ASSESSMENT OF FARMERS' ADAPTATION STRATEGIES TO FLOOD RELATED LOSSES IN ZONE ONE AREA OF EKITI STATE, NIGERIA

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ABSTRACT

This study assesses farmers' adaptation strategies to flood related losses in zone one area of Ekiti State, Nigeria. The objectives were to; examine the perceived effects of flood on the production of farmers, examine the adaptation strategies to flood related losses by farmers, analyze the determinants of the adaptation strategies to flood related losses in the area and examine constraints associated with adaptation strategies to flood in the study area. 4 stage sampling technique was adopted in the selection of 147 crop farmers. Data obtained were analyzed by the use of descriptive statistics and inferential statistics tool (Poisson regression model). The study revealed that respondents strongly perceived flood effects as loss in farm produce, loss in quality of yield and loss of farm infrastructure. The study findings show that common adaptation strategies adopted by the crop farmers include change in planting date, crop rotation, mixed cropping, planting of cover crops and mulching. Furthermore, the Poisson regression result of the determinants of adaptation strategies to flood showed that age, level of education, farming experience, extension visit, credit, compatibility and cost of practice were statistically significant in making decisions. However, constraints perceived by the respondents include: poor access to adaptation strategies information, high cost of improved crop varieties, lack of access to weather forecast technology and government irresponsiveness to risk management. Therefore, it was recommended that Extension agents should provide adequate information on various adaptation strategies to farmers, relevant stakeholders and concerned organization should provide farmers with weather forecast technology, financial institutions should make access to credit facilities to farmers to enable them adopt adaptation strategies.

Keywords: *Farmers, Adaptation strategies, Flood and Losses*

INTRODUCTION

Agriculture has contributed immensely to the economies of most Africans countries including Nigeria where it constitutes about 40% of the countries' Gross Domestic Product (GDP) and about 70% of the population depends on it as a source of their livelihood (Food and Agricultural Organization of the United Nations (FAO) 2015). Flood is the most common type of disaster causing serious economic losses in various part of the world (Ramakrishna *et al.,* 2015). Those effects have caused a huge threat to food security and farmers livelihoods around the world compromising the well-being of crop farmers, because majorly crop

farmers depend on natural climatic sensitive resources such as agriculture for their livelihood (Ubisi *et al.,* 2017).

METHODOLOGY

This Study was conducted in Ado, Irepodun/Ifelodun, and Ekiti west local government area of Ekiti State, Nigeria. In order to obtain a sample size for this study, a 4-stage multistage sampling technique was adopted for this study area. Descriptive statistics was used to achieve objective 1 and 3, while objective 2 was achieved using Poisson regression.

RESULTS AND DISCUSSIONS The results indicated that crop farmers in the study area have the average age of 43years, dominated by males and were married. Majority about 79.7%of the crop farmers were educated in formal institutions of learning and have a mean household size of 5 people. Also the respondents had the mean of 18years of farming experience and 59.9% owned their land with the mean of 1.4 hectares of land. *Table 1 shows that* Flooding has effects on production activities of farmers. Based on the mean score from table 4.2 it shows that loss in farm produce (4.57), loss in quality of yield (4.41), loss of farm infrastructure (4.37) has the highest perceived effects. All this lead to reduction of farmers' productivity hence reducing the revenue of the farmers specifically and the nation as a whole. This implies that farmers must find ways of adapting to flood strategies in the zone to sustain their production and socio-economic status. This finding is in agreement with the work of Musah *et al.* (2016). Similarly, the respondents reported that flood eroded their farm produce which in turn resulted in low quality and low harvest, which could further pose a negative impact on the income of the household. This is in line with Ibrahim *et al.* (2018) who reported that flood disasters had impacts on agriculture by destroying crops and all other produce.

Table 1: perceived effects of flood on crop production

Perceived effects	SA	A	U	D	SD	Mean	Rank
Loss of farm produce	93(63.3)	49(33.3)	1(0.7)	4(2.7)	0(0)	4.57	1st
Loss of yield quality	71(48.3)	70(47.6)	2(1.47)	4(2.7)	0(0)	4.41	2nd
Loss of farm infrastructure	65(44.2)	75(51.0)	4(2.7)	2(1.4)	1(0.7)	4.37	3rd
Increased weed growth	60(40.8)	59(40.1)	17(11.6)	7(4.8)	4(2.7)	4.12	5th
Soil erosion	39(26.5)	75(51.0)	25(17.0)	7(4.8)	1(0.7)	3.98	6th
Loss of soil nutrients	33(22.4)	82(55.8)	25(17.0)	6(4.7)	1(0.7)	3.95	7th
Low farm income	50(34.0)	62(42.2)	14(9.5)	16(10.9)	5(3.4)	3.93	8th

Source: field survey, 2021.

