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Off-Farm Income Effect on Farmer Response to Climate Change in the Northern Region of Ghana

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ABSTRACT

This study assessed the effect of off-farm income on maize farmers' responses to climate change in the Tolon district of Northern Region of Ghana. Using multi-stage sampling technique and semi-structured questionnaires, 150 maize farmers from five communities were interviewed. Heckman's treatment effect model was used. The result showed that majority had off-farm income that they received from trading. Furthermore, off-farm income has a significant effect on adoption of adaptation strategies. The majority of the farmers had perceived changes in the climate over the past decades and adaptation strategies practiced included changing planting date, changing crop variety, diversifying crop type, mixed cropping, and keeping animals alongside crop cultivation. Based on the findings from this study, government should provide enabling environment that will create and increase opportunities for farmers to engage in other income-generating activities that will provide them with additional income to procure necessary inputs and tools for appropriate response to the ongoing climate change problem.

KEYWORDS

Adaptation Strategies, Climate Change, Off-Farm Income, Tolon District

1. INTRODUCTION

Climate change continues to pose a threat to the lives and livelihood systems of many communities, especially rural communities. For many families, agriculture remain their primary source of food and income. Although the contribution of off-farm income to the total household income in the rural areas is increasingly recognized, not much is known about how it affects farmers' response to the challenges posed by the ongoing climate change issue. Adaptation as a form of response to climate change is generally costly, largely revolving around adoption of new or improved technologies such as improved varieties and use of improved crop husbandry practices (Nabikolo, 2014; Kalungu *et al*., 2013). But it is a response that many poor farming households have embraced.

Families with higher incomes and adaptive capacities are better able to experiment with new technologies and management systems that might be expensive but offer higher productivity and

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resilience in the future (IFPRI, 2009). Adaptive capacity of farmers takes several key factors into consideration but more importantly income of the farmers. This is recognized in United Nations Framework Convention on Climate Change (UNFCCC) grouping of the World (into Annex I and Non-Annex I Parties) in an effort to mitigate and adapt to the changing climate.

Many people believe that we cannot solve the climate change problem if we fail to address the issue of income inequality in the society. The proposition is that income of farmers of which off-farm income forms part, exerts great influence on their adaptation decisions. Off-farm income opportunities have been widely understood to be an important strategy for overcoming credit constraints faced by the rural households in many developing countries (Barrett, Reardon, & Webb, 2001). As about 40–45% of average household income come from non-farm sources (Bryceson & Jamal, 1997; Reardon, 1997).

Some empirical studies have been conducted regarding off-farm income and adoption in different parts of the World. Such studies include; impact of off-farm income on agriculture technology adoption intensity and productivity of maize farmers in Uganda (Diiro, 2009), impact of off-farm income on hybrid maize adoption and productivity of maize farmers in three ecological zones of Ghana (Addai, 2015) and some climate change related studies, including; Farmers' perception on climate variability and its effects on adaptation strategies (Yildiz, FatihEhiakpor & Danso-abbeam, 2016), determinants of choice of climate change adaptation strategies (Mabe.et al) and the work on impact of climate change on agriculture and crop yield in northern Ghana (Amikuzuno, n.d.). This study seeks to assess the effect of off-farm income on maize farmers' response to climate change in five selected communities in the Tolon district.

1.1 Study Objective

The main objective of this study is to assess the effect of off-farm income on farmers' response to climate change.

Specific objectives are:

1. To identify the various sources of off-farm income available to maize farmers in the Tolon district.
2. To identify the various climate change adaptation strategies practiced by maize farmers in the Tolon district.
3. To determine the effect of off-farm income on farmers' choice of adaptation strategies in response to climate change.
4. To identify constraints associated with the adoption of climate change adaptation strategies by maize farmers in the district.

2. LITERATURE REVIEW

2.1 Adaptation Strategies and Maize Farmers

Adaptation strategies may be specific to geographical area or vary from time to time and as a result, climate change adaptation strategy could become inappropriate overtime (FAO, 2009). According to (IPCC, 2012), adaptation refers to the adjustments in natural or man-made systems in response to actual or expected climatic stimuli or their effects. By this definition, the acceptance and use of strategies and technologies by farmers in a sustainable way to reduce the impact of climate change can be termed as adoption. Most of the local communities have developed indigenous-based adaptation practices which could be harnessed to improve the resilience of such communities (IPCC, 2007).

Though, different crop farmers may have different adaptation strategies in response to climate change, many of the strategies are common. Other studies such as (Mabe et al, 2014) identified the following strategies being practiced by farmers in northern Ghana in response to climate change; changing crop varieties, changing planting dates, planting of trees, destocking, increase farm size, application of fertilizer, farming on fallowed land, diversification and mulching.

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