

Minutes of the 13th Meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects held on 27.04.2018 at Narmada Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-3.

The 13th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 27.04.2018 with the Chairmanship Dr. S.K. Jain in the Ministry of Environment, Forest & Climate Change at Narmada Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi. The following members were present:

- | | | | |
|-----|--------------------------|---|-----------------------|
| 1. | Dr. S.K. Jain | - | Chairman |
| 2. | Shri Sharvan Kumar | - | Representative of CEA |
| 3. | Dr. J.A. Johnson | - | Representative of WII |
| 4. | Shri N.N. Rai | - | Representative of CWC |
| 5. | Dr. S.R. Yadav | - | Member |
| 6. | Dr. D.M. More | - | Member |
| 7. | Dr. J.P. Shukla | - | Member |
| 8. | Dr. T.P. Singh | - | Member |
| 9. | Dr. (Mrs.) Poonam Kumria | - | Member |
| 10. | Dr. S. Kerketta | - | Member Secretary |

Dr. A.K. Sahoo, Shri Chetan Pandit, Dr. R. Vasudeva, Dr. Vijay Kumar and Dr. Govind Chakrapani could not present due to pre-occupation. The deliberations held and the decisions taken are as under:

Item No. 13.0 Confirmation of minutes of 12th EAC meeting.

The Minutes of the 12th EAC (River Valley & Hydroelectric Projects) meeting held on 27.03.2018 were confirmed.

Item No. 13.1 CIA and CCS of Beas River Basin – reconsideration and presentation of Draft Final Report before the EAC

The Consultant, IRSET, Gurgaon has presented the draft Final report of CIA and CCS of Beas River Basin and *inter-alia* provided the following:

The CIA&CCS of Beas basin study's report was presented with special focus on the issues of post EAC's visit to the study area covering the issues raised during the visit. Site visit was conducted during April 12-14, 2018 to Parbati valley, Beas river up to Solang valley including Allain and Duhangan tributaries, Sainj valley and Tirthan valley. Detailed discussions were held during the visit based on the observations made by the Sub-committee of the EAC and following major issues were flagged:

- 1) Protected areas in the basin with status of declaration of ESZ along with marking on the map
- 2) Environment flow assessment for all the projects
- 3) Justification for projects recommended to be dropped

Consultant has discussed each point in detailed and have informed the Committee that they have updated the status of ESZ for all the protected areas in the Beas basin report. There are 10 Wildlife Sanctuaries and 3 National Parks in the basin. Indrakilla National Park ESZ has been declared by final notification, whereas remaining two national parks and 10 ESZ are in draft notification stage as listed below:

S. No.	Protected Areas	Area km²	Status of ESZ Notification
Wildlife Sanctuaries			
1	Dhauladhar Wildlife Sanctuary	982.86	Draft Notification
2	Kanawar Wildlife Sanctuary	107.29	Draft Notification
3	Khokhan Wildlife Sanctuary	14.94	Draft Notification
4	Manali Wildlife Sanctuary	29.00	Draft Notification
5	Sainj Wildlife Sanctuary	90.00	Draft Notification
6	Pong Dam Lake Wildlife Sanctuary	207.59	Draft Notification
7	Tirthan Wildlife Sanctuary	61.00	Draft Notification
8	Shikari Devi Wildlife Sanctuary	29.94	Draft Notification
9	Nargu Wildlife Sanctuary	132.37	Draft Notification
10	Kais Wildlife Sanctuary	12.61	Draft Notification
National Parks			
11	Great Himalayan National Park Conservation Area (GHNPCA)	1615.40	Draft Notification
12	Khirganga National Park	710.00	Draft Notification
13	Indrakilla National Park	104.00	Final Notification

Environmental flow assessment has been discussed in detail. Consultant informed that there are 50 hydropower projects in the Beas river basin with installed capacity of more than 5 MW, out of which 18 projects have installed capacity of 25 MW or more. These 18 projects have been assessed for modelling study. Small projects (less than 25 MW IC) could not be subjected to modelling study and recommendations for these projects are made based on standard guidelines of EAC/MoEF&CC.

Out of 18 projects subjected to environmental flow assessment by habitat simulation and hydraulic modeling, 10 are already commissioned, 3 are under construction and 5 are under different stages of survey & investigations. Area downstream of Pong dam is outside the study area and Uhl II (Basi) is tailrace development of Uhl I without any additional diversion; therefore, no environmental flow is recommended for these projects. For each of the remaining 16 projects, based on modelling exercise, environmental flows have been recommended in the range of 20-25% in lean season; 15-30% in peak season and 15-25% in other seasons. EAC deliberated on the subject in detail, especially keeping in view that many of the projects are operational for a very long time and presently they are releasing EFs as per the state government norms of 15% of lean season average. EAC decided that the matter will be discussed with the state government before making recommendations.

Major recommendations of the report were also discussed in details.

1. Following four projects falling in protected areas, were recommended for dropping by EAC:

S. No.	Name of Project	Capacity (MW)	Developer	Status	Reasons for Dropping
1	Jobrie	12	Green Infra Limited	Under S&I	Located within Inderkilla National Park
2	Manalsu	21.9		Yet to be allotted	Located within Manali Wildlife Sanctuary

3	Bujling	20	Sai Engineering Foundation	Recently Allotted	Located within Dhauladhar Wildlife Sanctuary
4	Makori	20.8	Sai Engineering Foundation	Recently Allotted	Located within Dhauladhar Wildlife Sanctuary

2. Two proposed projects, viz. Palchan Bhang and Bhang HEPs, both of installed capacity of 9 MW are allotted in the same river reach. Palchan Bhang HEP levels are 2246m to 2035m and Bhang HEP levels are 2240m to 2104m. Due to conflicts in level only one project is possible. Therefore, it is recommended that state government may take a decision on which project to proceed with and sort out the matter with private developers.
3. A yet to be allotted 7 MW project named Seri Rawala, is proposed with diversion weirs on Seri and Rawala nallas at an altitude of about 3000 m. The area is characterized by moist alpine scrub and is very rich in biodiversity. The project is recommended for dropping. EAC discussed the matter and accepted the recommendation.
4. Consultant discussed another proposed project viz. Raison HEP (18 MW) located on main Beas river, upstream of Kullu, along the National Highway between Kullu and Manali. The stretch along with tributaries has several trout fishing sites. EAC flagged the matter for discussion with State Government.
5. Consultant informed that four projects, namely, Parbati (12 MW), Sharni (9.6 MW), Sarsadi (9.6 MW) and Sarsadi-II (9 MW) with total capacity of 40.20 MW are proposed on Parbati river in cascade. Projects are allotted and are under survey and investigation stage. Total length of Parbati river from confluence of Malana Nallah to confluence with Beas river is about 15 km, out which 13 km will be affected by these four projects. These projects are not meeting the EAC/MoEF&CC norm of at least one km free flowing stretch between two projects.

