

MATHEMATICAL MODEL STUDIES FOR RESERVOIR SEDIMENTATION FOR DEVSARI H.E. PROJECT, UTTARAKHAND

BACKGROUND

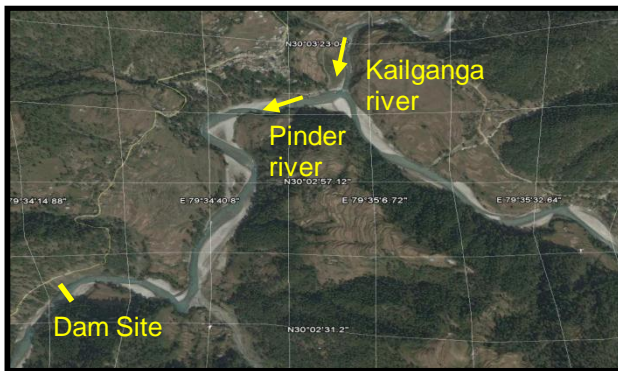
The Satluj Jal Vidyut Nigam Ltd. (SJVNL) has proposed to implement Devsari Hydro Electric Project (252 MW) on river Pinder in Alaknanda basin, Uttarakhand. The project is planned as a run of the river scheme with 35 m high dam at about 2.5 km downstream of the confluence of river Kailganga with Pinder river.

OBJECTIVES

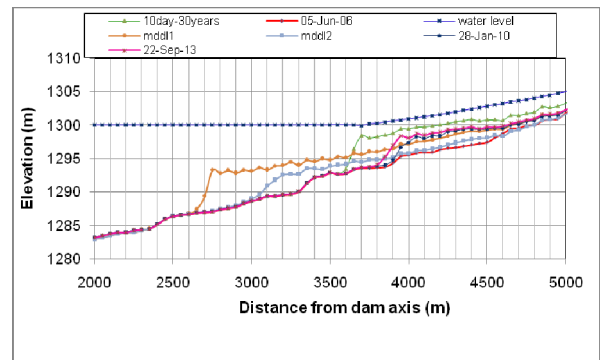
- To estimate the long term reservoir sedimentation profile.
- To assess the extent of sediment deposition in the reservoir and in the vicinity of intake and to assess the possibility of reservoir functioning as a desilting basin.

STUDIES CONDUCTED

- The simulation studies were carried out with observed daily flow series for the period from June 2006 to May 2010 by maintaining the downstream water level at dam axis at the FRL (EL.1300 m) and MDDL (EL. 1295 m).
- Changes in bed level, cross section and velocity profile were computed at the end of simulation period.
- Long term simulation studies were also carried out.



Pinder and Kailganga river near dam site



Bed profiles

OBSERVATIONS

- Sediment deposition in the form of deltaic pattern was observed at upstream reach of reservoir. The advancement of delta deposition towards dam was observed to be at very slow rate .
- No sediment deposition was observed near the intake and dam. The maximum flow velocity near dam and at intake area was of the order of 0.04 m/s during the lean flow period and 0.4 to 0.6 m/s during peak flow of 429 m³/s
- Due to low velocities near dam and intake and in the entire reservoir stretch of about 4 km in main Pinder river and 1 km in Kailganga river the reservoir was observed to function as a desilting basin.

SIGNIFICANCE OF THE STUDIES

Studies will help the project authorities in effective planning and design of various components of diversion structure, such as invert level of intake and provision of desilting arrangements.