File No. 8-98/2011-FC

Sub: Diversion of 187.20 ha of forest land (Surface forest land = 172.25 ha and underground area = 14.95 ha) for construction of Tawang H.E. Project –Stage-I (600 MW) on Tawang Chu River in Tawang District by NHPC, Tawang District of Arunachal Pradesh.

1. The IA.I Division vide their letter No. J-12011/13/2015-IA.1 dated 03.02.2016 has submitted a proposal regarding **Diversion of 187.20 ha of forest land (Surface forest land = 172.25 ha and underground area = 14.95 ha) for construction of Tawang H.E. Project –Stage-I (600 MW) on Tawang Chu River in Tawang District by NHPC Tawang District of Arunachal Pradesh.**

1. The above recommendation of the FAC were communicated to the State Government vide this Ministry's letter of even number dated 30th April, 2012.

2. Subsequently, referring to the recommendations of the FAC, a reference was received from the Hon'ble Chief Minister of Arunachal Pradesh clarifying that Biodiversity Study has been undertaken and conservation plan prepared separately for both projects envisaging an investment of Rs. 5.40 crores for Tawang Stage-I and Rs. 4.53 for Tawang Stage-II project. The same has been incorporated in the EIA and EMP reports of the projects which were duly considered by the Expert Appraisal Committee (EAC) and MoEF while according environmental clearance to the project.

3. Taking cognizance of the above letter of Hon'ble Chief Minister of Arunachal Pradesh, the proposal was again considered by the FAC in its meeting held on 17th to 18th September, 2012 and the Committee notes as given under:

i. The Committee discussed the above proposal for diversion of forest land for Tawang I Hydro-electric projects. The Committee took note of the letter written by the Hon'ble Chief Minister of Arunachal Pradesh addressed to the Hon'ble Minister, Environment and Forests regarding biodiversity study of the Tawang River Basin. The representatives of the user agency made a request that they may be granted stage-I clearance with a condition that the study envisaged will be conducted before stage-II clearances. However, the Committee felt that a comprehensive study to assess the impact of not just Twanag-I and II projects but other projects planned in the basin is required before the projects are considered for clearance. Some of the issues that should be addressed in such a study may be as indicated below:

a. An assessment is required to be made as to what is the minimum ecological water flow at different places along the river and its tributaries that should be maintained. The parameters of all projects have to be adjusted to ensure this ecological water flow. The State Government also has to come out with details of all projects planned in the river system to ensure correct assessment.

b. A study is required to be made to assess the overall impact of the projects on hydrology, biodiversity, ecology of the area especially the aquatic ecosystem of the river and the vegetation in the adjoining land area.

c. The environmental impact of the projects planned in the river system on individual basis as well as on cumulative basis needs to be studied.

d. As large number of projects are planned on the river system, a serious thought need to be given to disaster management. A proper disaster management plan keeping in view all the projects needs to be chalked out.

e. The impact of the projects on livelihood including displacement of the people and consequent pressures on the environment has to be adequately assessed and addressed.

ii. Accordingly, the Committee recommended that a comprehensive study to address the above issues needs to be undertaken. The Committee to undertake the study should comprise of experts from field of hydrology, ecology, wildlife, sociology, hydro power design engineers and disaster management. Some of the institutions that may have expertise and may be involved in the study would include Wildlife Institute of India, Dehradun, IIT Guwahati,

National Institute of Hydrology, Roorkee, Central Water Commission, and reputed NGOs working in the above fields. The team may include regional institutions as well as independent experts of national standing.

If approved, the above recommendations of the FAC may be conveyed to the State Government.

