**INTRODUCTION**

Hydrology is a branch of Earth Science. The importance of hydrology in the assessment,

development, utilization and management of the water resources, of any region is being

increasingly realized at all levels. It was in view of this that the United Nations proclaimed

the period of 1965-1974 as the International Hydrological Decade during which, intensive

efforts in hydrologic education research, development of analytical techniques and

collection of hydrological information on a global basis, were promoted in Universities,

Research Institutions, and Government Organizations.

***1-1 Definition of hydrometeorology***

Hydrometeorology is a branch of meteorology and hydrology that studies the transfer

of water and energy between the land surface and the lower atmosphere. UNESCO has

several programmers and activities in place that deal with the study of natural hazards of

hydro meteorological origin and the mitigation of their effects. Among these hazards are

the results of natural processes or phenomena of atmospheric, Hydrological

or oceanographic nature such as floods, tropical cyclones, drought and desertification.

Many countries have established an operational hydro meteorological capability to assist

with forecasting, warning and informing the public of these developing hazards.

A detailed hydro-meteorological study for the study area has been carried out using data

obtained from the National Meteorological Agency (NMA). Data has been collected from

seven stations in and around the sub-basin.

***1-2 Importance and applications of hydrometeorology***

This book describes recent developments in hydro meteorological forecasting, with a

focus on water-related applications of meteorological observation and forecasting

techniques. The topic includes a wide range of disciplines, such as rain gauge, weather radar,

satellite, and river and other monitoring techniques, rainfall-runoff, flow routing and

hydraulic models, and now casting and Numerical Weather Prediction. Applications

include flood forecasting, drought forecasting, climate change impact assessments,

reservoir management, and water resources and water quality studies. The book examines

how recent developments in meteorological forecasting techniques have significantly

improved the lead times and spatial resolution of forecasts across a range of timescales.

These improvements are increasingly reflected in the performance of the operational

hydrological models used for forecasting the impacts of floods, droughts and other

environmental hazards. This has led to improvements in operational decision-making,

which can range from decisions within the next few hours on whether to evacuate people

from properties at risk from flooding, to longer-term decisions such as on when to plant

and harvest crops, and to operate reservoirs and river off-takes for water supply and

hydropower schemes. The book provides useful background for civil engineering, water

resources, and meteorology and hydrology courses for post-graduate students, but is

primarily intended as a review of recent developments for a professional audience Key themes: floods, droughts, meteorological forecasts, hydrological forecasts, demand

forecasts, reservoirs, water resources, water quality, decision support, data assimilation,

probabilistic forecasts. Kevin Sene is a civil engineer and researcher with wide experience

in flood forecasting, water resources and hydro meteorological studies. He has published

some 45 scientific and conference papers on topics in hydrology, hydrometeorology and

hydraulics, and a book Flood Warning, Forecasting and Emergency Response.

Fresh water is one of our nation's most precious and valuable natural resources. The

management of this resource requires accurate and timely information on precipitation and

surface processes for water managers to make appropriate decisions regarding

infrastructure and resources. Knowledge of both the amount and uncertainty of

precipitation and stream flow information is also required by forecasters to produce robust

hydrologic simulations of stream discharge, to issue flood warnings to the public, and

improve overall awareness related to incoming storms. Recent studies have shown that

climate change will increase the occurrence of extreme precipitation events over time,

further highlighting the need for reliable information.

PSD's Hydrometeorology Modeling and Applications Team is focused on advancing

hydrometeorology methods, models and applications to address weather and climate

extremes. This information is used to provide guidance on observing network design,

modeling assimilation and analysis, and predictions that can be applied in National

Weather Service operations as well as informing local, regional, and national communities,

planners, and decision makers.