

A novel Account of Flooding Devastation and Consequences in Kogi State, Nigeria

Maureen N. Chukwu
Department of Biological
Sciences/National Open University of
Nigeria, Abuja
Nigeria
mchukwu@noun.edu.ng

Benjamin P. Edoaka
Department of Botany/Joseph Sarwaan
Tarkaa University
Makurdi
Nigeria
bedoka@noun.edu.ng

Abstract— The study investigated the Impact of flooding in the Kogi state community in Nigeria. The motive behind the research was ignited by the hardship and adverse conditions faced by the community as par the flood in Kogi state. In line with this, a structured questionnaire was utilized for interviewing 300 people who are residents of the affected state. The validation of the instrument was done through peer review and pilot testing. Data was collected and a summary was done. In the same vein they were computed using frequency, percentages and Linkert scaling test. The results from the analysis indicated that 94% of the respondents agreed that flooding destroyed their livestock and farm products, blocked their roads, submerged their buildings and rendered many homeless. It affected daily road transportation, businesses were distorted, thereby impacting negatively on their economy. However, it is recommended that government should assist the victims of this flooding by providing them with relief materials, an alerting device, Internally Displaced People's Camp with portable water and mosquito nets, while periodic meetings should be held between the weather forecasters and the community members to educate them.

Keywords: farm products, buildings, road transport, economy, government

I. INTRODUCTION

According to [1] flooding is an overflow of water that submerges a land that is normally dry. Human influences in the environment, including variations in waterway courses, removal of wetlands, land use changes like deforestation, flood control measures with levees, and other environmental issues such as climate change and sea level rise more often than not increase the severity of flooding [2].

According to [3], when there is a heavy rainfall, it can lead to significant environmental effects. It was estimate that 19% of the world's population is directly exposed to risks of flooding [4].

In developing countries, flooding results from climate change, excessive precipitation, building on waterways, sea-level rise, soil moisture regime, dam operations, especially along borders, uncontrolled rapid population growth, inadequate preparedness, and lack of political will [5, 6 and 7]. It was reported by [8] that the adverse effects of climate

change are more pronounced in developing countries, and are thus more prone to further change. The highly affected areas are the lowland areas and waterfront properties.

Flooding commonly occur in some Nigerian State such as Anambra, Akwa Ibom, Benue, Cross Rivers, Delta, Kogi, Niger and Rivers. Research shows that flooding of soils is considered a natural phenomenon, which occurs between May-October during the rainy season, and usually affects farmlands, residential areas, properties, and businesses particularly those located in the flood plains of rivers [9-12].

In line with this, the torrential rainfall between September and October 2012 that hit the low land areas of Nigeria resulted to devastation flooding of rivers, streams and coastline areas [13]. This flooding was attributed to natural phenomena such as climate change and global warning, thus creating huge awareness of flood disasters.

According to [14], the National Emergency Management Agency (NEMA) have raised alarm that heavy rains across Nigeria usually caused the overflow of rivers Niger and Benue thus leading to the flooding crisis. The flooding crisis in Nigeria was disastrous in 2022; on September 13, 2022 water from Ladgo dam in Cameroon and other dams were released which resulted in riverine flooding causing pain and anguish to thousands of people now rendered homeless and killing about 300 people in Kogi State, Nigeria.

This study attempt to assess the impact of the riverine flooding on Kogi state community and its environs in Nigeria

II. MATERIALS AND METHODS

A. Study area

Kogi State is located in North Central Nigeria occupying a landmass of 29,833 km². It shares boundaries with Niger state, Kwara, Nassarawa States and The Federal Capital Territory in the North, Enugu and Anambra States in the South, Benue state in the East, Ondo, Ekiti, and Edo states in the West. Kogi state is made up of the following tribes,



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

<https://doi.org/10.32792/utq/utjsci/v10i1.1044>

Igala, Ebira, Kabba, Yoruba, and Bssa. Kogi State is the only confluence state in Nigeria because the state capital Lokoja, is the meeting point for West Africa's largest rivers, Niger and Benue. The meeting of these two major rivers in Lokoja, impacted the banks of the Lower Niger river, thus flooding Lokoja and its environs (Figure 1).



