



EFFECTS OF FLOOD ON AGRICULTURAL PRODUCTION AMONG PEASANT FARMERS IN AHOADA WEST LOCAL GOVERNMENT AREA OF RIVERS STATE

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Abstract

This study investigated effects of flood on Agricultural production of peasant farmers in Ahoada West Local Government Area, Rivers State. The study adopted a descriptive survey research design. The population of the study consists of all peasant farmers in the study area. A purposive sampling technique was used to select 183 peasant farmers who were affected by flood. Three (3) research questions and two (2) hypotheses guided the study. Self-structured questionnaire and interview was used for data collection. The instrument was designed in 4-point rating scale of agreement. The reliability of instrument was tested using the test-retest method and yielded a reliability coefficient (r) of 0.91. Data was analyzed using mean and standard deviation with a criterion mean of 2.50 and above which was the benchmark for agreement. Z-test was used to test the null hypotheses at significance level of 0.05. The study revealed that building on drainage channels, illegal structure across waterways, blockage of inland waterways and heavy rainstorms among others are causes of flood crisis in the study area. The study also revealed that flood prevent root crop expansion, premature harvest, rotten of cassava tubers, increase in brooder pneumonia on poultry, foot rot disease on animals and reduction of nutritive value of livestock feed are some effects of flood on agricultural production. Hence, the study recommends that state government should offer to buy out flood-prone areas in order to avert repeated flood disaster, peasant farmers should consider creating run-off ponds, or sediment traps on the farm to reduce flood occurrence and peasant farmers should ensure livestock are vaccinated against foot rot and diarrhea during and after flooding in order to boost animal immune for disease resistance.

Keywords: Flood, agricultural production, peasant farmers

INTRODUCTION

Flood is a universal defy in the varying climatic pattern. Naturally, floods are results of tremendous weather conditions such as prolong rainfalls which are intensified by the human actions and environmental location of a place. Abua, Ewara, Abua and Atu (2009) argued that precipitation such as prolong rainfall and melting snow from snowfall are accountable for the flooding events in Nigeria, as one-third of the landmass of Nigeria is at an elevation of less than

eight meters above sea level. Regions liable to flooding are low-lying regions, but the southern parts of Nigeria are more susceptible owing to the double maxima rainfall experienced for a prolonged time, generally between March-October and as early as February-November in the case of Rivers States.

Flood occurs in Nigeria in different forms such as coastal flooding, river flooding, flash floods, urban flooding, dam spills and dam burst levee failures. Flooding in Rivers State is often related with rivers in the inland areas where unexpected heavy rains can alter them into devastating violent flow in a short time. Flood incident occurs due to some activities of man such as building on drainage channels, land encroachment, poor environmental planning, blockage of inland waterways and inadequate drainage channel. Soheli and Rayhanul (2015) assert that illegal structure across water ways has detrimental circumstances on rural dwellers and agricultural livelihood. Some natural influences include nature of topography, heavy rainstorms, base water flows and global warming. Typically, floods are outcome of extreme weather events such as prolonged rainfall which are exacerbated by the geographical location of and human activities (Joy & Edet, 2018).

According to Azad, Hossain and Nasreen (2013) agricultural damage incurred through floods affects rural farmers to go for other livelihood options leaving crop and livestock production given that majority of dwellers are peasant farmer in nature and thus, do not have adequate capacity to survive with the flood shock at that point of occurrence. Flooding results in spoiling of agricultural produce and thereby enhancing poverty among rural farmers (Umoh, 2008). Rural farmers suffer an enormous amount of agricultural losses every year as a result of flood in Rivers State. Markets places and farmlands are submerged for weeks and sometimes are washed away. The devastating effect of floods was not limited to houses and people. Many farmlands both arable and agro-forestry were swept away. Some animals lost their lives to flooding. According to Apan (2010), in most cases farmers find it difficult to carry their farm produce to and from the farm as water overflow its bank.

