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Research Article

Perceived Effects of Flood on Livelihood Activities of Smallholder Crop Farmers in Southern-Ijaw Local Government Area, Bayelsa State, Nigeria

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ABSTRACT

This study determined the effect of flood on livelihood and adaptation measures of smallholder crop farmers in Southern-Ijaw local government area, Bayelsa state. Purposive sampling technique was used in selection of Southern Ijaw Local Government Area. A sample of 100 smallholder farmers was randomly selected from four communities. Data were collected using structured questionnaire, and were analyzed with descriptive statistics such as mean, while multiple regression was used to test the hypothesis. The result showed that 61% of smallholder farmers were female and 48% were within the age bracket of 37-56 years. The study identified livelihood activities of smallholder crop farmer; plantain (X=3.3); root and tuber (X= 3.3), civil service (X=3.0), sugar cane farming (X= 2.6), vegetable farming (X=2.6) and transportation (X=2.8). The effect of flood on smallholder livelihood were marketing (X=2.3); harvest and storage (X= 2.3), sugar cane farming (X=2.1), root and tuber crop production (X= 2.1), vegetable (X=2.1) and plantain farming (X=2.4). The multiple regression result showed significant relationship on the perceived effects of flood on livelihood activities of smallholder crop farmers at $P<0.05$ level of significance. The study concluded that flood affected livelihood activities of smallholder crop farmers. Hence, government and flood management agencies should be proactive and invest massively in flood mitigation methods such as building of dams, dredging of rivers, clearing of drainages and natural waterways in the state, especially flood prone areas. Early maturing crops should be made available for smallholder crop farmers for planting to avoid much wastage.

Key words: Flood, Livelihood and Smallholder.

INTRODUCTION

The importance of agriculture to humans and the society have been continually lauded to include sources of revenue for governments at various levels and as a means of livelihood by providing employment for farmers, marketers, and processors of agricultural products. In Nigeria, agriculture engages over 70% of the labour force and contributes about 40% to Gross Domestic Product (GDP) (Federal Ministry of Agriculture and Rural Development, FMARD, 2012). It provides food for the teeming population, feed for animals and raw materials for various industries. However, it is one of the most climate sensitive economic sectors as a change in climate bears a direct effect on agriculture, and among several climatic factors flood happens to be the number factor which have posed so much treat on agriculture. Floods occur when water particularly from rainfalls accumulates across an impermeable surface and cannot rapidly dissipate or evaporate (Efobi and Anierobi, 2013). Each year, flood disasters cause tremendous losses and social disruption worldwide (Vanneuville *et al.,* 2011).

In Nigeria, flood has been reported to affect and displace more people than any other disaster. It also causes more damages to property. Etuonovbe (2011), clearly stated that at least 20 per cent of the population is at risk from one form of flooding to another. Flood disaster has been perilous to people, communities and institutions. Recently and specifically in 2012, Nigeria, especially in the Niger Delta regions, flooding displaced most inhabitants away from their socio-cultural and economic heritage. It shattered both the built-environment and underdeveloped environment. It claimed many lives, and millions of properties got lost due to its occurrence. Flood has not only

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devastated the people, their property and disrupted business activities, communities and residents but also exposed victims to cholera, diarrhea, malaria, skin infections and other water-borne diseases epidemic. It resulted in the destruction of bridges, roads, houses, infrastructures and farmlands (Baiye, cited in Etuonovbe, 2011).

Yet the social and cultural environment of the people displaced after the flood incidence has not been adequately studied and documented sociologically. Studies have also shown that communications and traffic were interrupted while many land areas were inundated. Also, industrial plants and commercial establishments were paralyzed during floods.

During flooding water supplies that result in contamination of water (water pollution). Clean drinking water becomes scarce. Unhygienic conditions and Spread of water-borne diseases result. People, buildings, infrastructure, agriculture, open recreational space and the natural world. In extreme cases flooding may cause a loss of life. Torrential rains pushed rivers over their banks, collapsed mud houses and washed away livestock (Adelye and Rustum, 2011). The specific objectives were to: describe the socio-economic characteristics of small holder crop farmers; identify the livelihood activities of small holder crop farmers and determine the effect caused by flood on the livelihood of farmers in the study area. The study hypothesized that socio Economic characteristics of crop farmers do not significantly influence flooding.