Fig. 1: Map of Kogi State showing the affected areas.

B. Research design

The design of this study was a descriptive survey approach to ascertain the impact of the flood disaster between May and October, 2022 on Kogi State community in Nigeria. A sample of the populations was as representatives was selected and studied, and the results generated were taken as a reflection of the whole population.

C. Population and Sample

The sample population was made up of three hundred (300) respondents residing or working in Lokoja and environs such as Ajaokuta, Kotonkarfi, Idah, Ofu and Ibaji Local Council Areas of Kogi State. The selection of respondents was done via a simple random sampling technique was from building and farmland owners, business class and civil servants in the community. Thus, this study was primarily focused on Kogi State, Nigeria.

D. Research Instrument

In this study, observation and personal interviews with the help of structured questionnaires, titled "Kogi State flooding Questionnaire" were the instruments used for data collection. The questionnaire has two sections; the first the socio-economic characteristics of the respondents, and the second comprises 18 Likert type categories designed for the assessment. There was validation of the questionnaire before administration as to improve it. A reliability coefficient of 0.82 was harvested from test-retest reliability scale.

E. Data Analysis

The summary data collected were computed using descriptive statistics; frequency and percentages. Information was computed on the impact of flooding on different activities of Kogi State community on a four-point Likert Rating Scale; strongly agreed, agreed, disagreed, strongly disagreed representing 4, 3, 2 and 1 respectively. The mean score was found to be 2.50. Using the interval score of 0.05, the upper limit cut-off was $2.50 + 0.05 = 2.55$ and the lower limit; $2.50 - 0.05 = 2.45$. Based on this, mean score (MS) below 2.45 (< 2.45) were considered 'low', those between 2.45 and 2.54 ($2.45 \leq MS \leq 2.54$) were ranked 'medium', while those greater than or equal to 2.55 ($MS \geq 2.55$) were seen as 'high'.

III. RESULTS AND DISCUSSION

A. Socio-economic Characteristics of the Respondents

The respondents and socio-economic features

The summary of the selected socio-economic characteristics of members of Kogi State community are shown in Table 1. Half of the respondents (50%) were males and 50% females. The prevailing religions were Christianity (40%), Islamic (44%) and traditional religion (16%). The average age of the respondents was 40 and majority of them (80%) are less than 50 years old. This implies that the population of the community is more of young, physically strong people that can help to control the flooding effectively. The married, formed the Major part of the respondents (80%), while 20% of the respondents are singles, an indication that most of them are responsible. The number that attended tertiary education are few (10%). Those that attended secondary education were about 36%, while 30% were primary school certificate holders implying that the members of the community have the basic education to tackle the menace of flooding on introduction of control measures. Similarly, the community members owing buildings are 58%, while 30% own farmlands, this shows that they might be victims of flooding on a high sale.

B. Impact of flooding on Community Members' livelihoods

Table 2 showing the scale of loss due to flooding as experienced by community members. Most of the members of the community experienced losses due to the flooding with the scale of (94%). Residential houses were submerged by flooding as shown in Figure 2a. In Figure 2b, household properties were destroyed there by rendering huge population of the community homeless. Flooding destroyed livestock and farm produce in the state capital Lokoja and extended to Ajaokuta, Kotonkarfi, Idah, Ofu, and Ibaji; five other Local Government Areas of the state.

Table1 Socio-economic features of members of the community

Characteristics	Respondents	Frequency	Percentage (%)
Gender	Male	150	50
	Female	150	50
Religion	Christianity	120	40
	Islamic	132	44
	Traditional	48	16
Age (years)	21 - 30	54	18
	31 - 40	102	34
	41 - 50	84	28
	51 and above	60	20
Marital status	Single	60	20
	Married	240	80
Educational attainment	No formal Education	72	24
	Primary	90	30
	Secondary	108	36
	Tertiary	30	10
Ownership of buildings	Yes	174	58
	No	126	42
Ownership of farmlands	Yes	90	30
	No	210	70

Table 2: The scale of loss experienced by community members during the Flooding (August – October, 2022)

Variable	Respondents	Frequency	Percentage (%)
Flooding Experience	Experience loss	282	94
	Did not experience loss	18	06
Proportion of loss experienced	80%	66	22
	60%	48	16
	40%	78	26
	20%	108	36

It also submerged churches and mosques in the community (Figure 3), market places and stores being the main means of livelihood for the populace of the community and were also submerged there by distorting their businesses.

