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Socio-economic and flood precautions of flood affected households in lower Niger basin areas of Nigeria

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ABSTRACT

Flood is a tropical climate change challenge in Nigeria. Its occurrence is always associated with heavy loss of life and property, misery, hardship, disease and at times famine. This study specifically examined socio-economic predicaments of flood affected households, factors predisposing farmers and their livelihood to flood and mitigation practices adopted in the Niger basins of Nigeria. Primary data were collected from 120 respondents with the use of questionnaire. About 389.6 hectares were affected by flood constituting 92.08% of the total farm area. About 446150 kg (N 35,692,000) of rice were lost to the flood accounting for 94.83% of the total loss, while maize of about 22800 kg (N 1,368,000) and sorghum of about 1500 kg (N 90,000) were also lost to the flood accounting for 4.85 and 0.32% of the total loss, respectively. Factors such as farmland proximity to river, lack of levee/dyke along the river channel, lack of insurance on flood, inadequate access to flood resistant crop varieties, inadequate assistance from the Government and other financial institutions predisposed respondents to flooding. Furrow channeling and use of cement blocks were the most adopted flood mitigation practices in the study area, while the use of sandbags, woods and heavy grasses were adopted. Study, therefore, calls for government and the private sectors participation in construction of embankments and complete dredging of the river as well as provision of flood resistant crop varieties, loans and enlightenment of farmers on insuring their properties.

Key words : Flood, households, socio-economic predicaments

INTRODUCTION

Flood is one of climate change hazards that constitute threat to livelihood and economic growth in Nigeria (NEMA, 2012). Conventionally, Nigeria has a tropical climate with distinct wet and dry seasons. However, the duration and intensity of the wet season decrease from nine months or more along the coast to about three months in the extreme north. The wet and dry seasons are associated, respectively, with the prevalence of the moist tropical maritime air mass from the Atlantic and the dry, dusty continental air mass from the Sahara Desert, respectively. The boundary zone between these two air masses, the Inter-Tropical Discontinuity (ITD) moves slowly northwards as from about February, reaching beyond Nigeria's northern boundary in August. As from September, it moves relatively rapidly southwards back to the coastal belt. The sequence of weather types, experienced at a particular location in the course of a year, is determined primarily by the location of that place relative to the fluctuating surface position of the ITD. Mean annual rainfall decreases from between 2400 and 3200 mm along the coast to between 520 and 650 mm along the northern boundary. However, climate change is making weather less predictable, rains more uncertain and heavy storm rainfalls more likely. Thus, areas considered as dry land in the northern part of the country witness excessive and torrential downpour, while some communities in the south are also submerged (*http://www.tribune.com.ng*).

Flood disaster is not a recent phenomenon in the country, and its destructive tendencies are sometimes enormous. Salami (2007) reported that in 1994 over 2,260 ha of

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sugarcane fields were flooded and remained inundated for over six weeks. According to him, the flood damaged irrigation and water conveyance structures, washed away the existing flood protection embankments, roads and caused displacement of settlements and communities along river Niger. Lawal and Nagya (1999) also reported that flood occurence in 1998 and 1999 in Nigeria led to enormous losses.

In 2012, Nigeria suffered from a severe flood which was reported as the worst in at least half a century. The preliminary findings of the Inter Agency Rapid Assessment conducted in 2012 revealed that out of the 774 Local Government Areas (LGAs) in Nigeria, flooding affected 2,389 communities in 231 LGAs within July-October 2012, resulting in displacement of 2.2 million people and 431 deaths (UNICEF, 2012). The joint national inter-agency assessments conducted by UNICEF, WHO, UNHCR, FAO, Oxfam, Nigerian Red Cross Society and State Emergency Agency (SEMA) showed that Kwara State was one of the most flood affected states in the country. The most affected regions in the state were the flood prone areas, like the lower Niger basin region. Many reports also indicated that most of the affected area was farming communities where agriculture was the main source of livelihood of the people (Natioanl Dailies, 2012). Despite a growing recognition of the possible effects of the floods on the affected communities, research-based information to inform decision making on the impact of the disaster on agricultural production in the affected areas is lacking. This, therefore, creates a research gap which needs to be filled in to enhance sound policy formulation on climate change hazards in Nigeria. This study, therefore, sought to provide answer to the following research questions :

- What is the socio-economic circumstances of flood affected households in the flood affected communities?
- What are the issues predisposing farmers and their livelihoods to flood in the affected communities?
- What mitigation practices do farmers adopt to mitigate the flood menace?

