Abstract

Climate change refers to a change in average weather conditions at a particular region or the earth as a whole due to many natural and man-made factors. The natural factors include volcanic eruptions, change in ocean currents, variation in solar radiation etc. It is a natural phenomenon that occurs slowly with respect to time. But in recent years due to high industrialization and development by mankind there is a drastic change in climatic conditions causing adverse effects on environment. One such field on which the impact of climate change is huge is occurrence of floods i.e., flood frequency. The analysis of climate change on flood frequency represents an important issue for water resources management and flood risk mitigation.

In view of the above, a review of the various studies is been carried out about climate change. The various studies that are being reviewed consists of various catchments in different parts of the world having different climatic conditions. The main objective of this review of studies is to predict the impact of climate change on flood frequency. Broadly all the methodologies in this review can be classified into four stages namely Collection of observed data, Statistical downscaling and weather generators, Hydrological modeling and simulation, Flood frequency analysis. In the first stage the raw observed data is collected from various research stations and organizations. Thereafter, the monthly change factors with respect to the baseline period are calculated for the future period by using RCMs and GCM outputs. These change factors were used as input data in LARS-WG to generate the future climate time series. Further, the future discharge series were simulated using a continuous hydrological model [Hydrologic Engineering Center-Hydrologic Modelling System (HEC-HMS)] and LARS-WG simulated future climate data. The impact of climate change on flood frequency was analyzed using the extreme discharge series extracted using the POT approach. For each POT series, the best-fitting distribution is selected by testing several distributions that are normally used in extreme values analysis, such as GPD, P3, LP3, Gumbel, LN, and GL distributions.

The results of various studies clearly showed that the climate change has an adverse effect on environment and mankind which is definitely going to increase drastically in the future. Everyone is going to experience ill its effects and also the

effects caused by increase in flood frequency intensity and duration which is a major area of concern for water resources engineers.

KEY WORDS: Continuous hydrological model; Climate change; Flood frequency; Peak over threshold (POT); Regional Climate Models (RCMs);Downscaling method; Global circulation model (GCM); Weather generator.