

Minutes of the 66th Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects constituted under the provisions of EIA Notification 2006, held on 3-4th May, 2013 at SCOPE Complex, New Delhi.

The 66th Meeting of the Expert Appraisal Committee (EAC) for River Valley and Hydropower Projects was held during 3-4th May, 2013 at SCOPE Convention Centre, Opposite Jawaharlal Nehru Stadium, New Delhi. The meeting was chaired by Dr. B. P. Das, Vice-Chairman on 3.5.2013 and Shri Rakesh Nath, Chairman on 4.5.2013. Dr. S. K. Mishra, Member, EAC could not attend the meeting due to pre-occupation. The list of EAC Members and officials associated with various projects who attended the meeting is annexed.

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

1st Day (3.5.2013)

1. **Agenda Item No.1: Welcome by Chairman.**

The Chairman welcomed the members and the following agenda items were taken up for discussion. The Minutes of the 65th EAC meeting were confirmed on 4.5.2013 with the following amendment:

The minutes of the 65th EAC meeting were confirmed with the following amendments:

Agenda Item No. 2.5 : Basin study for Lohit River Basin

As informed by CWC, flow series for some of the projects used by WAPCOS in the said study have not been approved by CWC. WAPCOS shall use CWC approved flow series and revise the studies accordingly.

Agenda Item No. 2.7 : Mawphu HEP (85 MW) project in East Khasi Hills District of Meghalaya by M/s NEEPCO Ltd. – For Consideration of ToR:

3rd paragraph from the bottom on environmental flow to be read as

“A site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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 period corresponding to 90% dependable year.”

Agenda Item No. 2.8 : Tuivawl HEP (42 MW) project in Aizwal District of Mizoram by M/s SPML Energy Ltd. – For Consideration of ToR:

3rd paragraph from the bottom on environmental flow to be read as

“A site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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 period corresponding to 90% dependable year.”

Agenda Item No. 2.9: Ar-Kacheri Larger Minor Irrigation Project in Buldana District of Maharashtra by M/s Minor Irrigation Division, Vidarbha Irrigation Development Corporation, Government of Maharashtra – For Consideration of ToR

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Agenda Item No. 2.10: Alewadi Larger Minor Irrigation Project in Buldana District of Maharashtra by M/s Minor Irrigation Division, Vidarbha Irrigation Development Corporation, Government of Maharashtra – For Consideration of ToR.

Delete ‘in both the projects’ from the beginning of last paragraphs.

Afterwards, the following agenda items were taken up for discussions:

2.1 Lower Orr Irrigation Project, Shivpuri and Datia Districts, Madhya Pradesh by National Water Development Agency- Reconsideration of TOR.

A dam on river Orr is proposed to be constructed near village Didoni in Ashok Nagar District of Madhya Pradesh. The site is approachable by Chanderi-Pichhore road and is about 21 km from Chanderi, a tehsil headquarter in Ashok Nagar District of Madhya Pradesh. Lower Orr Project shall provide irrigation to drought prone areas of Datia district in Bundelkhand region of Madhya Pradesh and water shortage area of Shivpuri district of Madhya Pradesh.

The project envisages construction of 2250 m long earth-cum masonry dam on river Betwa. The earthen dam will be 1874 m long with a maximum height of 32.805 m. Total length of masonry dam resting on granite rock will be 376 m, out of which the non over-flow section will be 90 m and 70 m in left and right sides respectively. The over flow section will be 216 m long with a maximum height of 41.84 m. It has been designed to pass a maximum moderated flood discharge of 16992 cumec with the help of 12 gates, each of size 15.24 m (L) x 12.15 m (h), separated by 11 piers, 3 m wide each.

Lower Orr dam will intercept a catchment area of 1843 km² with a reservoir of capacity 371.8 Mm³ at FRL. The annual average rainfall is 939.18 mm. The project is planned to provide irrigation to CCA of 53573 ha and annual irrigation to 80360 ha with irrigation intensity of 150%. The main left canal runs parallel to Rajghat Left Bank Canal providing irrigation to 39870 ha, above the Rajghat canal.

The 75% dependable yield is 399.25 Mm³, against the following identified demand.

- a) Irrigation demand of 39870 ha - 279.71 Mm³
- b) Irrigation demand for lift command of 2950 ha to be supplemented through pumping - 8.45 Mm³
- c) Irrigation demand of Angoori barrage, extent 7475 ha – 34.61 Mm³
- d) For pressurized irrigation of 5365 ha - 15.53 Mm³
- e) Reserve for drinking water - 6 Mm³
- f) Environmental flow in monsoon - 7.2 Mm³

The Lower Orr main canal will off take at FSL of 360.5 m from the reservoir. The initial reach of the Lower Orr canal run in almost northerly direction for about a distance of 10 km and just touching the boundary of protected Forest of Madhya Pradesh, thereafter in North easterly direction of about 20 km. Canal run further about 38 km in northern direction and then turn towards south direction for about 5 km and again turn towards north direction for about 20 km. After that the canal turn towards north east direction for about 17.6 km. and thus the main canal ends at 91.260 km RD. It is also proposed to feed existing Angoori barrage from the Lower Orr canal through about 15 km long feeder canal which will be used for intensification in the existing Datia irrigation canal system. The command area of Lower Orr canal lies in Shivpuri and Datia districts of Madhya Pradesh. The GCA and CCA of the project area are 77559 ha and 44751 ha. The annual irrigation intensity is 150%. The irrigation intensity in Kharif and Rabi seasons is 60% and 84% respectively. About 6% of perennial crops are proposed to be irrigated.

Concern was shown as to how the environmental need during the monsoon will be met.

The project proponent headed by the Principal Secretary (WR), Madhya Pradesh explained that with low duty crops planned for the Kharif season (shown below) the irrigation demand is minimal, as bulk of crop need is met by rainfall of 700 mm between June to October.

Kharif

Paddy	15%
Jowar	
Fodder}	15%
Maize	
Pulses	20%
Oilseeds	10%
Sugar	5%
Vegetables/Others	5%

Paddy is proposed only over low land, where rainfall and surface overland flow from up and medium land will suffice for the crop need.

Only when there is a prolonged drought irrigation release will be made, thereby preventing deep percolation loss which normally with continuous irrigation is 400 mm (100 days with 4 mm/day). This is reflected in Page-144 of PFR, February, 2013 where surface water need is shown as 66.47 Mm³ and 86.18 Mm³ is available from ground water. It was explained that conjunctive use of surface and ground water and pressurized irrigation will benefit the 146 drought prone villages suffering from recurring crop loss.

Thus the ecological release shown as 8.4 Mm³ will really get augmented to around 15 to 20 Mm³ in each monsoon month leading to 20-25% of the flow going down the river.

The proponents were advised to get the hydrology and irrigation planning features vetted by the CWC showing reduced Kharif drawal as early as possible and also document the contribution of the lower catchment upto Betwa confluence (176 Km² of free basin), which will supplement the ecological release (spill) from the reservoir. The scoping clearance is recommended with additional ToR for detailed ecological study, crop water study and the feasibility of reducing reservoir submergence as theoretically the reservoir should have live storage around 200 Mm³ at the end of monsoon for Rabi irrigation (60% \approx 35,000 ha of Wheat as the principal Rabi crop) and Domestic & Industrial use.

The proposal was reviewed in the 66th EAC meeting. During the meeting, the response made by the project proponents on the comments raised during the 63rd EAC meeting were discussed. The project proponents confirmed the following in response to comments raised in the above meeting:

- The project proponents confirmed that the Form-I (Appendix – I of EIA notification – 2006) is now filled as per amended notification 2009, and is being submitted for approval of TOR. The TOR too has been submitted in the revised format.
- As a part of TOR, it is proposed to conduct detailed Ecological Studies for three seasons to ascertain the status of biodiversity in the project area as well as the study area
- A map showing Reserved Forest and Protected Forest coming within submergence area is enclosed as Figure-III of Form-I.
- The clearance from Forest Department and Wildlife shall be taken on completion of DPR and CEIA study for the project.
- As desired by EAC, species names have been suitably corrected and are incorporated in the Revised Environmental Chapter of PFR.
- Baseline Environmental Data for 3 seasons shall be collected in uniformly/ equally distributed locations in the project area
- Corrections of faunal species have been incorporated in the modified Chapter on Environment in the PFR.
- It was confirmed that the Madhav National Park in Shivpuri district is the nearest National Park, which is located at a distance of about 100 km from the proposed project
- Detailed geological mapping of the proposed project site is presently being got carried out through GSI as part of Survey and investigation works leading to preparation of DPR of the project. Drilling work at various locations of proposed dam site as suggested by GSI under

its supervision is being carried out. The subsurface geological information will be incorporated in the DPR.

- Relevant details as suggested (showing wells on the u/s and d/s reaches of the proposed dam site etc., on map) will be incorporated in the DPR which is presently under preparation.
- Social Impact Assessment will be covered as a part of CEIA study
- It was confirmed during the EAC meeting that state government of Madhya Pradesh has authorized NWDA to obtain necessary clearances for the project from various agencies/Departments. The implementing agency for the project would be the Government of Madhya Pradesh
- The EAC was of the opinion that Environmental Flows have not been considered while assessing the irrigation water requirements of the project. It was suggested that a table showing month wise inflows, abstractions for various uses and environmental flows be given.
- The EAC noted that the crop water requirement is on the higher side. This needs to be relooked and irrigation planning be reassessed. Because, it was felt that demand is more than available water in the river.
- The EAC also suggested that one year discharge data of river Orr to be included in the DPR and CEIA Report.
- The EAC observed that, since the project area has rocks with joint, hence, significant seepage flow is expected. It was suggested that a detailed Geo-physical mapping be done.
- In the water planning section of PFR, field efficiency has been considered as 65%, which is on the higher side. This needs to be reassessed.
- EAC observed that Kennedy's Method has been used for design of canal. This method is not used for design of lined canal. The project proponents were asked to refer the book of Dr. G.L. Asoha for design of lined canal.
- The assessed sediment deposition in 100 years is double of that in 50 years (Page 76). This raises confusion on the correctness of the methodology used to assess sedimentation rate, which gradually reduces over the years naturally. The same rate for the first 50 years and for the next 50 years is impossible unless the catchment is dug up and disturbed frequently. This also implies that the Catchment Area Treatment (CAT) has no effect on reducing soil erosion from the catchment. Sedimentation levels after 50 years and 100 years of operation as given in the PFR needs to be reexamined. However, the Member representing the CWC later clarified that due to a lack of time-to-time measured sediment data, assuming a constant rate of sedimentation over the entire life of the reservoir has become the prevalent practice.

