, the power requirement will be high. However, 11 kV main transmission line is passing near the project, so power supply will be arranged from this TL.

The water availability details for the entire project are as below:

S.No.	Source of Water	Water available (TMC)
1.	Diversion of water from Godavari River	69.5
2.	Use of ground water due to irrigation recharge and to be used conjunctively	5.35
3.	**Total**	74.85
4.	Less due to supply of drinking water	1.05
5.	Less due to evaporation loss	4.09
6.	**Net Total**	69.71 (say 70)

After detailed deliberations as per the presentation including the fact presented by the PP, **the Committee deferred the proposal for want of the following additional information:**

1. Clearances on hydrology aspects and inter-state matter to be obtained from CWC.

Item No. 19.5 Majhgaon Medium Irrigation project (CCA: 9,000 ha), Panna district, Madhya Pradesh, Water Resource Department, Madhya Pradesh-reg. reconsideration of EC File No. J-12011/4/2017-IA-I(R)and Proposal No.IA/MP/RIV/61490/2017

The Project Proponent and the Consultant, Enviro Infra Solutions Pvt. Ltd., Ghaziabad, made a detailed presentation on the project and *inter alia* provided the following:

The project envisages construction of composite dam on Bada Nala (a tributary of Ken River) near Narayanchua village to provide irrigation facility in Panna District of Madhya Pradesh. It is proposed to construct 3 dams on Bada Nala,viz. 8261.50 m long composite dam comprising of 1123 m (left bank) and 3237 m long (right bank) earthen dam with a maximum height of 36.35 m across Bada Nala & two (2) saddle dams of length 2171.5 m and 1620 m also to be constructed. The Culturable Command Area (CCA) is 9,900 ha and irrigation facility proposed in Rabi Season is 9900 ha, and in Kharif Season it is 2700 ha, benefitting 34 villages in Ajaigarh tehsil.The total land requirement for project is 1523.70 ha. The total submergence area is 1489.39 ha out of which 426.763 ha is forestland; 166.197 ha is Government land and private land is 930.80 ha. The Stage-I FC clearance for diversion of 426.73 ha forest land has been granted vide letter No. F.8-37/2017-FC dated 3.5.2018. About 8 villages (partially) consisting of about 1696 families are likely to be affected due to this project. The total estimated cost of the project is about Rs. 358.99 Crores.

The CCA of the project is 9,900 ha and it is a Category-B project. The Panna Gangau Sanctuary and Ken Gharriyal Sanctuary are situated at a distance of 8.25 km and 5.25 km respectively. Therefore, the general conditions are applicable to this project. Hence, project was submitted at Central level. The project was granted scoping/TOR clearance on 16.5.2017 by Ministry of Environment, Forest & Climate Change.

The total catchment area of the river is 28,058 Sq.km Out of which 24,472 Sq.km is in Madhya Pradesh and remaining 3,586 is in Uttar Pradesh. The gross storage is 112.62 MCM and the live storage is 105.23 MCM. The total volumetric requirement of water during Kharif and Rabi Seasons shall be 15.08 MCM and 27.38 MCM respectively. The Micro irrigation by sprinkler shall be adopted in 100% command area.

The project was earlier considered by EAC in its meeting held on 27.7.2018. After detailed deliberations, and considering all the facts of the project as presented by the PP, EAC sought additional information/ clarifications on one season baseline data and EIA/EMP revision, environmental matrix provided in the EMP be revisited & revised, information on fish species from secondary sources be collected, plan for conjunctive use of water in the project area, CAD plan be revised and accordingly the EIA/EMP report be revised and submitted.

The PP submitted the additional information and the same has been presented before the EAC during meeting on 26.10.2018.The PP intimated that

- One season baseline data has been collected and included in Section 3.5.6 (ambient air), 3.5.7 (noise levels), 3.6.1 (soil), 3.7.2 (ground water and 3.7.3 (surface water). The resultant pollution load has been discussed in mitigation measures in Chapter-4 of EIA report. The capital budget under different heads is also provided.
- Modified Leopold Matrix during construction/operation has been provided in Section 4.8 of EIA.

