

Assessing the Yield Variation of Rice for Future Climate in the Mid-century of Sri Lanka

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Some work has been examined the impact of climate change on water availability, increase in temperature and the carbon dioxide and the subsequent implications on crop productivity. This study was aimed to (i) project climate of 3 major paddy growing regions in the mid-century (2040-2069) of Sri Lanka under high emission scenario (RCP8.5) for 20 General Circulation Models (GCMs) of the 5th phase of Coupled Model Inter-comparison Project (CMIP5) archive, (ii) evaluate the simulated future yield for mid-century using the Decision Support System for Agrotechnology Transfer (DSSAT) and (iii) study the climate sensitivity of rice yield using Coordinated Climate-Crop Modeling Project (C3MP) of AgMIP. When consider the mean temperature projections of all GCMs across the study region, the increment of minimum temperature (T_{\min}) by 1.9 °C (minor) and 1.8 °C (major) was higher than the increment of maximum temperature (T_{\max}) by 1.8 °C (minor) and 1.6 °C (major). The mean rainfall decreased by 2.2% in the minor season while it increased by 18.5% in the major season. Out of the two cultivars, Bg 357 was more sensitive to increased carbon dioxide and warmer temperatures than Bg 300 indicating significant varietal variations in yield responses. The predicted rice yield decreased in all the GCMs for both seasons. The highest reduction was from the minor season (*Yala*) (29.6±6.3%) when compared to the major season (*Maha*) (16.0±4.6%). Since the climate change possess a severe threat to country's food security, adaptation strategies are needed to minimize the yield losses under future climate.

Key words: C3MP, climate change, DSSAT, yield projections