



Construction of downscaled climate change scenarios and an assessment of implication through a crop simulation model

L. Das (1)

Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, West Bengal, INDIA (
daslalu@yahoo.co.in)

A study has been undertaken to investigate the climate change signal (if any) in the 20th century over the whole Indian region as well as over Gangetic West Bengal and its neighbourhood using CRU reanalysis data and observed stations data respectively. A downscaled high-resolution future climate change scenarios have been constructed followed by an assessment of the implications on agriculture sector over GWB and its neighbourhoods as a special emphasis. A warming trend is detected from the Fifties in case of the winter season while the Eighties for the postmonsoon season where as a significant recent decreasing trend in the monsoon rainfall is also noticed over the GWB and its surrounding states.

Future projection of climate change in the periods 2020s and 2050s using five GCMs namely HadCM2, CSIRO, GFDL, CGCM1 and ECHAM4 has been derived due to greenhouse gas forcing as well as sulphate aerosols forcing conditions. An amount of $0.3 - 0.6 \pm 0.2\text{oC}$ per oC global mean temperature change is noticed in the composite scenarios, with more warming in the northern India and less warming in the southern India. Downscaled scenarios using a statistical technique reveals a warming of $0.2-0.8\text{ oC}$ per oC global change for the period 2010-2039 with more warming and less changes of rainfall (-3 to +1%) in the monsoon season. So the projection for 2010-2039 indicates a warming of about $0.5-2.0\text{oC}$ by introducing the global change of GCMs (2.5oC). Such a change can alter the productivity of rice as assessed through Oryza 2000, a crop simulation model for rice. GWB and its neighbourhood is expected to experience nominal change in the either sides as rice production increases by about 10% with 1oC rise in temperature and falls by 30% with a rise of temperature by

20C. However, the same study should be carried out under different environmental conditions at different locations of the study area.