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Investigating the Economic Cost of Flood on Selected Households in Adamawa State

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Abstract

This study seeks to investigate the economic costs of flood on selected households in Adamawa State, Nigeria using descriptive survey research design (tables and percentages). The population of the study comprised 400 households selected from three local governments covering the three senatorial zones of the state. Though the study relied on purposive sampling technique, Taro Yamane formula was used to determine the sample size. Data collection was via self-constructed questionnaire with reliability index of 0.81. The results showed that the selected households suffered economic costs (in terms of man-hour loss, cleaning cost and health cost) resulting from frequent/reoccurring incidents of flood in Adamawa State. Based on the findings of the study, it was recommended among other that government should improve on rescue and intervention programmes as well as liaising with the Cameroonian government in addressing persistent overflow of the Lagdo Dam.

Key Words: *Flood, Economic Cost, Household, Adamawa State.*

1. Introduction

Flood is an important environmental factor that can affect the economy and/or inhabitants of any geographically defined area; the oxford advanced learner's dictionary defined flood as a disastrous overflow or irruption of water from a lake or other body of water due to excessive rainfall or other input of water. Ward (1974) considered flood as an abnormal high stage of water in a stream channel or the stage at which a stream overflows it bank while Etuonovbe (2011) saw flood as a situation in which land that is usually dry is covered with water from either an overflowing river or heavy rains.

Flooding is a global phenomenon which many countries (most especially in Africa) have endured different type and degree of hardship from its unexpected occurrences; this perhaps is due to its high frequency as well as shortage of emergency management agencies to manage its aftermath. Smith (1996) explained that flooding is a common ecological hazard that claims over 20,000

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lives globally per year. In Nigeria for instance, flood is one of the most common environmental hazards that has either led to loss of lives and/or property or displacement of hundreds of persons (Kwari *et al.*, 2015).

Though, the first flood in Nigeria was recorded in 1948 in the old western region, flood has spread to all parts of the country including Adamawa State which this study is based. Adamawa State was carved out of the old Gongola state in 1991 with its capital in Yola. The state has twenty-one local governments that are spread unevenly across three (3) senatorial districts (Adamawa North, Adamawa central and Adamawa South respectively) for easy administration. The state is ranked eighth in terms of land mass covering a total distance of 36,917km^2 and with a population of about 4.25 million in 2016 according to the National Bureau of Statistics (NBS, 2021). The state lies on latitude between 9^0 and 20^0N and longitude between 12^0 and 30^0E. Adamawa State shares national borders with Taraba, Borno, and Gombe and international border with Cameroun.

According to NBS (2012), the state has a total of 576,348 regular households and majority of these households depends on or practice agriculture for sustainability. Although the first incident of flood in Adamawa state was recorded in 2001, the most catastrophic incidents of flood were recorded in 2019 and 2021 respectively. According to the flash report of 2019, flood incidents were experienced in 8 out of the 21 local governments in the state namely Demsa, Fufore, Girei, Guyuk, Lamurde, Numan, Yola north and Yola south respectively. These incidents that led to death of 2 people, displacement of 12,092 individuals and destruction of 381 shelters were triggered by days of heavy rainfall. Two years later (i.e. 2021), another flood that covered 11 local governments was experienced. Though no human casualty was recorded, about 173,049 people were affected, additional 19,000 people were displaced while 7,700 houses were damaged.

These incidents cost the Adamawa state government, NGOs and international organizations huge loss in responses and interventions (via NEDC, NEMA, UNFPA, UNHCR, CARE international etc) to the victims of flood. The ADSEMA also confirmed that another 66 houses and 150 farmlands were ravaged by flood in Lababiri and Bakta communities in Shelleng local government a resultant effect of two days of heavy rainfall and surge in the famous Gongola River and Kiri Dam within the areas.

2. Statement of the Problem

Flood has remained a big threat to many in Adamawa state since 2001 (when it was first experienced in the state) up to this day with little or unsuccessful efforts (in most cases) by the successive governments (at federal, state and local level) to ameliorate the situation. Aside the physical threats flood poses in term of immeasurable damage or destruction to properties, infrastructures and lives; flood (if left unattended to) could be a threat to health and well-being of people in Adamawa and Nigeria at large because once flood is experienced, environmental and water pollutions become rampant. This in turn may be responsible for the rising cases of both mild and severe cases of water-borne diseases that are capable of afflicting illnesses or even death on people in the affected areas.

Also the state government is expected to provide reliefs for the victims of flood and/or other related disasters; this implies that the state government is forced into incurring an unplanned/unexpected or unbudgeted expenditures (any time flood is experienced in the state) which could have series of negative economic implications. In addition, there is high probability or possibility of an outbreak of epidemics in the various camps (provided by government and non-government agencies) where the affected people seek temporary refuge after flooding incidents.

Flood seems to be taking its toll directly or indirectly on the people of Adamawa State since it may be connected to the low productivity in agricultural and other related sectors of the state productivity. It is important to recall that sizeable numbers of people (in Adamawa state) are into agriculture, they are thus highly affected whenever flood occurs. This is so because floods often wash away farmland and/or variety of crops, this may be responsible for both the common shortages experience in term of food production.