FACT SHEET

1.	Name of the Proposal	**Diversion of 187.20 ha of forest land (Surface forest land = 172.25 ha and underground area = 14.95 ha) for construction of Tawang H.E. Project – Stage-I (600 MW) on Tawang Chu River in Tawang District by NHPC, Tawang District of Arunachal Pradesh**.
2.	District	Tawang
3.	Forest Division	Social forestry division, Tawang
4.	Name of the user agency	NHPC
5.	Area of forest land proposed for diversion (in hectare)	187.20 ha (against Tawang HEP Stage I of NHPC). Total land required 277.06 ha (Forest cover 172.25 ha Non forest cover 89.86 ha and Underground 14.95 ha)
6.	Legal status of forest	Unclassed forest land
7.	Density of vegetation	0.8 (very dense)
8.	Species-wise (scientific names) and diameter class-wise enumeration of trees (to be enclosed. In case of irrigation/hydel projects enumeration at FRL, FRL-2 meter & FRL-4 meter also be enclosed)	Coniferous species. Details are enclosed at Pg. 56/c
9.	Number of trees to be affected	Total trees to be affected are 1,99,505, which included 1,19,255, below 60 cm girth and 80,280 trees above 60cm girth. (p. 77/c)
10.	Brief note of vulnerability of the forest area to erosion.	Rocky and stable, not vulnerable to erosion.
11.	Approximate distance of proposed site for diversion from	No notified forest in this division. The proposed site of diversion is within the

	boundary of forest.	unclassed forest area.
12.	Whether forms part of National Park, wildlife sanctuary, biosphere reserve, tiger reserve, elephant corridor, etc. (If so, the details of the area and comments of the Chief Wildlife Warden to be annexed).	No
13.	Whether any rare/endangered/unique species of flora and fauna found in the area — if so details thereof.	No, rare and endangered flora and fauna is found/reported from the proposed area.
14.	Whether any protected archaeological/ heritage site/defence establishment or any other important monument is located in the area. If so, the details thereof with NOC from competent authority, if required.	No
15.	Whether the requirement of forest land as proposed by the user agency in Col. 2 of Part—I is unavoidable and barest minimum for the project. If so, recommended area item-wise with details of alternatives examined.	The proposed area is the barest minimum and unavoidable.
16.	Whether any work in violation of the Act has been carried out (Yes/No). If yes, details of the same including period of work done, action taken on erring officials. Whether work in violation is still in progress.	No
17.	Details of compensatory afforestation scheme: Details of non-forest area/degraded forest are identified for compensatory afforestation, its distance from adjoining forest, number of patches, size of each patch.	Maps enclosed herewith. Single patch of 344.50 ha proposed on degraded community land.

18.	Map showing non-forest/degraded forest area identified for compensatory afforestation and adjoining forest boundaries.	Maps enclosed at Pg 62/c
19.	Detailed compensatory afforestation scheme including species to be planted, implementing agency, time schedule, cost structure etc.	Estimate enclosed at Pg 63-68/c
20.	Total financial outlay for compensatory afforestation scheme.	Rs. 12,12,94,756/- as per estimate enclosed.
21.	Certificates from competent authority regarding suitability of area identified for compensatory afforestation and from management point of view. (to be signed by the concerned Deputy Conservator of Forests).	Enclosed (pg. 64/c)
22.	Details of Hydel Project **(Pg. 8-12/c)** **Catchment area** i. Total catchment area ii. Rainfed Area iii. Snow fed area iv. Max 10 daily discharge v. Min 10 daily discharge	 2937 sq km 2053 sq km 884 sq km 299.6 cumsec 28.2 cumsec
	Reservoir i. Full reservoir level (FRL) ii. Min. draw Down level (MDDL iii. Gross Storage at FRL iv. Gross Storage at MDDL v. Area under	 EL 2090 m EL 2087 m

	submergence	167.2 Ham 131.43 Ham 12.46 ha
	Barrage i. Type ii. Top elevation iii. Crest elevation iv. Downstream floor level v. Length at top vi. Height	RCC Raft with Piers EL 2092 m EL2068 m EL 2061 m 151.0 m 130.5 m 26 m
	Tunnels **i.** Branch tunnel **ii.** Head race tunnel **iii.** Tale tunnel	2 1 (13.987 km) 1 (1680 m)
	Power House i. Number of Units ii. Type iii. Installed capacity	3 Underground 600 MW
23.	Total Cost of Project	4992.26 Crores (pg.12/c)
24.	**Cost Benefit Analysis (Pg. 23-24/c** CB Ratio Costs Benefits	0.017 (Pg16/c) 2091.15 lacs 119499.94 lacs
25.	Catchment Area Treatment Plan	Not Enclosed

