

Full titled of the project: Additional Forest diversion case of *Integrated Kashang HEP*
Stage-II & III

Fill No.: FP/HP/HYD/49387/2020

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HISTORY

Large untapped hydro potential exists in the Himalayas, which can make a substantial contribution to the total power generation in the country. The country has no other option but to tapped hydel power in a big way if it has to avoid energy crisis in the long run. India has a large economically exploitable hydro potential assesed as equitant to about 25000 MW of installed capacity including pumped storage projects and small hydro schemes. The actual installed capacity at present is not even 10% of the assesed potential, out of this assesed capacity medium and large hydro electric projects contribute 84044 of potential at 60% load factor of which only 13942.60MW (16 %) has been harnessed. The balance 84% of untapped potential is concentrated in Northern and North Eastern region of the country.

Hydro power is a critical resource for any country and its potential cannot be realized without one enabling environment and strong commitment from Govt, Government of India has taken a conscious decision to have a three pronged strategy for expeditious development of hydro power potential in India and out of 1 lac MW of capacity additions projected by the financial year 2012-30000MW will be hydro power which will be contributed by northern and North Eastern region.

Indian power Secretary-facing challenges and despite significant growth in generation over the years, it has been suffering from shortage and supply constraints. Energy and peak load shortages were 7.8% and 13% respectively in the year 2000-2001. As GDP growth accelerates to an ambitious 8-10%, the shortage will become more sever. This prevailing chronic and ever growing power shortage in the country can surely be tackled by expeditious development of the vast and economically viable hydro electric potential of 21000 MW in the snow fed rivers of Himachal Pradesh, which emanate from the western Himalayas. The states which power potential need to focus on the full development of their potential at the earliest.

TABLE

SHARE OF HYDRO POWER IN INDIA'S INSTALLED CAPACITY

YEAR	TOTAL INSTALLED CAPACITY (MW)	HYDRO POWER CAPACITY (MW)	%AGE SHARE OF HUDROPOWER
1962-63	5801	2936	50.60
1969-70	14102	6135	43.50

1979-80	28448	11384	40.00
1989-90	63636	18308	28.80
1991-92	69070	19189	27.80
1993-94	76718	20366	26.60

HYDRO POTENTIAL IN HIMACHAL PRADESH

The total potential in Himachal Pradesh is 12235.24MW at 60% load factor, with an installed capacity of 20392.07 MW. The Satluj basin in Himachal Pradesh has a hydro power potential of 9443.75MW, which represents approximately 50% of its likely installed capacity. In addition to the Satluj other rivers that are part of the great Indus Basin and pass through Himachal Pradesh also contribute to the power potential of the state. Important ones among these are Beas river 4597MW, Ravi river 2294MW and Chenab river 2748 MW and Yamuna 591.52 MW. The total identified hydro power potential of Himachal Pradesh in its various stages of development is indicated in table.

TABLE

STATUS OF HYDRO POWER POTENTIAL IN HIMACHAL PRADESH.

STATUS	HYDROPOWER IN MW
Harnessed so far	6045.07
Under execution	4387.50
For which DPR is ready	1244.50
Under Investigation	3672.50
Schemes which are yet to be investigated	4292.50
Him Urja	750.00
Total:-	20392.07

Total exploitable hydro power in Himachal Pradesh is 12235 MW, which is 14.56% of India's total hydro power. Basin wise hydro power potential in Himachal Pradesh is depicted in table; Figure depicts important river basin of Northern India.

BASIN	HYDRO POWER IN MW
Bias Basin	4597.00
Ravi Basin	2294.00
Satluj Basin	9411.25
Yamuna Basin	591.52
Chenab Basin	2748.00
Mini Micro project	750.00
Total:-	20391.77

The proposed Integrated Kashang Hydro Electric Project is envisaged as run of the river development on the tributaries of Satluj River, i.e. Kashang and Kerang, river valleys are adjacent to each other and are separated by a high altitude ridge in the area of the project. Topographic features permit diversion of Kashang khad at an altitude of roughly 2830 m to an underground powerhouse located on the right bank of Sutlej river, developing a head of approximately 830 m. Topographic and geological features between Kerang and Kashang valleys are also conducive to diversion of Kerang khad, which has higher inflows than Kashang, into the Kashang water conductor system for significant augmentation of generating capacity at Kashang powerhouse near National High way-05.

