

## Water Supply and Demand Analysis for Ranchi City under Climate Change Using Water Evaluation and Planning System Model

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**Abstract :** There are different water user sectors such as rural, urban, mining, subsistence and commercial irrigated agriculture, commercial forestry, industry, power generation which are present in the catchment in Subarnarekha River Basin and Ranchi city. There is an inequity issue in the access to water. The development of the rural area, construction of new power generation plants, along with the population growth, the requirement of unmet water demand and the consideration of environmental flows, the revitalization of small-scale irrigation schemes is going to increase the water demands in almost all the water-stressed catchment. The WEAP Model was developed by the Stockholm Environment Institute (SEI) to enable evaluation of planning and management issues associated with water resources development. The WEAP model can be used for both urban and rural areas and can address a wide range of issues including sectoral demand analyses, water conservation, water rights and allocation priorities, river flow simulation, reservoir operation, ecosystem requirements and project cost-benefit analyses. This model is a tool for integrated water resource management and planning like, forecasting water demand, supply, inflows, outflows, water use, reuse, water quality, priority areas and Hydropower generation, In the present study, efforts have been made to access the utility of the WEAP model for water supply and demand analysis for Ranchi city. A detailed works have been carried out and it was tried to ascertain that the WEAP model used for generating different scenario of water requirement, which could help for the future planning of water. The water supplied to Ranchi city was mostly contributed by our study river, Hatiya reservoir and ground water. Data was collected from various agencies like PHE Ranchi, census data of 2011, Doranda reservoir and meteorology department etc. This collected and generated data was given as input to the WEAP model. The model generated the trends for discharge of our study river up to next 2050 and same time also generated scenarios calculating our demand and supplies for future. The results generated from the model outputs predicting the water require 12 million litter. The results will help in drafting policies for future regarding water supplies and demands under changing climatic scenarios.

**Keywords :** WEAP model, water demand analysis, Ranchi, scenarios

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