26.	R&R Plan	Total number of affected families 292. A total financial outlay of Rs. 1271.90 lakhs has been proposed for R&R. A detailed plan of R&R is enclosed at (Pg. 18-40/c)
27.	Recommendation i. DFO ii. CCF iii. Nodal Officer ,O/o of the PCCF iv. State Government .	All are have recommended the proposal. (Pg 78/c) (Pg79/c) (Pg 83/c) (Pg 84/c)
28.	Division/District profile	
	i. Geographical area of the district	2085 Sq ha
	ii. Forest area of the district	1230 Sq ha
	iii. Total forest area diverted since 1980 with number of cases	1580.398 ha
	iv. Total Compensatory Afforestation stipulated in the district/ division since 1980 on – a. Forest land including penal Compensatory Afforestation. b. b. Non- forest land	…… 1665.3 ha
	v. Progress of Compensatory Afforestation as on dated 03.09.2015 on - a. Forest land: 243.74 hectare. b. Non-forest land	365.0 ha Nil 365.0 ha
29	Specific recommendations of the Deputy Conservator of Forests for acceptance or otherwise of the proposal with	Considering the importance of the project in the all round development of the State of Arunachal Pradesh and to fulfill the national energy requirement,

	reasons	recommended for acceptance by the competent authority.

SITE INSPECTION REPORT

The site inspection has been carried put on 15th and 16th January, 2012 and point wise report in prescribed format is as under:

1. Legal status of the forest land proposed for diversion

The legal status of 172.25 ha of forest land as confirmed by the Dy. Commissioner, Tawang and DFO, Tawang vide Memo No. TJ/TBP/R&R-01/2011 dated 11.06.2011 (Copy enclosed as Annexure –I) is as under:

S. No.	Category of land	Area (in ha)
A.	Surface forest land	
1.	Unclassified State forest area	49.50
2.	Community land with forest cover	73.97
3.	Private land with forest cover	48.78
	Sub-Total	**172.25**
B.	Underground forest land	14.95
	Total	**187.20**

In addition to 172.25 ha of surface forest land 14.95 ha of underground forest land also been included in this diversion proposal seeking a total forest land diversion for 187.20 ha.

2. Item-wise breakup details of the forest land proposed for diversion:

The total land requirement for the project is stated as 262.11 ha, out of which 187.20 ha has been ascertained as forest land by the State Government.

The item-wise breakup details of forest land for diversion also indicating the component wise and location wise breakup is enclosed as Annex-IIA and II B.

3. Whether proposal involves any construction of buildings (including residential or not. If yes, details thereof.

The project involves construction of various structures like barrage, underground Powerhouse, Head Race Tunnel, Tail Race Tunnel etc. No permanent residential building is proposed in the reservoir area and at other component like Adits, Muck Dumping Areas (MDA), Constriction

Facility Areas (CFA), Quarry sites, Roads etc. However, at the Barrageand powerhouse complex sites some of the non-residential buildings will be restricted to the colony area only. In case of Powerhouse Complex all the structures of the project are proposed to be housed in underground cavern.

4. Total cost of the project at present rates:

Total cost of the project is Rs. 4824.00 crores including IDC cost and financing charges at Sept 2009 prove level.

5. Wildlife:

Whether forest area proposed for diversion is important from wildlife point of view or not:

The proposed site of diversion does not form part of any national Park/Sanctuary/Biosphere Reserve etc. the local forest Department officials have stated in the filled up formats in their inspection reports that the area is not important from wildlife point of view but many of the important faunal species available in the area as is stated in the EIA report is as under:

Mammals: reported from the area-*Rhesus macaque*, Barking deer, Sambar, Wild yak, takin, Serow, Goral, Wildboar, Black beer, Red Panda, Clouded leopard, Snow leopard, Musk deer, etc.

Avi-fauna: Blood pheasant, Crested Serpent eagle, Sclater's monal, long billed plover, Scarlet minivet, alpine accentor, Eurasian black bird, shrikess, thrushes, etc.

Fish: 12 species of fish have been recorded from Tawang river. Few of them are *Botia berdmorei, Salmo trutta faria, Mystus vittatus, Amblyceps mangois, Gangata cenis* etc.

6. Vegetation:

The river upstream of proposed barrage (near Nuranang chu) is almost gorge-shaped and on both sides steep hills are there which s covered with miscellaneous vegetation of medium density and the trees are not very tall rather they are mostly of the medium size. The forest is categorized as Himalayan Moist Tempertate Forest (Eco Class-VI) having medium dense to very dense forest.