Parbati river is rich in fish fauna and trout is known to migrate upstream in Parbati river; Kasol is an important trout fishing site upstream of these projects. Fish fauna of the sub-basin is comprised of 20 species comprised mainly of *Amblyceps mangois*, *Sperata aor*, *Botia dario*, *Crossocheilus latius*, *Garra gotyla*, *Labeo pangusia*, *Puntius chola*, *Schizothorax richardsonii* and *Systomus sarana*. The consultant recommended that all four projects should be dropped to keep this important stretch free from development. EAC deliberated the issue in detail and discussed and flagged it for further discussion.

6. The proposed Nakthan HE project is located on the boundary of Khirganga National Park. Draft notification declaring ESZ of Great Himalayan National Park Conservation Area (Khirganga National Park is a part) was issued on 25th July 2016; the matter was discussed in Expert Committee Meeting held on 27th February 2017 where it was recommended for finalization subject to certain corrections in coordinates. The project falls within the ESZ as it is just touching the boundary of the National Park, ESZ is about 1.8 km wide on this part of the park. Entire catchment of Nakthan constitutes Khirganga National

Park and is home to important wildlife and number of RET plant species. At present the matter related to diversion of Tosh Nalla for Nakhtan is sub-judice and EAC has taken a note of it during the discussion in 91st meeting held on 8-9th February 2016. EAC deferred the appraisal till the time the matter is settled in court. It is also recommended that whenever the project is considered by EAC for appraisal after court order, it will be ensured that all the project components and pondage, up to the tip of submergence should be outside the ESZ of Great Himalayan National Park Conservation Area. A wildlife management plan should be prepared and approved by Chief Wildlife Warden for the construction of the project ensuring enough safeguard to protect the wildlife in the region.

It was suggested that MoEF&CC will discuss the report with state government of Himachal Pradesh and thereafter the final report will be discussed in EAC again for final appraisal and recommendation. The EAC **deferred the proposal** for reconsideration in a subsequent meeting.

Table – E-flow details

Name of Project	River (Affected Stretch)	Recommended E-flow as % of average discharge in 90% DY			Recommended E-flow cumec		
		Lean Season (Dec-Mar)	Peak Season (June-Sept)	Other Months (Oct, Nov, Apr and May)	Lean Season (Dec-Mar)	Peak Season (June-Sept)	Other Months (Oct, Nov, Apr and May)
Beas Satluj Link	Beas River (25 km)	20	15	15	14.25	64.72	25.74
Parbati-III	Sainj River (13.7 km)	20	15	15	1.51	8.46	2.83
Allain Duhangan	Allain (9.2 km)	20	15	15	0.42	2.43	0.85
	Duhangan (5 km)	20	15	20	0.15	0.96	0.4
Larji	Beas River (5.65 Km)	20	15	15	11.42	64.06	21.45
Uhl-I	Uhl River (40 km)	20	15	15	0.44	2.37	1.11
Malana-II	Malana Nalla (5.2 km)	20	15	15	0.43	2.94	1.1
Sainj	Sainj River (9 km)	20	15	15	0.71	3.34	1.61
Malana-I	Malana Nalla (2.32 km)	20	15	15	0.49	3.32	1.24
Parbati-II	Parbati River (5.28 km)	20	15	15	2.99	16.3	3.79
	Jigrai Nalla (0.8 km)	20	30	25	0.2	1.16	0.54
	Jiva Nalla (8.2 km)	20	30	25	1.19	6.2	2.53
	Hurla Nalla (12 km)	20	30	25	0.57	3.12	1.28
Lambadug	Lambadug (6.3 Km)	20	15	15	0.25	1.28	0.6
Uhl III*	Rana Khad	20	30	25			
	Neri Khad						
Nakhtan	Toss (4.4 km)	25	20	20	0.93	5.24	1.99
	Parbati (8.9 km)	25	20	20	1.42	7.84	2.94
Thana Plaun	Beas River (12.7 km)	20	15	15	5.05	46.62	11.64

Triveni Mahadev	Beas River (5.5 km)	20	15	15	5.62	54.05	14.49
	Binwa Khad (3.2 km)	20	15	15	0.93	4.6	1.5
Malana-III	Malana Nalla (3.35 km)	20	15	15	0.34	2.32	0.95
Dhaulasidh	Beas River (37 km)	20	30	25	7.11	90.79	7.87

Item No. 13.2: Lugu Pahar Pumped Storage Project (1500 MW) in Bokaro District of Jharkhand by M/s Damodar Valley Corporation - for TOR -File No. J-12011/10/2018-IA.I (R), Proposal No. IA/JH/RIV/73970/2018

The project proponent has submitted this proposal online on 04.04.2018 for grant of fresh Terms of Reference to the Project for preparation of EIA/EMP report. The project proponent made a detailed presentation of the project along with the Consultant, WAPCOS, Gurgaon and *inter-alia*, provided the following information:

The Lugu Pahar Pumped Storage Project (1500 MW) is located near Lugu village in Bokaro District of Jharkhand comprises of 2 reservoirs i.e. one at lower elevation and another one at upper elevation. The difference of water levels of the reservoirs will represent the effective head of the project. The water conductor system will connect the 2 reservoirs through an underground powerhouse. During peaking hours power will be generated by releasing the water of upper reservoir through conductor, turbines and generator installed at powerhouse to lower reservoir. The project envisages construction of 2 dams i.e. 104.5 m high rock-fill upper dam across Kairo Jhama Nallah to provide a storage of 10.8 MCM with full reservoir level at 640 m & MDDL at 630 m and 31.5 m high rock-fill lower dam across Bokaro Nallah to provide a live storage of 11.5 MCM with full reservoir level at 269 m & MDDL at 262 m.

