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Original Article

Assessing the Effect of Borno Flood on the Livelihood of Maiduguri People

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Abstract

This study titled "Assessing the Effect of Borno Flood on the Livelihood of Maiduguri People" examines the causes, impacts, and coping mechanisms associated with flooding in Maiduguri, Borno State. The research aims to identify the major factors contributing to recurrent floods, evaluate their socio-economic and environmental effects, and suggest practical mitigation strategies. A descriptive research design was adopted, and data were collected through questionnaires, interviews, and field observations from residents of flood-prone areas in Maiduguri. The data were analyzed using descriptive statistics such as frequency and percentage distributions.

Findings revealed that poor drainage systems, blocked water channels, excessive rainfall, and unplanned urbanization are the major causes of flooding in the area. The study also found that floods destroy houses, farmlands, and infrastructure, displace residents, and negatively affect health and income sources. The research concludes that flooding has significant adverse effects on the livelihoods of Maiduguri people and recommends improved urban drainage systems, strict environmental management policies, community sensitization, and sustainable flood control measures.

Keyword: *Assessing; Effect; Flood; Livelihood; People*

Introduction

Flooding is one of the most common and devastating natural disasters globally. It is characterized by the overflow of water onto land that was typically dry and was often triggered by factors such as heavy rainfall, river overflow, inadequate drainage systems, deforestation, and the failure of water control structures like dams. In urban areas, especially in developing countries, rapid urbanization and poor environmental planning have significantly increased the frequency and severity of flooding events (Bailie et al., 2024).

In Nigeria, many cities are increasingly vulnerable to flooding due to a combination of environmental degradation, poor infrastructure, and population pressures. Maiduguri, the capital of Borno State in Northeastern Nigeria, has witnessed recurring flood disasters in recent years. One of the most catastrophic incidents occurred in September 2024, following the collapse of the Alau Dam, a critical water reservoir for the city. The collapse led to widespread destruction, causing the loss of lives, displacing thousands, and damaging homes, roads, bridges, and farmlands (Selaković, 2025).

The floodwaters submerged large agricultural areas, destroying crops and worsening food insecurity in a region already plagued by economic instability and humanitarian crises due to prolonged insurgency (Kapuge, 2025). The impact extended beyond physical destruction to include severe public health concerns. Contaminated water sources contributed to outbreaks of waterborne diseases such as cholera and typhoid (Douglas, 2017), while stagnant waters became breeding grounds for mosquitoes, resulting in a rise in malaria and other vector-borne diseases. Additionally, displaced populations were

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forced into overcrowded temporary shelters with inadequate sanitation, exacerbating the public health crisis (Douglas, 2017). Despite efforts by government agencies and non-governmental organizations, flooding remains a persistent challenge in Maiduguri due to ineffective urban planning and limited environmental enforcement (Adelekan, 2016). The 2024 disaster underscored the urgent need for a more comprehensive and sustainable approach to flood management in the region.

To mitigate future risks, a combination of infrastructural and community-based strategies was necessary. These include the construction and maintenance of robust drainage systems, reinforcement of dams, afforestation, and the promotion of sustainable land use practices (Douglas, 2017). Additionally, implementing early warning systems, enhancing public awareness through education campaigns, and strengthening community disaster preparedness initiatives are vital to improving resilience (Nyeduko & Awori, 2025).

Ultimately, addressing the devastating effects of flooding in Maiduguri requires a multi-stakeholder approach involving government bodies, environmental experts, humanitarian organizations, and local communities. Through proactive planning and long-term investment in resilient infrastructure, Maiduguri can reduce its vulnerability to flooding and ensure a safer future for its residents (Kapuge, 2025). Flooding in Maiduguri has escalated into a critical environmental and socio-economic challenge. The flood disaster of September 2024 alone resulted in over 30 reported fatalities and displaced more than 400,000 residents. Furthermore, the flood led to the escape of dangerous wildlife from local facilities, posing additional risks to already vulnerable communities.

The destruction of homes, public infrastructure, farmlands, and roads has had far-reaching implications for livelihoods, public health, and the local economy. Waterborne diseases such as cholera, typhoid, and dysentery are increasingly common during flood seasons, especially in overcrowded Internally Displaced Persons (IDP) camps. Despite ongoing interventions, the recurrence of floods and the lack of long-term solutions continue to endanger lives and hinder development efforts in the state.