Objectives of the Study

The general objective of the study was to examine the economic impact of the 2012 flooding on farmlands in the lower Niger River basin area of Kwara state, Nigeria. The specific objectives were to :

(i) examine the socio-economic characteristics of the households in the flood affected communities of the study area;
(ii) identify issues that predispose farmers to flood effects; and
(iii) assess flood mitigation practices by farmers.

MATERIALS AND METHODS

Study Area

The study was conducted in the Lower Niger Basin area of Kwara state, Nigeria. It lies between latitude (8°40´-10°10´) N and longitude (4°20´-6°20´) E. This floodplain had a lowland rainforest, derived savanna and guinea savanna vegetation with alluvial soil and an elevation pattern of between 0-300 meters. Characteristic climatic features included mean annual rainfall between 1016-1270 mm, high relative humidity (60-80%) with mean annual temperature ranging from 26-28°C. The rainy season lasted from April to September and caused the heavily silted single annual flood, the “white flood”, experienced in the area (Federal Ministry of Environment, Nigeria, 2012). Predominant livelihood in these areas was mainly farming and fishing. The major crops grown were rice, shorgum and maize, while livestock reared were cattle, sheep and goats (Fakayode *et al.,* 2009). The target

Table 1. Flood affected communities in Kwara lower Niger basin area

Local government area	Flood affected communities
Kaima	Gbajibo
Edu	Bele, Emi, Faigi, Tswatako, Patako, Tada, Shonga, Edogi, Dokun, Yemagi
Patigi	Gbaradogi, Gunji-saaci, Gbafun, Gakpan, Sunkoso, Esungi, Mawogi, Abefu, Chenu

Source : NEMA (2012) and national newspapers.