After detailed deliberations and further scrutiny, the committee recommended the project for awarding scoping clearance and approved the TOR subject to the following additional studies:

- *Study Area* :Considering the large area will be affected, for vegetational Analysis increase the Sampling locations from 5 to 10;
- Detailed Methodology to be followed for all the parameters to be studied; Sampling locations and intensity (For example "Number and size of Quadrats"); in Tabular form and in a map; instruments/ equipments used for the analysis;
- Under Data Collection Include "Land" before "Hydrology"and give appropriate details included under "Remote Sensing" and "Other details" pertaining to Land and also include Contour Map/Slope Map, Relief Map, Drainage Map, etc.
- Aquatic Environment: Give details of physico-chemical properties to be studied.
- Baseline studies: Include- Source of secondary information will be cited wherever required and citations included in a Reference List;

Biological Environment: Include -

- Forest type will be classified as per Champion & Seth's (1968) classification;
- Number and species of trees in the submergence area and their basal area will be studied.
- General vegetation pattern will include all groups of plants including "Pteridophytes, Bryophytes" and Bamboos spp.
- GPS reading of occurrence of RET species will be recorded for conservation and rehabilitation purpose.
- Under faunal elements "Amphibians" will also be studied.
- *Environmental Management Plan:* Include – "Wildlife" under Biodiversity Conservation Plan.

Other Aspects

- Relevant details as suggested (showing wells on the u/s and d/s reaches of the proposed dam site etc., on map) to be incorporated in the DPR and CEIA study
- Social Impact Assessment be conducted as a part of CEIA study
- A table showing monthwise inflows, abstractions for various uses and environmental flows be given. Detailed Reservoir Operation/Working Tables be included in the DPR.
- The EAC also suggested that one year discharge data of river Orr to be included in the DPR and CEIA Report.
- Crop water requirements need to be reworked after considering appropriate values of irrigation efficiencies.
- Sedimentation levels after 50 years and 100 years of operation as given in the PFR be reexamined.
- The proponents would get the hydrology and irrigation planning features vetted by the CWC showing reduced Kharif drawal as early as possible and also document the contribution of the lower catchment upto Betwa confluence (176 Km² of free basin), which will supplement the ecological release (spill) from the reservoir. The scoping clearance is recommended with additional ToR for detail ecological study, crop water study and the feasibility of reducing reservoir submergence as theoretically the reservoir should have live storage around 200 Mm³ at the end of monsoon for Rabi irrigation (60% ≈ 35,000 ha of Wheat as the principal Rabi crop) and D & I use.
- The project will affect 7 villages fully and 5 villages partially. No of displaced families will be 528. A separate report on Social Impact Assessment is mandatory.

2.2 Nabha Hydropower Project (1000 MW = 4x250) in Upper Subansiri District of Arunachal Pradesh by M/s Abir Infrastructure Pvt. Limited-Consideration of TOR.

The project proponent made a presentation before the EAC on the Nabha hydroelectric project (1000 MW) on 3rd May 2013 for consideration of the ToR. The following points emerged during the presentation.

The project envisages construction of concrete gravity Dam across river Subansiri, which is 167 m high above the river bed level and located around 16 km downstream of Limeking village. This is a run-of-the-river (RoR) scheme and located in between the downstream of proposed Niare H.E. Project and upstream of Nalo H.E. Project. The reservoir has a live storage capacity of 25.80 MCM between Full Reservoir Level at 1035 m and Min. Draw Down Level of 1025 m. Two power intakes are located on the right bank upstream of the Dam to tap the design discharge of 468.22

cumec from the river for power generation. The water from the intakes would be led through two no of horse shoe shaped concrete lined Head Race Tunnels (HRT) of 8.7 m dia of lengths 3.1 km and 3.85 km, which end in two nos 23 m dia surge shafts, provided to take care of transients in the system. Water is then led through two no. 7.65 m dia steel lined pressure shafts to a surface Power House housing four generating units each of 250 MW capacity coupled with Francis turbines. The normal Tail Water Level of the project as allotted by the Govt. of Arunachal Pradesh is 780 m. Water from the power house is led back into the river through a Tail Race Channel.

The project proponent proposes to release 12.43 cumec throughout the year (20% of average inflow during lean season) towards meeting environmental flow requirement downstream of the dam. It was also stated that Downstream flow contribution of tributaries in the intervening stretch (i.e. between Dam and Tail water) shall be studied as part of EIA study and accordingly, as per prevailing practices, the environmental flow releases for monsoon months and non monsoon months shall be addressed as a part of EIA / EMP Report.

The project would require 658.8 ha land under various project appurtenances and facilities out of which approximately 263 ha land shall come under submergence. There is no displacement of population. There is no National Park/ Wildlife Sanctuary/Biosphere Reserve located within 15 km radius of the project area. As mentioned in the PFR, the estimated cost of the project is Rs. 7801 Crores and the main project construction will be completed in 5 years.

The Committee was informed that as per the domain levels of Nabha H.E. Project given by Govt. of Arunachal Pradesh i.e. FRL at 1035 m and TWL of 780 m, free river stretch of around 1.3 km is available between the Nabha FRL and the TWL of upstream Niare H.E. Project and free river stretch of around 1.1 km is available between the Nabha TWL and the FRL of downstream Nalo H.E. Project.

The EAC feels that from the Environment angle Subansiri is a very important river in terms of biodiversity and uniqueness of various species etc. and therefore, it is necessary to make a balance between development of Hydel power and environmental issues.

The EAC observed that, the releases of minimum flows from the environmental considerations in the intervening stretch between the Nabha Dam site and the Tail water need to be maintained adequately in line with the general norms to sustain the aquatic life. The details of catchment/ contributions of the tributaries in the intervening stretch need to be studied and substantiated in detail. The water availability studies and power potential studies need to be carried out for consideration and approval of appropriate authorities.

It was suggested that the project proponents may explore possibility of putting some generating unit(s) at Dam toe thereby ensuring adequate and continuous releases of environmental flows.

It was also suggested that the project proponents may explore the possibilities of optimizing/ reducing the requirement of surface land getting affected by the project components.

Detailed studies need to be carried out with respect to the sedimentation aspects also.

The Committee after critically examining all environmental issues, recommended clearance for pre-construction activities with the following TOR:

- A site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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.
- The details of catchment/ contributions of the tributaries in the intervening stretch need to be studied and substantiated in detail for recommending different quantum of environmental flow release.
- Power potential studies be revised, considering the Environmental Flows as per MOEF norms. This would reduce the installed capacity and also reduce the land requirement for the project.
- The project area falls in highly sensitive seismic zone and detailed investigation and studies need to be carried out to assess the affecting factors and suitable measures need to be adopted in the design of project components.
- Calculation of new zero elevation for various years upto design life of the dam.
- Mechanism to monitor release of Environmental Flows be included in the DPR and CEIA study.
- Muck disposal sites should be at least 30 m from HFL and a detailed muck disposal plan be included in the CEIA report.
- Copy of application for forest land diversion has to be submitted before issue of ToR.
- The following corrections to be made in the FORM 1:

(II) Activity:

1.1 Give FCC of the Project area in support of land cover of 659 ha of land which is forest land; Give a detailed Location Map of HEP and a map showing all the existing/ proposed HEPs with FRL and TWL in the line drawing.

(III) *Environmental Sensitivity:*

1,2,3: Since 659 ha of the total project area is forest land which is protected under the law, 1,2,3 should be “YES” with appropriate details.

- The proposed TOR should also include the following:

(i) *EIA Report*

- (a) Detailed Methodology to be followed for all the parameters to be studied; Sampling locations and intensity (For example “Number and size of Quadrats”); in Tabular form and in a map;

instruments/ equipments used for the analysis; , include Contour Map/Slope Map, Relief Map, Drainage Map, etc.

- (b) Baseline studies: Include- Source of secondary information will be cited wherever required and citations included in a Reference List; Economic Valuation of Biodiversity and Ecosystem Services of the Forest area to be affected will be studied.
- (ii) *Biological Environment*: Include –
 - (a) Forest type will be classified as per Champion & Seth's (1968) classification; number and species of trees in the submergence area and their basal area will be studied.
 - (b) General vegetation pattern will also include "Pteridophytes, Bryophytes and Lichens", "Canes, Bamboos spp., Wild Banana (Musa sp.), Orchids";
 - (c) A separate list of all endemic species and RET species will be included
 - (d) GPS reading of occurrence of RET species will be recorded for conservation and rehabilitation purpose.
 - (d) Under faunal elements "Amphibians" will also be studied;
 - (e) The point" For RET species.....to facilitate rehabilitation" should be transferred under Flora.

2.3 Teesta Low Dam-V HEP (80 MW) Project, Darjeeling District of West Bengal by West Bengal State Electricity Distribution Company Ltd.- Scoping clearance regarding;

The project envisages construction of a 19 m high and 144 m long barrage proposed on Teesta River just downstream of Coronation Bridge and about 800 m upstream of Sevoke Railway Bridge in Darjeeling District of West Bengal for generating 80 MW of hydropower. A surface powerhouse is proposed on the right bank of river with 4 units of 20 MW each. Total land requirement is about 157.5 ha. Out of which, 142.5ha is forest land and 15 ha is private land. Total submergence area is 82.5 ha. The project was considered for TOR approval in the 61st Meeting of the Expert Appraisal Committee for River Valley and Hydroelectric Projects.

During the 61st EAC meeting, the committee noted that :

- (i) The free riverine stretch between FRL of TLDP-V HEP and TWL of upstream TLDP-IV HEP is about 1.1 km and the free riverine stretch between FRL of downstream Teesta Barrage Project and TWL of TLDP-V HEP is about 20 km.
- (ii) The EAC wanted to know whether the entire 8120 km² catchment is to be considered for developing CAT Plan or the catchment of the project.
- (iii) It was suggested that in the Form-1 under Items 1, 2 & 3 of Environmental sensitivity and under the head 1.30 the reply should be affirmative - "Yes". The PFR is to be more informative with respect to the water availability situation. The project proponent was asked to should resubmit the Form-1 with above amendments.
- (iv) In the PFR of the project, the project proponent has not considered environmental flow while conducting the power potential studies. The minimum environmental flow release during the lean months should be 20% of the average of the four lean months of 90% dependable year. In non-monsoon non-lean season the release should be between 20-30% of the average flows during the

period in 90% dependable year. The cumulative environmental flow releases including spillage during the monsoon period should be about 30% of cumulative inflow during the monsoon period corresponding to 90% dependable year. This should be adhered to cater to the downstream requirement. As Teesta river with very high flow opens out to the plains below this project the river has rich fish population species diversity. Maintaining adequate migratory path and flow are crucial. The project parameters may be finalized in the DPR keeping the above considerations.

