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# Rural Agriculture and Poverty Trap:

# Can Climate Smart Innovations provide breakeven solutions to Smallholder Farmers?

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**Abstract**

Agriculture is recognized as the solution to addressing food insecurity and alleviating poverty, especially in rural areas. However, the World Bank (2007) asserts that 75% of the world's poor are in rural areas, and agriculture is the primary source of their livelihood. Given this report, one would wonder whether agriculture is a vehicle for poverty alleviation or a source of poverty trap. The impacts of climate change have exacerbated rural poverty; but, FAO (2018) assures that climate-smart agricultural practices have the potential to eliminate poverty and food insecurity. Against this backdrop, the main objective of this study is to investigate the relationship between the adoption of climate-smart agricultural practices by smallholder farmers with their level of food security and income. Other objectives include i) to assess the perception of smallholder farmers on climate change, ii) to examine the effects of climate change on smallholder farmers, iii) to examine the extent to which smallholder farmers adopt climate-smart agricultural practices, and iv) to investigate the barriers to adoption of climate-smart agricultural practices. The Nandom district in the Upper West and the Bongo District in the Upper East were chosen purposively for this study based on climate change vulnerability of smallholder farmers in the districts. The study adopted a mixed methodological approach. Data collected through a survey questionnaire, focus group discussions, and interviews were analyzed using inferential and descriptive techniques. The results revealed a variation in the perception of climate change across the districts, particularly on rainfall dimensions. The majority of farmers in the Nandom district were affected by changed timing of rain, reduction in cropping season and increased frequency of droughts and crop failure; whereas, farmers in Bongo districts were affected by increased frequency of flood and farm destruction, disease prevalence and low yield. Likewise, on average, there was a high rate of adoption of climate-smart practices by farmers in both districts. Residue management and chemical fertilizer were the most adopted in the Nandom district, and planting on ridges and contour and manure management were the most adopted in the Bongo district. The least adopted practices were irrigation in the Nandom district, water storage, and harvesting in the Bongo district. Inadequate capital and no access to credit were critical barriers to the adoption of climate-smart agricultural practices in both districts. Other barriers identified as severe were no access to irrigation and low level of education, in Nandom and Bongo districts, respectively. A high proportion of farmers in both districts were food insecure and had low income from farming activities. Lastly, there was no statistically significant relationship between the adoption of climate-smart agricultural practices with food security and income. Recommendations made include the provision of agricultural infrastructures such as irrigation and storage, addressing the high cost and unavailability of inputs such as fertilizer and improved seeds, and the creation of the market for commodities.

**Keywords:** Rural Agriculture, Poverty, Climate-smart Agriculture, Smallholder Farmers, Food Security, and Income.