

Comparison of the Anomaly of Hydrological Analysis Tools used in Nepal

M. K. Shrestha, S. Chaudhary¹, R.K. Maskey² & G. Rajkarnikar³

Email:manojksth@gmail.com

¹*B. Tech. Environmental Engineering, Kathmandu University.*

²*Profesor for Hydraulics and Hydropower Engineering School of Engineering Kathmandu University.*

³*Senior Divisional Hydrologist Water and Energy Commusion Secretariat Kathmandu.*

ABSTRACT

The diverse physiographic and hydrological regime has booned Nepal with high potential of water resource projects. But these projects depend highly on hydrological data for which hydrometeorological stations need to be established. Their establishment, because of difficult topographic feature of Nepal and the high cost of installation, operation and maintenance, becomes feasible only for big projects. And thus hydrological data are needed to be predicted for small scale projects. These predictions for a given ungauged river system at particular location are facilitated by empirical methods such as WECS/DHM (Water and Energy Commission Secretariat/ Department of Hydrology and Meteorology) and MIP (Medium Irrigation Project) which have been used since its development without upgrading and checking its reliability. The objective of this study is to compare the anomaly of flow predicted by WECS/DHM and MIP method and determine reliability of minimum flow predicted by the methods. The anomaly of the method is presented by comparing the mean DHM monthly flow with the mean of predicted monthly flow for each of the seven rivers from Central and Western Development Region. Both methods give variable deviation for different periods of time for all the rivers. MIP method gives reliable prediction only if the discharge measurement is done during the dry period (November–April). The reliability of these methods is checked for estimating minimum flow by calculating the percentage of time discharge (minimum predicted flow) will be exceeded. WECS/DHM has given higher reliability for the minimum flow than MIP method. MIP (D) method has given good approximation to the DHM dry period flow than MIP (A). While analyzing the low flow, lower predicted value given by either of these methods when used gives good approximation. In order to improve the accuracy of prediction there is requirement of modification of these Hydrological Analytical tools.

Keywords: hydrological data; WECS/DHM method; MIP method; ungauged river; MIP (D); MIP (A)
