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Determinants of Adaptation Strategies to Climate Change: Implications on Sustainable Agriculture in Ghana

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Abstract

The agricultural sector of Sub-Saharan Africa including Ghana is rain-fed and less capital intensive. Unreliable and unfavourable climatic conditions have exerted negative effects on the sustainable supply of food. Therefore, food insecurity and poverty are prevalent in these countries, particularly Ghana. Smallholder farmers tend to respond to climate change by using different adaptation strategies. However, existing studies focus on analysing the determinants of farmers´ adaptation strategy decision without a considerable evaluation factors influencing the number of adaptation strategies used by farmers. Our paper therefore contributes to narrowing this knowledge gap by rigorously examining the determinants of the number of adaptation strategies adopted by 344 farmers selected from ten districts within the Pra River Basin around across three Ashanti regions of Ghana. We applied the Tobit regression model in the empirical analysis. We find that human capital variables such as primary education, secondary education, tertiary education, household size, and marital status shows significant positive effects on maize farmers' adaptation strategies to climate change whereas labour constraint exerts a negative effect. Institutional variables like extension constraint, credit constraint, and land tenure constraint are negatively related to adaptation strategy decision. Community infrastructure such as electricity, encourages farmers to adapt to climate change. We also find that perception variables – access to weather information, awareness of climate change and perception on amount of rainfall have positive effects on farmers' adaptation decision. To achieve sustainable agriculture and food systems, it is paramount to strengthen the adaptive capacity and resilience of vulnerable farmers by integrating their human capital, institutional variables, infrastructural development and climate perception variables into the national climate policy in Ghana.

Keywords: Adaptation strategies, climate change, sustainable agriculture, Tobit binomial regression

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