The project proponents informed that the Topographical survey was carried out in December 2012. The river stretch from Sevoke bridge on d/s up to the TRT Outfall of u/s TLDP-IV was surveyed. A free stretch of 1.1 Km is available between the TWL of TLDP-IV Tail race outfall and the end of TLDP-V reservoir spread.

Now, based on the comments and observations of 61st Meeting of the Expert Appraisal Committee, the response and clarifications submitted by the project proponent were found to be complete and satisfactory.

The project is located between Teesta Lower Dam IV (FRL 182.25 m and TWL 155.40 m) and Teesta barrage of FRL 116.0 m almost 15 Km downstream. There is adequate free riverine stretch both upstream and downstream of the barrage.

After detailed deliberations and further scrutiny, the committee recommended the project for awarding scoping clearance and approved the TOR subject to the following additional studies/conditions:

- The project lies in the vicinity of Mahananda Wildlife Sanctuary. Since, the project lies within 10 km radius of the sanctuary, the project proponent was asked to obtain Clearance from National Board of Wildlife (NBWL).
- Presence of Elephant Migratory Path in the Study Area along with impacts due to the project be ascertained
- A site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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. With a barrage toe power house release in the non-monsoon only for peaking generation in the evening may alter the pre project flow scenario significantly. This may be examined in the environmental flow analysis.
- The area falls in seismic zone –IV and therefore, the approval of the seismic parameters“ be obtained from the appropriate authority as a part of DPR.
- Detailed Geo-morphological and structural Mapping of the study area be conducted as a part of DPR.

- Details of RET floral and faunal species and appropriate management measures be included in the EIA Report.
- Eco tourism/water park may be considered in the reservoir area to enhance aesthetics & people's participation.
- Muck disposal sites may be selected to maintain at least 30 m horizontal distance between the outer edge of the retaining structure at its base and the HFL in the river.
- Concern was expressed on the afflux at the upstream coronation bridge while the barrage is passing SPF of 12226 Cumec. From studies conducted at Jadavpur University, the water level attained at Coronation bridge starting from FRL/MWL of 154.00 m at Low Dam-V would be 159.00, which is above the springing level of the arch at 145.50. The waterway is adequate in the semicircular vent provided in the 70 m wide bridge. The developers propose to provide additional protection to the bridge in shape of 300 mm thick PCC M30 cladding to the central piers. The W. S. profile however needs to be analytically and experimentally checked up to Teesta Low Dam-IV through coronation bridge.

2.4 Panan HEP (300 MW) in North Sikkim District of Sikkim by Himagiri Hydro Energy Pvt. Ltd. – For Consideration of Environment Clearance for revised capacity from 280 MW to 300 MW.

Panan HE Project is envisaged on Talong Chhu, a tributary of Teesta river in Sikkim, was accorded environment clearance in January, 2007 for an installed capacity as 280MW. This project was formulated as 300 MW project and EIA/EMP documents were prepared for 300 MW project (4 units of 75MW) following the site clearance issued by the ministry in 2005 for 300 MW installed capacity. Developer submitted the following documents to EAC to substantiate that the project was formulated as 300 MW scheme:

- MOU with Govt. of Sikkim signed dated December 05, 2005 to develop 300 MW Panan Hydro Project
- Site Clearance by MoEF for 300 MW installed capacity dated October 06, 2005
- EIA and EMP reports prepared by CISMHE for 300 MW capacity.
- Public hearing report from Pollution Control Board for 300 MW installed capacity for the Public Hearing meeting held on September 18, 2006.
- Stage I Forest Clearance from MoEF issued on December 19, 2008 for 300 MW.
- Final (Stage II) Forest Clearance received issued by MoEF for 300 MW on September 21, 2010.

The salient features of the scheme considered during the preparation of EIA/EMP study reports were:

FRL	1116.5m
MDDL	1102.0m
Gross Storage	2.88 Mm ³
Live Storage	1.58 Mm ³

Submergence Area (FRL)	14.5 ha
HRT Length	9.8km dia 6m
Normal discharge	91 m ³ /acc
Power House Surface	300MW, 4 units of 75MW
Gross head	364.5m

It was explained that the DPR prepared for the scheme at the time of finalization of EIA/EMP study reports adopted a flow series based on the data on 10-daily average water discharge of river Rangyong Chhu (Tolung Chhu) as available at the Sangklang gauge site (Catchment area 777 km²) for the period May1990-April 2004, the years 2002-2003 and 1992-1993 have been identified as the 50% and 90% dependable years. The design drawl was set at 91 m³/sec. The developer adopted a safe installed capacity of 280MW (4 units of 70MW) each with the assumption that a variation of installed capacity by ±10% is permissible in accordance with the MOA with Sikkim government. No specific environmental release was stipulated and the prevalent norm in 2006-2007 was 10% of the lean season flow. It is in this background that the EIA/EMP reports were prepared for 300 MW installed capacity, Public Hearing conducted for 300 MW installed capacity. However, EC was issued for 280 MW scheme as applied by the Developer.

Following the issue of EC, the developer obtained approval of the CWC to the flow series (hydrological year 1990-90 to 2003-04) vide **CWC UO No. 4/514/2006-Hyd (NE)/309 dated September 04, 2009**. The 90% dependable year (1999-00) year shows a yield of 2424 mm based on the approved hydrological series against 2366 mm at draft DPR stage available at the time of finalization of EIA/EMP study reports. The design discharge was fixed as 97.86 m³/sec. Based on approved hydrological series, the developer approached CEA for TEC, which was accorded for the 300 MW scheme on March 07, 2011.

The developer requested the MOEF to consider the EC for a 300 MW project. The matter was discussed at length in EAC and it emerged that in principle clearance of a 300MW scheme (variations of less than 10%) can be considered if

- a) It could be established that there is no material change in the project location & parameters leading to higher environmental impact,
- b) The design abstraction of 97.86 m³/sec allows for adequate environmental release to the river in the monsoon, pre-monsoon & lean season. As almost six year observed hydrology data is available after issue of EC, the response of the basin can be better judged in the context of drawl of 97.86 m³/sec. this needs to be explained in details,
- c) Mangan Earthquake of 6.9 M (16 Sept 2011) has caused severe damage around local area with a high seismic intensity. Therefore, it is necessary to revisit the seismic parameters with aftershocks of Mangan earthquake data and
- d) The Environment Management Plan may be suitably revised and cost of implementation of each component of EMP has to be examined to the realistic level in the present day norm.

In response to the above points, consultant of the Developer made a detailed presentation showing a comparison of the salient features of the project available at the time of EIA/EMP study

report with that of final salient features as approved by CEA. It was explained that there is no change in the project location and therefore, no material change in project parameters has taken place nor in the study area. Project levels and dam height also remain the same. Hydrology approval by CWC has changed the SPF and PMF values from 3600 to 6200 cumec and from 2250 to 8470 cumec respectively, which has resulted in the change in spillway design. This also required revising the Dam Break Analysis, which would have to be submitted.

Regarding the environmental flow release, the consultant presented in detail, the 90% and 50% dependable year flow data (10 daily values) based on CWC approved series, the design abstraction and spill available in river during monsoon. The data showed that in the monsoon there are spills for over 30 days in 90% dependable year, which increase to over 80 days in an average year. Further developer has obtained daily discharge data from CWC for the year 2004-05 to 2011-12. This 8 years data is for CWC G&D site located on Talong Chhu at Sankalang (CA: 777 Km²) and corrected to project site (CA: 592 Km²). Additional daily discharge monitoring is carried out at G&D Site established by project at diversion site; three years daily discharge data is available at this site (2009-10, 2010-11 and 2011-12) which is consistent with the CWC data transferred to the diversion site. Consultant showed that transferred CWC data and daily discharges observed at diversion site showed a consistently better monsoon flows to substantiate the fact that the drawl of 97.86 cumec will leave sufficient flow in the river during monsoon months. Out of these 8 years, during the leanest year (2009-10), spills will be of the order of 23% of the inflows in monsoon and during all other years it ranges from 37-55%. Further CWC daily discharge data revealed that spill occurs for more than 90 days during monsoon period for all the years except the lean year (2009-10). Several flood peaks were observed in 300-400 cumec range in almost all the years and some flood peaks were observed in the range of 500-600 cumec. Consultant also showed a map of the intermediate catchment and calculations for flow contribution from intermediate catchment. It was observed that total intermediate catchment is 128 Km² and a Rangli nalla (CA: 13.29 Km²) meet after 2 km downstream of the diversion site. Initial 2 Km of the riverine reach downstream of the diversion site is critical stretch which will receive about 0.45 cumec flow in lean season as calculated based on 90% DY lean season flow.

The following comments need to be addressed in the EIA Report:

1. *2. Methodology:* The overall methodology is very vague and generalized. There is inadequate sampling locations; sampling locations for all the parameters should have been shown in a Tabular form as well as in Map with respect to Project structures!!! “Surveys in different seasons” – how many and which ones? Why cant be specific?