The purpose of this research is to assess the impact of Borno flooding on the livelihoods of the people of Maiduguri. For better understanding, the characteristics of the local communities living in the study area, demographic characteristic of the respondents who participated in the research study regarding their sex, age, and marital status, level of education, household size, and occupation was captured.

Figure 1: *Photograph of the Devastating Effect of the Maiduguri Flooding*

Materials and Methods

This study adopts a quantitative research design to collect and analyze numerical data related to the causes and impacts of flooding in Maiduguri. The quantitative approach was appropriate because it enabled the research to measure variables, identify trends, and draw conclusions based on statistical analysis. The design focuses on collecting data from individuals in flood-prone areas to better understand their experiences and perspectives regarding the causes and effects of flooding in Maiduguri.

Study Area

Figure 2: *Map of Borno State (the study area)*

The study was focused on Maiduguri**,** the capital of Borno State in Northeastern Nigeria. Maiduguri has experienced recurring flood events over the past decade, making it a critical case for investigating flood vulnerability and disaster impacts. The city's flat terrain, rapid urbanization, poor drainage infrastructure, and proximity to the Alau Dam make it particularly susceptible to seasonal flooding. Areas such as Gwange, Bulumkutu, Jere, and areas surrounding the Alau Dam were among the most affected and are therefore selected for data collection.

Results and Discussion

Demographic Characteristics of the Study Area

To properly examine the effect of Borno Flood on the Livelihood of Maiduguri People, the respondents within the study area were sampled. A random sampling technique was used selecting 100 respondents within the population of the study. Section A consists of demographic characteristics of the respondents, while other sections (B, C, D, and E) dealt with the responses to the research questions of the study as earlier stated in chapter one. The last chart provides summary tables and a discussion of findings on the data analyzed.

Table 1: *Demographic Characteristics of Respondents*

Variable/ Category	Frequency	Percentage (%)
Gender		
Male	38	76
Female	12	24
Age		
18–25 years	16	32
26–35 years	21	42
36–45 years	7	46
46 years and above	6	14
Marital Status		
Married	16	32
Single	34	68
Educational Level		
Secondary	3	6
HND/Degree	44	88
Postgraduate	3	6
Occupation		
Civil Servant	22	44
Trader	6	12
Farmer	8	16
Student	14	28

Source: Field Survey, 2025

Table 1 shows that 76% of the respondents were male, while 24% were female, indicating that men participated more in the study. The age distributions of majority of the respondents were from 36–

45years representing (46%) as the highest group, suggesting that most participants are young and economically active. In terms of education, 88% had tertiary qualifications (HND/Degree), showing a high literacy level among respondents. The dominant occupations were civil servants (44%) and students (28%), indicating a mixed livelihood structure of both working-class and youth groups in Maiduguri.

Table 2: *Causes of Flooding in Maiduguri*

Statement	Responses	Percentage (%)
Heavy Rainfall	SA 22	44
	A 18	36
	N 4	8
	D 3	6
	SD 3	6
Poor Drainage Systems		
	SA 25	50
	A 15	30
	N 4	8
	D 4	8
	SD 2	4
Dumping of Refuse and Drainage Channels Blockage		
	SA 20	40
	A 17	34
	N 6	12
	D 5	10
	SD 2	4
Rapid Urbanization and Poor Land Planning		
	SA 18	36
	A 20	40
	N 4	8
	D 5	10
	SD 3	6

Source: Field Survey, 2025

Table 2 shows responses of respondents that indicate that 80% of respondents agreed that flooding in Maiduguri is caused by heavy rainfall. Similarly, 80% agreed that poor drainage systems are a major cause, while about 74% also believed that refuse dumping into drainage channels worsens flooding situation. These findings indicate that both human factors (refusing dumping, poor planning) and natural factors (heavy rainfall) contribute to flooding in Maiduguri.

Table 3: *Effects of Flooding on the Livelihood of Maiduguri People*

Statement	Responses	Percentage (%)
Flooding Destroys Houses and Properties		
	SA 28	56
	A 15	30
	N 2	4
	D 3	6
	SD 2	4
Flooding Leads to Loss of Farmland and Livestock		
	SA 22	44
	A 20	40
	N 4	8
	D 2	4
	SD 2	4
Flooding Affects Income and Economic Activities		
	SA 24	48

	A 18	36
	N 3	6
	D 3	6
	SD 2	4
Flooding Causes Displacement of People from Their Homes		
	SA 26	52
	A 17	34
	N 2	4
	D 3	6
	SD 2	4
Flooding Leads to the Spread of Diseases		
	SA 20	40
	A 19	38
	N 5	10
	D 4	8
	SD 2	4

Source: Field Survey, 2025

According to Table 3, indicate that a total of 86% of respondents agreed that flooding destroys houses and properties, while 84% reported that it leads to the loss of farmland and livestock. In another vain, 84% agreed it affects income and economic activities, likewise, 86% said flooding displaces people, and finally, 78% linked it to the spread of diseases such as cholera and malaria. This shows that flooding has severe socio-economic and health impacts on Maiduguri residents.