The total land requirement is about 496 ha. Out of which, 430 ha is forest land and remaining 66 ha is government land. The total submergence is about 318 ha (upper reservoir – 202 ha + lower reservoir – 116 ha). About 24 villages are coming under submergence due to proposed scheme. Total cost of the project is Rs.4303.48crores.

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 (3) season's data should be collected for the entire project.
- ii. As there are two reservoirs proposed for the pumped water storage project, details of district located may be identified for conducting Public Hearing.
- iii. Two dams are being constructed to divert water to store. E-flow requirement will be studied as per the existing norms i.e. Minimum environmental flow release should be 20% of average of four lean months of lean period and 20-30% of flows during non-lean and non-monsoon period corresponding to 90% dependable year. The cumulative environmental flow releases including spillage during the monsoon period should be about 30% of the cumulative inflows during the monsoon periods corresponding to 90% dependable year.
- iv. Land requirement if any, 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 430 ha of forest land. Forest clearance should be obtained as per the prevailing norms of FC Act, 1980.
- vi. Care should be taken to make free passage to Lugu Temple for easy access of the local forest dwellers.

Item No. 13.3: Banda Major Irrigation Project in Sagar District of Madhya Pradesh by M/s Water Resources Department, Government of Madhya Pradesh - for TOR File No. J-12011/08/2018-IA.I (R), Proposal No. IA/MP/RIV/73548/2018.

The project proponent has submitted this proposal online on 17.03.2018 for grant of fresh Terms of Reference to the Project for preparation of EIA/EMP report. The project proponent made a detailed presentation of the project *inter-alia*, provided the following information:

The Banda Major Irrigation project envisages construction of 23 m high composite dam having concrete gravity dam including earthen bund 710 m across Dashan River (tributary of Betwa River) near village Uldan in Sagar District of Madhya Pradesh to store 301 MCM of water to irrigate 72,000 ha of command area. The gross storage is 301 MCM and the live storage is 282.31 MCM of water. The catchment area of the project is about 1490.70 km². The culturable command area is 72,000 ha. The total submergence is about 4600.27 ha (of which forest land – 400.00 ha + private land – 3651.82 ha + government land – 548.45 ha). The project ensures the use of micro-irrigation techniques by the users. About 24 villages are coming under submergence due to proposed scheme. Total cost of the project is Rs. 2850.53 Crores.

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 (3) 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 400.00ha of forest land. Forest clearance should be obtained as per the prevailing norms of FC Act, 1980.
- vi. NOC from Govt. of Uttar Pradesh shall be obtained during final presentation of EIA/EMP report.
- vii. Form-I to be revised based on the data presented during ToR presentation.
- viii. Name of the NABET accredited consultant be intimated for preparation of EIA/EMP report to the Ministry within three months from the date of grant of ToR.

Item No. 13.4 Saundatti IRESP Storage Project, Saundatti Taluka, Belagavi District, Karnataka by M/s Greenko Solar Energy Pvt. Ltd- For Scoping Clearance (ToR).File No. J-12011/11/2018-IA.I (R), Proposal No. IA/KA/RIV/74600/2018.

The project proponent has submitted this proposal online on 16.04.2018 for grant of fresh Terms of Reference to the Project for preparation of EIA/EMP report. The project proponent made a detailed presentation of the project along with the Consultant, IRSET, Gurgaon and *inter-alia*, provided the following information:

Saundatti Integrated Renewable Energy Storage Project (IRESP) is an integrated scheme involving Solar, Wind and Hydro (Pumped Storage) projects in an integrated manner with an installed capacity of 4.8 GW i.e. 2.4 GW of Solar Project and 2.4 GW of Wind Project and with a storage capacity of 1.2/9.6 GWH.

The entire project is a self-identified project and is a first of its kind in the country which will supply firm dispatchable renewable power to the Discom/Grid for 24 hours i.e. round the clock (RTC). All three components of Saundatti IRESP are in closed vicinity therefore power from all three components will be pooled in a common pooling station and will be connected to PGCIL sub-station at Dharwad.

The Saundatti IRESP - Storage Project is proposed in Belagavi district of Karnataka. It envisages creation of reservoir across Jagavalla Halla (Depression). This is an IRES scheme and not a river valley project and the environment clearance is sought due to the storage component only. State Govt. of Karnataka as per proceedings dated 12.03.2018 has already approved to develop Integrated Renewal Energy Project as proposed by M/s Greenko Solar Energy Pvt. Ltd in Belagavi Dist. of Karnataka. The Project features are:

- Storage Project will comprise of two reservoirs i.e. Renuka Sagar Reservoir (already existing) and Saundatti IRESP Reservoir (proposed to be developed in natural depression).
- The proposed reservoir is not located on any river course and the existing Renuka Sagar reservoir is located across river Malaprabha. The proposed Saundatti IRESP reservoir is in a natural depression and it is far away from any river course.
- This scheme envisages non-consumptive re-utilization of 1 TMC (28.32 MCM) of water from the Renuka Sagar reservoir by recirculation.
- The water in the Renuka Sagar reservoir (existing lower reservoir) will be pumped up and stored in the proposed Saundatti IRESP reservoir (upper Reservoir) and will be utilized for power generation.
- Govt. of Karnataka has already issued NoC to utilize 1 TMC of non-consumptive water vide proceedings No. dated 12.03.2018.