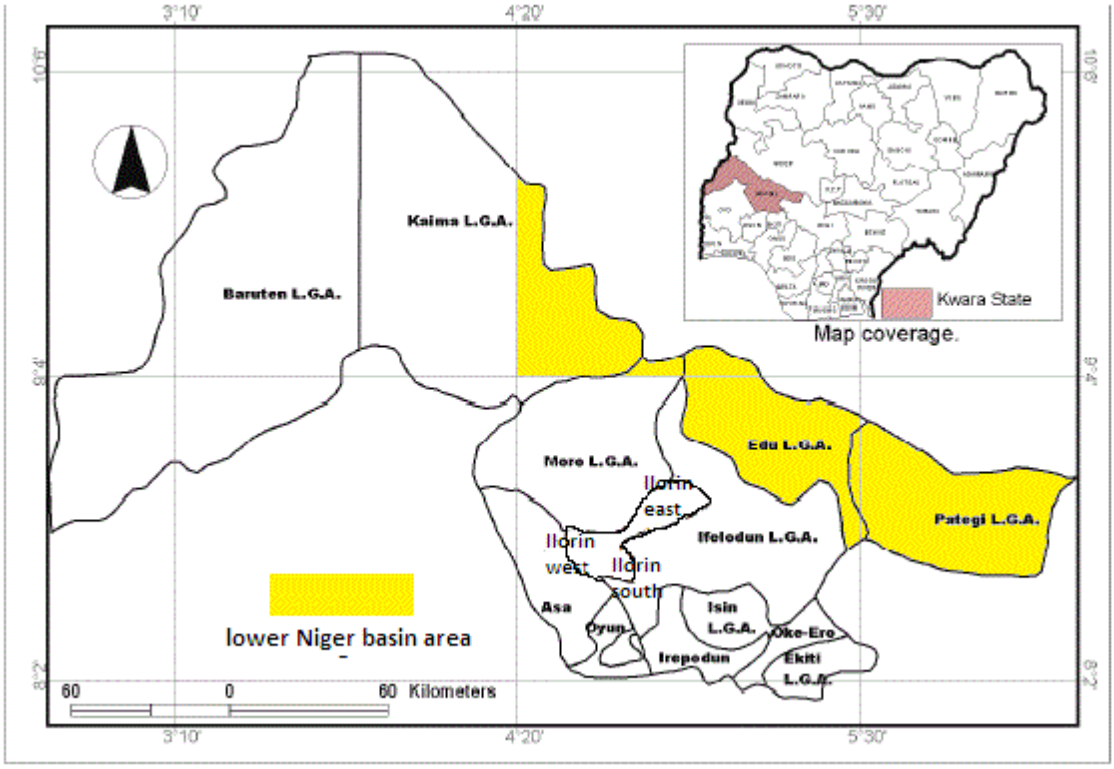

Fig. 1. Map showing lower Niger basin area of Kwara state.

population for this study consisted majorly of households within three Local Government Areas (LGAs), namely, Kaima, Edu and Patigi. According to NEMA (2012), the flood affected communities in the study area are presented in Table 1. The study area (Fig. 1) lied low of the River Niger and had been persistently prone to flooding.

Sampling Technique and Sample Size

The target population for this study was the farming households. A two-stage sampling technique was employed to select a representative sample for the study. The first stage involved a random selection of six flood affected communities in the study area. The second stage involved selection of 20 farming households in each of the selected flood affected communities, making an aggregate of 120 respondents (Table 2).

Sources of Data

The data of the study were obtained mainly from primary sources. Secondary sources were also considered. The primary data involved the use of structured questionnaire to solicit responses from the study respondents. In order to elicit adequate information from the respondents and facilitate understanding of the questionnaires, four interpreters were

Table 2. Sample design outlay of farming households in flood affected communities

Local government area	Communities selected	Number of respondents
Edu	Edogi	20
	Shonga	20
	Tada	20
Patigi	Gbaradogi	20
	Sunkoso	20
	Gakpan	20
Total	6	120

Source : Field Survey (2013).

employed to construe the questionnaires to the respondents. The secondary data were obtained from various literatures such as journals, conference proceedings, newspaper articles, National Emergency Management Agency (NEMA) bulletin and the internet.

Methods of Data Analysis

The main analytical tools used for this study were descriptive statistics. Descriptive statistics such as mean, mode, frequency distribution and coefficient of variation were used to describe the socio-economic characteristics of respondents, issues that predispose farmers to flood effects and flood mitigation practices by farmers.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Table 3 shows the socio-economic characteristics of the respondents. Most of the respondents were male constituting about 92.5% of the total respondents. About 75.0% of the respondents were married, while 25.0% were single. This indicates that most of the respondents were attached with responsibilities of catering for the families with their means of livelihood (farming). The average household size of the respondents was 8, while its modal group was of 6-10 persons. The modal age group of the respondents was 46-50, while its average was 49 years. These imply that the respondents were still agile and capable of engaging in farming. Survey revealed that all the respondents had formal education. This implies that they were likely to have ideas about flood hazards. The modal farming experience group of the respondents was of 26-30 years, while its mean was 29 years. Farmlands were inherited by 93.6% of the total respondents, while 5.8 and 1.7% of the total respondents rented and purchased it, respectively. Farmlands were individually owned by all the respondents in the study area.

Losses Incurred from the Flood Hazard

Fig. 2 shows the situation of things in the study area at the time of data collection. Table 4 presents the estimated losses incurred by respondents in the study area. Rice was cultivated by all the respondents in the study area, while maize and sorghum were cultivated as minor crops by 26.67 and 1.67% of the total respondents, respectively. About 389.6 hectares were affected by flood constituting about 92.08% of the total farm area cultivated by the respondents. Rice accounted for about 88.7% of the total farmland cultivated, while maize and sorghum accounted for 10.92 and 0.24%, respectively. Rice also accounted for about 94.53% of the total farm area affected while maize and sorghum accounted for 5.21 and 0.26%, respectively. About 446150 kg (N 35692000) of rice were lost to the flood accounting for 94.83% of the total loss, while maize of about 22800 kg (N 1368000) and sorghum of about 1500 kg (N 90000) were also lost to the flood accounting for 4.85 and 0.32% of the total loss, respectively. Valuation of the loss was based on the prevailing market prices in the study area. The market prices per kilogram of paddy rice, maize and sorghum grains in the study area were N 80, N 60 and N 60, respectively.

