

A comparison on rainfall averaging methods

Estimation of average rainfall over a catchment based on rainfall observations made at several locations within the catchment is necessary in many hydrological studies. Among the many methods available for averaging rainfall over an area, methods such as Arithmetic Mean Method, Thiessen Polygon Method, Isohytal Method and Distance Weighting/Girding Method are simple methods, which are widely in use. The accuracy and applicability of these methods depend on many factors. Some of them are topography of the area, distribution of the rainfall gauging stations, distribution of rainfall, etc.

A comparison of the above areal rainfall averaging methods was made by applying them to kotmala Oya Catchment. The study used monthly rainfall observations for twenty years at 14 gauging stations within and around the catchment. The data were visually checked and missing data were filled. Subsequently, the data were checked for consistency using double mass curve method. Areal average rainfalls over the catchment on monthly basis for the total period of 20 years were estimated based on all the above methods. In the case of Distance Weighting Method, areal average rainfalls were estimated for several different sized grids. The comparison of the methods was done based on means and standard deviations of the estimated areal average rainfalls for the twelve months in the year.

Results indicate that the monthly areal average rainfalls estimated from the Thiessen Polygon Method, Isohytal Method and Distance Weighting/Girding method are very close to each other while the estimations obtained based on Arithmetic mean method are slightly different, for the Kotmala Oya catchment.