Some of the salient features of the project are:

1	Saundatti IRESP Reservoir-Upper (Now Proposed)	
	Live Storage	1.01 TMC
	Dead Storage	0.74 TMC
	Gross Storage	1.75 TMC
	Full Reservoir level (FRL)	EL +793.00 m
2	Renuka Sagar Reservoir-Lower (Existing)	
	Catchment Area	2176 km ²
	Max. flood discharge	5239 cumecs
	Live Storage	972.56 MCum (34.346 TMC)
	Dead Storage	95.85 MCum (3.385 TMC)
	Gross Storage	1108.41 MCum (37.731 TMC)
	Full Reservoir level (FRL)	EL +633.832 m
3	Power Intake	
	Type	Open Semi Circular
	Elevation of Intake center line	EL +745.26 m
	Elevation of bell mouth bottom	EL +735.77 m
4	Head Race Tunnel	
	Head Race Tunnel – 2No's	Twin Tunnels
	Type of tunnel	Modified Horse Shoe
	Diameter of Tunnel	12.0 m

	Length of Tunnel	817 m each
5	Powerhouse	
	Type	Surface Powerhouse
	Dimensions including DT	L 200 m x B 24 m x H 56.50 m
6	Parameters of Storage Plant	
	Storage Capacity	9600 MWH
	Rating	1200 MWH
	No. of Units	7 (5x200 MW + 2x100 MW)
	Turbine Capacity	200 MW / 100 MW
	Total Design Discharge	925.68 Cumec
	Rated Head in Turbine mode	149.82 m
	Pump Capacity	230 MW / 105 MW

The project is located at 80 km from Belagavi (Dist. Headquarters). The project Saundatti IRESP Reservoir – Upper (Now Proposed) is bounded by latitude 15°51' 36.83" N & Longitude 75°00'42.57" E & Renuka Sagar Reservoir - Lower (Existing) is bounded by latitude 15°49'17.15" N & Longitude 75°05'48.23" E.

The total cost of the Storage Project is Rs. 4985.80 Cr. The land requirement for the project has been worked out is about 259 ha including 172 ha of forest land (Surface 165 ha +Under Ground 7 ha) and about 87 ha is private land.

PP explained that project design has made provision of dumping muck in the upper proposed reservoir bed to utilize that capacity as there is no water course existing; for dumping surplus quantity of muck, three additional dumping sites are also planned.

PP also explained that for this type of project where there is no significant catchment area contributing discharge, hence, CAT plan shall not be required. Similarly, the proposed reservoir is not on any water / river course and hence no aquatic life would be interfered with, therefore Fishery Development Plan will also not be applicable further, the reservoir created will have continuous fluctuating levels.

PP also proposed that Dam Break Analysis & Disaster Management Plan should not be applicable, since the project is not on any River Course. However, EAC did not agree and suggested that Dam Break Analysis should be carried out for the storage component in the upper reservoir.

PP requested that this is an IRES scheme and not a river valley project and they are seeking environment clearance due to storage component only. Therefore, they be allowed to complete the Baseline studies based on one season primary data with substantial secondary data. EAC deliberated the issue, and concluded that baseline studies should be carried out for 3 seasons as is the standard practice for river valley projects.

After the detailed deliberations, EAC recommended the project for scoping clearance with following additional conditions:

- i. Three (3) season's data should be collected for the entire project.
- ii. 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.
- iii. The project involves about 172ha of forest land. Forest clearance should be obtained as per the prevailing norms of FC Act, 1980.

Item No. 13.4 Pinnapuram Integrated RESP-Storage Project in Tehsil Nandyal, District Kurnool, Andhra Pradesh by M/s Greenko Energies Private Limited - reg. ToR / Scoping Clearance - File No. J-12011/12/2018-IA.I (R), Proposal No. IA/AP/RIV/29585/2015.

The project proponent has submitted this proposal online on 16.04.2018 for grant of fresh Terms of Reference to the Project for preparation of EIA/EMP report. The project proponent made a detailed presentation of the project along with the Consultant, IRSET, Gurgaon and *inter-alia*, provided the following information:

The scheme involving Solar, Wind and Hydro (Pumped Storage) projects in an integrated manner with an installed capacity of 4 GW i.e. 2 GW of Solar Project and 2 GW of Wind Project and with a storage capacity of 1/8 GWH.

This entire project is a self-identified project and is a first of its kind in the country which will supply firm dispatchable renewable power to the Discom/Grid round the clock (RTC). All three components of Pinnapuram IRESP are in closed vicinity therefore power from all three components will be pooled in a common pooling station and will be connected to PGCIL sub-station at Orvakallu. The Pinnapuram IRESP - Storage Project is in Kurnool district of Andhra Pradesh. It envisages creation of reservoir across Muni Madugu (Pond) near Pinnapuram Village. This is an IRES scheme and not a river valley project and the environment clearance is sought due to the storage component only. Memorandum of Understanding was executed between Government of Andhra Pradesh and M/s Greenko Energies Pvt. Ltd. for developing Integrated renewable Energy Project in Andhra Pradesh in Partnership Summit 2018 held during 24-26th Feb, 2018. The Project features are:

- Pinnapuram IRESP- Storage Project will comprise of two reservoirs i.e. Gorakallu Reservoir (already existing) and Pinnapuram Reservoir (to be constructed in a natural depression).
- None of the reservoirs is located on river course. Gorakallu reservoir (existing) is a balancing reservoir located on a canal network and Proposed Pinnapuram reservoir in a natural depression. These reservoirs are far away from any river course.
- This scheme envisages non-consumptive re-utilization of 1 TMC of water of the existing Gorakallu reservoir by recirculation. The water in the Gorakallu (existing lower reservoir) will be pumped up and stored in the proposed Pinnapuram reservoir (upper Reservoir) and will be utilized for power generation.

