

# **Bounds Testing Approach in Determining the Impact of Climate Change Indicators to the Rice Yield of Central Luzon**

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Crop production, among many others, is threatened by climate change. In the Philippines, one such crop is rice. Various models have been applied to investigate factors that affect the production of this grain. Specialized software has been utilized that simulates its production under different conditions. But these were done on a larger scale. Local and international organizations call for the creation of crop production models that are specific to locations which can describe their long- and short-term responses to the changes in the environment. Hence, a model is proposed that made use of the Bounds Testing feature of the Autoregressive Distributed Lag Model (ARDL) to determine the long-run and short-run effects of selected climate change indicators to the rice yield of Central Luzon, the Rice Granary of the Philippines. The findings showed that the speed of adjustment towards equilibrium is 1.26%. Precipitation, temperature, and atmospheric carbon dioxide concentration have long-run impacts, while the lagged differences of the yield itself and temperature as well as the first difference temperature have short-run effects. Sea surface temperature anomaly was found to have no significant contribution. The fitness of the generated ARDL Model was substantiated by several diagnostic tests performed. In addition, it showed gains in forecasting accuracy when compared with a baseline model. The results of this study could be used in decision-making and policy developments.

*Key words: autoregressive distributed lag, bounds testing, climate change indicators, rice yield, Central Luzon*