

## SOUTHERN FLOODING AND FOOD PRODUCTION: AN EMPIRICAL STUDY OF FARMER'S MOTIVATION IN THE ERA OF FLOODING

Chijioke-Eke Joy Ndidi\*

*\*Department of Agricultural Education Federal College of Education, Technical, Omoku*

**\*Corresponding Author:**

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### Abstract

*The importance of comprehending community vulnerability to extreme hydrological events has increased as a result of projections of climate change that indicate an increase in the frequency and intensity of climatic hazards like flooding. The present study examined the effect of flooding on farmers' motivation. Two hundred and twenty-five farmers recruited from farming communities in southern Nigeria completed a self-report instrument to ascertain their motivations relative to continuing farming activities in the era of flooding. A cross-sectional design was employed in the study. Data from the respondents were analyzed using the statistical package for social sciences (SPSS, Version 23). Simple regression was run to test the main hypothesis that flooding would predict farmers' motivation. The analysis demonstrated a statistically significant effect of flooding concerns on the farmers' motivation  $F(1,223), 21.31 P < .05$ , with the  $R^2$  indicating the independent variable accounted for 22.3% of the variation in farmers' motivation. The present finding contributes to the agricultural literature by revealing the flooding trend as a potential determinant of farmers' low motivations and the increasing low food production.*

**Keywords:** *flooding, farmers, motivation, food production*

**INTRODUCTION**

Across the world, floods have been identified as the most recurring natural hazard threatening the human ecosystem and have handicapped the economic development of both developed and developing countries (Ameen A et al., 2019; Chakraborty et al., 2021; Farooq et al., 2019; Joisy & Varghese Deepa, 2021; Mishra & Sinha, 2020; Mudashiru et al., 2022; Okoko, 2022; Salazar-Briones et al., 2020; Saleem et al., 2020; Zehra & Afsar, 2016). However, it has been demonstrated that the frequency and intensity of floods have increased in recent years due to climate change and anthropogenic activities. (Blenkinsop et al., 2021; Li-An et al., 2018; Thistlethwaite et al., 2018; Wing et al., 2022; Woodruff et al., 2021). Flooding can be natural or artificial (Eguibar et al., 2021; Stokes et al., 2021). The cases in Pakistan, India, Bangladesh, Sri Lanka, Thailand, and Indonesia show how devastating this issue can be, affecting not just individual lives but entire cities and economies. This flooding has the potential to cause a high migration rate as people seek safety for their lives, and as a result, all economic activity will be suspended during this time. Accordingly, the United Nations Office for Disaster Risk Reduction reported that flood disasters were the major natural disasters affecting the world in 2020 (UNDRR, 2020). The global flood damage to agriculture, infrastructure, and public utilities, as well as loss of human and animal life, costs billions of U.S. dollars each year and hurts people's ability to make a living.

Floods are the most expensive natural hazard and affect most people worldwide. In the last few decades, they have caused the most insured losses of all-natural disasters. Over the years, floods have caused several trillion worth of damage worldwide, and recent floods are thought to have caused even more damage. This includes damage caused by different kinds of floods, such as riverine flooding, when a river's flow capacity is exceeded and water spills over the banks, and coastal flooding, which happens when seawater floods low-lying land, including flash flooding, which is usually caused by heavy rain. But flash floods are often the most dangerous because they happen quickly and with little or no warning, making it hard to get help and manage emergencies.

Flooding is one of the most common environmental issues in the southern and eastern parts of Nigeria, along with deforestation and erosion (Adewoyin et al., 2020). Millions of acres of farmland have been significantly damaged by the recent flooding across the southern parts of Nigeria. The agriculture sector is particularly vulnerable to floods (Dickenson, 2004; Tanir et al., 2021). Floods have the potential to inundate agricultural lands and cause significant damage to the crops grown there, particularly if the floods occur during the planting or harvesting seasons. When the health of the soil is severely compromised, the effects of even a single flood can sometimes be felt throughout several growing seasons. As a direct result, the recent farming season occurred at the slowest pace in previous years. Farmers are faced with a difficult choice: whether or not to put off farming activities and run the risk of having a shorter growing season.