Other Salient features of the project are:

1	Pinnapuram IRESP Reservoir -Upper (Now Proposed)	
	Catchment Area	9.45 sq. km
	Live Storage	1.00 TMC
	Dead Storage	0.32 TMC
	Gross Storage	1.32 TMC
	Full Reservoir level (FRL)	EL +392.00 m
2	Gorakallu Reservoir -Lower (Existing)	
	Live Storage	10.29 TMC (291.38 Mcum)
	Dead Storage	2.15 TMC (60.88 Mcum)
	Gross Storage	12.44 TMC (352.26 Mcum)
	Full Reservoir level (FRL)	EL +261.00 m
3	Power Intake	
	Type	Open Semi Circular
	Elevation of Intake center line	EL +357.25 m

4	Tail Race Tunnel	Concrete Lined
	Type of tunnel & Nos.	Modified Horse Shoe & Twin Tunnels
	Diameter & Length of each Tunnel	12.0 m & 3860m each
5	Powerhouse	
	Type	Underground 'D' Shape
	PH cavern Dimensions	L 270 m x B 25 m x H 49 m
6	Parameters of Storage Plant	
	Storage Capacity	8000 MWH
	Rating	1000 MWH
	No. of Units	6 (4 x 200 MW + 2 x 100 MW)
	Turbine Capacity	200 MW / 100 MW
	Total Design Discharge	862.50 Cumec
	Rated Head in Turbine mode	134.00 m
	Pump Capacity	220 MW / 130 MW

The project Pinnapuram IRESP Reservoir – Upper (Now Proposed) is bounded by latitude 15°35'38.57" N & 78°18'29.17" E & Gorakall Reservoir - Lower (Existing) is bounded by latitude 15°35'43.25" N & 78°18'18.11" E.

The total cost of the Storage Project is Rs. 4829.22Cr. The land required for the project has been worked out and is about 380 ha including 283 ha of forestland (Surface 263 ha + Under Ground 20 ha) and about 97 ha is Private Land.

PP explained that project design has made provision of dumping muck in reservoir bed to utilize that capacity as there is no water course existing; for dumping surplus quantity of muck, three additional dumping sites are also planned. EAC favourably considered the concept.

PP also explained that for this project where no significant catchment area is contributing to the project, CAT plan shall not be required. Similarly, the proposed reservoir is not on any water / river course and hence no aquatic life would be interfered with. Therefore, Fishery Development Plan will also not be applicable. Further, the reservoir created will have fluctuating levels.

PP also proposed that Dam Break Analysis & Disaster Management Plan should not be applicable, since the project is not on any River Course. However, EAC did not agree and suggested that Dam Break Analysis should be carried out for the storage component in the upper reservoir.

PP requested that this is an IRES scheme and not a river valley project and they are seeking environment clearance due to storage component only. Therefore, they be allowed to complete the Baseline studies based on one season primary data with substantial secondary data. EAC deliberated the issue, and concluded that baseline studies should be carried out by using 3 seasons data as is the standard practice for river valley projects.

After the detailed deliberations, EAC recommended the project for scoping clearance with the following additional conditions:

- i. Three (3) season's data should be collected for the entire project.
- ii. 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.
- iii. The project involves about 283ha of forest land. Forest clearance should be obtained as per the prevailing norms of FC Act, 1980.

Item No. 13.5 Any other items

Item No. 13.5 Report on the Sub-Committee of Expert Appraisal Committee (a) visit to Beas River Basin in Himachal Pradesh

The Ministry of Environment, Forest and Climate Change made a presentation of the Beas River Basin Study and *inter-alia*, provided the following information:

CIA & CCS of Beas River Basin is being undertaken by MoEF&CC, the study is carried out by M/s R.S. Envirolink Technologies, Gurgaon. The interim report of the study was appraised by the EAC in its meeting held on 12.04.2017, wherein it was recommended that a site visit shall be carried out by the Sub-committee of the EAC as a part of ground truth verification of the study and the implication of the CIA & CCS.

As such, a Sub Committee of Expert Appraisal Committee for the visit to Beas River Basin in Himachal Pradesh was constituted vide Office Order J-11013/19/2015 dated 5.04.2018 with the following members:

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

The Sub Committee visited the Beas River Basin in Himachal Pradesh from 12th to 14th April, 2018. Dr. D.M. More and Dr. A.K. Sahoo could not make it up with the team due to last minute engagements, but, the other members visited the different valleys of the Beas river basin viz. Parbati valley, Beas valley (Upstream of Bhuntar– confluence of Parbati and Beas rivers and downstream of Bhuntar up to confluence of Tirathan River), Tirthan valley and Sainj valley. A copy of the site visit report of the Sub-committee is Annexed as **Annexure-I**.

The meeting ended with conclusion that MoEF&CC will discuss the report with state government of Himachal Pradesh and thereafter the final report will be discussed in EAC again for final appraisal and recommendation. And accordingly, the EAC ***deferred the proposal*** for reconsideration in the subsequent meeting.

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

**Report on the Sub Committee of Expert Appraisal Committee visit to
Beas River Basin in Himachal Pradesh**

CIA & CCS of Beas River Basin is being undertaken by MoEF&CC, the study is carried out by M/s R.S. Envirolink Technologies, Gurgaon. The interim report of the study was appraised by the EAC in its meeting held on 12.04.2017, wherein it was recommended that a site visit shall be carried out by the Sub committee of the EAC as a part of ground truth verification of the study and the implication of the CIA & CCS.

As such, a Sub Committee of Expert Appraisal Committee for the visit to Beas River Basin in Himachal Pradesh was constituted vide Office Order J-11013/19/2015 dated 5.04.2018 with the following members:

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

The Sub Committee visited Beas River Basin in Himachal Pradesh from 12th to 14th April, 2018. Although, Dr. D.M. More and Dr. A.K. Sahoo could not make it up with the team due to last minute engagements, the other members visited the different valleys of the Beas river basin viz. Parbati valley, Beas valley (Upstream of Bhuntar– confluence of Parbati and Beas rivers) and downstream of Bhuntar (up to confluence of TirathanRvier), Tirthan valley and Sainj valley.

Date: 12.04.2018

Visit of Parbati Valley:

The Sub Committee visited the Parbati valley on Bhuntar – Pulga – Tosh nallah road.