- It is not known how the surveys for Plant Diversity/ Inventory of Plants were carried out? There is no methodology given;
- For Floristic studies what size of Quadrats and how many replications were taken?
- For fauna also, the methodology is vague; why no proper methodology like “line transect” followed?
- For Soil analysis, there is no methodology for sampling/ collection technique is given

2. *11.2 Floristic Diversity*: It appears to be secondary data about the Khangchendzonga Biosphere Reserve. Give source of information with proper reference!!!
3. The proposed project is situated in the Buffer Zone III of Khangchendzonga Biosphere Reserve (Fig. 11.1) and 8 km from the Khangchendzonga National Park? Why no details were given in a separate Chapter about likelihood impacts of HEP on the Biosphere Reserve/ National Park? Show a map of the National Park and the project – dam, reservoir, etc. While, based on the aforesaid explanations, agreeing to the technical proposal in principle, the Committee felt that the cost of implementation of EMP component was on the lower side. The consultant presented that total EMP cost at the time of environment clearance was kept at 17.20 crore; as mentioned in EMP report. However, a provision of 21.51 crore for community development activities was added to make the total EMP cost as 38.71 crore. Committee deliberated the matter in detail and concluded that budget for EMP implementation is on lower side and need to be revised in line with present day pricing and norms. Committee asked the developer to update the EMP cost, giving component wise cost break for each EMP activity to be implemented during the construction phase. Committee also noted that the muck disposal cost has not been taken in EMP budget to which developer gave clarification that it is included in DPR. Committee desired that muck disposal cost should be adequate and should form part of the EMP cost under a separate head. Also, it would have to be explained as to whether there is an increase in muck generation as a result of increase in turbine capacity and thereby entailing higher dia of HRT. Present muck disposal norms to be adhered to by the Project Proponent which stipulate the horizontal distance between the outer edge of the retaining structure at its base and the river bank at HFL should not be less than 30 m. Committee also asked developer to submit the CWC daily flow data for Sankalang site (2004-05 to 2011-12), shown in presentation including the data analysis part to show abstraction and releases. On receipt of updated data and document, EAC will consider the project in next meeting.

The EMP should also address the following observations:

1. *1.3 Floral Diversity*: Information given is primary or secondary? If Primary baseline study why it has not been given under EIA Report?
2. *1.5 Management Plan*: The statement “None of the project components/activities are falling within the Biosphere Reserve/National Park” is not true as the National Park is barely 8 km from the Park?
3. *1.6 Biodiversity Conservation*: There is no Plan as such provided. There should have been a Plan giving names of plants- endemics, RET to be conserved/ protected through planting or establishing Conservation Areas of important species with appropriate budget; 1.6.1 Activities to be undertaken: I does not list any activities as such...? Under sub-section (v) five activities are listed with no details that as to how these will be implemented? (Under (vii) “planting of medicinal plants” – which ones? And where...? details are wanting; there is no

management plan for wildlife management/conservation when a large part of the Biosphere Reserve will be submerged affecting free movement of animals?

4. *1.1 Table: Estimated Cost:* The total cost to be enhanced to at least 500 lakhs including the component on Endemics/RET Species and Wild life management.
5. *9. Creation of Green Belt:* Avoid using exotics like *Grevillia robusta*.

2.5 Environment Impact Assessment of and Environment Management Plan of Jeera Irrigation Project- Odisha – For EC.

The project proponent has expressed inability to come and present the case.

2.6 Kalai HEP (1450 MW) project in Anjaw District of Arunachal Pradesh by M/s. Mountain fall India Pvt. Ltd – For consideration of downward revision of capacity from 1450 MW to 1304 MW & extension of validity of TOR

Kalai - I Hydroelectric Project located in Anjaw district of Arunachal Pradesh, envisages utilization of waters of the river Lohit (a major tributary of Brahmaputra River) for power generation. The project is the uppermost amongst a series of hydro power projects those have been planned for development in cascade on the Lohit River.

The Kalai-I HEP was allotted to M/s Mountain Fall India Pvt. Ltd. (MFIPL) for development on BOOT basis & Memorandum of Agreement was signed between GoAP & MFIPL accordingly on 23.11.2006. Kalai I HE Project was conceived as a RoR scheme with the parameters of FRL 1065.25 m, MDDL 1061.35m and TWL 904.80m and installed capacity of 1450 MW. The ToR approval for EIA & EMP study report was accordingly granted by MoEF vide its letter no. J-12011/46/2007-IA.1 dated 06.08.2007 and was extended till May 31, 2012. The DPR of the project having FRL 1065.25m, MDDL 1060.25m and TWL 910.40m (normal) was submitted to CEA for according TEC on 29.12.2011 and at that time capacity was revised to 1352 MW; based on final power potential as per approved CWC flow series. Three season baseline surveys were completed. However, socio-economic survey of project-affected families could not be completed due to local resistance.

In the meanwhile, Ministry of Power constituted a Standing Technical Committee (STC) to consider conversion of storage schemes to RoR schemes for those hydroelectric power projects which were earmarked as storage projects under Govt of India's 50000 MW initiative. Since Kalai I (RoR) formed part of the combined Kalai Storage Scheme identified by MOP, the STC desired that Kalai I project should be explored as storage project. Since it was not possible to take up Kalai I HEP as a storage scheme within the allotted level regime, STC decided that the project should be implemented as Run-of-the-River scheme with increased pondage by raising the FRL from 1065.25 m to 1080 m by keeping MDDL at 1060 m to create a live storage of 116 MCM to serve flood moderation purpose also.

Keeping in view the directions given by STC, the developer prepared revised PFR of Project (as ROR with pondage for flood moderation) and submitted to GoAP on 12.11.2012 and also submitted application for revised scoping clearance for the new scheme to MoEF.

Salient Features of the RoR as formulated in DPR are compared below with that of Revised Scheme as formulated in PFR based on directions of STC:

	As Per original DPR	As Per Revised PFR with Pondage
Installed Capacity	1352 MW	1304 MW
Gross Storage	324.24 MCM	421 MCM
Live Storage	31.74 MCM	116 MCM
FRL	1065.25 m	1080 m
MDDL	1060.25 m	1060 m
TWL	908.10 m (min)	908 m (min)
Deepest River Bed level	933 m	933 m
Submergence	581 ha	697 ha
No. village fully submerged	4	8
No. village Partially submerged	7	3
No. of families displaced	20	48
Land requirement	851 ha	1052 ha
Maximum Height of the dam from river bed	141 m	156 m
Length of the dam at top	415 m	631 m
Gross Head	154.85 m	169.60 m
Net Head	147.76 m	159.2 m
Normal Tail Water Level	910.4m	910.0m
Design Energy at 90% dependable year	5184 MU	5287 MU
Design Energy at 50% dependable year	7190 MU	7469 MU

A longitudinal profile of the Lohit river was presented showing all the projects proposed in cascade development. Kalai I is the uppermost project and on the upstream side the reservoir will be further extended by 2.75 Km due to increase in FRL for flood moderation. On the downstream side, there is no change as TWL remains unchanged and there is no free flowing river stretch between Kalai I Tail Water and downstream Kalai II FRL

Water availability series for the project has been approved by CWC. EAC observed that 20% of the four leanest months in 90% dependable year has been kept as environmental release and a provision of dam toe power house of 54 MW has been kept to release 46.35 cumec. Committee further noted that in other months no provisions has been kept for higher environmental flow releases as per the current EAC recommendations of 30% release in four monsoon months and 20-

30% release in non-monsoon non-lean months. EAC referred to the Lohit basin study for which draft report is available and it recommends similar environmental flow releases. However, developer commented that absolute figures given in Lohit basin study report for their project are incorrect as the flow series used in the report is old and not the one approved by CWC. EAC noted that this observation was made by CWC also on Lohit basin study and MoEF has received a letter in this regard. Therefore, EAC recommended that Lohit basin study data should be updated before its finalization and WAPCOS shall incorporate in the study.

EAC further noted that during the reservoir operation, reservoir level will be maintained at MDDL during the entire monsoon period for flood moderation and thereafter it can be increased and additional head can be utilized for power generation. However, during the 90% dependable year, there is not enough inflow for reservoir to fill up as long as the units are running. However, power potential show an increased head of 20m immediate after the monsoon period is over, which is incorrect and needs revision.

After detailed deliberations, EAC observed the following:

1. Justification has not been given for conversion of RoR scheme (for which ToR was granted) to flood moderation scheme in the ToR application. EAC did not find any merits in the revised scheme causing increased submergence of dense forestland and affecting increased number of local families. Unless the developer can provide adequate justification of the revised schemes for flood moderation based on discussion in STC meetings. . EAC asked developer to submit the Minutes of all the meetings of STC also in respect of Kalai-I HEP to get the background and reasons for revising the schemes.
2. A detailed geomorphic and structural mapping and site specific study of micro-earthquakes is required due to the high seismic zone of the Arunachal Himalaya.
3. The Power Potential Studies need correction, keeping in view the reservoir operation. Raising water level from MDDL to FRL after monsoon season or at the end of monsoon season need to be considered appropriately based upon inflows.
4. Ecological releases to be made in line with the present norms i.e. 30% release in four monsoon months and 20-30% release in non-monsoon non-lean months and 20% of the four leanest months in 90% dependable year during lean season. Keeping in view these releases, dam toe powerhouse should be planned and power potential study should be updated accordingly.
5. G&D observation made at site by project proponents from 2007-12 should be submitted to EAC.
6. Approved flow series should also be submitted to EAC.
7. Forest clearance has not been applied for the revised schemes; it should have been done before applying for Scoping approval. The project will be reconsidered only after submission of forest clearance application copy.
8. There should be always minimum free flowing stretches between two project including Kalai-I & Kalai-II.
9. The FORM 1 should be corrected as follows:

In general the filling up of Form-1 has been taken very casually with no proper/adequate details given; this should be resubmitted. There is no detailed location map and FCC of the area attached.

(I) Basic Information

Name of river is missing? Include the name of the River!!!

21. Give the extent of forest land for which clearance is required;

(II) Activity

(i) 1.1, 1.2 and 1.3: Very vague details are given!!! Give details of total land required (1030 ha) and its land use land cover and changes to be effected due to various activities with the support of FCC of the Project area ; 187.56 ha river bed; 443.59 ha community forest;

1.3 Include - .Creation of reservoir ofha (FRL) (Not given???) due to submergence will be a new land use?

1.30 It should be “Yes” as forest containing native species will be affected.

(III) Environmental Sensitivity

1,2,3: These should be “Yes” as 631 ha of forest land is involved; details given under 3 are inappropriate – these should be re-written considering what has been asked!!!

(ii) Give a detailed Location Map of HEP.

(iii) Are there any other HEP proposed on the same river? If yes give details in a line drawing with FRL and TWL.

10. Proposed TOR: Follow the standard TOR for north-eastern states. The proposed TOR should also include the following:

(i) *Study Area:*

(a) Include the study areas along with “ HRT area between d/s of Dam and Power House”.

