

Modeling persistent and periodic weekly rainfall in an environment of an emerging Sri Lankan Economy

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Abstract. The quantity of rainfall and its related events have become more and more uncertain due to climatic variability. The complexity of the climate change arises due to multiple asymmetries in rainfall, especially in tropical countries. Relatively, few measures have been taken to perform the modeling of rainfall in the context of long memory. This paper provides an assessment of such a phenomenon by fitting an appropriate time series model. A long range dependency model is proposed to fit weekly rainfall data to explore characteristics of persistence through an unbounded spectral density. Careful examination of the data exhibits periodic fluctuations as an additional feature. Since, the rainfall series exhibits periodic variations and persistence, a seasonal autoregressive fractionally integrated moving average (SARFIMA) model is fitted. Parameters of it are estimated using maximum likelihood estimation (MLE) method. A Monte Carlo simulation was carried out with different seasonal and non seasonal fractionally differing parameters to measure the suitability of the method for parameter estimation. Best fitted model is chosen based on the minimum of the mean absolute error and the forecasting performance using an independent sample as a creative contribution.