

JUSTIFICATION FOR LOCATING THE PROJECT IN FOREST LAND

Hydroelectric projects are generally planned on the river located in the mountainous/hilly region which is mostly forest areas and the land required for the project is forest land only. Dugar Hydro Electric Project is located in the similar terrain and topography in Chamba district of Himachal Pradesh. To minimise the requirement of forest land, layout of the proposed hydroelectric project has been optimised to the maximum possible extent and only unavoidable, minimum forest land is being proposed for the diversion of the project. Even the areas falling under submergence in the reservoir have been proposed to be utilised for construction of temporary infrastructure facilities.

Projects components such as dam structure, Power house and other infrastructure facilities like roads, dumping area, quarry area etc. have been fixed after detailed survey, investigation and examination of available alternatives.

Project as well as infrastructure facilities shall not result in displacement of people of the project area.

Alternatives Considered

Three different dam sites have been taken into consideration during Alternative Study. Dam axes have been selected within the concession limits of Dugar HEP defined in between FRL as 2114.0 m asl and normal tail water level as 2015.0 m asl. Alternative-II is situated approximately 1.06 km downstream of the bridge (Shukrali Bridge) of the Sach-Pass road at km 8+240 while Alternative-III is positioned at km 10+309. Alternative-IV is located after the 90° bend of the river at km 11+010. Water conductor system is planned at left bank of Chenab River. An underground power house is planned just downstream of Alternative-III dam axis. The layout of the surge shaft, pressure shaft and pressure tunnel, the power house including transformer cavern and tailrace tunnels has been kept the same for all three alternatives.



Fig - Alternatives considered in the Project

[Signature]
Divisional Forest Officer
Pangi Forest Division
Kilfar 176323

[Signature]
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हि.प्र.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

Alternative IIA : This alternative is the most upstream alternative, with dam at location where river bed is about El 2035 masl . This alignment involve comparatively less submergence in the reservoir, whereas long underground water conductor system. At the same time abutment on both banks at dam axis are not that stable so may trigger slide during dam abutment excavation. Longer water conductor system means more muck to be generated during construction, which will eventually need bigger dumping area.

Alternative IIIA: In this alternative Dam is proposed at location where river bed level is about 2017 masl. Abutments at both banks are steep rocky faces, with less of Geological problems. Layout of the project will be comparatively compact with smaller underground water conductor system; hence less muck generation. This layout will have more submergence area comparison to ALT II but less dumping area. Based on the techno-economical evaluation it was found that Alternative-III is the most attractive solution.

Alternative IVA: This alternative involve dam toe surface power house. In this alternative reservoir submergence will be maximum. To accommodate surface power house on the right bank significant surface excavation will be involve which may trigger slides in long run or may need very elaborate slope stability arrangements. This alternative also has some geological challenges in the reservoir bank stability due to presence of fault.

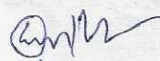
Based on the investigation done on the three alternatives, the findings are referred below:

| Parameters | Alternative II A | Alternative III A | Alternative IV A |
|----------------------------|---------------------|-----------------------|--------------------------------|
| DAM type- Concrete gravity | Feasible | Feasible | Feasible |
| Underground works | Long Tunnel (4800m) | Small Tunnel (1000 m) | V. Small length Tunnel (800 m) |
| Energy Production | 1500 MU | 1758 MU | 1690 MU |
| Geological Risks | High | Moderate | Moderate |
| Submergence area | 155 Ha | 160 Ha | 210 Ha |
| Dumping area | 25 Ha | 9.0 Ha | 7.8 Ha |
| Other Area | 30 Ha | 42 Ha | 40 Ha |
| Total forest area | 210 Ha | 211 Ha | 257.8 Ha |

Considering all the engineering and environmental consideration it is decided to develop the project at Alternative III A, which has least probability of increase in area medium geological risk.

Considering all the above factors, Alternative III A has been considered for the Project as it is techno commercially viable.


Divisional Forest Officer
Pangi Forest Division
Killar 174101


General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हि.प्र.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

Map: Alternatives considered in the Project



(Signature)

महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हि.प्र.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

(Signature)
Divisional Forest Officer
Pangi Forest Division
Kifhar 176323