

## Abstract

This chapter presents the trend of drought as a stochastic natural disaster influenced by the climate variability for the upper Tana River basin in Kenya. Drought frequency, duration and intensity in the upper Tana River basin have been increasing over the years. To develop measures for mitigating impacts of drought, the influencing hydro-meteorological parameters and their interaction are necessary. Drought definitions, fundamental concepts of droughts, classification of droughts, types of drought indices, historical droughts and application of artificial neural networks in analyzing impacts of drought on water resources with special focus on a Kenyan river basin is presented. Gaps for more focused research are identified. Although drought forecasting is very vital in managing key sectors such as water, agriculture and hydro-power generation, drought forecasting techniques in Kenya are limited. There is need therefore to develop an effective drought forecasting tool for on-set detection, classification and drought forecasting. The forecasting is necessary for decision making on matters of drought preparedness and proper water resources planning and management.