(b) Detailed Methodology to be followed for all the parameters to be studied; Sampling locations and intensity (For example “Number and size of Quadrats”); in Tabular form and in a map; instruments/ equipments used for the analysis; , include Contour Map/Slope Map, Relief Map, Drainage Map, etc.

(c) Baseline studies: Include- Source of secondary information will be cited wherever required and citations included in a Reference List; Valuation of Biodiversity and Ecosystem Services of the Forest area to be affected will be studied.

(iii) *Biological Environment:* Include –

11. Forest type will be classified as per Champion & Seth’s (1968) classification; number and species of trees in the submergence area and their basal area will be studied.

12. General vegetation pattern will also include “Pteridophytes, Bryophytes and Lichens”, “Canes, Bamboos spp., Wild Banana, Orchids”; (c) GPS reading of occurrence of RET species will be recorded for conservation and rehabilitation purpose and their photographs provided.
 13. A separate list of all the endemic species in the project area will be prepared along with their photographs; (f) Under faunal elements ”Amphibians” will also be studied.
- (iii) *Environmental Management Plan*: How come only CAT Plan is proposed under EMP!!! What about other Management Plans?

2.7 Hutong II HEP (1200 MW) project in Anjaw District of Arunachal Pradesh by M/s. Mountain fall India Pvt. Ltd – For consideration of downward revision of capacity from 1250 MW to 1200 MW & extension of validity of TOR

Hutong-II Hydroelectric Project located in Anjaw district of Arunachal Pradesh, envisages utilization of waters of the river Lohit (a major tributary of Brahmaputra River) for power generation. The project is one amongst a series of hydro power projects planned for cascade development on the Lohit River.

The Hutong II HEP was allotted to M/s Mountain Fall India Pvt. Ltd. (MFIPL) for development on BOOT basis & Memorandum of Agreement was signed between GoAP & MFIPL accordingly on 23.11.2006. Hutong II HE Project was conceived as a RoR scheme with an installed capacity of 1250 MW. The ToR approval for EIA & EMP study report was accordingly granted by MoEF vide its letter no. J-12011/47/2007-IA.1 dated 07.08.2007 and was extended till May 31, 2012. The DPR of the project having FRL 714.5m, MDDL 710.88m and TWL 596m (normal) was submitted to CEA for according TEC on 27.12.2011 and at that time capacity was revised to 1200 MW; based on final power potential as per approved CWC flow series. Three season baseline surveys were completed. However, socio-economic survey of project-affected families could not be completed due to local resistance.

In the meanwhile, Ministry of Power constituted a Standing Technical Committee (STC) to consider for conversion of storage schemes to RoR schemes for those hydroelectric power projects which were earmarked as storage projects under Govt of India’s 50000 MW initiative. Since Hutong II (RoR) formed part of the combined Hutong Storage Scheme identified by MOP, the STC desired that Hutong II project should be explored as storage project. Since it was not possible to take up Hutong II HEP as a storage scheme within the allotted level regime, STC decided that the project should be implemented as Run-of-the-River scheme with increased pondage by raising the FRL from 714.5 m to 760 m by keeping MDDL at 710 m to create a live storage of 278 MCM to serve flood moderation purpose also.

Keeping in view the directions given by STC, the developer prepared revised PFR of Project (as ROR with pondage for flood moderation) and submitted to GoAP on 21.09.2012 and also submitted application for revised scoping clearance for the new scheme to MoEF.

Salient Features of the RoR as formulated in DPR are compared below with that of Revised Scheme as formulated in PFR based on directions of STC:

	As Per original DPR	As Per Revised PFR with Pondage
Installed Capacity	1200 MW	1200 MW
Gross Storage	210 MCM	468 MCM
Live Storage	16.33 MCM	278 MCM
FRL	714.5 m	760 m
MDDL	710.88 m	710 m
TWL	596 m (normal)	596.5 m (normal)
Deepest River Bed level	593 m	593 m
Submergence	452 ha	774 ha
No. village fully submerged	3	6
No. village Partially submerged	11	8
No. of families displaced	19	41
Land requirement	702 ha	1030 ha
Maximum Height of the dam from river bed	125.5 m	171 m
Length of the dam at top	519 m	610 m
Gross Head	118 m	163 m
Net Head	115.37 m	144 m
Normal Tail Water Level	596.0m	596.5 m
Design Energy at 90% dependable year	4903 MU	5460 MU
Design Energy at 50% dependable year	7027 MU	7983 MU

A longitudinal profile of the Lohit river was presented showing all the projects proposed in cascade development. Hutong II HEP falls between upstream Hutong I HEP and downstream Anjaw HEP and on the upstream side the reservoir will be further extended by 3 Km due to increase in FRL for flood moderation. On the downstream side, free flowing stretch between Hutong II TWL and downstream Anjaw FRL (580 m) is 400 m.

Water availability series of the project has been approved by CWC. 20% of the average flow during four leanest months in 90% DY works out to be 56 cumecs. However EAC observed that environmental flow has not been considered in power potential studies. Project proponent clarified that since Powerhouse being located at the dam toe, releases of water will be directly into the river just down-stream of the dam. Developer further explained that running one machine at 50% load during non-monsoon non peaking period will release (about 75 cumec) more water than the riparian

flow requirements. Running one machine at 50% load during non-monsoon non peaking period will release (about 75 cumec) more water than the riparian flow requirements.

The Committee further noted that in other months also, no provisions has been kept for higher environmental flow releases as per the current EAC recommendations. The Committee suggested a site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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 period corresponding to 90% dependable year. However, developer commented that absolute figures given in Lohit basin study report for their project are incorrect as the flow series used in the report is old and not the one approved by CWC. EAC noted that this observation was made by CWC also on Lohit basin study and MoEF has received a letter in this regard. Therefore, EAC recommended that Lohit basin study data should be updated before its finalization. The study is being undertaken by WAPCOS.

The EAC further noted that during the reservoir operation, reservoir level will be maintained at MDDL during the entire monsoon period for flood moderation and thereafter it can be increased and additional head can be utilized for power generation. However, during the 90% dependable year, there is not enough inflow for reservoir to fill up as long as the units are running. However, power potential show an increased head of 33.30m immediately after the monsoon period is over, which is incorrect and needs revision.

After detailed deliberations, EAC observed the following:

1. Justification has not been given for conversion of RoR scheme (for which ToR was granted) to flood moderation scheme in the ToR application. EAC did not find merits in the revised scheme causing increased submergence of dense forestland and affecting increased number of local families. Unless the developer can provide adequate justification of the revised schemes for flood moderation based on discussion in STC meetings. EAC asked developer to submit the Minutes of all the meetings of STC also in respect of Hutong II HEP to get the background and reasons for revising the scheme.
2. The Power Potential Studies need correction, keeping in view the reservoir operation. Raising water level from MDDL to FRL after monsoon season or at the end of monsoon season; need to be considered appropriately based upon inflows.
3. A detailed geomorphic and structural mapping and site specific study of micro-earthquakes is required due to the high seismic zone of the Arunachal Himalaya.
4. A site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of

lean period and 20% to 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 period corresponding to 90% dependable year. Keeping in view these releases, dam toe power house should be planned and power potential study should be updated accordingly.

5. Ecological releases to be made in line with the present norms i.e. 30% release in four monsoon months and 20-30% release in non-monsoon non-lean months and 20% of the four leanest months in 90% dependable year during lean season. Keeping in view these releases, dam toe powerhouse should be planned and power potential study should be updated accordingly.
6. G&D observation made at site by project proponents from 2007-12 should be submitted to EAC.
7. CWC Approved flow series should also be submitted to EAC.
8. Forest clearance has not been applied for the revised schemes; it should have been done before applying for Scoping approval. The project will be reconsidered by EAC only after application for forest clearance has been submitted.
9. The FORM 1 should be corrected as follows:

In general the filling up of Form-1 has been taken very casually with no proper/adequate details given; this should be resubmitted. There is no detailed location map and FCC of the area attached.

(I) Basic Information

- (i) Name of river is missing? Include the name of the river!!!

(II) Activity

- (i) 1.1, 1.2 and 1.3: Very vague details are given!!! Give details of total land required (1030 ha) and its land use land cover and changes to be effected due to various activities with the support of FCC of the Project area ; 164 ha river bed; 474 community forest; 392 ha agriculture.

1.3 Include - .Creation of reservoir of how much ha (corresponding to FRL) due to submergence will be a new land use?

1.30 It should be “Yes” as forest containing native species will be affected.

(III) Environmental Sensitivity:

1,2,3: These should be “Yes” as 638 ha of forest land is involved; details given under 3 are inappropriate – these should be re-written considering what has been asked!!!

- (ii) Give a detailed Location Map of HEP.

- (iii) Are there any other HEP proposed on the same river? If yes give details in a line drawing with FRL and TWL.

10. Proposed TOR: Follow the standard TOR for north-eastern states. The proposed TOR should also include the following:

(i) *Study Area:*

- (a) Include the study areas along with “ HRT area between d/s of Dam and Power House”.
- (b) Detailed Methodology to be followed for all the parameters to be studied; Sampling locations and intensity (For example “Number and size of Quadrats”); in Tabular form and in a map; instruments/ equipments used for the analysis; , include Contour Map/Slope Map, Relief Map, Drainage Map, etc.
- (c) Baseline studies: Include- Source of secondary information will be cited wherever required and citations included in a Reference List; Valuation of Biodiversity and Ecosystem Services of the Forest area to be affected will be studied.

(ii) *Biological Environment:* Include -

- (a) Forest type will be classified as per Champion & Seth’s (1968) classification; number and species of trees in the submergence area and their basal area will be studied.
- (b) General vegetation pattern will also include “Pteridophytes, Bryophytes and Lichens”, “Canes, Bamboos spp., Wild Banana, Orchids”;
- (c) GPS reading of occurrence of RET species will be recorded for conservation and rehabilitation purpose and their photographs provided.
- (d) A separate list of all the endemic species in the project area will be prepared along with their photographs;
- (e) Under faunal elements “Amphibians” will also be studied.

(iii) *Environmental Management Plan:* How come only CAT Plan is proposed under EMP!!! What about other Management Plans?

2nd Day (4.5.2013)

The following agenda items were taken up for discussions:

2.8 Lower Dnyanganga-II Minor Irrigation project in Buldana District of Maharashtra by M/s Minor Irrigation Division, Buldana, Water Resources Department, Government of Maharashtra – For consideration of ToR.