Total number of trees to be felled. Effect of removal of trees on the general ecosystem in the area.

As per enumeration list the no. of trees affected in this HEP project are as follows:-

Total no. of trees affected – 1,99,505
Trees less than 60 cm girth class – 1,19,225
Trees above 60 cm girth class – 80,280

Main Tree Species – Species of Quercus, Alnus nepalensis, Jugulans regia, Pinus wallichiana/patella, poplar, salix, Rhododendron, Abies, densa, Junipers, Cryptomeria japonica, Acacia, Schima wallichi etc.

Flora reported from submergence area- Alnus nepalensis, Alangium chinensis, Pinus wallichiana, Macaranga postulate, Ficus nerifolia, Rubus ellipticus, Artemesia indica, Galium aparine, etc.

Pertidophytes in submergence area- Species of *Equisetum, Lycopodium, Sellaginella, Vittaria, Pyrrosia, Pteris spp.*etc.,

Some of the locally threatened plant species like *Phododendron sp., Taxus spp., Ponirochis spp., Saussurea obvallata, Fritillaria cirrhosa, Aconitum spp., Rheum spp., Podophyllum hexandrum, Berberris spp., Calamicaulis, Potentila spp*., etc are reported from the area.

7. Background note on the proposal:

Tawang HE project Stage-I (600 MW) is a run-of-the river scheme and envisages construction of 26 m high RCC Raft Barrage across Tawang river at about 1100 m upstream of Fore Bridge and near Nurangchhu existing and operational Power House of the State Govt. diverting the water through 14 km lomng and 7 m diameter horseshoe-shaped Head Race Tunnel for generation of 600 MW (3 x 200 MW) of power by utilizing gross head of 543 m and constructing an underground Power House on right bank of Tawang river at village yusum. The water from turbines shall be discharged back to the river through one 1680 m long and 7 m diameter horseshoe-shaped Tail Race Tunnel. 12.46 ha of area shall be submerged at Full Reservoir level. FRL and minimum Draw Down Level of reservoir is at EL 2090 m and 2087 m respectively. Berrage shall give its top EL at 2092 m, crest EL at 2068 m and Down Stream floor level at 2061 m. Length of barrage at top is 130.5 m.

Berrage axis is above operational Nuranang Power House over left bank of Tawang river. Surplus water of Nuranang chu shall also come to the pondage of proposed barrage. Tail Race water of Nuranang chu shall also be going into the barrage.
The total land requirement of project has been stated as 262.11 ha out of which 187.20 ha (including 14.95 underground land) is ascertained as Forest land.

8. Compensatory afforestation:

- **Whether land for compensatory afforestation is suitable from plantation and management point of view or not:**

344.5 ha CA site has been identified over degraded community land at Bleting village of Dudungahar Circle, Lumla Sub-Division falling under tawang Social Forestry Division along Tawang river opposite territory of Bhutan. The concerned DFO has certified its suitability for raising and maintenance of CA however, final approval from local office of concerned Land Management Deptt. for transfer of land is under process.

- **Whether land for compensatory afforestation is free from encroachment/other encumbrances:**

The undersigned has also seen part of the area (though only form a distance due to its difficult accessibility) but has assessed its suitability. No encroachment has been seen on the site identified for CA. Dy. Commissioner of the District has also issued non-encumbrance certificate with respect to the identified CA land.

- **Whether land for compensatory afforestation is important from Religious/Archaeological point of view:**

No the land for CA is not imporatn from religious/Archeological point of view.

- **Land identified for raising compensatory afforestation is in how many patches, whether patches are compact or not:**

Single compact patch of 344.50 ha of degraded community land.

- **Map with details:**

  Map enclosed.

- **Total financial outlay:**

Rs. 6,05,70,700/- including 10th year operations cost escalation value, cost of Light and Heavy Motor vehicles along with hiring drivers/Handyman, afforestation supervisor, costruction of labour shed and provison of entry point activities.