- Information on fish species has been included in Section 3.9.9.1 of EIA and Chapter-9 of EMP. About 22 fish species have been listed in report which have been collected from secondary sources.
- CAD plan has been revised based on the actual ground reality and accordingly the EIA/EMP report has been revised. Conjunctive use of ground water is suggested in about 150 ha area by developing 50 tube wells. A revised CAD plan with revised financial allocation of 7535.08 lakhs has been provided.
- Major positive and negative environmental impacts of the project have been provided.
- Details of revised EMP costamounting to Rs.12349 lakhs with break-up capital and recurring cost has been provided.

After detailed deliberations as per the presentation including the facts presented by the PP, the Committee sought the following additional information and **accordingly the proposal has been deferred.**It shall be considered in the subsequent EAC meeting:

1. The environmental matricesfor both construction and operation phases was presented. The committee opined that the PP shall relook at the matrices and update them. For each activity, weights should be assigned carefully. Updated matrices shall be submitted to the Ministry for reconsideration in the EAC.
2. One season data collected by the PP is from March-May, 2018 and is prior to the EAC meeting wherein the EAC sought some additional information. The PP must explain why such data was furnished along with the proof of collection of such data.

Item No. 19.6 Tel Integrated Multipurpose Project at Nabarangpur, Orissa by M/s Executive Engineer Kalahandi Investigation Division- reg. Fresh ToR
File No. J-12011/24/2018-IA-I (R) Proposal No. IA/OR/RIV/81538/2018

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

The project envisages construction of 87 m high and 3682 m long earthen dam across Tel river (tributary of Mahanadi river) near village Karlaparah in Nabarangpur District of Odisha to provide irrigation facility to 9903 ha of command area and to generate hydropower with an installed capacity of 18 MW.The project involves a large storage dam, a diversion structure, two new irrigation command areas and a command area for stabilization. A main canal of length 23.395 km will off take from the barrage at Phatki with FSL 324.5 m and will cross over the Banjari Nallah through an aqueduct.The gross command area is 15,474 ha. The Interstate boundary of Tel Ayacut (project site) is Tel River which is 1.5 km from the boundary of Chhattisgarh. Total land requirement is about 637.55 ha and entire land is reserve forest. Total submergence area is about 1330 ha. The water from reservoir will be carried through surface powerhouse 1 and 2 located on the right bank of river near village Phatki.

This is a category-B project. The project is located near the boundary of Chhattisgarh and general conditions are applicable. Therefore, the project has submitted for grant of TOR at the central Level. The project has been considered by EAC as per EIA Notification, 2006 as Category-A project.

The project was considered by EAC and after detailed deliberations and considering all the facts of the project as presented by the PP, **the EAC recommended for grant of scoping/ToR clearance for the proposed project** with the following additional conditions along with the standard ToR:

i. Three season's data should be collected for the entire project.
ii. A detailed irrigation management plan should be worked out so that at least 10% of the CCA would be covered by micro irrigation scheme.
iii. The issue of conjunctive irrigation may also be considered in the project right from the formulation stage.
iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provision of Right to Fair Compensation and Transparency in Land acquisition, Rehabilitation and Resettlement Act, 2013.
v. The project involves about 637.55 ha of forest land. Forest clearance should be obtained as per the prevailing norms of FC Act, 1980.
vi. The proposed cropping pattern includes a small component of sugarcane. This may not work out to be a practical preposition from the view point of irrigation management as the canal system will be required to be run during summer season also for such a small sugarcane area. It would be better to delete the same and make the project as eight monthly one.
vii. The PPshould explore conjunctive use of water.
viii. The economic viability calculations including the cost apportionment (for power and irrigation, etc.) be given.

