EFFECTS OF FLOOD ON LIVELIHOOD ACTIVITIES OF SMALLHOLDER CROP FARMERS IN SAKI WEST LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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ABSTRACT

This study was conducted to examine the effect of flood on the livelihood activities of smallholder crop farmers in Oke-ogun, Saki West Local Government Area, Oyo State. Specifically, it identified the livelihood activities of farmers, assessed the effects of floods, and identified adaptation measures adopted by the farmers. Multiple sampling techniques were used to select 120 respondents for the study. A structured interview schedule was used to collect primary data. The result shows that the majority (60.0% and 85.0) of the respondents were male and married. Root and tuber production (75.0%), vegetable farming (75.0%), agro-marketing (66.7%), and arable cropping (66.7%) were the leading livelihood activities of respondents. All (100.0%) of the respondents reported that flood has caused heavy erosion and damage to farm infrastructures and food insecurity while another majority (85.0%) indicated damage to farm roads, loss of farm crops, livestock destruction, and malaria sickness. Also, crop rotation (90.0%), shifting cultivation (85.0%), early planting (75.0%), prevention of soil erosion (75.0%), and cover crop (60.0%) were the main flood adaptation measures with less planting of flood resistance seeds (45.0%) by respondents. Inferential analyses showed that respondents' marital status ($\chi 2=29.400$), educational status ($\chi 2=18.00$), age ($r = 0.282$), and experience in farming ($r = 0.301$) showed a significant relationship at $p\leq 0.05$ level of significance with the effects of the flood on livelihood activities of respondents. The study concluded that smallholder farmers were engaged in agricultural livelihood diversification including root and tuber production, vegetable farming, arable cropping, plantain production, and animal rearing, which have been adversely affected by flood disaster. Therefore, farmers should intensify efforts in the cultivation of flood-resistant varieties while extension agents should assist farmers in timely access to flood-resistant seeds.

Keywords: ***Livelihood activities, flood, loss of crops, adaptation measures, educational status***

INTRODUCTION

Agriculture is one of the backbones of Nigeria's economy. It is the main source of livelihood that provides employment, food, and income among Nigerians, most especially rural dwellers (Komolafe *et al*., 2022). One of the major challenges to farming-related livelihoods in Sub-Saharan Africa is the adverse impact of floods (Balgah *et al*., 2023; Mwakyusa *et al*., 2023). Floods are among the furthermost common and severe weather events in the world. The occurrence of floods is associated with the effects of global warming and annual rainfall variability (Adedapo *et al*., 2020; Tanoue *et al*., 2021). For several years, the global incidence of floods has been responsible for the majority of the natural catastrophes' effects on livelihood outcomes and overall human well-being (Agbadaga *et al*., 2021; Suhr & Steinert, 2022). From 2000 to 2019,

flooding was the primary contributor to global catastrophes, and it has also caused more deaths than any other natural disaster, second only to droughts (Tanoue *et al*., 2021). Prominent records of flooding impact on farming households include loss of lives, loss of livestock, destruction of properties, damage of crops, and food insecurity (Okeleye *et al*., 2016).

Nigeria has experienced a series of catastrophic floods due to the influence of climate variability, resulting in the displacement of millions of individuals and incurring financial losses (Agbadaga *et al*., 2021; Okeleye *et al*., 2016). According to Nemine (2015), the flood disaster has caused extensive destruction to more than one and a half million hectares of land, as well as a decrease in food production in areas affected by flooding. This has been a frequent occurrence, particularly in areas with flood plains, where farmers depend on the river for irrigation in the dry season, yet find themselves amid floods during the rainfall period. According to Agbadaga *et al*. (2021), the extensive dependence of farmers solely on rainfall is becoming increasingly uncertain due to the adverse effects of climate variability. Nkwunonwo *et al*. (2015) The effects of the recent incidence of flooding in Nigeria remain a source of concern for food security, as well as the susceptibility of rural farmers due to their limited financial resources to implement various adaptation strategies. As a result, the government is typically left to manage the consequences of subsequent shocks (Bolarin *et al*., 2021).

This study aims to examine the effect of flood on the livelihoods of smallholder crop farmers in Oke-Ogun Area, Oyo state: A case study of Saki-West Local Government. The specific objectives were to (i) identify respondents' livelihood activities; (ii) examine the influence of flood on the livelihood activities of respondents; and (iii) assess the respondents' adaptation measures for the incidence of flood. Hypothesis **(**H0): socio-economic characteristics do not significantly influence the effects of the flood on the livelihood of the smallholder farmers.