Seeds and seedlings regardless of crop type are living organisms and need moisture to survive. If there is moisture in the soil and early flood comes it has negative effect on crop performance. Khan (2018) stated that excess moisture in crop reduces the ability of the plant to access subsoil water if summer weather becomes dry and hot. Soheli and Rayhanul (2015) posited that flood takes away rural farmers' crops which is the only source of income for survival, thus making

them extremely susceptible to the subsequent poverty. Rural farmers are those predominantly affected by flood as their crop soak in water (Sohel et al., 2015). According to Khan (2018) excess moisture in crop reduces the ability of the plant to access subsoil water if summer weather turns dry. Peasant farmers' crops are at a high risk for disease development for pathogens that thrive in flood conditions. Seeds, seedlings and cultivars, regardless of crop type, are living organisms hence need adequate moisture for survival. In this regard, Hitoshin (2005) asserts that early flood affects oxygen in the soil, thus have a long-term negative effects on crop performance.

Standing crops such as cassava, yams, maize and sugar cane are flushed away by flood. Umoh (2018) posits that cash crops like vegetables have been badly affected and damaged thus worsening the sufferings of the rural farming communities. Crop such as sugarcane, cassava, yam, maize and among others are affected as water are raised to its maximum on farm lands, thus, making the individual and communities poor through disruption of services and the degradation of agricultural land. Khan (2012) revealed that cucumber plants were damaged by flood due to unavailability of controlling measures. Department of Livestock & Dairy Development (2018) opined that root and tuber crops get rotten and in most cases flushed away as a result of water overflow. According to Umoh (2018), most cases rural farmers harvest tuber crops at a premature stage to avoid loss during flooding.

Livestock being the main livelihood of the poor farming community is already at a risk due to lack of modern animal husbandry practices and recent floods further augmented the sufferings of the peasant farmers in the communities. Flooding environment increases worm larvae survival on pasture in moist conditions, thus affecting the feed of livestock (Department of Livestock & Dairy Development, 2018). A large number of poultry has been perished due to flood crises in Rivers State. Ghulamhabib and Zakir (2017) posited that flood occurrence directly affects the shelter/houses made for rural farmers' animals' productions. Among those animals who survived are endangered by non-availability of feed and shelter. Like other agricultural crops, fodder fields have been absolutely destroyed. Stocks of animal feed such as wheat straw and hay and feed have been washed away. According to Banerjee (2010) tons of dried fodder, green fodder and tons of concentrates have been washed away and badly affected by the flood. Thus effecting the already nutritive deficient animals are facing scarcity. Azad et al., (2013) assert that Erysipelas disease often affects turkeys and swine after flooding. In same vein, Abua et al.,

(2009) asserted that most of the poultry birds are being infected by Brooder Pneumonia as a result of water flow over. In same vein, FAO (2016) stated that foot rot problems are a major concern to stock susceptible after long period of immersion in flood or muddy ground. It further posited that abscesses and other flood diseases are common where an animal foot is constantly wet. According to Victoria (2011) flood affected area are likely to enhance diarrhea on livestock due to exposure to prolonged cold.

Ahoada West local government area is virtually surrounded by rivers and streams, hence its dwellers in most cases during wet season encounter flood crisis as a result of river bank overflow. This situation has caused loss of properties, shelter, infrastructures and other valuables of the rural dwellers in the area. Majority of the populace in Ahoada West are peasant farmers who produce crop and rear livestock for family consumption and little for sale for income generation. Hence, the study investigate effects of flooding on Agricultural production of peasant farmers in Ahoada West Local Government Area, Rivers State

Purpose of the Study

The purpose of the study was to investigate effects of flood on Agricultural production of peasant farmers in Ahoada West Local Government Area, Rivers State. Specifically, the study sought to

1. Ascertain the causes of flood in Ahoada West Local Government Area, Rivers State.
2. Determine the effect of flood on crop production among peasant farmers in Ahoada West Local Government Area, Rivers State.
3. Determine the effect of flood on livestock production among peasant farmers in Ahoada West Local Government Area, Rivers State.

Research Questions

The following research questions were formulated to guide this study

1. What are the causes of flood in Ahoada West Local Government Area, Rivers State?
2. What are the effects of flood on crop production among peasant farmers in Ahoada West Local Government Area, Rivers State?