Many roads were covered and blocked by the flood (Figure 4a), including the Ganaja axis of Lokoja, Ganaja road which leads to the eastern senatorial district of the state and also to the southern part of the country. This caused gridlock and pains to travelers who took to travelling by water using Canoe as an alternative (Figure 4b).



Fig. 2a: Houses submerged by flood



Fig. 2b: People rendered homeless in Lokoja



Figure 4b: Transportation by Canoe



Fig. :3 A church submerged by flood



Fig. 4a: Tarred Road submerged by flood

A. *Impact of Flooding on some activities of the Community Members*

The impact of flooding on some activities of the community members were shown on Table 3. Having considered the mean scores greater than 2.55 as high, flooding was found to have influenced all activities in the community significantly, there by having severe adverse effect on the members of the community as a whole. Stakeholders and the government should assist the victims of the flooding and design measures that should be used to check and combat flooding in Kogi State communities.

IV. CONCLUSION

It is obvious from the research work that flooding had impacted negatively on the Kogi state community. It is recommended based on findings, that assistance from the government should be rendered to the members of the community by providing them with the following:

- i. relief materials
- ii. an alerting device for the weather forecast.
- iii. Internally Displaced People's Camp (IDPC) with portable water and mosquito nets to avoid outbreak of cholera, malaria and typhoid fever
- iv. periodic town hall meetings should be held between the weather forecasters and the community to educate them about such disaster.

Table 3: Showing the impact of flooding on some activities of the community members

Variables	Strongly disagreed	Disagreed	Agreed	Strongly agreed	Total	Mean Score
Effect on houses in the community.	0 (0.00)	0 (0.00)	44 (0.44)	256 (3.41)	300	3.85
Effect on landmass.	0 (0.00)	0 (0.00)	76 (0.76)	224 (2.99)	300	3.75
Effect on community members' abode.	0 (0.00)	0 (0.00)	52 (0.52)	248 (3.31)	300	3.83
Effect on community development.	0 (0.00)	2 (0.013)	32(0.32)	266 (3.55)	300	3.88
Effect on farmlands.	0 (0.00)	4 (0.027)	100 (1.00)	196 (2.61)	300	3.64
Effect on community roads	0 (0.00)	0 (0.00)	14 (0.14)	286 (3.81)	300	3.95
Effect on the community's social life.	0 (0.00)	0 (0.00)	96 (0.96)	204(2.72)	300	3.68
Flooding influences the area seasonally.	0 (0.00)	45 (0.30)	179 (1.79)	76 (1.01)	300	3.1
Effect on community members' job.	0 (0.00)	4 (0.027)	52 (0.52)	244 (3.25)	300	3.80
Influence on plant species.	0 (0.00)	0 (0.00)	30 (0.30)	270 (3.6)	300	3.90
Effect on animal species.	0 (0.00)	0 (0.00)	34 (0.34)	266 (3.55)	300	3.89
Effect on the community's population.	0 (0.00)	14 (0.09)	64 (0.64)	222 (2.96)	300	3.69
Accrued Losses to the community for the past 10 years (hundreds of Millions of Naira).	0 (0.00)	0 (0.00)	116 (1.16)	284 (2.45)	300	3.61
Accrued Losses to individual community members for the past 10 years (tens of Millions of Naira).	0 (0.00)	0 (0.00)	124 (1.24)	176 (2.35)	300	3.59
There will be more harm will in the coming years if the situation is left unchecked.	0 (0.00)	0 (0.00)	164 (1.64)	136 (1.81)	300	3.45
You are taking some control measures to salvage this situation	20 (0.07)	102 (0.68)	36 (0.36)	142 (1.89)	300	3.00
Government in the known of the problem.	28 (0.09)	108 (0.72)	56 (0.56)	108 (1.44)	300	2.81
It can wash away the community from the map of Nigeria.	0 (0.00)	16 (0.12)	148 (1.48)	136 (1.81)	300	3.41

