Climate and Varietal Choice in Rice Systems: Evidence from Path Model Estimation

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Rice is the primary staple crop in South Asia. With increasing climatic volatility, exclusively rain-fed rice paddies have experienced a triple threat in droughts, floods and salinity. This study investigates the linkages of these abiotic stresses on yield and subsequent farmer decisions on varietal choice. A structural path model is estimated using 2523 farm household observations from Bangladesh farmers to obtain parameter estimates for direct effects and mediated effects discussed above. It was found that drought and flood impacts, in contrast to salinity impacts, are influential to both yield and varietal choice. The adaptation motive, however, is clear only in the case of salinity. Time preference of farmers and previous exposure to climate shocks predict adaptation motive substantively. The models reveal the following relationships among the variables of interest. Drought and flood damage has a statistically significant negative impact on yield. Salinity damage has a negative effect but not statistically significant. Among the socio-demographic variables, in all the three impact models with adaptation pathway, education level has a positive relationship with the yield. Farmers' time preference (preference for shorter time horizons) and level of yield have negative associations with the adaptation motive. The years of experience of droughts and floods within last 5 years also have negative association to the adaptation motive. For salinity, however, the effect of previous exposure contributes positively to adaptation.

Key words: Bangladesh, Climate shocks, Path analytic modeling Rice, Varietal choice