3. What are the effects of flood on livestock production among peasant farmers in Ahoada West Local Government Area, Rivers State?

Research Hypotheses

Based on the research question, the following null hypotheses were formulated to guide the study

H₀₁: There is no significant difference in the mean score of male and female peasant farmers on effects of flood on crop production in Ahoada West Local Government Area.

H₀₂: There is no significant difference in the mean score of male and female peasant farmers on effects of flood on livestock production in Ahoada West Local Government Area.

Methodology

Ahoada West local government area is one of the 23 local governments that made up Rivers State. The study area shares boundary with Emohua, Ogba/Egbema/Ndoni local government area and part of Bayelsa State. The local government is predominantly an agrarian community with good vegetation and agrarian weather that enhance agricultural production. Thus, majority of inhabitants depend on optimal production of farm produce for food security and livelihood of the families. The study was a descriptive survey research design. The target population was all peasant farmers in Ahoada West Local Government Area. A purposive sampling technique was adopted to select 183 peasant farmers (86 male and 97 female) from the flooded communities in the study area. The instrument for data collection was a self-structured questionnaire designed in a 4-point rating of agreement which elicited information on each research questions. Interview was scheduled for those who could not respond to the questionnaire item properly. The reliability of instrument was tested using the test-retest method and yielded a reliability coefficient (r) of 0.91. Data was analyzed using mean and standard deviation with a criterion mean of 2.50 and above which was the benchmark for agreement, while any item with a mean score below 2.50 was disagreed. Z-test was used to test the null hypotheses at significance level of 0.05.

Findings and Discussion

Research Question 1 What are the causes of flood in Ahoada West Local Government Area, Rivers State?

Table 1 Mean response of male and female farmers on the causes of flood in Ahoada West Local Government Area

S/N	Items	Male farmers (86)			Female farmers (97)		
		X	SD	Remark	X	SD	Remark
1.	Building on drainage channels	3.34	0.73	Agreed	3.21	0.59	Agreed
2.	Illegal structure across waterways	3.12	0.84	Agreed	3.17	0.76	Agreed
3.	Blockage of inland waterways	3.13	0.56	Agreed	3.10	0.63	Agreed
4.	Nature of topography	3.23	0.91	Agreed	3.10	0.52	Agreed
5.	Heavy rainstorms	3.09	0.54	Agreed	3.11	0.62	Agreed
6.	Inadequate drainage channel	2.93	0.65	Agreed	2.97	0.81	Agreed
7.	Global warming	3.01	0.64	Agreed	3.04	0.86	Agreed
8.	Base water flows	3.06	0.58	Agreed	3.06	0.65	Agreed
9.	Land encroachment	3.31	0.67	Agreed	3.21	0.67	Agreed
10.	Poor environmental planning	3.11	0.89	Agreed	3.00	0.73	Agreed
	Grand Mean	3.13	0.70	Agreed	3.09	0.68	Agreed

Source: Field Work, 2019

Result in Table 1 shows the mean response of male and female farmers on causes of flood in Ahoada West Local Government Area, Rivers State. The study revealed that building on drainage channels (3.34 & 3.21), illegal structure across waterways (3.12 & 3.17), blockage of inland waterways (3.13 & 3.10), nature of topography (3.23 & 3.10), global warming (3.01 & 3.04) and heavy rainstorms (3.09 & 3.11) are some major causes of flood in peasant farmers' production in Ahoada West local government area. These findings are corroboration with Soheli and Rayhanul (2015) who opined that global warming, nature of topography and illegal structures across waterways have unfavorable conditions on agricultural livelihood of rural dwellers. Also the result revealed that inadequate drainage channel (2.93 & 2.97), base water flows (3.06 & 3.06) and poor environmental planning (3.11 & 3.00) enhances flooding on peasant farmers' production in Ahoada West local government area. The finding is in line with Joy et al, (2018) who posited that floods are outcome of prolong rainfall and melting snow which are exacerbated by the geographical location and human activities of a place.