REFERENCES

- [1] I. E. Djimesah, A. N. D. Okine, and K. K. Mireku, "Influential factors in creating warning systems towards flood disaster management in Ghana: An analysis of 2007 northern flood" *International Journal of Disaster Risk Reduction*, vol. 28, pp. 318–326, 2018.
- [2] M. J. A. N. Bhuiyan, and D. Dutta, "Assessing Impacts of Sea Level Rise on River Salinity in the Gorai River Network, Bangladesh. Estuarine", *Coastal and Shelf Science*, vol. 96, pp. 219-227, 2012.
- [3] M.A. Nwachukwu, C.P. Alozie, and G.A. Alozie, "Environmental and rainfall intensity analysis to solve the problem of flooding in Owerri urban", *Journal of Environmental Hazards*, vol. 1, p.107, 2018.
- [4] M. Gall, K. A. Borden, C. T. Emrich, and S. L. Cutter, "The unsustainable trend of natural hazard losses in the United States", *Sustainability* vol. 3, p. 2157–2181, 2011.
- [5] S. Aliu, I. Rusinovci, S. Fetahu, B. Gashi, E. Simeonovska, and L. Rozman, "The effect of salt stress on the germination of maize (*Zea mays* L.) seeds and photosynthetic pigments", *Acta Agriculturae Slovenica*. Vol. 105 (1), pp. 85–94, 2015.
- [6] D.A. MacLeod, R. Dankers, R. Graham, K. Guigma, L. and E. Mwangi, "Drivers and subseasonal predictability of heavy rainfall in equatorial East Africa and relationship with flood risk", *Journal of Hydrometeorology*, vol. 22 (4), pp. 887–903, 2021.
- [7] C.C. Olanrewaju, M. Chitakira, O.A Olanrewaju, and E. Louw, "Impacts of flood disasters in Nigeria: A critical Evaluation of health implications and management", *Jàmbá: Journal of Disaster Risk Studies*, vol. 11 (1), p. 557, 2019.

- [8] O.M. Kolawole, A. B. Olayemi, and K. T. Ajayi, "Managing flood in Nigerian cities: Risk analysis and adaptation options – Ilorin city as a case study", *Archives of Applied Science Research*. 3 (1):17-24. (2011).
- [9] E. Adeoye, L., Lewis, R. Whitehair, and B. Zitricki, "The Effects of Simulated Acid Rain on Corn Seed Germination. Maryland, USA: Maryland University", Retrieved From http://mda.maryland.gov/Documents/ag_brief/AgBriefAgriculture.pdf, 2013.
- [10] S. T. Ashley, and W. A. Ashley, "Flood Fatalities in the United States", *Journal of Applied Meteorology and Climatology*, vol. 47, pp. 805-818, 2008.
- [11] A. J. Echendu, "The impact of flooding on Nigeria's sustainable development goals (SDGs)", *Ecosystem Health and Sustainability*, vol. 6 (1), p. 1791735, 2020.
- [12] J. N., Eze, C. Vogel, and P. A Ibrahim, "Assessment of social vulnerability of households to floods in Niger State, Nigeria" *International Letters of Social and Humanistic Sciences*, vol. 84, pp. 22–34, 2018.
- [13] M.A. Al-Amin, "An assessment of Nigeria's preparedness to environmental disasters from its commitment to international environmental treaties", *European Scientific Journal*, vol. 9, pp. 242-253, 2013.
- [14] European Commission Joint Research Centre, "Update on Floods in Nigeria, JRC Emergency Report #022. Available online at: https://reliefweb.int/sites/reliefweb.int/files/resources/2018-09-24_floods_nigeria_jrc_report.pdf , 2018.