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"Bridging the gap between increasing knowledge and decreasing resources"

A Sustainability Analysis of Observed Climate Change Adaptation Strategies in Maize Farming in Northern Benin (West Africa)

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Abstract

The issue of sustainable adaptation to climate change is viewed like a window towards a long-term future for agriculture. However, little is known on the extent to which observed climate change adaptations could ensure a sustainable agriculture. In this context, the main objective of the study was to analyse relationships between observed climate change adaptations as developed by farmers and the sustainability of their production systems. Accordingly, a Participatory-Indicators-Based (PIB) approach was used to measure agricultural sustainability at the farm level. Then, a Tri-variate Tobit regression model was used to analyse the main drivers of the measured sustainability levels, including the observed climate change adaptations as explanatory variables. The data collection was conducted by survey methods on 336 maize producers randomly sampled and interviewed based on a questionnaire. The results highlighted that maize farming in the study area presented weaknesses in the economic and social spheres but positively scored in the environmental area. Furthermore, a positive and strong correlation was found between economic and social dimensions of sustainability and weak negative correlations between environmental and economic dimensions of sustainability on the one hand, and environmental and social dimension of sustainability on the other hand. Farmers' socio-economic characteristics such as contact with extension services, organisation membership, access to credit, farm size, and observed climate change adaptations such as on-farm diversification, land use changes, and other adaptations were found to be the major driving forces underlying the sustainability level of maize farming systems. Among the observed climate change adaptations, on-farm diversification and land use changes strategies were found to be sustainable options whereas the group of other adaptations appeared to be an unsustainable option.

Keywords: Adaptation strategies, Benin, climate change, maize farming, sustainability

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