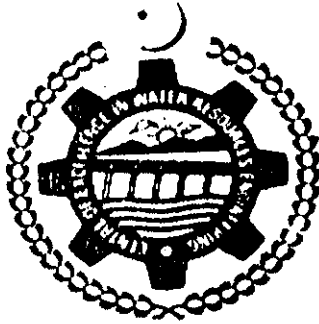


THESIS

**HYDROPOWER ANALYSIS OF A MULTIPURPOSE RESERVOIR
LOCATED IN COLD REGION**



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ABSTRACT

Hydropower analysis of Satpara reservoir is performed in the present study. Satpara dam project is not the part of the national grid. It will be operated on stand-alone basis. It is eminent in the sense that it is located in cold region due to which it is fed by snowmelt instead of monsoon, which is feeder of many constituents of Indus Basin System. Satpara Chu flows are higher in Kharif and much lesser in Rabi. The methodology adopted for this study processes through data collection, comparison of hydrologic characteristics of Satpara Chu with neighboring rivers, extension of Satpara Chu flows, development and comparison of flow duration curves of Satpara Chu using historic and extended values, selection of design discharge, computation of power and energy potential and economic benefits. As only one-year flow data of Satpara Chu is available, so it is compared with Rivers Kachura and Yugo having long term flow data to find the option, which is closer to Satpara. Coefficient of determination (R^2) value is the principal criterion in the decision. River Kachura having better results is thereby used for extension. In extension, regression based on runoff factors is found to give better results than regression based on discharge values. The same is also found to be true for Nalter flows extended from Hunza flows. For selection of design discharge, flow duration curves developed from historic and recorded data are considered. Their results are further counterchecked by simulation through a hydrologic software DRW (DESIGN RESERVOIRS For Windows). In the end, power and energy potential and economic benefits of powerhouses are computed.