Issues Predisposing Respondents to Flooding Effect

Table 4 presents factors predisposing respondents to flooding effect in the study area. Factors such as farmland proximity to river, lack of levee/dyke along the river channel, lack of insurance on flood, inadequate access to flood resistant crop varieties, inadequate assistance from the Government and other financial institutions totally predisposed respondents to flooding, while climatic condition of the study area, inadequate access to information and farm infrastructures had no predisposing effect on them to flooding. Also time of planting was a major predisposing effect on about 88.33% of the total respondents to flooding in the study area.

CC–Climatic condition of the study area
LLRC–Lack of levee/dyke along river channel
IAIFP–Inadequate access to information on flood prevention
LIF–Lack of insurance on flood
IAFRCV–Inadequate access to flood resistant crop varieties
IAFI–Inadequate access to farm infrastructures

Table 3. Socio-economic characteristics of the respondents

Variable	Category	Frequency	Percentage
Gender	Male	111	92.5
	Female	9	7.5
Age	<30	1	0.8
	30-35	16	13.4
	36-40	13	10.8
	41-45	16	13.3
	46-50	24	20
	51-55	11	9.2
	56-60	15	12.5
	61-65	16	13.3
	66-70	6	5
	>70	2	1.7
	Minimum	29	
	Maximum	72	
	Mean	49	
	SD	11.17	
	CV	0.23	
Marital status	Single	30	25.0
	Married	90	75.0
Highest educational status attained			
	Primary	58	48.3
	Secondary	40	33.4
	Tertiary	22	18.3
	<10	2	1.7
	10-15	19	15.8
	16-20	17	14.2
	21-25	8	6.6
	26-30	22	18.4
	31-35	19	15.8
	36-40	19	15.8
	41-45	8	6.6
	46-50	4	3.3
	51-55	2	1.7
	Minimum	5	
	Maximum	52	
	Mean	29	
	SD	11.14	
	CV	0.39	
Household size	≤5	11	9.2
	6-10	90	75
	11-15	12	10
	16-20	2	1.6
	21-25	1	0.8
	26-30	3	2.4
	>30	1	0.8
	Minimum	3	
	Maximum	36	
	Mean	8	
	SD	5.26	
	CV	0.62	
Source of farmland	Purchased	2	1.7
	Inherited	111	92.5
	Rented	7	5.8
Farmland ownership	Individually owned	120	100

Source : Field Survey (2013).

Patigi (Gakpan/Gbaradogi)

Edu (Tada/Shonga)

Fig. 2. Flood situation in Edu and Patigi at data collection.

Table 4. Factors predisposing respondents to flooding effect

Variable	Tada		Shonga		Edogi		Gakpan		Gbaradogi		Sunkoso		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
FPR	20	100	20	100	20	100	20	100	20	100	20	100	120	100
LLRC	20	100	20	100	20	100	20	100	20	100	20	100	120	100
LIF	20	100	20	100	20	100	20	100	20	100	20	100	120	100
IAFRCV	20	100	20	100	20	100	20	100	20	100	20	100	120	100
TP	20	100	15	75	16	80	19	95	19	95	17	85	106	88.33
IAG	20	100	20	100	20	100	20	100	20	100	20	100	120	100
IAFA	20	100	20	100	20	100	20	100	20	100	20	100	120	100

FPR – Farmland proximity to river.