Table 4: *Coping Strategies Adopted by Residents*

Statement	Responses	Percentage (%)
Residents Use Sandbags to Protect Their Homes from Floodwater		
	SA 15	30
	A 20	40
	N 5	10
	D 6	12
	SD 4	8
People Relocate Temporarily to Safer Areas During Heavy Rains		
	SA 20	40
	A 18	36
	N 4	8
	D 5	10
	SD 3	6
Community Members Help Each Other During Flooding		
	SA 25	50
	A 15	30
	N 4	8
	D 3	6
	SD 3	6
People Clean Drainages to Reduce Flooding		
	SA 16	32
	A 18	36
	N 6	12
	D 5	10
	SD 5	10

Source Field Survey: 2025

In table 4 70% of the respondents reported using sandbags as a preventive measure. Similarly, 76% relocate temporarily to safer areas during floods. 80% indicated that community cooperation is common,

while 68% said they clean drainages to reduce flood risks. This suggests that community-based coping mechanisms exist but remain largely reactive rather than preventive.

Table 5: *Government Efforts toward Flood Control*

Statement	Responses	Percentage (%)
The Government Provides Relief Materials to Flood Victims		
	SA 14	28
	A 16	32
	N 5	10
	D 10	20
	SD 5	10
The Government Constructs Drainages in Flood-Prone Areas		
	SA 18	36
	A 14	28
	N 6	12
	D 8	16
	SD 4	8
The Government Raises Awareness of Flood Prevention		
	SA 12	24
	A 18	36
	N 5	10
	D 10	20
	SD 5	10
Government Response to Flooding is Adequate		
	SA 8	16
	A 10	20
	N 7	14
	D 15	30
	SD 10	20

Source Field Survey: 2025

Table 5 indicates that 60% agreed that the government provides relief materials, and 64% agreed that drainages have been constructed in flood-prone areas. However, only 36% agreed that government response is adequate, while 50% disagreed. This implies that although some measures are in place, government efforts remain insufficient **in** terms of awareness, infrastructure, and emergency response.

Other information or findings from this research work were presented in charts as shown below:

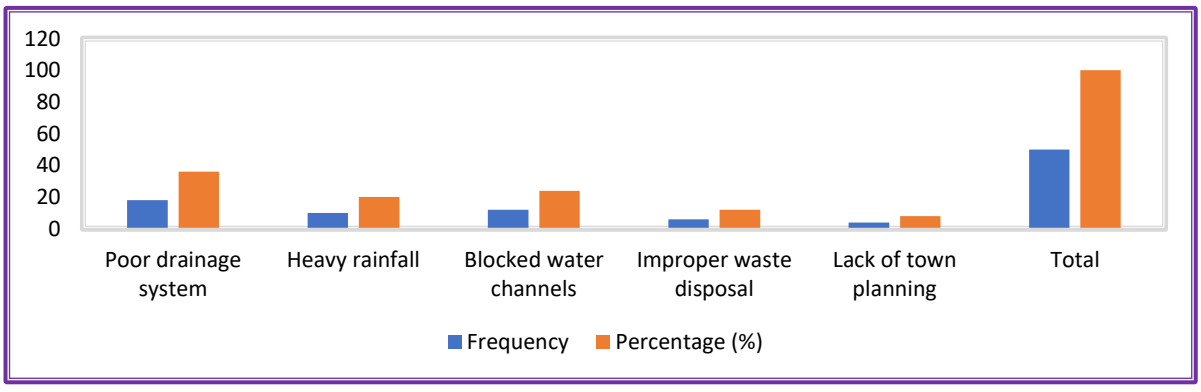

Figure 2: *Major Cases of Flooding in Maiduguri. The Respondents Within the Study Area Reported That Poor Drainage (36%) And Blocked Water Channels (24%) Are the Most Frequently Mentioned Causes Resulting to Flood Cases in the Study Area*