The project proponent made a detailed presentation. The committee noted that this is a **Category-B** minor irrigation project. The project is submitted to Central Level because submergence area of 275 ha land is involved and Dnyanganga Wildlife Sanctuary is 2.50 Km away from the boundary of the project. The project envisages construction of 21.24 m high and 4010 m long earthen dam to impound a gross storage of 10.8217 Mm³ water to provide strengthen irrigation of 1181 ha of land in Khamgaon tehsil of Buldana District and 1.34 Mm³ water is reserved for drinking purpose. The gross command area (GCA) is 1845 ha, culturable command area (CCA) is 1476 ha and irrigable command area (ICA) is 1181 ha. The catchment area at the diversion site is 303.75 Sq.km. The total land requirement is about 301 ha. No forest land is involved. Total submergence is 275 ha (Private land- 262.35 ha + 12.65 ha Government land). Dnyanganga Wildlife Sanctuary is 2.50 Km away from the boundary of the project area. Total cost of the project is about Rs. 3045.38 lakh.

During the discussions, the project proponent admitted that the construction work has already been started. Therefore, the committee noted that a violation has occurred in the project as EAC can consider only fresh proposals beginning from scoping as stipulated in EIA Notification, 2006. The EAC was further informed that such cases are to be dealt in terms with the MoEF OM No. J-11013/41/2008-IA-II dated 12.12.2012. Accordingly, the project proponent is required to submit an affidavit with an undertaking not to execute works without obtaining environmental clearance and furnish photographs of the site from all four sides of the project. The extant procedure may be followed in the Ministry to deal with/examine such cases at the first instance. EAC may consider such proposals on the event of such decision to be taken by the MoEF at appropriate level.

The project proponent admitted that the construction work had been started as they were not aware of requirement of such clearances because, this is an extension of Dyanganga-I project.

2.9 Pemashelpu 90 MW Hydro Electric Project on River Yargyap Chhu in West Siang District of Arunachal Pradesh by M/s. Mechuka Hydro Power Pvt ltd-Extension of Validity of ToR and Intimation for change of barrage location etc.

The project proponent, through their Consultants made a detailed presentation and the following emerged.

The project is located on Yargyap Chhu, which is a right bank tributary of Siyom river. There are seven planned hydropower projects on Yargyap Chhu and this is the upper most project. Downstream of Pemashelpu is Kangtangshri HEP; as shown in the L-profile, the river flows for about 14.9 Km between TWL of Pemashelpu and FRL of Kangtangshri.

Scoping clearance was accorded to Pemashelpu Hydro-electric project vide MoEF letter No:J.12011/32/2009-IA.I dated 25.08.2009 for 96 MW installed capacity. which is valid for a period of 4 years i.e. till August 24, 2013. CEA, after studying the power potential report has approved installed capacity of Pemashelpu HE project as 90 MW and this was communicated to MoEF. MoEF confirmed no objection to reduction in installed capacity from 96 MW to 90 MW vide letter No. J-12011/32/2009-IA-I dated 12th Dec 2011.

Based on the approved Hydrology by CEA/CWC (vide letter No.2/ARP/24/CEA/10-PAC5472-74 dated 23-nov 2010) and Power potential by CEA and after completing required S & I works, the final DPR was submitted to CEA in July 2011. A presentation on DPR to CEA was made on 2-9-2011. CEA recommended additional investigation in barrage area & power house area.

During the process of further investigation, a landslide occurred on the left bank of proposed barrage axis, which after further investigation, resulted in shift of barrage axis about 300 m upstream. Due to shifting of Barrage Axis, FRL has also been changed from El. 2220 m to El. 2236 m to keep water storage capacity in the reservoir almost same. Govt. of Arunachal Pradesh has approved revised FRL El.2236 m vide its letter No. PWRS/PHD/2009/54-55 dated 7th Jan 2013 and same was submitted to MoEF through letter ref No. REHPL/Pemashelpu/ 2013/0302 dated 13th March, 2013. Changes in the project parameters due to shifting of the barrage axis are as below:

S. No.	Item	Original	Now
1.	Catchment Area (Km ²)	366	368
2.	F.R.L (m)	El.2236.00	El.2220.00
3.	Area under submergence at FRL (Ha)	2.87	2.5
4.	Gross storage at FRL (MCM)	0.256	0.248
5.	Live storage (MCM)	0.202	0.200
6.	Net Head (m)	264.30	245.67
7.	Design Discharge (Cumecs)	37.73	40.37
8.	Installed Capacity (MW)	90	90
9.	Land Requirement (Ha)	55.25	63

EAC enquired about the water availability series and environmental flow scenarios in different seasons. Consultants of the Developer explained that CEA/CWC have approved hydrology series vide their letter no: 2/ARP/24/CEA/10-PAC 5472-74. Approved 10 daily flow series is for a period of 25 years (1978-79 to 2008-09) and 1978-79 has been considered as 90% dependable year. Environment flow has been calculated as 20% of the average discharge in four leanest months in 90% dependable year and this has been kept constant throughout the year. Regarding the higher releases in monsoon and other months, Consultant presented that even in 90% dependable year sufficient spills will be available in the year. 10 daily values in 90% DY are as high as 77 cumec against design abstraction of 37.73 cumec. Spills are available in monsoon for 10 out of 12, 10-daily flows and average spills are about 25% of the inflows corresponding to 90% dependable year. Average spills in 75% and 50% DY are of the order of 30.6 and 36.7% respectively. Further, daily observed data at project G&D site is available for 4 years i.e. 2009-12; this data show that there are several flood peaks in monsoon in the range of 100-150 cumec and some of the flood peak are over 200 cumec as against the design discharge of 37.73 cumec.

It was explained that River length between barrage and powerhouse is about 4.6 Km for which intermediate catchment has been allotted with a total area of 54 Km². A major nalla; Shashirong (CA: 41 Km²) meets 1.5 Km downstream of barrage axis on left bank. As the Shashirong catchment is about 11% of the total project catchment, its contribution to the flow will be significant in all the seasons.

On the issue of shift of barrage axis due to land slide, EAC observed that during site selection, geological investigation must have been done so geologist should keep in view active slides/lineaments etc in view. It further noted that for the new site, investigation should be such to ensure that no further shifting of project component is needed.

Although EIA/EMP studies were almost final at that time, changes in project components need to be addressed in the report. In view of this, project proponent requested to extend ToR for at least one year from Expiry date of Existing ToR and also the approval to changed barrage location.

After further deliberations, the Committee recommended to resubmit modified form-1 as certain vital information such as changed down axis site, new study area, Dibang biosphere reserve etc. Following are also to be addressed:

- With regard to environmental flow, a site specific study may be carried-out for establishing the proper environmental flow release during monsoon, non-monsoon, non-lean and lean months. Release of minimum environmental flow must mimic the pre-dam flow pattern of the river for sustaining the aquatic bio-diversity together with downstream user need and accordingly, water withdrawal for power generation is to be regulated. Minimum environmental flow release would be 20% of average of four months of lean period and 20% to 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 period corresponding to 90% dependable year.
- Present muck disposal norms i.e. minimum distance of muck disposal site from HFL of river should be 30m; to be adhered to by the Project Proponent and EIA/EMP to also factor into impact due to operational and constructional parameters.
- Project falls inside Dibang Dihang Biosphere Reserve, so information provided in FORM 1 needs to be corrected. Also, in view of project falling within Biosphere reserve, bio-diversity details need to be studied thoroughly. This is to be added in proposed ToR.
- Environmental sensitivity is to be assessed adequately as there may be loss of native species.
- EIA & EMP study should also concentrate on RET species available in the study area, and suggest suitable management plan in detail.
- Shift of barrage axis will increase land requirement from 50.13 ha to 55.25 ha and as such increasing area of submergence. It is to be explained of this will lead to more Project Affected Family (PAF).

There are seven HEP proposed on Yargyap Chu river; Fig in Annexure VI should also show FRL and TWL for each project to make it clear the stretch of free flow of river in between two dams.

Revised FORM 1:

(I) Basic Information: No. 21: It is not mentioned whether approval has been taken for the diversion of 15.49 ha of Forest land;

(II) Activity

1.3 Include - .Creation of reservoir of 2.87 ha due to submergence will be a new land use?

(ii) Give Location Map of HEP.

Location Map is not clear as it is too small to read.

Proposed TOR:

There is no TOR attached with the FORM 1. The TOR should also include the following:

(i) *Study Area:*

(a) Include “ HRT area between d/s of Dam and Power House”.

(i) For vegetation Analysis the Sampling will also be done in the HRT Area (3.708 km long).

(b) Detailed Methodology to be followed for all the parameters to be studied; Sampling locations and intensity (For example “Number and size of Quadrats”); in Tabular form and in a map; instruments/ equipments used for the analysis; , include Contour Map/Slope Map, Relief Map, Drainage Map, etc.

(c) Aquatic Environment: Give details of physic-chemical properties to be studied.

(d) Baseline studies: Include- Source of secondary information will be cited wherever required and citations included in a Reference List; Valuation of Biodiversity and Ecosystem Services of the Forest area to be affected will be studied.

(ii) *Biological Environment:* Include -

(c) Forest type will be classified as per Champion & Seth’s (1968) classification; number and species of trees in the submergence area and their basal area will be studied.

(d) General vegetation pattern will also include “Pteridophytes, Bryophytes and Lichens”, “Canes, Bamboos spp., Wild Banana, Orchids”;

(e) GPS reading of occurrence of RET species will be recorded for conservation and rehabilitation purpose.

(f) Under faunal elements “Amphibians” will also be studied.

(iii) *Environmental Management Plan:* Include – Wildlife under Biodiversity Conservation Plan.

To be substituted.

As it was noted that the changes in project parameters are minimal, the project proponent, would after incorporating the modified environmental flow in Revised Form-I submit the same to MoEF and upon receipt of which scoping clearance extension by one year can be recommended.

2.10 & 2.11 RAIGAM HEP (141 MW) ON DALAI RIVER AND GIMLIANGHEP (80 MW) ON DAV RIVER IN ANJAW DISTRICT, ARUNACHAL PRADESH

Committee has raised the issue that the Raigam and Gimliang HEPs have been listed in agenda as 96 MW and 99 MW installed capacity projects respectively whereas the developer has sent the documents for 141 MW and 80 MW installed capacities to all the members. Developer explained that the projects are under self-identified schemes and during the process of preparation of DPR, where hydrological series has already been approved by CWC for both the projects, the capacities have been revised. A letter was also submitted from State Government confirming no objection to change in installed capacities. Committee further observed that updated documents of revised capacities are not available in MoEF’s record therefore agenda listed the older installed capacities. Keeping this in view, EAC observed that developer should first complete all the documents in

MoEF's records; then only the matter will be discussed in EAC. Copy of application for forest clearance are also to be furnished with revised Form – 1 & PFR.

