NNPublication Journal of Advance Research in Food, Agriculture and Environmental Science ISSN: 2208-2417

DOI: https://doi.org/10.53555/nnfaes.v9i4.1635 Publication URL:https://nnpub.org/index.php/FAES/article/view/1635

FLOODING IMPACTS AND FARMING MOTIVATION IN ANAM COMMUNITY OF ANAMBRA STATE, NIGERIA: IMPLICATION FOR FOOD SECURITY

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Abstract

Climate change projections that show an increase in the frequency and intensity of climatic hazards like flooding highlight the significance of understanding community vulnerability to extreme hydrological events. The current study looked at how farmers' motivation is impacted by flooding. Two hundred and twenty-five farmers recruited from farming communities in Anam, Anambra State, 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 primary 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 security*

INTRODUCTION

Floods are the most common natural disaster that endangers the human ecosystem, and they have slowed the progress of economies in both the developed and the developing worlds (Ameen A et al., 2019; Chakrabortty 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, evidence shows that climate change and human activities have increased the frequency and severity of floods in recent years (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 that have taken place in Pakistan, India, Bangladesh, Sri Lanka, Thailand, and Indonesia demonstrate how catastrophic this problem can be and how it affects not only individual lives but also entire cities and economies. This flooding can potentially cause a high migration rate as people seek safety for their lives. As a direct result, all economic activity will be suspended during this period. 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 that most commonly affects people worldwide. In recent decades, they have resulted in the most insured losses of all-natural disasters. Floods have cost the global economy several trillion dollars in damage over the years, and recent floods are likely to have done even more. This covers damage brought on by various types of flooding, including coastal flooding, which occurs when seawater inundates low-lying land, and riverine flooding, when a river's flow capacity is exceeded and water spills over the banks. Flash flooding is also included, typically brought on by heavy rain. However, flash floods are frequently the most hazardous because they occur quickly and with little to no notice, making it challenging to manage emergencies and get help.

Along with deforestation and erosion, flooding is one of the most prevalent environmental problems found in the southern and eastern regions of Nigeria (Adewoyin et al., 2020). Recent flooding in southern Nigeria has caused significant damage to millions of acres' worth of farmland. This damage is spread across the country. The agricultural industry is particularly susceptible to damage from floods (Dickenson, 2004; Tanir et al., 2021). Floods have the potential to inundate agricultural lands and cause significant damage to the crops grown there, mainly if the floods occur during the planting or harvesting seasons. This is especially true if floods happen during the times of the year when crops are most vulnerable to damage. When the health of the soil is severely compromised, the effects of even a single flood can sometimes be felt throughout several growing seasons. This is especially the case when the soil is in an area that experiences severe drought. As a direct consequence, the most recent farming season proceeded at the slowest pace compared to those that came before it. Farmers are faced with a challenging choice: postponing farming activities and running the risk of having a shorter growing season or continuing with farming activities as usual and taking the risk of having a shorter growing season.

The present study

Anam is a community located on the peninsula in Anambra State, South East Nigeria, bounded by the River Niger and the Anambra River. The area is a low-level land based on both rivers, with other minor rivers, such as Ezichi, Ezu, and Oyi, flowing into the area through the Anambra River. The people of Anam are predominantly farmers and fishermen with farm settlements. This area is annually ravaged by flood that damages crops and animal, and this flood arises from the overflowing of the River banks by the two Rivers in the area, usually between August and October of the year. This year the flood took the farmers unawares because it started in June due to the opening of the various dams in the north. This affected the farm produce because, after a very high sun which killed the yam planted in November last year, it was expected that the early rains of March would have made the plants recover, but this did not come as expected since the rains never came till late April and early May. After a few months of planting came the first flood, which prompted farmers to harvest their crops to avoid total loss hurriedly; not many farmers were lucky, as many of them never took anything out of their farms.

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 expected 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 Anam community of Anambra State people living on flood plains destroyed large hectares of agricultural land, thus, severely impacting food production.

Fig 1: Satellite images of flooding impacts in the Anam community

Fig 2: images of submerged farmlands

Rainfall-induced flooding and the waterlogging that results from flooding are two examples of agricultural disasters that frequently cause crop production to suffer significant losses and are common in many parts of the world. Along with the direct impact of the rushing water, the submergence stresses the crops in a complex abiotic way by reducing light availability, depleting oxygen levels, and changing the chemical composition of the soil. The cumulative effect of these chemical and physical environmental alterations 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. The acceleration of the hydrological cycle due to climate warming is anticipated to 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 without 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 predicts farmer's motivation in the Anam community of Anambra State, Nigeria*

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 the Anam community, 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	β	t	R^2	Sig
Flooding	.67	.077	.64	12.15	113	.000

Note: B = Unstandardized regression coefficient; SEB = Standardized error of the Coefficient; β = Standardized coefficient; R^2 = 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^2 of 223.

Discussion

The present study examined farmers' motivation during 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 & Wizor, 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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