

ABSTRACT

The economic life of Pakistan depends to large extent on its agriculture, which in turn is dependent on irrigation through a vast network of barrages, diversions, and channels from the River Indus and its tributaries. Most of the flows abstracted for irrigation from the River Indus is fed by a combination of meltwater from seasonal and permanent snow fields and glaciers, and direct runoff from rainfall both during the winter and monsoon season from July to September. Besham Qila flow gauging station is just above Tarbela the biggest water reservoir of Pakistan. Skardu Basin, Hunza Basin, and Gilgit Basin are the main sources of runoff at Besham Qilla. Flow volume from Hunza and Gilgit Basins together with minimum And maximum temperature, and precipitation at respective catchments are taken as independent variables for the flow volume at Besham Qua. Box and Jenkins (1970) ARIMA and SARIMA models are subsequently become very popular in stochastic hydrology. Weekly data from 1980 to 1991 is used for this study. Since the inflows from Hunza and Gilgit basins reach at the Besham Qila in approximately seven days, therefore the in flow volumes and temperatures are taken at lag one. A class of SARIMA models is fitted and checked for the adequacy through different diagnostic tests and criteria. The best fitted model s used to forecast within the sample i.e. 1981-1990 and out of sample i.e. 52 weeks of 1991. The Mean Absolute Percentage Forecast Error out-of-sample is 22.2% and Theil inequality coefficient as 0.098365 indicating a reasonably good forecast.