The following sites / locations of the HEPs under construction / proposed in the valley were visited:

Sarsadi-II (9 MW), Sarsadi (9.6 MW), Sharni SHEP (9.6 MW) and Parbati SHEP (12 MW) – These are four proposed Small HEPs (<25 MW), which are located in cascade on the main Parbati river stretch, downstream of confluence of Malana Nalla upto confluence of Parbati river with Beas.

The Sub-committee found that the length of Parbati river from confluence of Malana Nalla to confluence with Beas is little more than 15 km, out of which 13 km will be affected by these four projects. Parbati river is rich in fish fauna and Trout is known to migrate upstream in Parbati river; these projects may impact the upstream migration of trout from Beas to Parbati.

Malana Nallah HEP confluence with Parbati River – EAC observed that there is hardly any discharge in Malana Nalla near confluence. This is due to the fact, that Malana river is being diverted by Malana I (86 MW) HEP, which releases the water from tailrace in Parbati river.

Malana I (86 MW) project was commissioned in 2001. The project has a 18m high barrage, with powerhouse on right bank of Parbati river with a 480 m head for a design discharge of 26 cumec. Powerhouse houses two turbines of 43 MW each. Environmental flow as per HP government notification is 0.235 cumec.

Jari SHEP (12 MW) is under survey and investigation, the project is located on Parbati river, upstream of Malana confluence.

Jail Micro Hydel Project (1 MW) is a under construction project, the powerhouse of which is located along the Bhuntar-Manikaran road. Signboard of the Kanawar WLS was seen nearby. The Sub Committee made observation about the likely location of the project, whether it is inside the ESZ or within the Kanwar WLS. Kanawar WLS is spread in an area of 107.29 km², located on the left bank of Parbati River.

Balargha SHEP (9 MW) – recently commissioned project located on Parbati river; downstream of Parbati II HEP and upstream of Malana Nalla confluence. EAC observed that the downstream stretch of the diversion structure was completely dry.

Parbati-II HEP (800 MW), this is an inter-basin project where water from Parbati river will be diverted through HRT to Sainj River. Nallas falling en route viz. Jigrai, Hurla and Jiva Nalla shall also be diverted. Tailwater outfall is upstream of Parbati III HEP on Sainj river and falls just downstream of Jiva Nalla confluence with Sainj river.

Toss SHEP (10 MW) project on Tosh Nalla was commissioned in 2008. The project is on Tosh Nalla and having provision to expand up to the capacity of 20 MW.

Nakhtan HEP Site (460 MW) on Tosh and Parbati river. The project has two diversion locations - one on Tosh river upstream of Tosh HEP and another on Parbati River, upstream of Parbati II HEP.



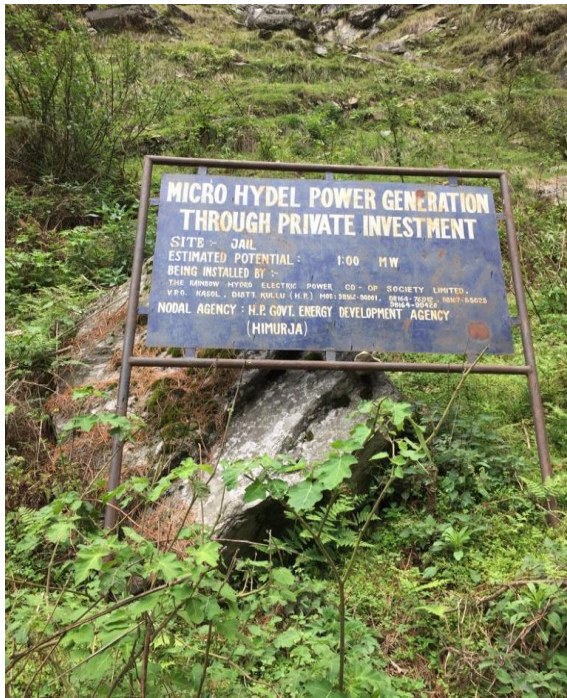
Confluence of Beas river with Parbati (a left bank tributary) from Bhuntar bridge on road to Manikaran.



Malana Power House on right bank of Parbati river



Malana Nallah



Jail Micro Hydel (1MW) Under Construction.



Signboard of Kanawar Wild Life Sanctuary - Adjacent to Micro Hydel Signboard



Member Secretary addressing the members



Expert Member from Wild life observing the aquatic life in the nallah



Parbati river near Manikaran



Members at Hot spring at Manikaran



View of Balargha diversion structure on main Parbati River



View of Adit of HRT of Parbati-II HEP (right bank of Parbati river)



View of backwater of Parbati-II HEP in Tosh Nallah



Tosh nallah catchment



Tosh Nallah Power House

Date: 13.04.2018

Visit of Beas Valley (Upstream of Parbati Confluence at Bhuntar)

The Sub Committee visited the Beas Valley (Upstream of Parbati Confluence at Bhuntar) on Bhuntar – Rohtangroad.

The sites/locations of the following hydroelectric projects are under construction / proposed in the valley were visited:

Visit to PatliKuhl Trout Fish Farm, Department of Fisheries, Govt. of Himachal Pradesh. The fish farm is located on Sujan Nalla. It gets technical support from the Norwegian government. The members of the Sub Committee were informed in detailed about the Trout farm by the In-charge of the Farm. The committee visited the hatchery unit and the raceways of the farms and enquired about the various aspects of Trout fish farm. It was explained that the trout fish farm has been adopted by many private farmers and has helped in improving their socio economic status.

Raison HEP (18 MW), proposed project on Beas River. The project is designed with a weir across Beas river near Raison, diverting water through a power channel (16 m wide) along right bank of Beas with a surface powerhouse.

Allain Duhangan HEP (192 MW) project was commissioned in 2010. It has two diversion locations – Allain Nalla (Barrage) and Duhangan Nalla (trench weir) with an underground powerhouse on left bank of Allain Nalla and tailwater discharging into Beas near confluence of Allain and Beas river. Committed environment flow release is 0.234 cumec on Allain Nalla and 0.14 cumec on Duhangan Nalla.