Item No. 19.7 Sunni Dam HEP 1355 MW) project in Mandi & Shimla District of Himachal Pradesh by Satluj Jal Vidyut Nigam Limited-reg. Amendment of ToR.
File No. J-12011/14/2017-IA-I (R) andProposal No. IA/HP/RIV/63789/2017

M/s SJVN Ltd. (PP) submitted online application to MoEF&CC on 17.09.2018 requesting for amendment in ToR. An EDS was raised on 3.10.2018, which was duly replied by PP on 10.10.2018 and the proposal was considered by the EAC on 26.10.2018.

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

The proposed Sunni Dam HEP is a run- of-the river project envisaged to harness the hydro potential of river Satluj in Himachal Pradesh near village Khaira, tehsil Sunni, district Shimla, Longitude 77^{0}12'39"E and Latitude 31^{0}14'53"N. The project envisages construction of a concrete gravity dam of 71 m high above river bed level across river Satluj. The dam toe underground

power house is proposed near village Nanj, tehsil Karsog, district Mandi on the right bank of river Satluj.

Initially the proposed project was envisaged for 352 MW with FRL at 710 m and was appraised by the EAC (RVP) in its meeting held on 31.05.2017 and Scoping clearance/ToR was granted to Sunni Dam HEP vide letter No. J-12011/14/2017-IA-I dated 29.06.2017. Subsequently, PP awarded the EIA/EMP Study to Voyants Solutions Pvt. Limited and the same is now under preparation.

Central Electricity Authority (CEA) in the first consultation meeting held on 17.08.2017 desired to review the power potential of the project. Subsequently CEA revised the power potential of the project to 382 (292 MW+90 MW) vide its letter no. N.R. 201/53/2018-HPA-I/488-490 dated 18.06.2018. Accordingly, the revised installed capacity of the project became382 MW (5x73 MW + 1x17 MW). The water will be restored back in Satluj river at El 651.20 m through twin tailrace tunnel of size 10.5 m diameter and 9.0 m diameter and length of about 280 m.The gross head and rated head for turbine will be 59.97 m and 57.85 m, respectively. The design discharge will be 555.68 cumecs from the main plant and 171.27 cumecs from auxiliary plant for each turbine.

PP also informed that FRL of project has been revised from EL 710 m to EL 712 m with no change in the dam height of 71 m. Due to rise in FRL, the total land requirement of the project has increased from 319.09 ha to 442.2064 ha. The forestland requirement has increased from 262.52 ha to 389.009 ha. The case for diversion of forestland for 389.01 ha, for revised 382 MW IC, has been submitted to HP Forest Department on 27.12.2017. There is no change in the previously approved e-flow.

The changes in salient features are provided the table below:

Parameters	**For 355 MW**		**For 382 MW**	
	Main Plant	**Auxiliary Plant**	**Main Plant**	**Auxiliary Plant**
FRL	EL 710.00 m		EL 712.00 m	
MDDL	EL 707.00 m		EL 709.50 m	
IC (MW)	4x67.4	1x67.4 + 1x18	4x73	1x73 +1x17
Design Discharge (Cumecs)	541.6	171.6	555.68	171.27
Design Energy(MU)	925.46	373.53	987.84	393.93
Reservoir Length (km)	18		21.7	
Forestland	262.52		389.009	
Private Land	56.58		53.1974	
Total Land	**319.09**		**442.2064**	

After brief deliberations, **EAC recommended for amendment in ToR/Scoping clearance** for Sunni Dam HEP due to increase in installed capacity from 355 MW to 382 MW and subsequent increase in FRL and land requirement.