METHODOLOGY

Study Area

This study was conducted in Saki West Local Government Area (LGA). It lies on 8050'N, 3020'E in the Northern part of Oyo State, Nigeria (Olugbamila *et al*., 2017). The majority of the inhabitants of this LGA are employed in agriculture, while the remainders are employed in a variety of other occupations, such as crop processing, agricultural marketing, petty trading, and hunting. The land and climate are favorable for the cultivation of yam, okro, pepper, maize, cassava, cashew, and mango among others.

Study Population and Sampling Techniques

The population of the study includes all arable crop farmers in Saki West Local Government. A multistage sampling procedure was used to select the respondents. Multi-stage sampling was followed to select respondents. Firstly, from 11 wards that make up Saki-west LGA, 5 (30%) wards were randomly selected. Selected wards and population of farmers gotten from Oyo state ADP were Ayekale (150), Sango (70), Eroome (60), Igboro (50), Isale Oke (30), making a total of 360 smallholder crop farmers. The second stage involved a proportionate sampling of 33% of the population of farmers in each selected ward. This gives a total sample size of 120 respondents.

Data Collection and Analysis

Primary data was collected through the use of an interview schedule designed to address

the set objectives of the study. The instrument was administered to 120 smallholder crop farmers sampled for the study. The effect of flood on the livelihood of the smallholder farmers was measured on a scale of yes or no while scores of 1 and 0 were assigned respectively. Similarly, adaptation measures to flood employed by smallholder farmers were measured on the scale of yes or no while scores of 1 and 0 were assigned respectively. Descriptive statistics such as frequency and percentage were used to analyze the personal characteristics of the respondent in the study area while chi-square and person correlation were used to test for the hypothesis at a 5% significant level.

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Respondents

Table 1 shows that respondents were predominantly 60.0% male while the remaining 40.0 % were female. The results of the study demonstrate that the majority of individuals involved in agricultural activities in the study area are male, thus demonstrating the prevalence of male involvement in agricultural activities in rural Nigeria (Komolafe, 2021). The average age of the respondents was 38.6 years. This implies that smallholder farmers in the study area are youths. The survey revealed that the majority of respondents (85.0%) were married, and the average size of their household was 10.4 people. This implies that smallholder farmers in the study area have household responsibilities. About, 45.0% of the respondents had tertiary education, indicating that average proportions of smallholder farmers in the study area are literate. The average years of experience in farming was 17.3 years, implying that smallholder farmers in the study area had relatively long years of experience in farming activities. Further analysis on monthly income shows that appreciable percent of the respondents (45%) earned between ₦60,001 and above while the overall average amount was ₦27,650.3. This suggests that the majority of respondents had a relatively low level of income considering the present economic situation in Nigeria with minimum monthly wage workers of ₦30,000. This amount may not be able to provide farmers the financial capability to put in place the necessary measures to avert the incidence of floods on farms.

Livelihood activities of smallholder crop farmers

Results presented in Table 2 show majority of the respondents were engaged in root and tuber production (75.0%), vegetable farming (75.5%), arable cropping (66.7%), plantain production (58.3%), and animal rearing (58.3%). This indicates that root and tuber production, vegetable farming, arable cropping, plantain production, and animal rearing were the main sources of livelihood for smallholder farmers in the study area. However, appreciable percentages of the respondents were involved in agro-processing (50.0%) and agricultural marketing (41.7%) while few (16.7%) cultivate sugar cane. It could be deduced from the findings that smallholder farmers in the study area diversified livelihood and income sources in farming activities.

Table 1: Socio-economic Characteristics of Respondents (n=120)

Variable	Frequency	Percentage	Mean	Std. Dev.
Sex				
Male	72	60.0		
Female	48	40.0		
Age				
20-29	18	15.0		
30-39	54	45.0	38.6	11.4
40-49	18	15.0		
50 and above	30	25.0		
Marital status				
Single	18	15.0		
Married	102	85.0		
Educational status				
Non formal	18	15.0		
Primary school	36	30.0		
Secondary school	12	10.0		
Tertiary	54	45.0		
Household size				
1-5	18	15.0		
6-10	54	45.0	10.4	6.7
11-15	30	25.0		
16 and above	18	15.0		
Year of experience				
1-5	30	25.0		
6-10	10	8.3	17.3	10.0
11-15	10	8.3		
16-20	30	25.0		
21 and above	40	33.4		
Monthly Income (₦)				
Below 20,000	-	-		
20,001-30,000	36	30.0		
30,001-40,000	12	10.0	27,650.3	13313.9
40,001-50,000	18	15.0		
50,001 and above	54	45.0		

Source: Field survey, 2022

Effect of Flood on Livelihood of the Smallholder Farmers

The presentation of results in Table 3 shows that all (100.0%) of the respondents reported that flood has caused heavy erosion and damage to farm infrastructures and food insecurity. Another majority (85.0%) indicated damage to farm roads, loss of farm crops, livestock destruction, and malaria sickness. More of the respondents (75.0%) indicated hunger and starvation, displacement from the natural domain, loss of properties, high incidence of poverty, and loss of family members. A higher percentage of the respondents further indicated loss of soil nutrients (70.0%), and

environmental pollution (60.0%). These findings indicated that flood incidence has negatively affected livelihood activities, thereby resulting in food insecurity, sickness, and poverty among smallholder farmers in the study area. This finding is consistent with reports by (Jonathan *et al*., 2020; Udemezue *et al*., 2019).

