

Category	: International Rice Research Conference
Select Theme	: Climate change and environmental sustainability
Endorsement email	:
Keyword 1	: Adaptation to climate change
Keyword 2	: Multidimensional sustainability (environment, economic, social, governance)
Keyword 3	:
Title of Entry	: Climate and crop modeling to assess the climate change and its impact on rice production towards mid-century in Sri Lanka
Presenting author	: S.P. Nissanka
Presenting author email	: spn@pdn.ac.lk
Co author 1	: S.P. Nissanka
Co author 2	: A. S. Karunarathna
Co author 3	: W.M.W. Weerakoon
Co author 4	: B.V.R. Punyawardena
Co author 5	: D. Wallach
Co author 6	: Sonali McDermid
Co author 7	: Alex Ruane
Co author 8	:
Co author 9	:
Co author 10	:
Co author 11	:
Co author 12	:
Co author 13	:
Co author 14	:
Affiliation presenting author	: Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka
Affiliation 1	: Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka

Affiliation 2	: Faculty of Agricultural Sciences, Sabaragamuwa University, Belihuloya, Sri Lanka
Affiliation 3	: Department of Agriculture, Peradeniya, Sri Lanka
Affiliation 4	: Natural Resources Managements Centre, Department of Agriculture, Peradeniya, Sri Lanka
Affiliation 5	: INRA, Toulouse, France
Affiliation 6	: Climate Impacts Group, NASA GISS, 2880 Broadway, New York NY 10025, USA.
Affiliation 7	: Climate Impacts Group, NASA GISS, 2880 Broadway, New York NY 10025, USA.
Affiliation 8	:
Affiliation 9	:
Affiliation 10	:
Affiliation 11	:
Affiliation 12	:
Affiliation 13	:
Affiliation 14	:
Select only one type of presentation	: 15 minute oral presentation
Abstract	: Extreme climate events of drought, flood and high temperature are in the rise causing severe threat to the food production in Sri Lanka. Analysis of temperature data across all agro-climatic regions of the country from 1960-2010 showed an overall increasing trends of maximum, minimum and average, and a reduction trend of diurnal temperatures. Therefore, predicting the climate change in the future under different Global Climate Models (GCMs) which are more applicable to the Asian region and their impacts on future food production is essential to develop adaptation strategies in meeting food security challenges. Thus, this study was initiated with the objectives of performing climate change predictions for mid century based on historical data for 20 GMSs and to model its impacts on paddy production for a major rice growing districts in the country. Climatic data of 30 years (1980-2010) was considered as the baseline to downscaled 20 GCMs (CMIP5-RCP8.5) in mid-century (2040-2069) for the comparison of simulated future predicted yields using DSSAT model. Crop management and yield data of randomly selected representative 104 paddy farmers who cultivated rice varieties of Bg-300 (3 months old) and Bg-357 (31/2 months old), from three regions namely; Rajanganaya, Nikaweratiya and Batalagoda from one of the major rice cultivating district of Kurunegala (comes under dry and intermediate agro-climatic zones of Sri Lanka) during 2012/2013 growing seasons (Minor (May-September) and Major (Oct-February) were used to evaluate the experimentally calibrated DSSAT model for future predictions. Average annual temperature increase in the mid-century range from 1.0C (GCM-ILXA) to 2.30C (GCM-IMXA) with the predicted yield reduction range from 6.5% to 22% in the major rice growing season while the temperature increase range from 1.20C (GCM-ILXA) to 2.60C (GCM-IAXA) with the yield reduction range from 16% to 39% in the minor seasons respectively. Effect of temperature increase was severe for longer duration variety than the short duration variety. These outcomes highlight the urgent need of making appropriate policy level interventions to ensure sustainable rice production to meet the countries growing demand.

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