9. Whether proposal involves violation of forest (conservation) Act, 1980 or not. If yes a detailed report on violation including action taken against the concerned officials:

No

10. Whether proposal involves rehabilitation of displaced persons. If yes, whether rehabilitation plan has been prepared by the state government or not:

There is no displacement of people involved in this project; however, 292 families of 18 hamlets are likely to be affected due to required acquisition of their private land as well as community land. As informed by the user agency R&R plan as per the policy of the State Government has been prepared and submitted to the concerned DC Tawang, which is under process of approval by the State Government.

The total land requirement for the project stated in the FC proposal of the State Government, Rehabilitation plan furnished with FC proposal and land verification certificate enclosed with proposal is different including forest land requirement.

Details be furnished specifically if rehabilitation plan would affect any other forest area by translocating outsee in around the said forest.

No other forest area is getting affected as there is no displacement and translocation of human population involved in this project.

The final approved R&R plan is presently not there, the plan may require revision and thereafter approval of the State Government.

11. Reclamation plan:

Details and Financial Allocation

Fir meeting the requirement of coarse and fine aggregates, rock fill and filter materials, quarrynsites, such as barrage site terrace deposites (TW IG-3), fore bridge rock quarry (TW1R-3), Fore bridge (lower terrace) impervious soil deposits (TW1C-1), fore bridge (upper terrace) impervious soil deposits (TW1C-2), and Teli village impervious soil deposits (TW2C-3) [Excluding excavated material from Power House (TW1R-2) and HRT (TW1R-4] are proposed for diversion. After excavation of the required material, these quarry sites are proposed to be restored using various engineering, bio-engineering and biological measures. The estimated cost for restoration of quarry sites proposed in EMP is Rs. 389.60 Lakhs.

Different projects related activities will result in disturbances of area like clearing of vegetation and degradation of slopes. After construction of the project the constructions sites are proposed to be restored by various engineering and biological measures. In addition, beautification and landscaping of the construction sites has also been proposed in EMP at estimated cost of Rs. 143 Lakhs.

12. Details on Catchment and command area under the project:

Catchment area of Tawang river for tawang HE project Stage-I is 2,93,700 ha. For preparation of CAT Plan, free draining catchment of Tawang river has been taken into consideration which is 12,588 ha and comprising 28 sub-watersheds. After required analysis, an area of 811 ha and coming under very severe and severe erosion intensity has been considered for CAT, for which various engineering measures like construction of brushwood checkdams, DRSM check dams, mulching contour bundling and bench terracing and biological measures like improvement have been proposed in EMP is Rs. 435.50 Lakhs.

13. Cost benefit ratio:

1: 57

14. Recommendations of the Principal Chief Conservator of Forests/State Government:

The proposed forest land diversion has been recommended by the State Government and from all levels of State Forest Department as the project will help in fulfilling power requirement of the State as well as of the country.

15. Recommendations of Chief Conservator of Forests (Central) along with detailed reasons:

The area, required for the project and its surround though temporary, but shall face air pollution during the construction phase to drilling, blasting, construction activities and vehicular movement. Due to excavation lot of loose soil shall be there in the area and noise shall also be generated by various machineries in the initial phase. The water of Tawang harbours several taxa of algae and macro invertebrates. Berrage shall inundate about 12.50 ha of land along with its floral and micro-faunal diversity. In the construction phase many important faunal species shall also get disturbed due to the reasons stated above specially mammals (like musk deer, snow leopard, cloded leaopard, red panda, Wild yak, Black beers, Gorals, Takin, serow, etc). Very large number of trees, about 2 lakhs, shall be affected and may require felling including locally threatened species of *Rhododendron, Taxus, Saussurea, Podiphyllum, berberis, Aconitum, Rheum* etc. Species of fish in the river shall also be affected in permanent basis. Therefore, the project shall have a negative impact on the Eco-system and environment specifically in the construction phase.

The project includes muck disposal and rejuvenation of such sites, restoration of quarry sites, green belt development around reservoir, restoration of construction areas and landscaping, provision of fish hatchery and fish ladder, Biodiversity Management Plan, Compensatiry afforestation scheme, provision of 12.60 km Sela Road tunnel to by-pass 4176 m Sela pass whiocj normally remains snow bound during winter which will also be used for defence purposes, provision of establishing NHPC college of Arts, Scinece and Commerce at Tawang, construction of electric crematorium, extension of Hospitals and Schools facilities to locals, 12% free power to State Government, free 100 units of electricity per PAF/month for 10 years, improvement of road network and bridges in and around project area, employment opportunities to locals, opportunities for contracts and supplies, benefits from R&R plan and work of community and social development.