MATERIALS AND METHODS

Southern Ijaw Local Government Area with a population of 321,808, has the second largest population in Bayelsa State after the Yenagoa Local Government Areas. It has its headquarters at Oporoma in the north of the area 4º 48' 17 N6º 04' 44"E and 4.80472ºN. The area has a coastline of approximately 60km on the bright of Benin according to National Population Commission (2006). Purposive sampling technique was used in selection of southern Ijaw local government area. In the first stage, Stratified sampling was used in selection of the sample size of 100. While, in the second stage simple random sampling technique was used in selection of four (4) communities. In the third stage, twenty five smallholder crop farmers, giving us a sample size of one hundred smallholder farmers. Data were collected through well-structured questionnaire and were analyzed with descriptive statistics such as mean and percentage, while multiple regression was used to test the hypothesis. The questionnaire was on a 4-point rating scale of strongly agree, agree, disagree and strongly disagree to which numerical values 4, 3, 2 and 1 were assigned respectively. The scores up to 10 and a mean of 2.5 when divided 4. Hence, the cutoff point of 2.55 as upper limit was used to determine the positive response (i.e., 2.5 + 0.005).

Model specification: the multiple regression model used to test the hypothesis is specified thus:

$Y1= b0+b1x1+ b2x2+b3x3+b4+x4+b5+x5+b6+x6 + e_i$

Where;

Y = Level of Damage Caused by Flood (measured in loss of income)

X= livelihood activities measure using 4 point rating scale

Table 1: Distribution according Socio-economic Characteristics of smallholder

Variables	Freq. (n= 100)	Percent (%)
Gender		
Male	39	39
Female	61	61
Age (year)		
<36	27	27.0
37-56	48	48.0
57+	25	25.0
Years of education		
6years	81.0	81.0
12years	17.0	17.0
16 years and above	2.0	4.0
Marital Status		
Single	15	15.0
Married	73	73.0
Widowed	12	12.0
Household size		
<5	37	37.0
5-10	51	51.0
11-25	12	12.0
Types of dwelling		
Slum	59	59.0
Hut	17	17.0
Bungalow/ flat	24	24.0
family description		
Extended	56	56.0
Nuclear	44	44.0
Main income activities		
Farming	86	86.0
Trading	9	9.0
Civil servant	3	3.0
farming and trading	2	2.0
Experience		
<19	60	60.0
19-37	22	22.0
38-60	18	18.0

Source: (Field Survey, 2021)

a=the intercept

X_1= plantain production

X_2= Root and tuber crop production

X_3= sugar cane farming

X_4= vegetable farming

X_5= transportation

X_6= civil service

e = error term

RESULTS AND DISCUSSION

Table 1 shows that 61% of the smallholder crop farmers were females while 39% of them were males. This corroborate the assertion of Bryceson (2000) who noted that women are now taking up household sustainability role as a result of economic hardship caused by natural disasters. The result further showed that moderate proportion 48% of smallholder farmers were within the age bracket of 37-56 years. Hernandez-Peck (2001). Reported that age disparity of farmers is due to exposure to risks of sickness among smallholder farmers. The result in Table 1 still shows that 65% of smallholder farmers were married. Loaiza and Wong (2012) noted that early marriage is most likely to occur among girls who are poor, have low education level, and live in rural areas. The result in Table 1 still showed that 51% of smallholder farmers had household size of 5-10 person eating from the same pot.

Table 2: Mean rating of the livelihood activities of smallholder crop farmers

Variables	SA (4)	A (3)	D (2)	SD (1)	∑FX	Mean
	Scores (100)					
Plantain	52 (208)	32 (96)	6(12)	10 (10)	326	3.3
Root and tuber crop production	45 (180)	43(129)	10 (20)	2 (2)	331	3.3
Civil service	29(116)	47(141)	22(44)	2 (2)	303	3.0
Sugar Cane farming	20 (80)	15(45)	65(130)	0	255	2.6
Vegetable farming	20 (80)	31 (93)	42(84)	7 (7)	264	2.6
Transportation	40 (160)	24 (72)	12 (24)	24(24)	280	2.8
Grand mean score						2.9
Decision cut-off point						2.5

Source: Field Survey, 2021: Note: SA = Strongly Agreed; A = Agreed; D = Disagreed; SD = Strongly Disagreed

Table 3: Mean rating of the effect caused by flood on the livelihood activities of smallholder farmers in the study area.

