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Evaluation of rainfall forecasting in Golestan province using time series

H. Sharifan , **B. Ghahraman**

(Scientific staff member, Gorgan University: E-Mail= H_sharifan47@yahoo.com)

(Scientific staff member, Ferdowsi Mashhad: E-Mail= bijangh@ferdowsi.um.ac.ir)

Abstract

Limiting water resources for agricultural and non agricultural usages pose some difficulties for the present and also for the future. Rainfall is the most important water resource. Therefore, for optimal allocation of water resources, forcasting rainfall for a region is of special importance. Time series analysis seems to be a suitable tool for such forecasting. Four stations of Fazelabad, Gorgan, Maraveh-Tappeh, and Torshakly with different climates were selected for this study. SARIMA model were fitted to 26 years data, using MINITAB software, and rainfall was forecasted accordingly for the period from years 2000-2003. Two different time horizons of 10-day and monthly were adopted for modeling. Forecosted monthly rainfall was discritisized to 10-day intervals based on the distribution of month in a similar year. In overall, monthly and annual rainfall were determinated by summing 10-day and monthly values, respectively. The forecasted rainfalls were compared to actual observed data. The results showed that for forecasting 10-day rainfall, using 10-day time horzon in SARIMA model formulation is more suitable. While, for monthly and annual forecasting purposed it is preferred to proceede whit monthly values.

Key words: Time series, rainfall forecasting, SARIMA model, Golestan Province.