Though it is difficult to quantify and assess the accurately all losses and gains due to project implementation, losses to ecology and eco-system but power is also very important as it is a basic need for infrastructure development of the area. The country as a whole is having a vast gap between supply and demand of power whereas Arunachal Pradesh is having large potential of HEP. HEP is considered comparatively non-polluting source of power. Hence tapping HE power at suitable place is also one of the major requirement of the country and more particular in the area where of where tapping HEP is possible and feasible.

In the light of above facts, the proposed diversion may be considered but with cautions and very strict adherence of impact-mitigationa measures specifically in construction phase. A high level of Committee consisting representatives of State Government Central Government (From MoEF, CWC etc.) and reputed institute working in the sphere of bio-diversity conservation can be constituted to monitor implementation of all impact-mitigational measures from beginning upto the stage of commissioning to avoid probable negative impact on the environment and ecosystem.

16. Regional Chief Conservator of Forests shall give detailed comments on whether there is any alternative routes/alignment for locating the project on the non-forest land:

The location and alignment of the various structures of Tawang HE project Stage-I has been finalized after detailed survey and geological exploration and also after examining various alternatives which has also been concurred by the Central water Commission (CWC) and Central Electricity Authority (CEA) while granting concurrence to the project on 10.10.2011.it is site specific project. The selection of site for HEP is highly technical subject and has to be on a river meeting required head for the project. Therefore, the alternative, if any, is actually not possible to suggest on the basis of this site inspection report.

17. Utility of the project:

Tawang HE Project Stage-I will generate 2963 million units of electricity per annum. In fact, the project will improve the infrastructural facilities and quality of life of people in Tawang district and also bemnefit the State of Arunachal Pradesh and the country as a whole.

Numbers of Scheduled caste/Scheduled Tribes to be benefited by the project.

Project affected people, which belong to the Scheduled Tribe category will be benefitted by the project as they will get good R&R package like ex-gratia payment, land development charges, livelihood grant, assistance for agricultural production, scheduled tribe family grant, annuity policies for pension for life (for vulnerable persons), free electricity @ 100 units PAF per month, and subsistence grant (for assets less) and rights and privileges. Moreover, the local people of the Tawang district, 75% of which belong to scheduled tribe and 0.6% belong to the scheduled caste, will also be the indirect beneficiaries of the project, as for improving the infrastructural development and quality of life in the region, community and social development plan will be implemented by the project for which Rs. 2367 lakhs has been earmarked.

18. Whether land being diverted has any socio-cultural/religious value

No, the land being diverted has no any socio-cultural/religious value.

Whether any sacred groove or very old growth trees/forests exist in the areas proposed for diversion.

No sacred grooves or very old growth trees/forsts exists in the area proposed for diversion.

Whether land proposed for diversion forms part of any unique ecosystem.

The area though does not form part of any identified unique ecosystem but together with its vast floral and faunal diversity, presence of several threatened species, high altitude, steep slopes of adjoining hills, fragile nature of hills, coupled with high rainfall, occasional snowfall etc can be considered an important ecosystem if not unique.

19. Situation with respect to nearest Protected Areas

The nearest P.A. is Eagle Nest Wildlife Sanctuary and the distance of the same from Barrage and power house site is approximately 27 km and 32 km, respectively as stated by the concerned DFO.

20. Any other information relating to the project

- The project is purely run-of-the-river scheme and envisage creation of only a small pondage of 12.6 ha including river bed by constructing a 26 m high Barrage.

- The project has been accorded EC by MoEF vide letter No. J-112011/53/2006-IA-I dated 10.06.2011 and concurred by the CEA vide OM No. 2/NHPC/59/CEA/09-PAC/7068-7091 dated 10.10.2011. Defence clearance has also been accorded by the Ministry of Defence vide letter no. 21(8)/2010/D(Coord) dated 14.12.2010.

- Transmission line for power evacuation has not been proposed with this project, therefore, this power house shall require forest land again for power evacuation. The extent of such requirement is not known presently.