Livelihood activities	Very serious (3)	Serious (2)	Not serious (1)	∑FX	Mean
	Score (100)				
Marketing	48 (144)	31 (62)	21 (21)	227	2.3
Harvest and storage	50 (150)	30 (60)	20 (20)	230	2.3
Sugar cane farming	45(135)	20 (40)	35 (35)	210	2.1
Root and tuber crop production	52 (156)	43(86)	5 (5)	247	2.1
Vegetables farming	43 (129)	22 (44)	35(35)	208	2.1
Plantain production	55 (165)	30(60)	15 (15)	240	2.4
Grand mean score					2.2
Decision cut-off point					2.0

Source: (Field Survey, 2021)

Table 4: Ordinary Least Squares Multiple Regression Results of respondents' livelihood activities and effect of flooding

Variables	Linear	Exponential	Semi-log	Double-log
Constant	86.403	43.422	112.288	94.146
	(5.861)	(0.289)	(6.569)	(0.027)
Plantain production	-21.117	-0.065	-16.542	-0.008**
	(6.608)	(0.004)	(2.553)	(0.031)
Root and tuber crop production	3.313	0.609	1.274	2.912**
	(1.051)	(1.322)	(0.056)	(0.011)
Vegetable farming	17.788	0.832	3.408	2.717
	(5.581)	(9.564)	(1.872)	(2.662)
Sugar cane farming	12.529	8.309	-8.821	0.024
	(1.045)	(1.909)	(2.142)	(0.015)
Transportation	89.578	0.643	50.875	0.097**
	(2.555)	(5.901)	(1.786)	(0.003)
Civil service	-1.869	3.128	-1.719	3.383
	(0.404)	(-0.235)	(3.160)	(0.061)
R^2	0.690	0.511	0.491	0.309
Adj. R^2	0.713	0.536	0.514	0.328
F-value	31.084	24.001	17.921	26.037

Source: (Field Survey, 2021); ** = Significant at both 5% and 1%

This result is in line with the findings of Conchi (2014) which states forty percent of the world's households depend on family farming for their livelihood. Sixty percent of smallholder farmers had farming experience of 19 years. This stands to affirm that rural youths are leaving agriculture because they find farming 'unlucrative and that the farming sector is ageing rapidly (Aslihan, 2019).

The result in table 2 shows the livelihood activities of small holder crop farmers. The table shows that the activities of smallholder crop farmers had the following means: plantain (X=3.3); root and tuber (X= 3.3), civil service (X=3.0), sugar cane farming (X= 2.6), vegetable farming (X=2.6) and transportation (X=2.8). However, the result goes contrary to the suggestion of Rabi'u (2014), that civil service was an enviable means to better livelihood of the people. The implication of this findings give an impression that Root and tuber crops are movers of the food market in the study area, as it plays vital role in the diet of the people and are one of the main stay food items in households when processed.

The result in table 3 shows the effect caused by flood on the livelihood of farmers in the study area. The table shows that the effect caused by flood on the livelihood of farmers had the following means: marketing (X=2.3); harvest and storage (X= 2.3), sugar cane farming (X=2.1), root and tuber crop production (X= 2.1), vegetables (X=2.1) and plantain production (X=2.4). The result implies that flooding had serious effect on livelihood activities of smallholder farmers. This result supports the assertion of Week and Wizor, (2020) who noted that floods have reduced the efficiency of farmland in terms of food production causing food insecurity, income reduction and poor livelihood among the residents of the core the Niger Delta States.

Table 4. The linear functional form was chosen as the lead model because it had the highest value of the coefficient of multiple determination (R^2), F-statistics, number of significant variables and the signs on the variables which conform to the priority expectations. The model showed that the independent variables included in

the model explained about 60 percent of the observed variation on the effect of flooding the study area. The F-statistic of (31.084) was significant at 5% level and confirms the significance of the entire model. The effect of flood had negative impact on rural farmers' plantain production, root and tuber crop production sugar cane farming. The coefficient of plantain production was positively signed and significant at 5% level. This implies a direct relationship exists between plantain production of the rural farmer and the manner which they adapted to the negative effect of flood. The coefficient of root and tuber crop production of the rural farmers was positively signed and significant at 5% level. This implies a direct relationship exists between root and tuber crop production and impact of flooding. Thus, root and tuber crop production of individual rural farmers can enable him/her to cope with the impact of flood. The coefficient of sugar cane farming of rural farmers was positively signed and significant at 5% level. This implies a direct relationship exists between flood and the sugar cane farming of the rural farmers.

Conclusion and Recommendations

The study concluded that flood affected livelihood activities of smallholder crop farmers. However, the government and relevant flood management agencies should be proactive and invest massively in flood mitigation methods such as building of dams, dredging of rivers, clearing of drainages and natural waterways in the state, especially flood prone areas. Setting up the early warning system is a good development but there is need for more sensitization of farmers to heed to early warnings.

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