None of the projects indicates whether there will be any displacement due to submergence. Both the projects intend to acquire 6.5 ha of cultivated land which is required to be checked.

2.12 Naying HEP (1000 MW) project in West Siang District of Arunachal Pradesh by M/s Naying DSC Power Ltd. – For consideration of Environment Clearance.

The project proponent made a detailed presentation along with consultants. A videography of the site are was also shown covering from submergence and moving down up-to powerhouse area.

It was informed that Naying HEP with the installed capacity of 1000 MW was allotted to D.S. Constructions Ltd. (now DSC Limited) on BOOT basis by Government of Arunachal Pradesh and a Memorandum of Agreement (MoA) in this regard was signed between GoAP and D.S. Constructions Ltd. on 22.2.2006. Scoping clearance for the project was accorded by MoEF on July 13, 2007, which was extended up-to July 12, 2012. The Public Hearing was conducted on May 11, 2012.

The proposed dam site is located at 28°31'10" N 94°30'25" E, which is 40 km upstream of Middle Siyom HEP dam site and 4 km downstream of village Yapik. The project is located 100 km upstream of Along Town (the District Headquarter of West Siang District).

The Project envisages utilization of the waters of the river Siyom (major right bank tributary of Siang River) for power generation on a run of river type development harnessing a gross head of about 285 m in a stretch of about 15 km (from FRL to TWL). The project with a proposed installation of 1000 MW (4x250 MW) will generate annual energy of 4325.50 MU from the project in 90% dependable year with 95% machine availability giving 50.21% load factor.

A longitudinal profile of the Siyom river was shown depicting upstream and downstream projects proposed for cascade development on Siyom River. The immediate upstream project is Tato-II and free flowing stretch is 190m between Tato-II and Naying & the immediate downstream project is Middle Siyom and free flowing stretch between Naying and Middle Siyom is 800 m.

- The Naying HE Project envisages construction of a concrete gravity dam 108 m high (from river bed).
- Five spillways 4 nos. of 8 m (W) & 12 m (H) at lower level and 1 no. of 6m x 3.2m at upper level.
- 4 Nos. 10.6m dia. (2 nos. on either bank of river) Circular diversion tunnels, with upstream and downstream coffer dams of concrete faced rockfill type each.
- Well type intake structure, with bell mouth type openings and two nos. 6.5m x 7.5m sized Intake gates.
- Concrete lined single Head Race Tunnel 10.6m dia., 7.08 km long.
- Open to sky 28 m dia. 89.1 m high orifice type surge shaft.
- 4 Nos. 4.5m dia. steel lined, 366 to 388m long pressure shafts.
- 23 m wide, 54.22 m high, 181 m long Power House with 10 m (W), 24.45 m (H) x 105 m (L) MIV cavern and 16.5m wide, 25.5m high, 168.1m long transformer cavern.
- 464.9 m long 11 m wide Tail Race Tunnel.
- Other Hydro-mechanical components.
- 4 nos., 250 MW Generating Units, a pot head yard & switchyard.

Total land requirement for the construction of various components and submergence in the reservoir is 644 ha including that for underground works and is classified as Unclassified State Forest. 120 PAFs of nine villages have been identified for the purpose of preparing R&R Plan.

The project proponent explained that based upon thorough desk study, five alternative diversion sites were identified viz. Alt-I, 200m upstream of axis proposed in PFR; Alt-II, 1.72km upstream of PFR axis; Alt-III, 2.83 km upstream of PFR axis; Alt-IV, 4.05 km upstream of PFR axis and Alt -V, 700m upstream of PFR axis. Subsequently, based upon site inspection, Alt-II & V were not considered viable as these sites were not geologically suitable. Alt-IV was not found favorable as sufficient live storage for mandatory peaking was not possible. As such detailed geological investigations were restricted to Alt-III & Alt-I. Seven exploratory drill holes were done for Alt. III dam site. The results of two of these drill holes on the left bank abutment revealed that the bed rock is available at a depth more than 68m thus making choice un-economical/prohibitive considering the dam height from deepest foundation level. Hence Alt -I where bed rock is at about 35 m was chosen. The Site Specific Seismic Design Parameter Studies have been conducted through Earthquake Engineering Department of IIT, Roorkee and taken into consideration for preliminary designs of various civil structures. Micro-earthquake survey (4 seismic station network) is essentially required for a period of at least one year, as the project envisaged the construction of 108 meters concrete gravity dam.

It was intimated that flow series has been approved by CEA/CWC vide their letter no. 2/ARP/17/CEA/09-PAC/1949-51 dated May 25, 2010. The water availability studies for the project have been done on the basis of average 10-daily discharge series for Middle Siyom HEP for the period 1978-2003. The water availability has been derived on the basis of catchment area proportion and applying an overall reduction factor. The computed inflow series worked out has been utilized for Power Potential studies. The design flood has been assessed as 8270 cumec.

After detailed deliberations on minimum environmental flow requirements, it was informed that detailed modeling has been done in the most critical initial stretch before intermediate streams start meeting river. 100% release is taken equivalent to average of lean season flow (December-March) in 90% dependable year i.e. 71.255 cumec. This is baseline scenario without any dam or without any diversion of flow. Further scenarios were simulated for releases of 10%, 15%, 20%, 30%, 40% and 50% of average of lean season flow (December-March) in 90% dependable year. For each scenario depth, velocity and water width of flow were worked out. It was concluded that a release of 10% downstream provides adequate habitat for snow trout and Mahseer, which is more than the minimum requirement of 50 cm depth and 1.25 m/s velocity. However, as EAC's present requirements mandate to maintain a minimum release of 20% of the average of lean season flow (December-March) in 90% dependable year. It has been recommended that a release of 14.25 cumec (20% of the average of lean season flow in 90% dependable year) should be maintained which provides 87.44 cm max water depth and 1.97 m/sec water velocity at about 20 m waterway.

The EAC noted that 14.25 cumec has been taken as environment flow through-out the year and there is no provision of higher releases in monsoon and other months as per the present norms of EAC. Developer responded that the TOR was accorded in 2007 and there is no condition of higher release in the TOR. The consultant informed that Siang basin study is under progress and final recommendations once accepted by MoEF will be applicable to all the projects in the basin including Naying HEP. It was further informed to the committee that the Gauge & Discharge is established and regular observations are being made since September, 2006. Rain Gauge station is also established at Village Yapik. A plot of observed data from 2007-8 to 2012-13 was also shown vis-à-vis design draws for power generation. Out of 6 years daily-observed data presented, there is sufficient flow

available in the river expect for 2009-10 where spills were not adequate in monsoon. The committee suggested exploring the option of dam-toe powerhouse to ensure adequate and continuous releases in monsoon, lean and other months.

Detailed presentation was made for the coverage of EIA and EMP studies, which included baseline data, environment impacts, environment management plan and public Hearing proceedings. On EIA report EAC observed that some methodological parts for certain parameters are given under baseline studies, which is creating confusion. Methodology for all the parameters should have been given only under the Chapter describing methodology. Sampling locations for all the parameters should have been shown in a tabular form as well as in Map with respect to Project structures. Specific information needs to be given for surveys carried out in different seasons. Separate maps to be given for each parameter showing sampling location of that component with respect to project location. Details of the literature consulted during EIA study to be given so that all the secondary data has references. In the floristic survey critical analysis needs to be attempted with respect to families and genera. There is no documentation of epiphytes, Orchids, Lichens and different groups of plants viz Gymnosperms, Pteridophytes and Bryophytes.

Further on EIA report, the faunal list particularly the avifaunal and the butterfly one is deficient. A higher diversity of avifauna and butterfly is expected from the region. The list should be presented family wise as per the accepted classification and not alphabetically. It was clarified the list has been prepared based upon sighting of birds in the influence zone of the project. The list would be given as per classification system in future. There are certain wrong inclusions in the avifaunal list such as Willow Warbler and Olive Bulbul which are not expected from the area. Willow warbler is in fact Blyths Warbler which has been included by mistake and regarding Olive Bulbul it has been reported from different areas of Arunachal though the identification of the same would be cross-checked for any discrepancy. It was told that no mention of the Schedule I species of birds has been made which are included in the avifaunal list such as Great Pied Hornbill and Grey Peacock Pheasant. It was clarified that these species were not recorded during the surveys from the impact zone.

In EMP, information on the threatened (Schedule I and red listed) species should be provided. Regarding the nest boxes, different hole-sizes should be used to benefit diverse species. The initiative will require expert supervision, careful experimentation and adaptive management since such nest boxes have not been tried with birds of north-east. It was clarified that the Management is implemented by the State Forest Department who will undertake the detailing of the different measures and plans suggested under the Biodiversity Management Plan.

On CAT Plan committee observed that the cost of Catchment Area (Rs 304.80 lakh) is on lower side and needs to be revised. The consultant explained that total free draining catchment is 362.7 Km² for which CAT plan is proposed and costing is done based on local rates, however, it will be re-examined and revised

On Fisheries development plan, EAC observed that the fish diversity has been very well documented and suggested that appropriate measures should be taken for conservation of species like *Bagarius bagarius*. Flows through concrete raceways were suggested in hatcheries.

EAC observed that some of the proposed muck disposal sites are quite near the river as shown in the cross sections in the EMP and also there is no confirmation in the EMP that the current norms of muck disposal are being adhered to. It was suggested that recent muck disposal norms should be adhered to by the Project Proponent and EIA/EMP to factor into impact due to operational and

constructional parameters also. Appropriate angle of repose should be adopted and retaining walls should be properly designed so as to withstand load and should have adequate drainage arrangements like drainage holes. Project proponents explained that these have already been included and this will be further reviewed in line with the current norms.

Committee enquired about the number of project affected villages as it is mentioned as 11 villages in EIA report under baseline and 9 villages have been identified in R&R plan. It was explained that baseline includes the list of vicinity villages i.e. villages which are near the impact zone whereas R&R Plan covers villages of Project Affected Families (PAFs) only.