Item No. 19.8 Parbati (Rinsi) Major Project at Village- Fatehpur, Gram Panchayat Fatehpur, Tehsil Narsinghgarh, DistrictRajgarh, Madhya Pradesh by M/s Water Resources Department Government of M.P- reg. Amendment of ToR
File No. J-12011/1/2018-IA.1(R) andProposal No. IA/MP/RIV/71975/2017

The project proponent made a detailed presentation of the project and *inter-alia* provided the following information:

The Parbati (Rinsi) major Irrigation project envisages construction of 22.70 m high and 1350 m long concrete barrage across Parbati river (tributary of River Chambal) near village Rinsi in Rajgarh district of Madhya Pradesh to store 171.47 MCM of water to irrigate 48,663 ha of command area. The gross storage is 171.47 MCM and the live storage is 162.21 MCM of water. The gross command area is 54,000 ha. The total submergence is about 3719.13 ha (forestland is 38.50 ha, private land is 2434.42 ha and revenue land is 1246.21 ha). The catchment area of the project is 3,302 km^2. The project ensures the use of micro-irrigation techniques by the users. About 13 villages are coming under submergence and 864 families are likely to be affected due to the proposed scheme. Total cost of the project is Rs. 1732.17 crores.

The project was accorded scoping/TOR clearance on 26.2.2018.

The project proponent submitted an online application on 3.10.2018 requesting the Ministry for an amendment in ToR to keep the project components outside the boundary of the protected area and thereby shifting the dam site to upstream by about 2 km. The PP informed the committee that due to shift in the dam site, catchment area and other project features have changed, submergence area is reduced and now there is no forestland involved in the project. The gross command area (GCA) and culturable command area (CCA) have been changed.The comparative statement with reference to earlier proposal and revised proposal are presented below:

S.No.	Details	Original	Revised
1	Dam height (m)	22.70	23.40
2	Gross Command Area (ha)	54,000	70,000
3	Culturable Command Area (ha)	48,663	48,000
4	Catchment Area (km^2)	3302	3150
5	Gross Storage (MCM)	171.47	172.54
6	Live Storage (MCM)	162.21	162.62
7	Total submergence area (ha)	3719.13	3494.64
8	Private land (ha)	2434.42	2290.57
9	Revenue land (ha)	1246.21	1204.07
10	Forest land (ha)	38.50	Nil
11	Villages under submergence (Nos.)	13	18
12	Total families affected (Nos.)	864	1125

13	Total cost of the project (Rs. in crore)	1732.17	1815.54

The PP also mentioned that 2 seasons data have been collected (i.e. pre-monsoon and post-monsoon) by the MP State Pollution Control Board. Monsoon season has been collected by EIA Consultant (R.S. Envirolink Technologies Pvt. Ltd).

After detailed deliberations and considering all the facts of the project as presented by the PP, the EAC recommended the project for **amendment of ToR/Scoping clearance** with a total GCA of 70,000 ha and CCA of 48,000 ha. EAC also agreed for using the data already collected by the project proponent for the preparation of EIA/EMP report.

Item No. 19.9 Any other items with the permission of the Chair

As there being no agenda item left, the meeting ended with a vote of thanks to the Chair.

(Dr. S. Kerketta)
Member Secretary

(Dr. S.K. Jain)
Chairman

Annexure I

Site visit Report of Kosi-Mechi Intrastate Link Project (Construction of canal-76.20 km) on the existing barrage beyond existing Eastern Kosi Main Canal (41.30 km) for irrigation purpose under Kosi-Mechi Intrastate Link Project in the State of Bihar

In the 16th meeting of the re-constituted Expert Appraisal Committee for River Valley & Hydroelectric Projects was held on 27.07.2018. In the meeting, it was decided that a 4 Member Sub-Committee shall visit the proposed project site and to submit a report as per the Office Order for appraisal in the next EAC meeting. The Sub Committee was constituted vide Ministry letter No. J-12011/22/2016-IA-I(R) dated 20.09.2018 having the following Expert Members:

1.	Dr. D.M. More	- Chairman
2.	Prof. S.R. Yadav	- Member
3.	Dr. A.K. Sahoo	- Member
4.	Dr. S. Kerketta	- Member Secretary

The Sub Committee visited the area around Kosi-Mechi Intrastate Link Project in Bihar on 28th and 29th September, 2018. Although, Prof. S.R. Yadav could not make it up with the team due to preoccupation, the other members visited the area.