Flood is a not just a complex environment factor that has dealt Adamawa state a huge blow; it is both a national and global phenomenon that requires urgent attention. To this end, flood is a known or identified ecological/environmental enemy of both the inhabitants and economy of Adamawa state and Nigeria at large, what is however yet to be ascertained is the degree or magnitude of its impact in terms of the monetary worth of what the people of Adamawa state lose or suffer as a result of the flood. In other words, the question on the minds of households in the state is not if flood is costly but of how costly is flood? It is in view of this that this study is set out to determine the economic cost of flood on selected household in Adamawa State.

3. Research Questions

The present is aimed at finding answers to the following research questions:

i. What is the economic cost of flood on selected households in Adamawa State?

ii. What is the cleaning cost of flood on selected households in Adamawa State?

iii. What is the man-hour cost of the selected households in Adamawa State?

iv. How are the economic cost distributed across the three senatorial zones in Adamawa State?

4. Objectives of the Study

The broad objective of this study is to ascertain and quantify in monetary terms the economic cost of flood in the selected households in Adamawa State. While the specific objectives are:

i. To determine the economic cost of flood on selected households in Adamawa State.

ii. To ascertain the cleaning cost of flood on selected households in Adamawa State.

iii. To investigate/estimate the man-hour cost of flood on selected households in Adamawa State?

iv. To examine the distribution of economic cost of flood across the three senatorial zones in Adamawa State.

5. Methodology

Descriptive survey research design was used for the study; the population consisted of all the four hundred (400) households spread across the three (3) senatorial zones in Adamawa State

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using the ratio of the total population of households in each of the local government; out of which 46 (about 11 percent) are female while 354 (about 89 percent) are male.

The data for the study was collected using a self-constructed questionnaire. The questionnaire was subjected to both face and content validation from experts and professionals from various tertiary institutions in Nigeria. The reliability index of the questionnaire was 0.81 and also the questionnaire followed the "Likert" 2-point scale of Agree (A) and Disagree (D). The questionnaires were administered by the researchers through the help enumerators trained and guided by the researchers.

To avoid lost and mutilation (of questionnaire), the enumerators were tasked with oral administration of the questionnaires to the respondents and recording their responses accordingly, with the data collection process lasting a little above a month. These questionnaires were further screened (to ensure accuracy) before being coded into frequency table and analysed using simple percentage.

6. Results

The result of the findings is presented in what follows (Table 1 to Table 12):

6.1.1 Data on Households Demographics (Tables 1-3)

Table 1: Distribution of Households across the Three Senatorial Zones/LGAs

Senatorial Zone/LGA	Number of Households interviewed
Adamawa South/Numan LGA (Gewana)	36
Adamawa Central/Yola North LGA (Bakin Kogi)	117
Adamawa North/Madagali LGA (Kirshinga)	247
Total	400

Source: Field survey, 2023

Table 2: Distribution of Households by Size

Household Size (Number of regular members)	Number of Households
01-10	266
11-20	94
21-30	29
31-40	11
41 and above	0
Total	400

Source: Field survey, 2023

Table 3: Distribution of Households by Income/month (Estimated)

Household Income/month (estimated)	Number of Households
Less than ₦100,000	239
₦101,000 – ₦200,000	138
₦201,000 -- ₦300,000	11
₦301,000 - ₦400,000	8
Above ₦400,000	4
Total	400

Source: Field survey, 2023

Table 4: Responses on whether the respondents have lived in the selected area of study for (at least) 5 years

Responses	Frequency	Percentage (%)
Agree	400	100
Disagree	0	0
Total	400	100

Source: Field survey, 2023

Table 5: Responses on whether the respondents have experienced flood within the last 3years

Responses	Frequency	Percentage (%)
Agree	396	99
Disagree	4	1
Total	400	100

Source: Field survey, 2023

Table 6: Responses on whether the respondents experienced flood incidents only during raining season

Responses	Frequency	Percentage (%)
Agree	381	95
Disagree	19	5
Total	400	100

Source: Field survey, 2023

Table 7: Responses on whether flood incidents cause destruction of farmlands, crops and disruption of other businesses

Responses	Frequency	Percentage (%)
Agree	400	100
Disagree	0	0
Total	400	100

Source: Field survey 2023

Table 8: Responses on whether household members were displaced during flood incidents

Responses	Frequency	Percentage (%)
Agree	358	90
Disagree	42	10
Total	400	100

Source: Field survey, 2023

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Table 9: Responses on whether household members suffered any of the flood related illnesses (Malaria, Typhoid Fever, Dysentery, and Cholera) during/shortly after the last flood incidents

Responses	Frequency	Percentage (%)
Agree	391	98
Disagree	9	2
Total	400	100

Source: Field survey, 2023

Table 10: Responses on whether households spend more on treatment of the illnesses during flood incidents (than during non-flood season)