The following observations were made by the committee:

- It was noted by committee that TOR compliance as well as compliance of public hearing meetings have not been included in the EIA/EMP reports which should be done.
- Consultants NABET accreditation certificate and list of experts involved in carrying out EIA/EMP studies as per NABET's requirements should also be included.
- Siang basin study is in advanced stages of completion, EIA/EMP's findings should be established vis-à-vis Siang basin study.
- Regarding the environment flow EAC recommended that current norms should be considered i.e. 20% of average discharge in four leanest months in 90% dependable year for lean season discharge; 20-30% of inflows to be released in non-monsoon and non-lean months corresponding to 90% dependable year. The cumulative environmental flow release including spillage during the monsoon period should be about 30% of the cumulative inflows during the monsoon period corresponding to 90% dependable year. Committee further suggested to explore the possibility of dam toe powerhouse for environment release.
- Micro earthquake survey is recommended for one year at project site.
- For muck disposal, cross-sections of retaining walls should be shown on map clearly highlighting distance w. r. t. HFL. Videos/photos of sites should also be brought in presentation.
- A detailed write up is needed on Local Area Development plan and CSR activities of the company. This should include details of the activities proposed for development with implementation plan and budget for each activity.
- Cost of Environment Management Plan is on lower side; it should be revised and re-submitted on a realistic basis.
- Updated and modified reports to be submitted to MoEF for reconsideration by EAC.

3.0 Any other item with the permission of Chairman

With the permission of the Chairman, the following item was considered:

(A) Simang –I (66 MW) & Simang II HEP (67 MW) in Arunachal Pradesh -Extension of ToR validity regarding:

EAC was informed the following :

- The ToR validity date of the HEP is May, 2013.
- Draft EIA/EMP reports have been submitted to APSPCB by the project proponent.
- APSPCB has not been able to fix any date for Public Hearing so far.

- Public Hearings may take considerable time considering upcoming Panchayat Election in the State.
- (i) In view of the anticipated delay in conducting Public Hearing, the Project Proponent requested for time extension purely on administrative ground for one year
- (ii) EAC observed that the project proponent should submit a detailed chronological events of the salient activities associated with the EIA/EMP and justify the need for further extension of validity. Upon receipt of the requisite information/clarification the projects may be considered afresh by EAC.

(B) Display of Documents in MoEF's portal :

With reference to some communication about non availability of various documents in MoEF's website, the following were explained to the EAC :

The information has been received from NIC. The documents of all the projects which were to come up for discussion in the EAC meeting on 3-4th May, 2013, including the agenda, had been uploaded more than a fortnight ago. The data was available on temporary website <http://10.22.0.70/finalec> which has since been moved to public domain <http://moef.gov.in>. This has been verified and found that the documents are accessible on the above site. It was also mentioned that the MoEF, as a practice always attempts to ensure that all the documents related to EAC meeting are uploaded well in time.

The meeting ended with vote of thanks to Chair

Annexure

List of EAC members and Project Proponents who attended 66th Meeting of Expert Appraisal Committee for River Valley & Hydro Electric Power Projects held on 3rd -4th May, 2013 in New Delhi

A. Members of EAC

1.	Shri Rakesh Nath	-	Chairman
2.	Dr. B. P. Das	-	Vice-Chairman
3.	Dr. Arun Kumar	-	Member
4.	Dr. S. Bhowmik	-	Member
5.	Dr. K. D. Joshi	-	Member
6.	Dr. (Mrs.) Maitrayee Choudhary	-	Member
7.	Shri G. L. Bansal	-	Member
8.	Dr. Dhananjay Mohan	-	Member
9.	Dr. A. K. Bhattacharya	-	Member
10.	Dr. Praveen Mathur	-	Member
11.	Dr. J. K. Sharma	-	Member
12.	Shri B. B. Barman	-	Member Secretary & Director, MoEF
13.	Dr. P. V. Subba Rao	-	MoEF

B. Lower Orr Project in Shivpuri District of Madhya Pradesh by M/s. National Water Development Agency (NWDA) – For Reconsideration of TOR

1.	Shri R. S. Julaniya	-	Principal Secretary
2.	Shri R. K. Jain	-	Chief Engineer
3.	Shri N. C. Jain	-	Director(T)
4.	Dr. Aman Sharma	-	Chief Engineer, (Env.)
5.	Ms. Devyani Billore	-	Resident Engineer, MPWRD
6.	Shri Shrikant Nigam	-	Superintending Engineer
7.	Shri O. P. Singh Kushwaha	-	Superintending Engineer
8.	Dr. D. K. Sharma	-	Superintending Engineer
9.	Shri Raghavendra Kumar Gupta	-	Assistant Director
10.	Shri Pushp Kumar Sharma	-	Assistant Engineer
11.	Shri P. S. Murty	-	Assistant Engineer
12.	Shri Anil Singh	-	Executive Engineer

C. Nabha (4 x 250 MW) HEP in Upper Subansiri District, Arunachal Pradesh by M/s. Abir Infrastructure Pvt. Ltd – For consideration of TOR.

1.	Shri Y. U. Rao	-	Executive Director
2.	Shri Judd Prasada Raju	-	Senior Vice President
3.	Shri Rajendra Singh	-	Advisor
4.	Dr. S. S. Garhia	-	Senior Vice President
5.	Shri S. Arivumani	-	Assistant Manager
6.	Shri Senthil P.	-	Engineer

D. Teesta Low Dam-V HEP (80 MW) of WBSEDCL in District Darjeeling, West Bengal – For consideration of TOR

- | | | | |
|----|-------------------------|---|-------------------------|
| 1. | Shri D. P. Mallik | - | Chief Engineer |
| 2. | Shri Amitabh Sen | - | Superintending Engineer |
| 3. | Shri S. Debsarma Biswas | - | Superintending Engineer |
| 4. | Shri D. K. Kaushik | - | Consultant |
| 5. | Shri Amitabh Tripathi | - | Chief Engineer |
| 6. | Shri Tanmay Das | - | Consultant |
| 7. | Shri Arvind Dev | - | Chief Engineer |
| 8. | Shri Mehankjeet Singh | - | Engineer |
| 9. | Shri A. P. Chaudhary | - | Consultant |

E. Panan HEP (300 MW) in North Sikkim District of Sikkim by Himagiri Hydro Energy Pvt. Ltd – For consideration of Environmental Clearance for revised capacity from 280 MW to 300 MW.

- | | | | |
|----|------------------------|---|---------------------------|
| 1. | Shri Shekhar Gupta | - | Chief Executive Officer |
| 2. | Shri T. Gopal Reddy | - | Senior General Manager |
| 3. | Shri G. S. Rao | - | General Manager |
| 4. | Shri S. N. Subramaniam | - | Consultant |
| 5. | Shri Surya Narayan | - | Consultant |
| 6. | Shri R. S. Bhatia | - | Consultant |
| 7. | Dr. Arun Bhaskar | - | Consultant |
| 8. | Shri Vimal Bhaskar | - | Consultant |
| 9. | Shri T. D. Negi | - | Assistant General Manager |

F. Kalai HEP (1450 MW) project in Anjaw District of Arunachal Pradesh by M/s. Mountainfall India Pvt. Ltd – For consideration of downward revision of capacity from 1450 MW to 1304 MW & extension of validity of TOR

G. Hutong Stage-II HEP (1250 MW) project in Anjaw District of Arunachal Pradesh by M/s. Mountainfall India Pvt. Ltd – For consideration of downward revision of the capacity from 1250 MW to 1200 MW & Extension of validity of TOR

- | | | | |
|----|------------------------------|---|--------------------------|
| 1. | Shri H. S. Kohli | - | Director |
| 2. | Shri P. S. Khurana | - | Chief Operating Officer |
| 3. | Shri Tarun Chandra Borgohain | - | Executive Vice President |
| 4. | Shri R. S. Gill | - | Consultant |
| 5. | Shri Sunil Kumar | - | Director General Manager |
| 6. | Shri Janardan Baruah | - | Consultant |
| 7. | Shri Chandan Kumar Pathak | - | Engineer |

H. Lower Dnyanganga-II Minor Irrigation Project in Buldana District of Maharashtra by M/s. Minor Irrigation Division, Buldana, Water Resources Department, Government of Maharashtra – For consideration of TOR.

- | | | | |
|----|---------------------|---|-------------------------|
| 1. | Shri R. B. Shukla | - | Chief Engineer |
| 2. | Shri R. P. Landekar | - | Superintending Engineer |

3. Shri U. M. Pad,ame - Executive Engineer
4. Shri S. T. Kharat - Sub Divisional Enginner
5. Shri C. P. Vibhute - Consultant

I. Pemashelpu HEP (90 MW) in West Siang District of Arunachal Pradesh by M/s. Mechuka Hydro Power Pvt. Ltd – For extension of Validity of TOR.

1. Shri Ramesh Chandra - President
2. Shri Gopi Krushan Nikku - Manager
3. Shri Ganesh Babu - Senior Manager
4. Shri Tarun Rajvanshi - Engineer
5. Shri Arjun Avasthy - Engineer
6. Shri A. K. Menon - Senior Vice President
7. Shri S. S. Garhi - Senior Vice President
8. Shri Arivumani - Assistant Manager
9. Shri Senthili - Engineer
10. Shri Arun Bhaskar - Director
11. Shri Ravinder Bhatia - Director
12. Shri Vimal Garg - Director

J. Raigam HEP (96 MW) in Anjaw District of Arunachal Pradesh by M/s. Sai Krishnodaya Industries (P) Ltd. For consideration of TOR.

K. Gimliang HEP (99 MW) in Anjaw District of Arunachal Pradesh by M/s. Sai Krishnodaya Industries (P) Ltd. For consideration of TOR.

1. Dr. H. K. Singh - Vice President
2. Shri K. Palani Sami - General Manager
3. Shri Arun Kumar - Manager

L. Naying HEP (1000 MW) project in West Siang District of Arunachal Pradesh by M/s. Naying DSC Power Ltd – For consideration of Environmental Clearance.

1. Shri H. S. Kohli - Director
2. Shri P. S. Khurana - Chief Operating Officer
3. Shri Tarun Chandra Borgohain - Executive Vice President
4. Shri Sunil Kumar - Director General Manager
5. Shri Chandan Kumar Pathak - Engineer
