World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:16, No:06, 2022

Understanding the Endogenous Impact of Tropical Cyclones Floods and Sustainable Landscape Management Innovations on Farm Productivity in Malawi

Authors : Innocent Pangapanga, Eric Mungatana

Abstract : Tropical cyclones–related floods (TCRFs) in Malawi have devastating effects on smallholder agriculture, thereby threatening the food security agenda, which is already constrained by poor agricultural innovations, low use of improved varieties, and unaffordable inorganic fertilizers, and fragmenting landholding sizes. Accordingly, households have engineered and indigenously implemented sustainable landscape management (SLM) innovations to contain the adverse effects of TCRFs on farm productivity. This study, therefore, interrogated the efficacy of SLM adoption on farm productivity under varying TCRFs, while controlling for the potential selection bias and unobservable heterogeneity through the application of the Endogenous Switching Regression Model. In this study, we further investigated factors driving SLM adoption. Substantively, we found TCRFs reducing farm productivity by 31 percent, on the one hand, and influencing the adoption of SLM innovations by 27 percent, on the other hand. The study also observed that households that interacted SLM with TCRFs were more likely to enhance farm productivity by 24 percent than their counterparts. Interestingly, the study results further demonstrated that multiple adoptions of SLM-related innovations, including intercropping, agroforestry, and organic manure, enhanced farm productivity by 126 percent, suggesting promoting SLM adoption as a package to appropriately inform existing sustainable development goals' agricultural productivity initiatives under intensifying TCRFs in the country.

Keywords : tropical cyclones–related floods, sustainable landscape management innovations, farm productivity, endogeneity, endogenous switching regression model, panel data, smallholder agriculture
Conference Title : ICAS 2022 : International Conference on Agricultural Statistics
Conference Location : Paris, France
Conference Dates : June 23-24, 2022