Research Question 2 What are the effects of flood on peasant farmers' crop production in Ahoada West Local Government Area, Rivers State?

Table 2 Mean response of male and female on effects of flood on peasant farmers' crop production in Ahoada West

S/N	Items	Male farmers (86)			Female farmers (97)		
		X	SD	Remark	X	SD	Remark
1.	Flood prevent root crop expansion	3.21	0.65	Agreed	3.11	0.64	Agreed
2.	Affects growth of plant cultivars	3.15	0.55	Agreed	3.17	0.68	Agreed
3.	Enhances premature harvest	3.14	0.72	Agreed	3.13	0.56	Agreed
4.	Affect production quality	2.95	0.85	Agreed	3.18	0.63	Agreed
5.	Rotten cassava tubers	3.11	1.01	Agreed	3.07	0.73	Agreed
6.	Destroys root crops	3.00	0.61	Agreed	3.03	0.70	Agreed
7.	Soaks planted seeds	3.32	0.65	Agreed	3.24	0.56	Agreed
8.	Affects harvesting operation	2.87	0.84	Agreed	2.95	0.63	Agreed
9.	Hinders transportation of agricultural produce	3.44	0.78	Agreed	3.34	0.92	Agreed
	Grand Mean	3.13	0.74	Agreed	3.15	0.67	Agreed

Source: Field Work, 2019

Result in Table 2 shows the mean response of male and female farmers on effects of flood on peasant farmers' crop production in Ahoada West Local Government Area of Rivers State. The respondents agreed that flood prevent root crop expansion (3.21 & 3.11), growth of plant cultivars (3.15 & 3.17), enhances premature harvest (3.14 & 3.13), affect production quality (2.95 & 3.18) and rotten cassava tubers (3.11 & 3.07). The finding affirmed with Department of Livestock & Dairy Development (2018) when they posited that root and tuber crops get rotten and in most cases flushed away as a result of water overflow. The finding was also supported by Umoh (2018) who asserted that rural farmers harvest tuber crops at a premature stage to avoid crop loss due to flood disaster. The study also revealed that flood destroys root crops (3.00 & 3.03), soaks planted seeds (3.32 & 3.24), affects harvesting operation (2.87 & 2.95) and hinders transportation of agricultural produce (3.44 & 3.34). These findings are in agreement with Apan (2010) who posited that flood pose difficulty for farmers in conveying farm produce home and market distribution.

Research Question 3 What are the effects of flooding on livestock production among peasant farmers in Ahoada Local Government Area, Rivers State?

Table 3 Mean response of male and female farmers on effects of flooding on livestock production among peasant farmers in Ahoada West

S/N	Items	Male farmers (86)			Female farmers (97)		
		X	SD	Remark	X	SD	Remark
1.	Enhances diarrhea on livestock	3.14	1.00	Agreed	3.12	0.87	Agreed
2.	Increases cost of livestock production for farmers	3.20	0.62	Agreed	3.15	0.56	Agreed
3.	Causes brooder pneumonia on poultry birds	3.11	0.86	Agreed	3.41	1.04	Agreed
4.	Increases foot rot disease on animals	2.98	1.05	Agreed	3.01	0.78	Agreed
5.	Reduces nutritive value of feed for livestock	3.17	0.89	Agreed	3.12	0.94	Agreed
6.	Destroys animals' shelter/houses	3.01	0.77	Agreed	2.97	0.63	Agreed
7.	Flooding result in Erysipelas disease on livestock	3.19	0.65	Agreed	3.14	0.67	Agreed
8.	Affects livestock feed	3.11	0.57	Agreed	3.09	0.88	Agreed
	Grand Mean	3.11	0.80	Agreed	3.12	0.80	Agreed