All the concerned officers (Assistant Engineer to Chief Engineer) from the field were present during the site visit.

Background of the Project:

The river Kosi is an international river. It originates in Tibet and flows down through Nepal and India (plains of North Bihar). Kosi is a mighty river with a catchment area around 62,000 km^2 and peak flood of the order of 9.5 lac cusecs up to Birpur barrage. It is a snow fed river and meanders through Himalayan mountains in its upper reaches and carries lot of sediments during floods. To overcome the problems of shifting of river course and heavy sediment loads during floods, causing suffering to the people of Bihar, it was decided by an agreement of 1954 between Govt. of Nepal and India to undertake construction of Kosi Project. The project includes 1,150 m long barrage at Hanumannagar town close to Indo-Nepal border, head works for two canals viz. Eastern Kosi Main Canal (EKMC) of length 41.3 km for irrigating 6.13 lac ha area in India and Western Kosi main canal (WKMC) for Nepal. The designed carrying capacity of EKMC is 425 cumecs and that of WKMC 241 cumecs. The barrage is located in Nepal near Hanumannagar and the nearest town from India is Birpur.

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The objective of extension of EKMC beyond 41.3 km and up to river Mechi, a tributary to Mahananda river is mainly to provide irrigation benefits to the water scarce Mahananda basin area in the districts of Araria, Purnia, Katihar and Kishanganj during Kharif season only depending upon the availability of water in Hanumannagar barrage. Right now it is a run of the river scheme as there is no backup storage, but in future it has been planned to support this project through 'Kosi High Dam' on upstream in Nepal, likely to take concrete shape in the years to come. The proposed Kosi-Mechi link canal of length 76.2 km (i.e. up to 117.5 km) plans to irrigate about 2.15 lac ha (out of the total of 4.4 lac ha of Mahananda river basin) area of Mahananda river basin. The interstate link scheme transfers part of surplus water of Kosi basin to Mahananda basin. The river Mechi is a tributary of river Mahananda, which again a tributary to river Kosi. The river Kosi joins river Ganga further downstream. The extended portion of Kosi-Mechi canal terminates in to river Mechi at 117.5 km. and thus Mechi acts as a tail escape channel for the Kosi Mechi Project. The waters of Kosi link with Mechi and therefore the project is described as an interstate link project.

The construction of Kosi-Mechi interstate link project involves mainly two components viz. remodeling of the old canal up to 41.3 km and construction of extended Kosi main canal including the distribution network up to 117.50 km. The present carrying capacity of the existing canal is around 425 cumecs that needs to be enhanced to 573 cumecs to cater to the irrigation requirement of additional 2.15 lac ha area during Kharif season only. The annual yield at 75% dependability at Hanumannagar barrage is 45,374 MCM. The water requirement of the existing EKMC is 5741 MCM and that for new command is 2,050 MCM. The barrage consists of 76 bays of 30 feet each in addition to 5 bays of 30 feet each for under sluices and one fish ladder. The crest of the under sluices is kept 3 feet lower than that of the weir. The basic purpose of the barrage is to raise the pond level to feed the irrigation canals on both the banks and generate hydro-electric power on EKMC with power generation capacity of 19.2 MW (water head around 13 feet). The construction of the barrage was done in a period of five years i.e. from 1959 to 1963. The Kosi-Mechi interstate link canal off-takes from left head regulator of existing Hanumannagar barrage. In its initial reach, the link canal will utilize entire length of existing EKMC after its re-modeling to provide adequate water supply to the new command i.e. (4.4+2.15) 6.55 lac ha. The extended canal over a length of 76.2 km is to undertake large numbers of structures of the kind siphon aqueduct, canal siphon, HR, CR, escape, culvert, bridges, settling tank and so on.