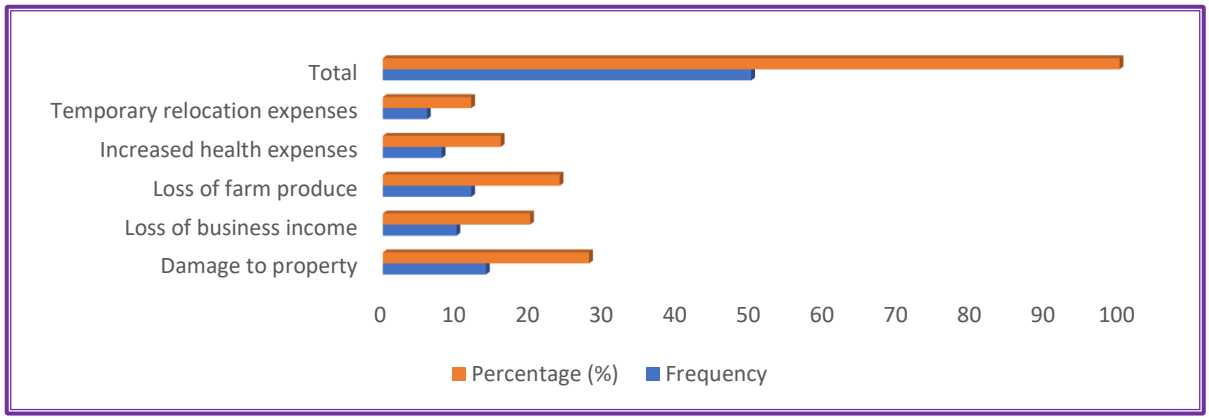

Figure 3: *Explained The Rate at Which Household Livelihoods and Income Are Affected During Flooded Periods. Nearly One-Third of Respondents (28%) Reported Property Loss, While Others Cited Business (20%) And Agricultural Losses (24%) As Major Effects. This Highlights the Multifaceted Economic Burden of Flooding*

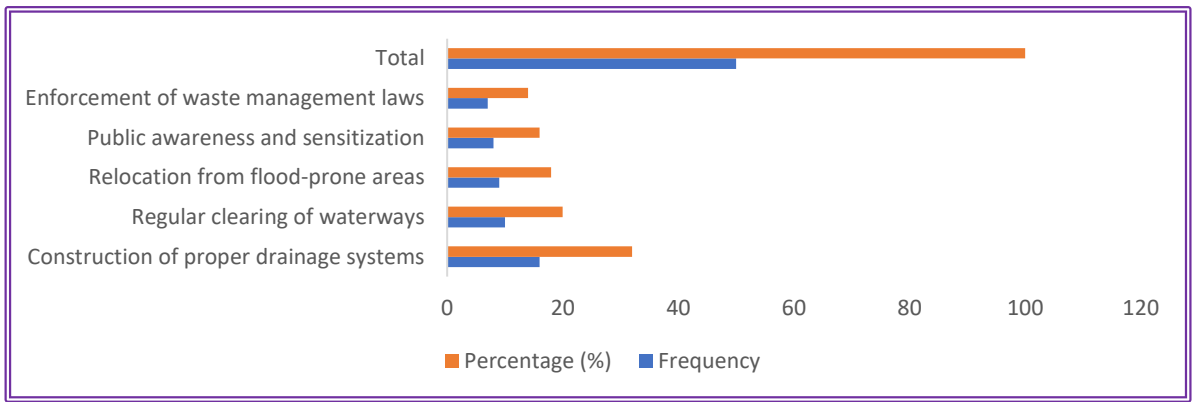

Figure 4: *Highlight On the Possible Measures to Be Prioritized by Local Communities and Government. Drainage Construction (32%) And Clearing Waterways (20%) Were Top Priorities Suggested by Respondents, Showing Strong Demand for Infrastructural Solutions*