Source: Field Work, 2019

Result in Table 3 shows the mean response of male and female farmers on effects of flooding on peasant farmers' livestock production in Ahoada Local Government Area, Rivers State. The respondents agreed that flooding enhances diarrhea on livestock (3.14 & 3.12), increases cost of livestock production for farmers (3.20 & 3.15), causes brooder pneumonia on poultry birds (3.11 & 3.41), reduces the nutritive value of feed for livestock (3.17 & 3.12) and increases foot rot disease on animals (2.98 & 3.01). The finding affirmed with Victoria (2011) who posited that flood affects area enhance diarrhea on livestock due to exposure to prolonged cold. The finding is also in corroboration with Azad et al., (2013) and FAO (2016) who opined that flood crises results in high cost of livestock production for peasant farmers and cause foot rot diseases for animals. The Table also revealed that flooding destroys animals' shelter/houses (3.01 & 2.97), result in Erysipelas disease on livestock (3.19 & 3.14) and affects livestock feed (3.11 & 3.09). The finding was also supported by Azad, Hossain and Nasreen (2013) who assert that Erysipelas disease often affects turkeys and swine during flooding disaster. The finding also aligned with

Banerjee (2010) who stated that tons of dried fodder, green fodder and tons of concentrates have been washed away and badly affected by the flood.

Hypotheses Testing

Hypotheses 1: There is no significant difference in the mean score of male and female peasant farmers on effects of flooding on crop production in Ahoada West Local Government Area.

Table 4: Z-test Analysis on mean score of male and female peasant farmers on effects of flooding on crop production in Ahoada West Local Government Area

Respondents	N	$\bar{X}$	SD	Df	Z-cal	Z-crit	α	Decision
Male	86	3.13	0.74	181	1.53	1.96	0.05	Accepted
Female	97	3.15	0.67					

Data on Table 4 shows summaries mean scores, standard deviation and Z-test analysis of the mean ratings of male and female peasant farmers on effects of flooding on crop production in Ahoada West Local Government Area of Rivers State. The calculated Z-value of 1.53 was less than the Z-critical value which stood at 1.96. Hence, the null hypothesis which stated that there is no significant difference in the mean score of male and female peasant farmers on effects of flooding on crop production in Ahoada West Local Government Area was upheld.

Hypotheses 2: There is no significant difference in the mean score of male and female peasant farmers on effects of flooding on livestock production in Ahoada West Local Government Area.

Table 5: Z-test Analysis on mean score of male and female peasant farmers on effects of flooding on livestock production in Ahoada West Local Government Area

Respondents	N	$\bar{X}$	SD	Df	Z-cal	Z-crit	α	Decision
Male	86	3.11	0.80	181	0.87	1.96	0.05	Accepted
Female	97	3.12	0.80					

Data on Table 5 shows summaries mean scores, standard deviation and Z-test analysis of the mean ratings of male and female peasant farmers on effects of flooding on livestock production

in Ahoada West Local Government Area of Rivers State. The calculated Z-value of 0.87 was less than the Z-critical value which stood at 1.96. Hence, the null hypothesis which stated that there is no significant difference in the mean score of male and female peasant farmers on effects of flooding on livestock production in Ahoada West Local Government Area was upheld.

Conclusion

Based on the findings, it was thus deduced that flood has detrimental impact on peasant farmers' livelihood through enormous crop shortage, premature harvest, rotting of seeds, seedlings and cultivars, thus resulting to food scarcity. This menace has destroyed arable land for agricultural purposes which are the major source of economic empowerment in the area. Livestock farming is largely affected by flooding due to worm larvae survival on pasture in moist conditions, thus affecting the feed of livestock, increasing animal diseases and reducing quality of meat consumption.

Recommendation

Based on the findings and conclusions made, the study therefore recommend that:

1. State government should offer to buy out flood-prone areas in order to avert repeated flood disaster in the study area. This will enable them put a check on where peasant farmers will produce.
2. Peasant farmers should consider creating run-off ponds, or sediment traps on the farm to reduce flooding occurrence. This will virtually direct run-off water to the created channel.
3. State government should endeavor to build good water channel and direct it to the rivers.
4. Farmers should always identify fields at higher ground where livestock can be moved to safety and gain permission to use these in advance of flooding.
5. Peasant farmers should ensure livestock are vaccinated against foot rot and diarrhea during and after flooding in order to boost animal immune to disease resistance.
6. Loosen soil to leave a rough surface after harvesting to allow more water to soak in rather than run off land

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