Fish farm at PatliKuhl



Road side Apple Orchards enroute Kullu - Manali



Road side Deodar trees enroute Kullu - Manali



Road side Agriculture produce (Pea farming) enroute Kullu-Manali



Beas river upstream of Manali – Along Rohtang road



View of Rohtang hill from Allan-Duhangan H.Qtrs



View of the Rohtang area from Solang valley

Date: 14.04.2018

Visit of Tirthan & Sainj Valley

Larji HEP (126 MW) project was commissioned in 2006 and falls on Beas river with 26 m high dam, 4.1 km long HRT and an underground powerhouse, housing 3 turbines of 42 MW each.

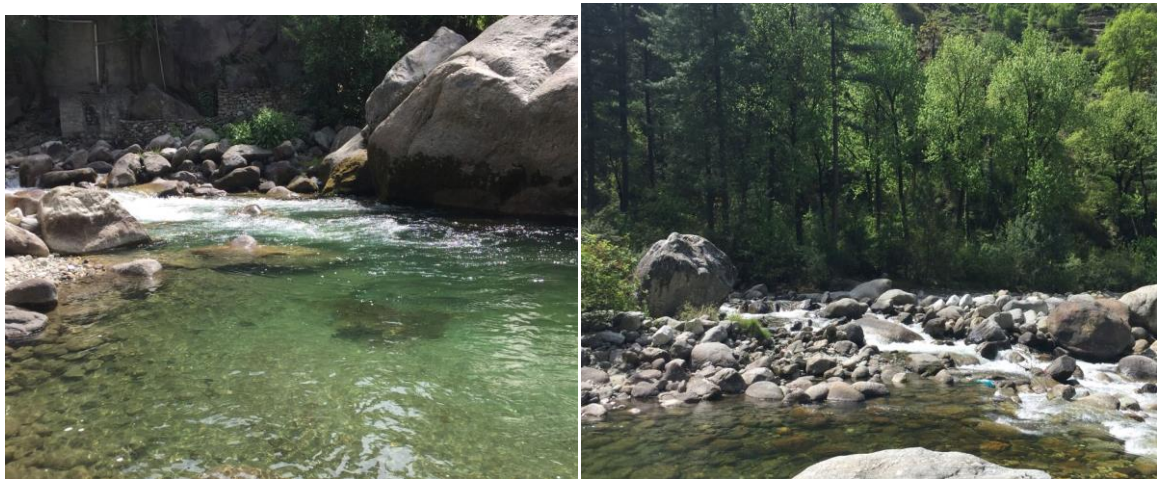
Sainj HEP (100 MW) project has been commissioned in 2017, with 25m gated barrage, 6.36 km long HRT and underground powerhouse with 2 turbines of 50 MW each.

Parbati-II HEP (PH) project is located on right bank of Sainj river, just downstream of JivaNala confluence. The powerhouse has 4 turbines of 200 MW each. Powerhouse construction is complete. Project is likely to be shortly and shall use water from Jiva nallah and Hurla Nallah. HRT work is under construction.

Parbati-III HEP (520 MW) project was commissioned in 2014 on Sainj river. The project is designed for utilization of tailrace water of Parbati II HEP and therefore, till the commissioning of Parbati II, it is operating at 1/3rd of the installed capacity.



Tirthan river and the pristine riparian vegetation



Tirthan river - Riffle, Pool and Run - parts of a river important for aquatic life

Great Himalayan National Park and River Tirthan

The Great Himalayan National Park (GHNP) was constituted in 1984 in Kullu District of Himachal Pradesh, was notified as National Park under Indian Wildlife Protection Act in 1999. Adjacent to the National Park boundaries, the Tirthan and Sainj Wildlife Sanctuaries are located. The GHNP is a UNESCO Natural World Heritage site since 2014 and harbours a variety of flora and fauna with 832 plant species, 209 bird species, 125 insect species, 31 mammal species and 9 amphibian species and 12 species of fishes. A total of four tributaries of River Beas originate from within the park boundaries namely, Tirthan, Sainj, Parbati and Jiwa, of which, former three are the major

tributaries. River Tirthan is a pristine tributary, its complete basin being untouched by human interventions in terms of diversions and damming and is also a no-go area for anthropogenic development due to strong protest by the local communities. Tirthan originates from Chakri glacier at an altitude of 4880 m asl in Western Himalaya. After traversing a distance of 120 km through GHNP and Tirthan Wildlife Sanctuary, it confluences with Beas near Larji village at an altitude of 900 m asl. The climate varies from temperate at the origin to sub-tropical downstream. The river is characterized by its turbulent crystal clear blue water and runs throughout a steep and narrow valley. The river bed is mostly dominated by bedrocks and boulders in the headwaters and boulders and cobbles in the lower region. The river is of immense importance in sustaining the fish populations of the area by providing them safe havens for breeding and migrations. Currently, the river is gaining popularity as an “angling reserve” specifically for brown & rainbow trouts due to provision of limited day-based licenses by the National Park and State Fisheries authorities for sustainable angling, however no scientific study is available so far about the status and size structure of the population which is crucial for sustainable management.



Office of the Wild Life Warden - Great Himalayan National Park at SaiRopa near Banjar



Wild Life Expert explaining the team - different part of the hilly river important for aquatic life

Observations of the Sub Committee:

1. Detailed and logical justification required for projects recommended for dropping. For example dropping a project at high altitude cannot be justified unless the ecological sensitivity vis-à-vis project impacts are established.
2. Projects proposed in the protected areas should be dropped based on the permissible installed capacity in the ESZ.
3. EAC should deliberate and make certain criteria for dropping of projects in river basins.
4. Details of protected areas in the basin should include the status of declaration of ESZ on the map and overlay all the projects.
5. Environment flow assessment is required to be done for all the projects i.e. projects commissioned, projects under construction and projects under S&I stage.
6. For smaller projects, i.e. less than 25 MW, where modeling study is not practical, e flow should be recommended based on standard ToR and NGT order.
7. Nallah/small streams being tapped by Parbati II and other projects should also be assessed for environment flow requirement.
8. Operational projects (without any environmental flow regulation) are releasing environment flow based on Himachal Pradesh State Government notification, which states, ***“for the purpose of determination of minimum discharge, the threshold value shall not be less than 15% of minimum inflow observed in the lean season shall be considered”***, but, projects like Allain Duhangan is releasing based on the 15% of the minimum value in long term discharge data.
9. It was observed by EAC that river stretch downstream of Malana I diversion up to confluence with Parbati river was almost dry
10. It was observed that there are large numbers of less than 5 MW projects (operational as well as under construction). One such project, Jail HEP appeared to be being constructed in Kanawar WLS. Although such projects (≤ 5 MW) are not covered by the basin study, EAC need to deliberate the issue to assess impacts and take appropriate action.
11. It was observed by EAC sub-committee that Balargha HEP (9 MW) which, as per Basin study is under construction, has become operational as the downstream of diversion site, the river was absolutely dry.
12. A discussion with HPPCL, project proponent of Nakhtan HEP, was held at Parbati II project office and visit was made to Tosh Nallah side. Tosh HEP is presently operational on Tosh Nallah with 10 MW installed capacity, with the provisions to expand to 20 MW. Diversion, for Nakhtan HEP on Tosh Nallah will make the downstream stretch dry and Tosh HEP will not get water for generation. Therefore, the matter is

matter is sub-judice and any further decision will be taken once the matter is settled by court. On the Parbati river, submergence area of Nakhtan HEP is likely to fall in ESZ of GHNP. Draft ESZ notification was issued on 25.07.2016; which has already been discussed and approved by ESZ Committee, however, final notification is yet to be issued. EAC suggested to HPPCL, to ensure that all project components including the submergence falls outside the final ESZ boundary; for further consideration for environment clearance by the EAC.

13. It was observed that Aleo HEP (3 MW) is under operation on Allain Nallah, however, it is drawing water from tailrace of Allain-Duhangan HEP as the project is diverting water upstream of Aleo diversion.
14. **Maintenance of Free flow section of River between successive projects:** River habitat is highly dynamic from the stagnant/ dammed water, which has provided varying degree of microhabitats such as different depth, flow, substrates, different types of food resources (drifted leaves, plant parts, detritus, diatoms and benthic insects over rocks) and oxygen level. This dynamic nature of river habitat support different types of life forms, which intern maintains the structural integrity of river ecosystem. During the visit it is understood that a series of hydropower projects are proposed in the Beas river basin. In order to maintain the fluvial functionality of river, a minimum free flow river stretch should be maintained between two successive projects.
15. **Projects should be away from Protected Areas & Eco-sensitive areas:** The projects which fall within the Protected Area Boundaries or within ESZ should be dropped in the CIA & CC report as per the ESZ notification.
16. **Separate sluice gate provision for e-flow release:** During the visit, it was observed that many river stretches have dried after the barrage/divergent structure. E-flow for all existing and proposed dams should be recommended and implemented accordingly, so that the cumulative dry riverbed length may be minimised. As a part of e-flow recommendation, the developers should provide a separate sluice structure at the barrage for planned projects for releasing e-flow or shall have the provision of any linear structure. This sluice not only provides adequate flow, it may also facilitates connectivity between aquatic habitats.


(S. Kerketta)


(J.A. Johnson)


(Sharvan Kumar)


(N.N. Rai)


(S.K. Jain)

Subject: **Re: Draft MoM of 13th EAC meeting (RVP) held on 27.04.2018 - regarding**

Date: 05/07/18 06:16 AM

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

From: Sharad Jain <s_k_jain@yahoo.com>

Cc: S Kerketta <suna1466@rediffmail.com>

Reply-To: Sharad Jain <s_k_jain@yahoo.com>

Minutes of 13th Meeting - Expert Appraisal Committ... (47kB)

Dear Dr Kerketta,

I am sending the approved minutes of the 13th meeting of EAC (RVH).

Regards,

Sharad Jain

NIH Roorkee

On Saturday, 5 May, 2018, 8:06:27 AM IST, Dr S Kerketta <s.kerketta66@gov.in> wrote:

Sir,

Please find the attachment of the draft MoM of 13th EAC meeting (RVP) held on 27.04.2018. The draft MoM is being sent after compiling all the comments received from the other EAC members. But, till yesterday evening, no comments have been received. It is requested to kindly approve the minutes to enable to upload the same in the website of the Ministry.

--

regards,

Dr. S. Kerketta

Director- IA (Thermal, River Valley & HEP)


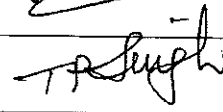
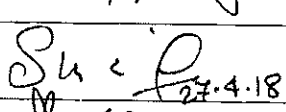
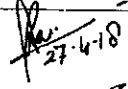
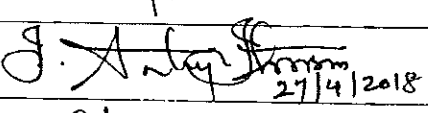
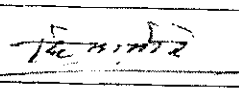

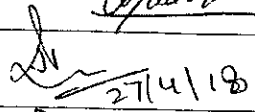
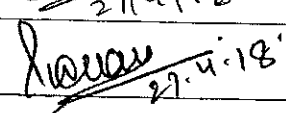
MoEF&CC, New Delhi

Phone: 011-24695314 (O), 26113096 (R)

LIST OF MEMBERS

13th MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR RIVER VALLEY & HYDROELECTRIC PROJECTS

DATE : 27th April 2018
TIME : 10:30 am onwards
VENUE : NARMADA 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	
4.	Shri N. N. Rai, Member	
5.	Dr. J.A. Johnson, Member	
6.	Dr. B. K. Das/ Dr. AK Sahoo Member	ABS
7.	Dr. Vijay Kumar, Member	ABS
8.	Prof. Govind Chakrapani, Member	ABS
9.	Dr. Chetan Pandit, Member	ABS
10.	Dr. Dinkar Madhavrao More, Member	
11.	Dr. R. Vasudeva, Member	ABS
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)	