The Kosi-Mechi Intrastate link project is proposed on River Kosi in Supaul and Araria Districts of Bihar by Water Resources Department, Government of Bihar. The Eastern Kosi-Mechi Canal (EKMC) is an existing canal of 41.30 km long having headworks (barrage) at Hanuman Nagar

(Birpur), Nepal passing through Supaul and Araria Districts of Bihar providing irrigation facility to the Districts of Supaul, Saharsa, Madhepura and partly in the Districts of Purnia, Araria and Katihar. The present proposal is an extension of EKMC from RD 41.30 km up-to river Mechi, i.e. up-to RD 117.50 km which will connect river Kosi to river Mechi (a tributary of Mahananda river). The escape canal of EKMC meets river Parman (originates from Nepal) beyond RD 41.30 km. There will be an aqueduct to be constructed to route the water into the canal system.

The proposed gross command area of the project and culturable command area are 2.75 lac ha and 2,14,812 ha (CCA 2.15 lacha), respectively spread over in the districts of Araria, Kishanganj, Purnia and Katihar in the state of Bihar. The Kosi-Mechi Link Project envisages diversion of part of surplus water of Kosi River from existing Hanuman Nagar barrage to Mahananda basin. Main components of the project involve remodeling of existing EKMC up-to 41.30 km i.e. lining of the existing canal and construction of a new canal from RD 41.30 km to 117.50 km long. The FSL of link canal at head is 74.371 m and at tail end is 54.238 m.

There is no acquisition of any forestland in the canal alignment. This canal project at RD 3.66 km is having a hydroelectric project component of 19.20 MW capacity. The total land requirement is about 1,396.81 ha. No National Park, Wildlife Sanctuary, Eco-sensitive areas/zones, etc. are present within 10 km radius enroute of the proposed canal. The total project cost is about Rs. 4,900/- Crores.

Environmental flows have been calculated based on 90% dependable year (1992-93). The total monsoon flow is estimated to be 33,281.27 MCM and the 30% monsoon flow has been calculated to be 9,985 MCM.

Following components of the project were visited on 29.09.2018:

1. The Kosi barrage and fish ladder
2. The existing eastern Kosi canal.
3. The hydro power station at RD 3.6 km on EKMC.
4. The initial portion the proposed canal beyond RD 41.3 km of extended Kosi main canal i.e. where it joins Parman river.
5. The command of the existing and the proposed eastern Kosi-Mechi main canal.
6. The cropping pattern in the command.
7. The breached portion (2008) of the Kosi left bank on upstream of barrage.

Observations and suggestion of the Sub-committee:

1. Fisheries activities were observed in the proposed canal just downstream of the Lock gate. Indigenous fish species were collected through different fishing gears as shown in the pictures. This indicates livelihood of poor fishermen is dependent on this canal. Further, during site visit, it was noticed that freshwater prawn form major catch in the upstream of the canal which has not been reported in the EIA report submitted for EC clearance consideration. During market survey, it was recorded that migratory fish species such as *Tor* sp. (Mahseer) distant migrant, *Eutropiichthysvacha* local migrant and other commercial important fish species such as *Bagarius* Sp. list were not mentioned.

Local trap for fish catch d/s of canal

Cast net operation in downstream of canal

Prawn catch in the upstream of EK Canal	*Freshwater prawn a major catch*
	
Bagarius sp. an important commercial catch	*E. Vachha and Wallago attau in total fish catch*
	
Local trap used for fishing in canal	*Tor* sp.: a migrant fish species in the Kosi river

2. The discharging capacity at head of the existing EKMC is around 15,000 cusecs or so. On the day of visit, the canal was carrying a discharge of around 9,000 cusecs. The Western Kosi Main Canal for Nepal was also flowing. The Kosi river was discharging around 52,000 cusecs of water downstream of barrage. The powerhouse on the left bank canal was not functioning on account of some administrative reasons.
3. The command area was seen as a flat and plain terrain. The main crop was seen as paddy. Horticultural crops like mango, citrus, banana, etc. were also seen. The crops like maize, vegetables, pulses and jute were seen grown at places.
4. The existing canal is operated for both Kharif and Rabi seasons. The crops grown in therabi season are wheat, pulses, oilseeds, maize,

vegetables like potato, etc. The bamboo farming was seen to be an attractive option.