- The total land requirement and forest land requirement as stated in FC proposal. R&R plan furnished with FC proposal and land verification report of DFO and extra Asst. Commissioner (LM) Tawang (Annexure I) differs from each other. The project authorities have verbally stated that R&R plan shall be revised shortly because the land requirement has been reduced subsequent to the submission of the R&R Plan to the Government.

Now, the Cumulative Impact Assessment of Tawang river basin in Arunachal Pradesh for development of Hydro electric power projects (HEPs) is come in by IA Division **(F/X).** The major approved recommendations of the study report as outlined below may kindly be considered for further necessary action for development of HEPs in Tawang river basin is given below:

Major Recommendation:

(i) 11 proposed HEPs totalling 2802.20 MW of installed capacity have been considered in the basin. List of project considered is attached at Annexure-I **(F/A)**.

(ii) 2 proposed HEP projects totalling 103 MW capacity as against the total planned capacity of 2802.20 MW for 11 HEP projects in the basin have been recommended to be dropped. The details of dropped HEPs are annexed as Annexure-II**(F/B)**. . These projects shall not be considered for EC/ FC or any other approval by State/ Central Government.

(iii) These 2 HEPs shall not be re-allocated by altering their features, location, names, etc. In the location of river stretches where these projects have been recommended to be dropped, NO HEP should be developed.

(iv) On the other free stretches of tributaries, no further HEPs should be planned/ allotted in the entire Tawang basin even if they are of smaller capacity (less than 25 MW) and do not fall under the purview of EIA Notification, 2006.

(v) For the remaining 9 HEPs, environmental flow release has been recommended are attached as Annexure-III **(F/C)**. These must be conditioned in the final approval of the HEPs.

(vi) The E-flow of Nyamjang Chu HEP as proposed is 70 % in the lean season will have implication on the project viability/ capacity. The conservation issues of Black-necked crane which is seen in its proximity needs to be addressed. A study in this regard may be commissioned through Wildlife Institute of India (WII) or its equivalent because E-flow for this HEP has been indicated

based on only one season study. Therefore, the E-flow values for Nyamjang Chu project may be finalized with four seasons study.

(vii) Mitigation measures suggested for taking up by all the individual projects **(F/D)**.

a) Strict management and regulatory measures be adopted for pollution control, e-flow as recommended, needs to be strictly maintained to minimize the impact on faunal species.

b) Proper muck disposal arrangement to be ensured.

c) Impacts of noise due to drilling, tunnelling, blasting and vehicular movements on the faunal groups to be minimised. For this high–tech equipments to be used.

d) Vehicular movement may be regulated to check noise pollution.

e) To mitigate the impacts of influx of population and pressure on the local natural resources, appropriate regulatory mechanism has to be in place.

f) To minimize the impact of invasion alien species (IAS), the existing identified IAS should be weeded out and adequate measures should be taken to avoid introduction of new IAS through appropriate quarantine measures. An appropriate policy to regulate the introduction of IAS needs to be formulated by the Government of Arunachal Pradesh.

g) Afforestation programmes using dominant native tree species and woody shrubs are to be undertaken to compensate the floral and faunal losses in the project areas. The activities planned under compensatory afforestation and catchment area treatment and biodiversity management plan in the report should be strictly followed.

h) To mitigate the possible impacts due to seismicity,safety criteria are to be followed in design of the barrage/ dam.

i) For fish migration, fish ladder at all the project sites should be a part of barrage design. Prescribed e–flow must be ensured at all project sites, and regulatory steps to minimise the pollution close to zero discharge by polluters should be taken.

j) All the activities/ interventions/ suggested in the report under biodiversity and development plan at landscape/district levels may be made mandatory for the individual projects. The specific activities recommended in the landscape level plan those fall within the 10 km radius of the projects should be taken up by the respective proponents. The project proponents, for this purpose, should refer this report.

(viii) Specific measures suggested for taking –up by the individual projects **(F/E)**.

a) Tawang-I
Adequate care must be taken so save the existing tourist spot (Nuranang falls) from the adverse impacts of barrage construction. Religious sites are to be left undisturbed.

b) Tawang-II
The habitats for birds are to be protected. The host plant species must be planted under various afforestation programmes, and artificial nest boxes must be installed in sufficient number. No religious sites should be disturbed.

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