

Flood Predicting in Karkheh River Basin Using Stochastic ARIMA Model

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Abstract : Floods have huge environmental and economic impact. Therefore, flood prediction is given a lot of attention due to its importance. This study analysed the annual maximum streamflow (discharge) (AMS or AMD) of Karkheh River in Karkheh River Basin for flood predicting using ARIMA model. For this purpose, we use the Box-Jenkins approach, which contains four-stage method model identification, parameter estimation, diagnostic checking and forecasting (predicting). The main tool used in ARIMA modelling was the SAS and SPSS software. Model identification was done by visual inspection on the ACF and PACF. SAS software computed the model parameters using the ML, CLS and ULS methods. The diagnostic checking tests, AIC criterion, RACF graph and RPACF graphs, were used for selected model verification. In this study, the best ARIMA models for Annual Maximum Discharge (AMD) time series was (4,1,1) with their AIC value of 88.87. The RACF and RPACF showed residuals' independence. To forecast AMD for 10 future years, this model showed the ability of the model to predict floods of the river under study in the Karkheh River Basin. Model accuracy was checked by comparing the predicted and observation series by using coefficient of determination (R^2).

Keywords : time series modelling, stochastic processes, ARIMA model, Karkheh river

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