The result in Table 1 shows that the farmers adopted the practice of change in planting date, crop rotation and mixed cropping as the major flood adaptation strategies with the mean (3.22, 3.03, 3.01) respectively. This implies that the various strategies adopted are not expensive to practice and farmers have various crops at their disposal to plant which may be the reason for greater adoption of these strategies. While the use of drainage system (2.49) and change in use of chemicals (2.55) was the least practice the farmers adopted because it is expensive to practice. This finding is in line with Oselebe *et al.* (2016) in the study of strategies employed by rice farmers in south eastern Nigeria in adapting to climate change and Onyeneke (2018) in the study of challenges of adaptation to climate change by farmers Anambra State, Nigeria.

Table 2: Level of the adaptation strategies to flood related losses

Adaptation strategies	NA	AW	I	E	T	A	Mean	Rank
Change in planting date	21(14.3)	11(7.5)	24(16.3)	15(10.2)	11(7.5)	65(44.2)	3.22	1st
Crop rotation	7(4.8)	30(20.4)	22(15.0)	16(10.9)	36(24.5)	36(24.5)	3.03	2nd
Mixed cropping	11(7.5)	31(21.1)	26(17.7)	11(7.5)	14(9.5)	54(36.7)	3.01	3th
Planting of cover crops	12(8.2)	37(25.2)	18(12.2)	8(5.4)	18(12.2)	36(24.5)	2.99	4th
Mulching	17(11.6)	39(26.5)	10(6.8)	11(7.5)	15(10.2)	55(37.4)	2.90	5th
Use of farm yard manure	14(9.5)	50(34.0)	11(7.5)	3(2.0)	6(4.1)	63(42.9)	2.86	6th
Planting of trees	24(16.3)	44(29.9)	7(4.8)	0(0)	3(2.0)	69(46.9)	2.82	7th
Zero tillage	13(8.8)	36(24.5)	22(15.0)	12(8.2)	28(19.0)	36(24.5)	2.78	8th
Soil conservation	20(13.6)	41(27.9)	19(12.9)	9(6.1)	21(14.3)	37(25.2)	2.55	9th
Use of drainage system	10(6.8)	53(36.1)	24(16.3)	7(4.8)	21(14.3)	32(21.8)	2.49	10th
Change use of chemicals	25(17.0)	50(34.0)	16(10.9)	8(5.4)	15(10.2)	33(22.4)	2.25	11th

Source: field survey, 2021

The result on Table 2 shows that the age of respondent had negative and significant effect on crop farmers' probability to adopt flood strategies. This implies that younger farmers are likely to adopt strategies than the older farmers indicating that younger farmers have a longer planning ability to cope with flood strategies. The probability of adoption of flood related strategies decreases by 6% increase in the age of crop farmers in the study area. As shown in Table 3 level of education of the crop farmers was significant and positive influenced the adoption of flood related strategies. In other words the level of education of crop farmers increased the probability of adopting strategies related to flood by 0.0214, this implies that the level of education has exposed farmers to different adaptation measures and has allowed them to have a significant understanding of what flood losses is and the likely things they can do to cushion its effects. This is in line with the study of Fatuase and Ajibefun (2015). Table 3 also indicated that the farming experience of respondents in the study area had a positive and significant effect on crop farmers' probability to adopt to flood adaptation strategies. This probability of adoption of flood related strategies increases by 7%, this implies that the respondents had useful information and experiences of flood with coping strategies as it affects their farming practices. The number of extensions visit, credit and compatibility increased the probability of adopting strategies related to flood by 0.028, 1% and 0.2% respectively. This implies that the more number of contact farmers have with extension personnel and services the more access to adaptation strategies and information and level of their adaptation strategies to flood improves farmers' awareness as well as the better implementation of the strategies. The positivity of credit implies that farmers with access to credit are more likely to use different flood adaptation strategies and allocate the credit for purchasing it. Also the compatibility implies that the crop farmers' existence practices are compatible with the adaptation strategies which made the probability of adopting it positive. Table 3 also indicated that the cost of practice of the strategies by the respondents had a negative and significant effect on crop farmers' probability to adopt flood related strategies. This probability of adoption decreases by 0.099, this implies if the practice is costly there is low probability of adopting it. This finding is in line with the study Arimi (2017).

