THESIS

ESTIMATION OF WATER AVAILABILITY AND OPTIMIZATION OF POWER POTENTIAL OF AKHORI DAM WITH MULTIPLE EXISTING USES ON INDUS RIVER

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ABSTRACT

Estimation of water availability in Indus Basin and hydropower optimization for Akhori reservoir are done in the present study. Akhori Dam is a fast track project in WAPDA's program but its viability is still to confirm. It is eminent in the sense that it is an off-channel storage project on Nandna Kas, a tributary of Haro river, and to be fed from surplus flows of Indus river at Tarbela. As about 84% flows of rivers of Indus Basin occur during three summer months and a sizeable part of these flows is wasted due to non-availability of storage capacity, therefore such reservoirs are very important from national point of view. The methodology for this study processes through data collection, establishing irrigation demand, evaluation of Nandna Kas flows, estimation of water availability in Indus Basin using different approaches, optimization of power potential and computation of energy potential and economic benefits.

As Nandna Kas is not gauged its flows are computed using the rainfall data and Hyundai equation for the area for runoff computation. Irrigation demands are established through shortages in IRSA indent at Tarbela and through WAA allocation to provinces on canal heads at Kalabagh. The estimation of water availability in Indus Basin and in Indus River are performed by using both forward and backward techniques. The hydropower optimization through simulation is done by using the software DRW (Design Reservoir for Windows). In the end the peaking power, energy potential and hydropower benefits of the project are computed.