5. The eastern Kosi main canal, even in the extended portion up to RD 117.5 km is going to be a contour canal passing through a rich agricultural land. It has to have many cross drainage works and a large network of branch canals, distributaries, minors, sub minors and so on.The Sub-committee had a glimpse of the terrain of the initial portion of the extended canal i.e. beyond RD 41.3 km.
6. There appears to be no problem from the design and construction point of view in taking up of the works of canal system in the extended portion. The activity seems to be conventional one.
7. While touring the existing eastern Kosi main canal from RD 41.3 km and upward, it was seen that, the canal negotiates the natural streams, rivulets, etc. mainly through canal siphons. There was no siphon aqueduct over the entire 41.3 km length. Culverts were also rarely seen. There were escapes in the vicinity of siphons mostly on upstream side but at some places escapes were seen located on downstream of siphon.
8. The existing canal is unlined one and passes through soft soil (may be sandy silt) mostly in cutting. The excavated stuff is dumped on both sides of the canal just adjacent. The carrying capacity of the canal is to be increased from 425 cumecs to 573 cumecs in the head reaches. At RD 41.3 km, carrying capacity is to be enhanced to 235 cumecs. From the information given in the booklet and the discussions with the field officers, it was learnt that the capacity was proposed to be enhanced by widening the canal section. For such a venture, the problems to be faced at full cutting, partial cutting and full banking canal sections will be different. It furthertranspired that the issue was going to be outsourced to a consultant.
9. By providing lining to the existing canal section over the entire length, the carrying capacity of the canal section could be enhanced sizably. If required,FSD of the canal could be raised by raising the bank work suitably. For sections in cutting , there may not be any problem. For better operation of the canal, the FSD could be regulated through the intervention of cross regulators. The extended canal for its entire length of 76.2 km is going to be lined one.
10. The critical issue will be, of increasing the carrying capacities of the existing siphon conduits. This has to be dealt with very carefully.
11. It could be advisable to observe the performance of the remodeled section with various alternatives on a hydraulic model.
12. The excavated muck from the canal section is dumped on either sides in a haphazard way, is the normal practice everywhere. A proper shape to the spoil banks/ landscaping improves the surroundings and environment. This is to be taken care of.
13. The service road of the canal was black topped over the entire length and maintained properly. This was rarely seen. The up-keeping of the canal

portion was not to the expected level. There were bushes and shrubs seen grown at rampant on the canal sides.