Table 2: Distribution of respondents on livelihood activities of smallholder crop farmers

Livelihood	Yes	
	Frequency	Percentage
Marketing	50	41.7
Sugar cane farming	20	16.7
Root and tuber production	90	75.0
Vegetable farming	90	75.0
Plantain production	70	58.3
Processing	60	50.0
Arable cropping	80	66.7
Animal rearing	70	58.3

Source: Field survey, 2022

Table 3: Effect of flood on the livelihood of the smallholder farmers

Effects of Flood	Frequency	Percentage
Loss of farm crops	102	85.0
Hunger and starvation	90	75.0
Displacement from the natural domain	90	75.0
Loss of properties	90	75.0
High incidence of poverty	90	75.0
Cause of malaria	102	85.0
Loss of a family member	90	75.0
Adding nutrients to the soil	48	40.0
Causes environmental pollution	72	60.0
Enriched farmers	36	30.0
Loss of soil nutrient	84	70.0
Food insecurity	120	100.0
Damage of farm road	102	85.0
Livestock destruction	102	85.0
Caused erosion	120	100.0
Damage to infrastructure	120	100.0

Source: Field survey, 2022

Adaptation measure used by smallholder farmers

As shown in Table 4, the adaptation measures of a majority of the respondents were crop rotation (90.0%), shifting cultivation (85.0%), early planting (75.0%), prevention of soil erosion (75.0%), and cover crop (60.0%). Others indicated the use of flood-resistant crops (55.0%) and avoiding the dropping of waste in the drainage (45.0%). These findings indicated that crop rotation, shifting cultivation, early planting, prevention of soil erosion, and cover crops were a range of adaptation strategies to ensure their success by smallholder farmers.

Table 4: Flood adaptation measure used by smallholder farmers

Adaptation Measures	Frequency	Percentage
Shifting cultivation	102	85.0
Early planting	90	75.0
Cover crop	72	60.0
Use of flood-resistant crops	54	45.0
Avoid dropping waste in the drainage	66	55.0
Proper drainage construction	90	75.0
Crop Rotation	108	90.0

Source: Field survey, 2022

Test of Hypothesis

H_{O1}: There is no significant relationship between the socio-economic of the respondents and the effect of flood on the livelihood of the smallholder farmers

Results in Table 5 showing the relationship between the socio-economic of the respondents and the effect of flood on the livelihood of the smallholder farmers indicate that marital status ($\chi 2=29.400$; $p<0.01$), educational status ($\chi 2=18.00$; $p<0.01$), age ($r = 0.282$; $p<0.05$), and years of experience in farming ($r = 0.301$; $p<0.01$) indicated significant relationship in the positive direction. This shows that marriage, education, advanced age, and increased years of farming experience support the employment of adaptation measures against flood, thereby reducing the effects of floods on the livelihood activities of the farmers in the study area.

Table 5: Relationship between the socio-economic of the respondents and the effect of flood on the livelihood of the smallholder farmers

Variable	Chi-square ($\chi 2$)	Df	Significance	Remark
Sex	2.400	1	0.121	Not significant
Marital Status	29.400	1	0.000	Significant
Educational status	18.000	3	0.000	Significant
	Pearson (r)			
Age (years)	0.282		0.021	Significant
Farming experience (years)	0.301		0.002	Significant
Household size (persons)	0.044		0.497	Not significant
Monthly Income (Naira)	0.068		0.289	Not significant

CONCLUSION AND RECOMMENDATIONS

The study concluded that smallholder farmers were practicing diversification of farming livelihood activities including root and tuber production, vegetable farming, arable cropping, plantain production and animal rearing. However, flood disaster has negatively affected their livelihood activities, thereby resulting to food insecurity, sickness and poverty among smallholder farmers in the study area. Consequently, the farmers mainly employed flood adaptation measures including crop

rotation, shifting cultivation, early planting, prevention of soil erosion and cover crop while the least used was flood resistant crop seeds. Factors that significantly influenced the effects of flood experienced by the farmers were farmers' marital status, educational status, age, and years of experience in farming. Therefore, farmers should intensify effort in the cultivation of flood resistant seed while extension agents should assist farmers for timely access to flood resistant seeds.

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