TP–Time of planting
IAG–Inadequate assistance from the Government
IAFA–Inadequate assistance from other financial authorities (*Source* : Field Survey, 2013)

Flood Mitigation Practices Adopted by the Respondents

Table 5 presents various flood mitigation practices adopted by respondents in the study area. Respondents in Shonga, Gakpan and Gbaradogi adopted no flood mitigation practice. Tada, Edogi and Sunkoso respondents adopted flood mitigation practices at a varying level constituting 35, 20 and 30% of the total respondents in each of the villages, respectively. Furrow channeling and use of cement blocks were the most adopted flood mitigation practices in the study area constituting 7.5% each of the total respondents, while use of sandbags, woods and heavy grasses were adopted by 6.67, 4.17 and 1.67% of the total respondents, respectively, in the study area. Most of the respondents adopted no flood mitigation practices constituting about 72.5% of the total respondents in the study area.

Table 5. Flood mitigation practices adopted by respondents

Villages	Sand bagging	Furrow channeling	Wood	Cement block	Heavy grass	Total Freq.	Total (%)
Tada	4	6	4	4	2	7	35
Shonga	0	0	0	0	0	0	0
Edogi	3	1	0	2	0	4	20
Gakpan	0	0	0	0	0	0	0
Gbaradogi	0	0	0	0	0	0	0
Sunkoso	1	2	1	3	0	6	30
Total Freq.	8	9	5	9	2		
Total (%)	6.67	7.5	4.17	7.5	1.67		

Source : Field Survey (2013).

Conclusion and Recommendations

This study analyzed the economic impact of flood on affected farmlands in Kwara state, Nigeria.The study identified the major problems faced by the farmers in the study area. These included inadequate attention of both the Government and the private sectors to their plights such as provision of flood resistant crop varieties, loans and other financial assistance, construction of embankments/dykes/levees along river Niger course, lack of insurance on flood and dredging of the river Niger. Therefore, in order to increase the efficiency of crop production and minimize the destruction of properties suffered by the people in the study area, the aforementioned problems need to be addressed. Thus, the following recommendations are suggested :

- Farmers should be encouraged to insure their properties in order to mitigate their losses to unforeseen environmental hazard like flood, etc.
- Also farmers should be provided with necessary incentives such as loans, flood resistant crop varieties, etc. by either the Government or other financial institutions in order to facilitate crop production at its optimum level.
- Dredging of river Niger should be done in order to minimize flooding especially in the surrounding farmland.
- Structural measures such as construction of dykes, levees or embankments along the river course should be implemented in order to minimize/prevent overflow of water to surrounding farmlands during flooding.
- Adequate enlightenment programmes on flood and its effects should be provided to farmers in order to ensure increase in their knowledge to the causes and the control of flood events.

REFERENCES

Fakayode, S. B., Omotesho, O. A. and Omoniwa, E. (2009). Economic analysis of rice consumption patterns in Nigeria. *J. Agric. Sci. & Technol.* **12** : 135-44. Published by Faculty of Agriculture. Tarbiat Modarres University, Iran. Available online at *http://jast.modarres.ac.ir/form_send_article.php.*

http://www.tribune.com.ng/news2013/index.php/en/community-news/item/1455.

Lawal, A. F. and Nagya, M. T. (1999). Socio-economic effects of flood disaster on farmers in Mokwa Local Government Area, Niger State, Nigeria. A paper presented at the 33rd Annual Conference of Agricultural Society of Nigeria held at National Cereal Research Institute, Badeggi, Niger State. pp. 1-10.

National Emergency Management Agency (NEMA) (2012). Strategic partnership for preparedness (SPP), emergency preparedness and response capacity assessment. *National Capacity Assessment Report, Part 2.* Accessed on 20/12/2012 from *http://nema.gov.ng/upload/National-Capacity-Assesment-Pt2.pdf.*

NEMA blames climate change for flood in Nigeria. Accessed on 20/12/2012.

Salami, A.W. (2007). Operational performance of water management models for a hydropower system under reservoir inflow forecasts. Ph. D. thesis report submitted to the Department of Geography, University of Ilorin, Ilorin, Nigeria.

United Nations International Children Emeregency Fund (UNICEF) (2012). Nigeria Monthly Situation Report, 29 October, 2012.