



CENTRAL WATER AND POWER RESEARCH STATION

Desk Studies for Hydrological Re-assessment of the New Railway Line between Indore-Budhni, Madhya Pradesh for Rail Vikas Nigam Limited, Bhopal

STUDY OVERVIEW

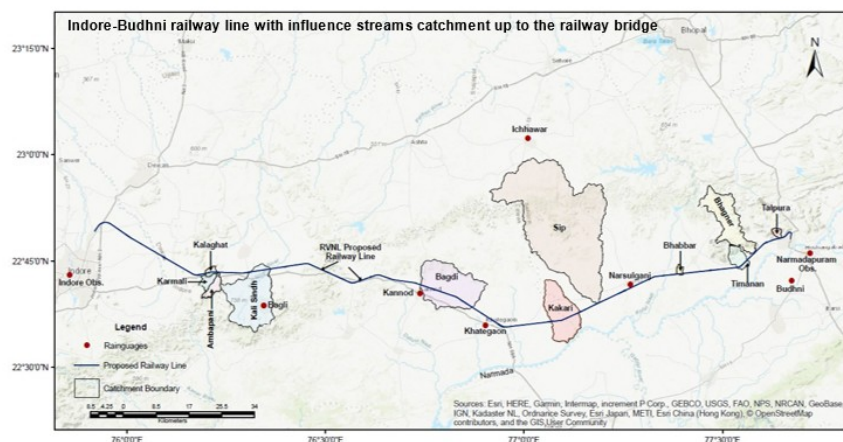
The objective of the study is to carry out the hydrological re-assessment studies for the railway bridges in the proposed railway line between Indore-Budhni, Madhya Pradesh for a length about 198 km for Rail Vikas Nigam Limited (RVNL), Bhopal. The project aims to reduce travel time of Indore-Jabalpur and Indore-Mumbai as also bypassing the congested Bhopal-Itarsi route.

Approach

- Review of available reports on the study area and carry out site visit for reconnaissance survey and to collect site specific data and review of topographical features of the project site and its surrounding area.
- Collection, processing and extreme value analysis of rainfall data using statistical approach.
- Collection of Survey of India Toposheets and DEM NRSC/USGS) of study area.
- Delineation of catchments/ sub-catchments of the rivers and streams in study area.
- Estimate the peak floods by using the weighed rainfall for influencing catchment for different return periods with suitable Rainfall-Runoff model.
- Determination of linear water ways for different return periods of various railway bridges located in railway line.
- Based on the outcomes of the study, submission of technical report to the project authority.

IMPACT

The study ensured that the results presented in the technical report will be useful for RVNL, Bhopal while carrying out the task related to the proposed railway line project between Indore and Budhni.



KEY FINDINGS

- The weighted rainfall for different return periods (say, 25-year (yr), 50-yr 75-yr and 100-yr) were computed through Thiessen weights of influence stream catchments of railway bridges from the estimated design rainfall depths using MLM estimators of EV-I distribution of 9 IMD rain-gauge stations.
- By using the weighted rainfall and catchment characteristics, the peak flood discharge (PFD) was carried out by adopting rational formula for minor catchments (catchment area less than 25 km²) as per the guidelines of RDSO Report RBF-16.
- By applying the procedures of Synthetic Unit Hydrograph described in CWC Flood Estimation Reports for Chambal [Subzone-1(b)] and Upper Narmada & Tapi [(Subzone - 3(c) (Revised))] for the study region for major catchments (catchment area more than 25 km²), the PFD at railway bridges were computed.
- The estimated PFDs were further used for determination of linear waterways for railway bridges located on the proposed railway line between Indore and Budhni by applying the procedures as described in Paragraph 4.5.3 (Lacey's formula) of Indian Railway Standard Code of practice for the design of sub-structures and foundations of bridges (IRS SSC).