**Southern flooding, food production, and farmers' motivation**

Following the onset of the 2022 rainy season in Nigeria, the Nigerian Meteorological Agency (NiMet) and the Nigerian Hydrological Services Agency (NIHSA) reported that flooding was imminent and that parts of the country would experience heavier rainfall compounded by water flowing from Lagdo Dam in Cameroon. The agencies predicted that the volume of water across Nigeria would increase. Even though seasonal flooding is common in Nigeria, the devastation caused by the floods in 2022 was the worst since the floods of 2012, with heavy rains producing deadly, destructive floods in numerous states. Specifically, flooding in the country's south submerged homes and farmland and displaced hundreds of thousands of people. The floods completely or partially destroyed over 200,000 homes of people living on flood plains and destroyed an estimated 110,000 hectares of agricultural land, thus, creating a severe impact on food production.



**Fig 1:** Satellite images of southern flooding



**Fig 2:** images of submerged farmlands

Flooding caused by rainfall and the waterlogging that occurs as a result of flooding are examples of agricultural disasters that are common in many parts of the world and frequently cause crop production to suffer significant losses. In addition to the direct effect of the rushing water, the submergence causes complex abiotic stress in the crops, including a reduction in the amount of light available, a depletion in the amount of oxygen, and altered chemical characteristics of the soil. The cumulative effect of all of these chemical and physical alterations to the environment can significantly negatively impact crop stand, growth, and yield. The current climate conditions have resulted in a substantial reduction in crop yields due to the occurrence of excess rainfall events. This has harmed both the grain supply and the ability to ensure food security. It is anticipated that the acceleration of the hydrological cycle that is occurring due to climate warming will change the timing, magnitude, and frequency of extreme floods. The accompanying crop damage that is caused by flooding is likely going to be greater under future climate conditions; as a result, the management of agricultural floods will likely face more challenges. Researchers, for instance (Nkwunonwo et al., 2020) has pointed out that flood hazard is often poorly understood and understudied. Indeed, there is insufficient empirical literature relating to the flood-farmer's motivation correlation. Thus, the present study aimed to ascertain the motivation of farmers in the era of flooding in southern Nigeria.

Agricultural production in every society is plagued with various uncertainties (Aimin, 2010). It exemplifies a state in which there is no anticipation or preparation for the future. (Hamsa & Bellundagi, 2017). As the world becomes more volatile to climate change, the threat of natural disasters continues to arise, presenting new challenges to agricultural and food production. The present paper argues that the perceived farming uncertainties related to severe flooding can negatively impact farmers' willingness to farm. Based on the above, the following hypothesis is proposed to establish a correlation between the southern flooding and farmers' motivation.

***Hypothesis 1: flooding will significantly predict farmer's motivation***

Motivation is a psychological construct reflecting an individual's desire and willingness to engage in a specific activity. In this study, farmers' motivation is operationalized as the willingness of farmers to continue their farming activities in the era of flooding. In these rising uncertainties of climate change, the motivation to work on the farm may be inhibited by extreme concern for flooding, thus, affecting the motivation, productivity, performance, and physical and mental well-being of farmers. Previous studies have underscored various factors influencing farming motivation in different domains (Alimirzaei & Asady, 2011; Dyah & Pinesti, 2021; Fauziyah & Sanudin, 2020; Saleh & Lumintang, 2012). For instance, perceived risk (Han & Li, 2020), farmer's education (Cao et al., 2020), attitudes, and social norms (Rezaei et al., 2018) have been found to determine the farmer's intention. However, the role of flooding relative to farming motivation is lacking in the literature.

**Method**

The present study was conducted in the farming communities of River, Imo, Delta, and Anambra States, Nigeria. A convenient sample of two hundred and twenty-five farmers was approached between December 2022 and February 2023, and they were asked to participate in the study. They were briefed on the study's objectives and were informed that participation in the survey was voluntary and that they could withdraw any time they wanted. In particular, the participants were urged to complete a consent form before they were handed the questionnaire fill on the spot. A questionnaire designed to assess the farmer's motivation and eagerness to engage in farming during flooding was given to the participants who consented to participate in the study. The instrument consists of 17 items rated on a 5-point Likert-type scale (1 = Never, 5 = Always). A higher score on this scale indicates high motivation. The instrument was validated following a pilot study, and 0.77 Cronbach's alpha was obtained.