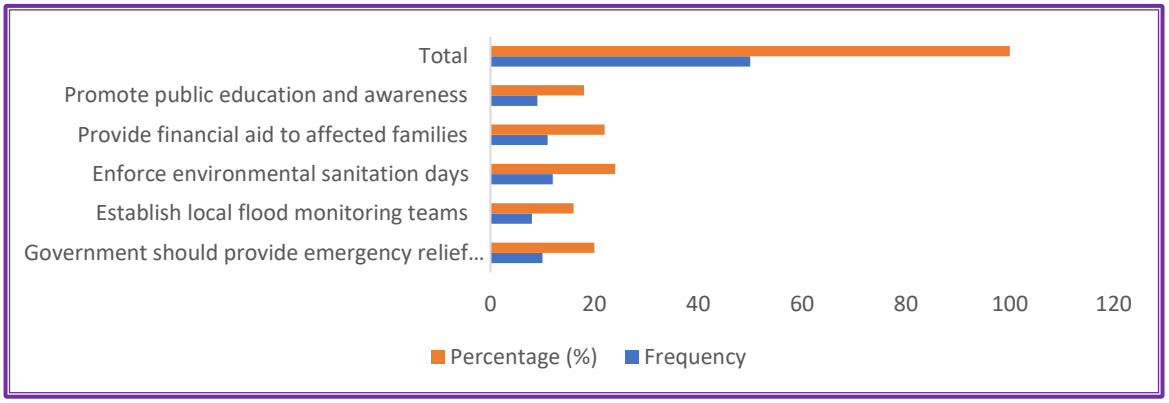

Figure 5: *Shows Respondents Suggestions on How to Reduce Flood Impacts in Maiduguri. Respondents Emphasized Both Preventive (Sanitation, Awareness) and Supportive (Relief, Aid) Measures. This Indicates the Need for An Integrated Flood Management Plan*

Discussion

The findings of this study show that flooding in Maiduguri arises from a combination of natural and human factors, including heavy rainfall, poor drainage systems, indiscriminate dumping of refuse, and unplanned urban expansion. These causes align with recent evidence across Nigeria as in the work of (Mane, 2026); (Kayode, 2025) where climate-induced extreme rainfall events, coupled with weak drainage infrastructure and poor land-use planning, have significantly increased flood risks. Flooding in

Maiduguri (Borno State) has become more frequent and severe, damaging homes, displacing residents, and contributing to outbreaks of water-borne diseases such as cholera and malaria.

Flooding across Nigeria has also destroyed farmlands, disrupted livelihoods, and worsened poverty, echoing the socio-economic losses observed in Maiduguri where respondents reported property destruction, income loss, and displacement (Danasabe et al., 2025). The study further found that while residents demonstrate resilience through coping strategies such as the use of sandbags, temporary relocation, community cooperation, and drainage cleaning, these responses remain largely reactive and insufficiently preventive. Local responses across Nigeria rely heavily on community initiative rather than long-term planning or structural interventions (Okeleye, 2015; Olagunju *et al*., 2021).

Although the government has made efforts in providing relief materials and constructing drainages, most respondents perceived these interventions as inadequate, reflecting wider national challenges of weak institutional coordination, limited funding, and poor enforcement of environmental regulations.

Conclusion

In summary, the findings confirm and conclude that flooding in Maiduguri is not merely a natural phenomenon but a human-exacerbated environmental crisis that demands integrated management approaches, including improved drainage infrastructure, stricter urban planning enforcement, effective waste management, public awareness campaigns, and stronger collaboration between government, Non-governmental Organizations and local communities to shift from reactive coping to proactive flood prevention and resilience building. Finally, based on the study findings, the following recommendations are proposed:

Improvement of Drainage Systems:

The Borno State Government should prioritize the construction and rehabilitation of modern drainage networks across flood-prone areas, ensuring regular dissimilating and maintenance to enhance water flow.

Regular Environmental Sanitation: There should be strict enforcement of waste disposal regulations and regular community sanitation exercises to prevent blockage of drainage channels.

U*rban Planning and Regulation Enforcement*: Government agencies must enforce building codes and land-use regulations to prevent construction on natural waterways and floodplains.

Strengthening of Alau Dam Infrastructure: Regular inspection, maintenance, and reinforcement of the Alau Dam and similar hydraulic structures are essential to prevent further failures.

Public Awareness and Education: Awareness campaigns should be intensified to educate residents about flood preparedness, waste management, and environmental conservation.

Early Warning Systems: Establishment of reliable early-warning systems using local radio alerts, SMS notifications, and weather forecasting will help reduce casualties and property loss during flood events.

Reforestation and Climate Adaptation: Promote tree planting, sustainable agriculture, and other climate adaptation practices to reduce runoff and improve soil water absorption.

Government–Community Collaboration: Community leaders, NGOs, and local authorities should collaborate in developing community-based disaster management plans to strengthen resilience and quick response mechanisms.

Provision of Emergency Relief and Financial Support: Post-flood rehabilitation programs should include timely distribution of relief materials, medical assistance, and financial support for rebuilding livelihoods.

Conflict of Interest

The authors declare that they have no competing interests.

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