14. The average rainfall in the area is around 1,500 mm and therefore, the proposed irrigation during kharif is going to remain as protective irrigation only. There is no dearth of groundwater. There are shallow bamboo tube wells (of 10 to 15 feet) and groundwater could be utilized for rabi and summer crops. The river Kosi carries sizable discharge even during summer season. The existing irrigation (up to RD 41.3 km) is practiced for Kharif and rabi seasons. It was not understood as to why they have put ban on Rabi irrigation for the extended command. Alternatively small village tanks, farm ponds could be developed in the entire command of the EKMC and Kosi-Mechi canal and decentralized storages could be created in the kharif season with canal water. This stored water could be used for doing irrigation in rabi and hot weather seasons with micro irrigation method. There is ample groundwater at the command of the farmers. The area at places was seen water logged. This will take care of water requirement of perennial crops like banana, sugarcane and so on. With this background in the days to come the system could be converted to perennial one.
15. In the extended command, about 20% area has been proposed to be developed under micro irrigation system. It is basically for enhancing the productivity and quality of the agri-produce, in addition, it saves plenty of water. More and more area can be planned to be brought under micro irrigation in the days to come and water could be saved. The water stored in the secondary storages in the command, use of groundwater and also the water saved in micro irrigation could help to transform the entire command into a perennial farming. Additional area from the Mahananda basin (left over as un-irrigated) could also be brought under irrigation with the help of the increased water availability as explained above. The land holding in this area is very small and therefore, it will be very much necessary to support farmers with irrigation facility.
16. The project involves remodeling of existing EKMC upto R.D. 41.30 km and construction of new canal upto RD 117.50 km. The discharge of canal will increase from present 425 cumecs to 573 cumecs. This will also involve remodeling of existing structure like canal siphons and head regulators of the branch canal, distributaries with cross regulators and escapes. PP (WRD, Govt. of Bihar) shall submit their programme to undertake such remodeling work.
17. The maintenance of canal needs improvement. Particular attention should immediately be given in head reaches where the canal needs proper re-sectioning as well as proper dumping of excavated silt with landscaping wherever.
18. Water quality particularly variation of water temp.,DO, pH, TS and alkalinity, Phosphate, Nitrate, Silicates and Carbon (soil) at the site of

joining of Kosi with Mechi (Upstream and downstream of joining point). E.coli data to be revisited.

19. Fish species available upstream and downstream of joining point in Mechi river.
20. Possibilityof fish pass in the Kosi canal (if possible) for efficient migration of Tor to be explored.
21. Inventorization of fish species available in the Kosi canal to be revisited.

26/10/2018

(S. KERKETTA)

26.10.18

(A.K. SAHOO)

(D.M. MORE)

LIST OF MEMBERS

19th MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR RIVER VALLEY & HYDROELECTRIC PROJECTS

DATE : **26th October, 2018**

TIME : **10:30 am onwards**

VENUE : **TEESTA HALL, INDIRA PARYAVARAN BHAWAN,NEW DELHI**

Sl.No.	Name of Member	Signature
1.	Prof. Sharad Kumar Jain, Chairman	
2.	Shri. T. P. Singh Member	
3.	Shri. Sharvan Kumar, Member	26.10.18
4.	Shri N. N. Rai, Member	
5.	Dr. J.A.Johnson, Member	
6.	Dr. AK Sahoo, Member	26.10.18
7.	Dr. Vijay Kumar, Member	26/X/18
8.	Prof. GovindChakrapani, Member	G. J. Chakrapani (attended after 2.00 PM) 26/10/18
9.	Dr. ChetanPandit, Member	
10.	Dr. DinkarMadhavrao More, Member	
11.	Prof. R.K. Kohli, Member	26/10/18
12.	Prof. S.R. Yadav, Member	
13.	Dr. Jai Prakash Shukla, Member	
14.	Dr. Poonam Kumria, Member	
15.	Dr. Kerketta, Member Secretary Director (IA-1)	26.10.2018

Subject: **Re: Draft 19th EAC for RVP held on 26.10.2018 - reg.**
To: Dr S Kerketta <s.kerketta66@gov.in>

Date: 11/11/18 07:23 PM
From: Sharad Jain <s_k_jain@yahoo.com>
Reply-To: Sharad Jain <s_k_jain@yahoo.com>

Final 19th MOM_26.10.2018.docx (76kB)

Dear Dr Kerketta,

I am sending the approve minutes of the 19th meeting of EAC.

Regards,

Sharad Jain
Chairman EAC (RVH)

On Sunday, 11 November, 2018, 7:05:52 PM IST, Dr S Kerketta <s.kerketta66@gov.in> wrote:

Sir,

MoM has been addressed duly. It was corrected, but do not know how the uncorrected has been sent.

regards,

Kerketta

On 11/11/18 03:26 PM, **Sharad Jain** <s_k_jain@yahoo.com> wrote:

> Two comments have not yet been addressed.
> Pls see the attached.
>
> Regards,
>
> Sharad Jain
> NIH Roorkee