OBJECTIVE AND SCOPE OF WORK

The main objective of the study is to carry out the Environmental Impact assessment (EIA) for the proposed Integrated Kashang Hydro Electric Power Project to meet the environmental clearance criteria of the Ministry of Environment and forest, Government of India. The scope of study would be as outlined in the EIA guidelines of Ministry of Environment and forest for water resources /river valley project. This will facilitate the regulatory funding agency to decide that the project options are environmentally sound and sustainable on long-term basis.

The study would include the description of project setting, appraisal of project activities and assessment of environmental impacts related to the location, design, and construction and operation of the project. An Environmental Management Plan (EMP) has been prepared to mitigate/ eliminate the negative impacts. The cost of the environmental management and monitoring programs has worked out for budgetary provisions in the overall project cost.

PROJECT LOCATION AND APPROACH

Himachal Pradesh is located in the western portion of the Great Himalayan Mountain Range of Northern India, bounded by the state of Jammu and Kashmir to the North, Tibet to the East, and the plains of Northern India to the South and West. The Sutlej River is one of the major rivers draining this region. It rises in the Tibetan plateau, passes via steep valleys and gorges through the Himalayan Mountains and foot hills and meets the Arabian Sea across the plains of Northern India.

The project site area is about 240 KM from Shimla, the state Capital and national High way-05..

GENERAL

The Integrated Kashang Hydro Electric Project has been envisaged with the purpose of exploiting the potential of the Kashang and Kerang streams. The tributaries of River Satluj in Distt. Kinnaur. The project consists of four stages. Viz. stage-I, II, III & IV.

Kashang Stage- I (2x65MW)

- Trench weir diversion of Kashang Khad at an elevation 2830m
- Cut and cover inlet channel
- Head race tunnel/ Channel (a portion is cut and cover, rest is underground).
- Underground balancing Reservoir.

- Underground Pressure Shaft.
- Underground Power House complex (Machine hall and transformer hall).
- Surface switchyard

Kashang Stage-II (Kerang –Kashang link scheme).

- Trench weir diversion at Kerang Khad at an elevation 2872m.
- Inlet Tunnel
- Underground Desilting Chambers.
- Link tunnel for flow of water from desilting chambers to Kashang water conductor system.

Kashang Stage-III (1x65 MW)

- Addition of one unit in Kashang Power House using Kerang Khad.
- To be developed later independently.

Kashang Stage-IV (48 MW)

The forest and Environment Clearances For Kashang Stage- I (66 MW now 65 MW) has already been accorded by the MoEF&CC vide letter No. 8-8/2001-FC dated 23-06-2004 and letter No. J-I 2011/13/2002-IA-I dated 15-12-2002 the project is expected to provide annual energy generation of about 735.20GW-h in a 90% dependable year.

The project will be constructed in a period of four years. Some preliminary works on Infra Structure facilities will be carried out prior to taking up construction of the main Power project the start of the main project components is expected by 2009 and the project is likely to be commissioned by the end of 2013. Integrated Kashang HEP 243 MW is techno economically viable and its early execution is planned for reducing the gap between availability and demand of power in the Northern region of the country.

NEED OF PROJECT

Installed power generation capacity in India increased for 1362 MW in 1947 to 64,729 MW in 1990 during that period, energy production jumped from 4 to 264 TWH. However despite that appreciable growth, power demand has almost throughout outstripped the supply. At the end of the 7th plan, the shortfall in energy availability on an all India basis was 6.8 % and the shortage with to peak availability was 19%.

The hydro power potential of Himachal Pradesh is surplus to its own requirement. However, the surplus power is usefully made available to meet the power and energy requirements in other parts of the country, and very particularly, the Northern Grid. Therefore, it is necessary to look into energy and power requirement of the Northern Region while planning of hydropower development in Himachal Pradesh, Power demand and supply for the Northern region are given in table whereas energy and pack load demand for the Region during; 1995-2010 is given in Table

TABLE
POWER DEMAND AND SUPPLY (1990-1995).

ITEM	UNIT	1990-91	1992-93	1992-93	1993-94	1994-95
Installed capacity	MW	19203	20581	22195	24274	26681
Peak availability	MW	11408	11291	12777	14008	15271
Peak lode	MW	14908	16259	17721	19240	20814
Surplus/Deficit	MW	-3500	-4338	-4944	-5232	-5543
Energy Availability	GWH	80803	82755	88165	106143	101643
Energy Requirement	GWH	79338	86553	93396	110841	110841
Surplus / Deficits	GWH	1465	-3798	-6231	-4698	-4698

TABLE
ENERGY AND PEAK LOAD DEMAND (1995-2010)