Responses	Frequency	Percentage (%)
Agree	367	92
Disagree	33	8
Total	400	100

Source: Field survey, 2023

Table 11: Responses on whether flood incidents cause loss of man hour

Responses	Frequency	Percentage (%)
Agree	351	88
Disagree	49	12
Total	400	100

Source: Field survey. 2023

Table 12: Responses on whether households incur cleaning cost after experiencing flood incidents season)

Responses	Frequency	Percentage (%)
Agree	309	75
Disagree	91	25
Total	400	100

Source: Field survey, 2023

7. Discussion

The demographic data of the selected households were captured using Tables one (1) through three (3); Table 1 summarizes the distribution of the household across the selected three local governments drawn from the three senatorial zones of Adamawa State. This table further reveals that 36 respondents were drawn from Gemawa in (Numan LG) Adamawa South senatorial zone, one hundred and seventeen respondents were drawn from Bakin Kogi (Yola North LG) in Adamawa Central senatorial zone while two hundred and forty-seven were drawn from Kirshinga (Madagali LG) in Adamawa North senatorial zone. The ratio of the total regular households from each of the local government was used to determine the selection.

Similarly, Table 2 shows the distribution of household by size; it revealed further that two hundred and sixty-six of the selected households have family size of between one to ten (1-10), ninety-four households have family size of between eleven and twenty (11-20), twenty-nine households have family size of between twenty-one and thirty (21-30) while eleven households have family size of between thirty-one and forty (31-40). Table 3 contains the distribution of the selected households income; it shows that two hundred and thirty-nine household earn less than 100.000/month, one hundred and thirty-eight households earn between 101,000 and 200,000/month, eleven households earn between 201,000 and 300,000/month, eight households earn between 301,000 and 400,000 while just four households earn above 400,000/month.

Sequel to the succinct descriptions of the demographics of the households, the researchers proceed to discussing the findings of the study. Table 4 contains the responses of the respondents on how long they have been residents of the study are, it shows that all the 400 households responded in affirmative of being resident in the area for not less than five years. This shows that they are in the right position to provide the need data for inference. Table 5 which contains the responses to enquiry on whether or not the respondents (households) have recently experienced flood, it shows that a whopping 99% (396) of the respondents have witnessed (recently) incidence of flood while just 4% (4) respondents responded to the contrary. This further cemented the earlier notion that the right set of respondents were selected for this study.

Furthermore, Table 6 revealed that 95% (381) of the selected households have experienced flood only during the raining season while 5% (19) of the confirmed they have at some points experienced flood outside the raining season making reference to incidence of flood caused by the release of water from the Lagdo dam (in Nigeria boundary with Cameroun). It is worthy of note at this point that flood incidence (in the study area) are sometimes caused by external factor. Table 7 showed that all the respondents agreed that flooding imposes damages on farmland, crops, houses etc. This is because all the 400 (amounting to 100%) households agreed to have suffered severely during flood incidence. Meanwhile, Table 8 shows the respondents' responses to question on whether their households were displaced during the last flooding incident. 90% (358) of the households stated that they were displaced while the remaining 10% (42) responded negatively.

In Table 9, 98% (i.e. 391) of the selected household affirmed positively to suffering from the earlier mentioned flood related illnesses while 2% (9) of the households responded negatively. Similarly, 92% (i.e. 367) of the respondents (to the question on whether or not they spend more for treatment of the mentioned illnesses during flood incidents) responded in affirmative while the remaining 8% (33) responded to the contrary in Table 10. Table 11 contains responses on whether flooding leads to loss of man-hour, the table shows that majority of the respondents (88%) responded positively while only 12% expressed a different position. Lastly, Table 12 provides answers to question on whether the studied households incur cleaning cost during flooding, 75% (309) of the households incurred cleaning cost while the remaining 25% (91 households) did not during the last flood experience.

8. Conclusion and Recommendations

The findings of this study revealed that the economic costs of flood on the selected households were enormous, to worsen the situation is the cross-border discharge of overflow from the Cameroonian Lagdo Dam. Among the economic costs burden on the studied households are loss of lives (in some instances), arable agricultural land and crops (which usually submerge during flood),

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destruction of property (including houses, vehicles), water pollution (resulting in cholera, typhoid fever and other related illnesses) and man-hour loss due to ill-health of members of the household; so also, since working hours are channeled into cleaning and clearing of houses after flood incidents, these are hours that would have been channeled into productive activities (if not for flooding).

Furthermore, the researchers observed that significant number of households are usually displaced during flooding. This affects concentration of both young (whose education are affected) and adult (who pay for temporary resettlement and other unexpected or unplanned expenditures) household members. Sequel to the findings of this study, the following recommendations were suggested:

i. The government at the state level should invest more in proactive programmes such as environmental sanitation to reduce blockage of drainage systems within the state.

ii. The government at the state level should seek support of the federal government and legislators in making laws to abate illegal structures in the state.

iii. The government should also invest more in emergency/rescue operations/services to assist during incidence of flood.

iv. The federal government should also interact with the government of Cameroon to find ways around proper management of Lagdo dam in order to forestall future destruction of life and properties.

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