Socio-economic Impact of Climate Change on Rice Production in Southern India and Assessing Uncertainties in Regional Climate Model Projections

S. Senthilnathan, H. Annamalai, V. Prasanna and Jan Hafner

IPRC/SOEST, University of Hawaii, USA

Rice is the major and staple food crop in the southern state of Tamilnadu, India, and agriculture provides employment to about 60% of the rural women. The state is the sixth largest contributor to rice production in India. The average size of land holdings is only 0.83hectre (ha) and about 91% of the farming community comes under the category of marginal (<1ha) and small farmers (1-2ha). The state is the sixth largest (25% contribution) contributor to rice production in India. Tamilnadu receives about 80 percent of its annual rainfall during northeast monsoon season (Sep-Dec). Under enhanced green house gases forcing, climate models project significant changes in the behavior of the monsoon. To understand how the projected monsoon changes impact rice production, as a first step, the present study is focused on assessing uncertainties in the current climate and its imprint on current yield. This aspect is carried out by performing high-resolution regional model climate simulations (IPRC_RegCM) with multiple lateral forcings, and the climate variables from regional model serve as input to economic model (Multiple regression model). Preliminary results indicated that uncertainties in IPRC_RegCM simulations are reflected more in monsoon rainfall than temperature. However, there is a close correspondence between years of anomalous climate conditions and rice yield departures. The uncertainties in climate variables, particularly rainfall, are reflected in large diversity in yield.