**Result**

A cross-sectional design was employed in the study. Data from the respondents were analyzed using the statistical package for social sciences (SPSS, Version 23). According to the demographic statistics, 89 (25.6%) responders were between 18-29 years old, 114 (58.0%) were 30-50 years old, and 22 (12.4%) were 51 years and above. There were 132 (59.0%) males and 93 (41.0 percent) females among the responders

**Table.1.** Demographic results.

	Frequency	Percentage (%)	Mean	SD
Age			16.64	1.48
18-29	89	25.6		
30-50	114	58.0		
51 above	22	12.4		
Gender				
Male	132	59.0		
Female	93	41.0		

**Table 2:** shows linear regression for flooding and farmers' motivation.

	B	SEB	$\beta$	t	R <sup>2</sup>	Sig
Farming insecurity	-.67	.077	-.64	-12.15	.113	.000

Note: B = Unstandardized regression coefficient; SEB = Standardized error of the Coefficient;  $\beta$  = Standardized coefficient; R<sup>2</sup> = Coefficient of determination. \*P<.000.

Simple regression was run to test the central hypothesis that flooding would significantly predict farmers' motivation. The analysis demonstrated a statistically significant effect of flooding concerns on the farmers' motivation F (1,223), 21.31 P<.05 with an adjusted R<sup>2</sup> of 223.

**Discussion**

The present study examined farmers' motivation in the period of uncertainties relating to the devastating effect of flooding. Two hundred and twenty-five farmers recruited from farming communities of various states in southern Nigeria completed a self-report instrument to ascertain their motivations relative to continuing farming activities in the era of severe flooding. A regression model was employed to test the hypothesis that flooding would predict farmers' motivation. The analysis revealed a positive interactional effect between the variables. The result showed that flooding explained about 22.3% of the variation in farmers' motivation. The finding presupposes that the perceived effect of flooding, especially in farming communities, exacerbates the intense emotional state that might potentiate the experience of fear, thus, propelling many farmers to react slowly to farm activities. In other words, those who exhibit a high level of flooding concern due to the uncertainties of modern-day climate changes and the perceived inability of intervention from the authorities are likely to show signs of dampened motivations.

Moreover, many farmers are forced to exit their farmlands and suspend farming activities for fear of submerging by water. There is an indication that the enormous burden of farming in the era of flooding results in a massive fall in food production (Week & Wizer, 2020). Thus, the absence of agricultural activities and lack of inspiration emerge as a common characteristic in today's heightened flooding. The outcome is evident in the growing food insecurity in Nigeria. This present finding offers evidence that the trend of flooding activates a certain level of uneasiness that interferes with the motivation of the farmers. Accordingly, a recent study stressed that anxiety and stress are significant factors that predominantly affect the farmer (Greig et al., 2020). Thus, this finding assumes that many farmers within the volatile farming communities might attempt to circumvent the dangers of witnessing their farmlands being submerged by water by reducing the enthusiasm associated with farm work, thereby contributing to declining food production and increased food scarcity in the country.

**Conclusion**

The present research examined the farmers' motivation based on the impact of flooding. A single hypothesis was formulated for the study. The linear regression analysis performed on the data confirmed that the effect of flooding positively predicted farmers' motivation. Thus, the research finding offers insight into the farmers' psychological state during severe flooding in Nigeria. Consequently, the study concludes that the tension occasioned by the heightened rate of submerging of farmlands by flooding water negatively impacts the farmers' psychological well-being and affects food production. In other words, the finding demonstrated a positive interaction between flooding, farming motivation, and food insecurity. However, the study encountered certain limitations that are necessary to report. For example, the mechanism through which flooding correlates with farming motivation remains unclear and requires further research. Also, the self-reported measures used in data collection raise concerns about biases and limit the generalization of the result. Future research should use experimentation to establish clear causes and effects and adopt multiple means of data collection. Nonetheless, the present finding contributes to the farming literature by revealing flooding as a potential contributor to farmers' low motivations, which is implicated in the increasing low food production.

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