Table 3; Poisson regression analysis on determinants of adaptation strategies to flood related losses

Explanatory variables	Coef.	Std. Err.	Z value	p>| z |
Age	-.0066992	.0020003	-3.35***	0.001
Gender	.0389414	.0377567	1.03	0.302
Land ownership	.0972777	.1139436	0.85	0.393
Level of education	.021417	.010472	2.05**	0.041
Farm size	.0129469	.0103532	1.25	0.211
Farm experience	.0073353	.0023398	3.14***	0.002
Household size	-.0073947	.0290937	-0.25	0.799
Extension visit	.028249	.0129293	2.18**	0.029
Farm income	-1.19e-07	9.15e-08	-1.31	0.192
Credit	1.01e-06	2.00e-07	5.04***	0.000
Loss due to flood	-3.97e-08	2.80e-07	-0.14	0.887
Compatibility	.2204492	.0565947	3.90***	0.000
Relative advantage	.0733252	.0484915	1.51	0.131
cost of practice	-.099682	.0335543	-2.97***	0.003
Cons	2.982538	.1120157	26.63***	0.000
Log likelihood	622.99005			
LR chi2(14)	132.27			
Prob> chi2	0.0000***			
Pseudo R2	0.9601			
Number of obs	147			

Source: field survey, 2021. * and ** significant at 1%, 5% respectively**

Table 4 shows that among the crop farmers in the zone, constraints include poor access to adaptation information, poor information on early warning system. In the present information age, problem could pose serious challenges to farmers' adaptation strategies as they may not be aware of recent development regarding flood adaptation and the necessary adjustments needed. Weather forecasts are supposed to guide farmers on flood losses so that they can make informed decisions and useful farm plans. However, the absence of this facility will undoubtedly make the farmers became ignorant of the weather situations and hence become vulnerable to effects of flood and weather. Ozor *et al.* (2016) noted that poor change information and farmers lack of access to weather forecast technologies as major barriers to climate change adaptation among farming households in Southern Nigeria.

Table 4; Constraints associated with the adaptation strategies to flood

Constraints associated with the control of flood	Severe constraint	Not severe constraint	Not constraint	Mean	Rank
Poor access to adaptation strategies information	89(60.5)	46(31.3)	12(8.2)	2.52	1st
High cost of improved crop varieties and strategies	89(60.5)	44(29.9)	14(9.5)	2.51	2nd
Lack of access to weather forecast technology by crop farmers	84(57.1)	47(32.0)	16(10.9)	2.46	3rd
Government irresponsiveness to risk management	77(52.4)	56(38.1)	14(9.5)	2.43	4th
Tedious nature of adaptation strategies	74(50.3)	57(38.8)	16(10.9)	2.39	5th
Poor information on early warning system	72(49.0)	54(36.7)	21(14.3)	2.35	6th
Poor agricultural extension services	62(42.2)	71(48.3)	14(9.5)	2.33	7th
Lack of collateral to secure loan to support farming	52(35.4)	88(59.9)	7(4.8)	2.31	8th
High cost of chemicals	60(40.8)	68(46.3)	19(12.9)	2.28	9th
Lack of access to supporting institutional facilities	44(29.9)	96(65.3)	7(4.8)	2.25	10th
Low level of education of the farmers	55(37.4)	65(44.9)	26(17.7)	2.20	11th
Inherited system of land ownership	46(31.3)	65(44.2)	36(24.5)	2.07	12th
Small-scale production of the farming households	31(21.1)	76(51.7)	40(27.2)	1.94	13th
Shortage of labour for implementing adaptation strategies	28(19.0)	60(40.8)	59(40.1)	1.79	14th
Involvement of the farmers in some off farm jobs	22(15.0)	46(31.3)	79(53.7)	1.61	15th

Source: field survey, 2021

RECOMMENDATIONS

Therefore, it was recommended that Extension agencies should provide adequate information on various adaptation strategies to farmers, which was one of the major constraints they face, relevant stakeholders and concerned organization should provide farmers with weather forecast technology, financial institutions should make access to credit facilities to farmers to enable them adopt adaptation strategies.

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