PERIOD	ENERGY (GWH)	PEAK LODE (MW)
1995-1996	119887	22466
1996-1997	129587	24234
1997-1998	139976	26124
1998-1999	151086	28143
1999-2000	162954	30295
2005-2006	248332	45634
2009-2010	318715	58117

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From table and table it can be seen that peak demand over a period of 20 years is likely to quadruple (four times) from 14908 MW in 1990-91 to as much as 58117 MW in 2009-2010. From the growth of peak demand and anticipated installed generating capacity on the basis of schemes proposed for benefits under construction/ consideration during eighth and ninth five year plan, it is observed that there is dire need to provide additional capacity to the Northern Grid to meet the increasing demand of the grid. Thus new schemes are required to be taken up immediately for their implementation to get the timely benefit.

The most important source of power development in the Northern region is Hydro resources located in Himachal Pradesh, Uttaranchal and Jammu and Kashmir. Integrated Kashang Hydro Electric Project is very good and attractive scheme from the view of deriving benefits by feeding power to the Northern grid.

DoE Govt. of Himachal Pradesh has allotted Integrated Kashang HEP, to Himachal Pradesh Power Corporation, vide letter No. DoE/ CE/ Mis Vol-III/2010-1483 dated 22.02.2010, after

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obtaining all the statutory clearances, Project proponent had started the construction activities. MOEFCC has already accorded the Forest Clearance for 17.6857 ha (Copy attached as **Annexure-I**) for the construction of Integrated Kashang HEP, Stage II & III. Due to Hydrological surprises in the operation of Stage I, of IKHEP, some modification / amendment in the project component has been envisaged. This has resulted in the requirement of additional forest land for which Project proponent has proposed & investigated three alternates and concluded one alternate for diversion case as under:

Alternate -I:-

Alternate - I, Proposed for construction of SFT drain, is situated 8 meter away from SFT portal and the requirement of land for alternate I is 0.2205 ha. which is located in DPF-C 234, although there is huge numbers of Fully grown Deodar Trees (Total 58 Number) standing on the aforesaid land but, technically this land is not suitable for construction of SFT out fall since it has huge number of trees and it is a avalanche prone zone with a vertical cliff, therefore this alternate is not considered, hence rejected.

Alternate II :

Alternate - II, Proposed for construction of SFT drain is situated 264 meter away from SFT portal, and the requirement of land is 0.3104 ha. which is located in DPF-C 234, although in this site too, there are no trees standing on the aforesaid land but, technical this land is not suitable for construction of SFT out fall since it is a avalanche prone zone, therefore this alternate is also not considered, hence rejected

Alternate III :

Alternate - III, Proposed for construction of SFT drain, is situated 360 meter away from SFT portal and the requirement of land for alternate III is 0.1920 ha. out of 0.4148 ha of total requirement of land for additional Forest Diversion case for Stage II & III, which is located in DPF-C 234, although in this site, there are only 4 number fully grown Deodar trees & 17 numbers sapling trees (12 sapling Deodar, 2 No's Kail & 3 No.'s Neoza) standing on the Proposed land but, technically and physically this land is best suitable for construction of SFT out fall/ drainage since it is not a avalanche prone zone geologically it is also suitable for the construction of SFT drainage/ out fall therefore this alternate is considered for the construction of SFT Out fall/ drainage .

Details of three alternates:-

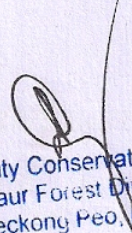
SN	Alternate	Length of alignment (mts)	Area Involved (Ha)	No of trees Involved	Remarks
1	Alternate-I	245	0-22-05	58	Not suitable
2	Alternate-II	326	0-3104	Nil	Not suitable
3	Alternate-III	213	0-19-20	4 trees and 17 saplings	Suitable

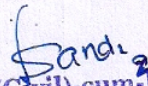
Details for Land diverted is attached as (Annexure—II) by implementation of this project,

3 numbers of Panchayats being declared as Project affected Panchayats of IKHEP Stage II & III will be benefitted under various R&R schemes are as under :

SN	Name of Gram Panchayat	No. of Beneficiaries	Remarks
1	Pangi	759	
2	Lippa	291	
3	Rarang	391	
	Total	1441	

Approximately 350 skilled, semi skilled and unskilled persons during construction phase would be employed for a period of 48 months (including infrastructure development) beside about 25 directly employed regular staff in the operation phase . In addition to it the project would generate indirect employment in both construction and operation phases like, Hiring of vehicle, hiring of Buildings, petty contracts, fisheries, retail business & tourism etc.


Deputy Conservator of Forest
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