**IMPACT OF CLIMATE CHANGE ON THE HYDROLOGY OF MAHANADI RIVER BASIN**

**ABSTRACT**

The increasing rate of global surface temperature is going to have significant impact on local

hydrological regimes and thus on water resources, this leads to the assessment of water resources

potential resulting from the climate change impacts. Main parameters that are closely related to

the climate change are temperature, precipitation and runoff. Therefore, there is a growing need

for an integrated analysis that can quantify the impacts of climate change on various aspects of

water resources.

The present work intends to determine climate change impact on the hydrological processes in

the Mahanadi River Basin through:(1) Statistical analysis of historical and future climate trends,

(2) use of General Circulation Models (GCM) for simulating the response of climate variables

globally, accounting for the effects of greenhouse gases in the atmosphere, (3) use of statistical

downscaling technique to model the hydrology variables (e.g., precipitation) at a smaller scale

based on large scale GCM outputs, (4) use of hydrological modelling for assessment of global

climate change impacts.

Statistical trend analysis has been done using Mann Kendall Test and Sen’s Slope Estimator to

find out the magnitude of the trend for the historical and future records. Statistical downscaling

model has been used to predict the future precipitation and temperature time series from the year

2011 to 2099 by using HadCM3 coupled model. Artificial Neural Network (ANN) and Multiple

Linear Regression analysis has been used to predict the future runoff from the precipitation and

temperature.