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INTRODUCTION

Problem of under reported news about the consequences of climate related events in Africa is arguably persisting but the ineffective coping measures in developing countries on account of poor resources is more concerning (CRED, 2015; Reinhardt, Fu & Balikuddembe 2019); exposing the place of flooding as the most wide-spreading climate event in Africa. It poses a serious threat to sustainable development goals especially in Sub-Saharan parts of the continent (Adedeji, Odufuwa & Adebayo 2012; Olanrewaju et al.2019). Nigeria is not as exception as many communities are faced with perennial flooding related challenges especially during rainy season. It is revealed that 20% of the country's population is vulnerable to flooding (Etuonovbe 2011; Njoku, Efiog & Ayara 2020; Abimbola et al. 2020).

Kogi state presents a good picture of the disastrous nature of flooding in Nigeria; showing the meeting point of Niger and Benue rivers next to its capital city overflow; flooding the river catchment areas of the state especially Lokoja metropolis. As at 2018, flood related deaths and displacements stand at 250 and 85, 000 respectively among other damages amounting to huge sums of money in dollar terms (National emergency Management Agency; Oyedele et al.; the Federal Government of Nigeria with technical Support from the World Bank, EU, UN, and Other Partners in Nche, 2024). The incidence in September, 2019 was very impactful; submerging 150 communities and that of 2022 which affected nine local government areas

TERTIARY INSTITUTIONS AND FLOOD GOVERNANCE IN LOKOJA METROPOLIS

ABSTRACT

The increasing rate of flooding across the globe has arguably compelled governments to intensify efforts toward addressing the challenge using flood governance. While the government is expected to provide direction in flood governance, it cannot singlehandedly effectively solve this problem given its multifaceted nature. Therefore, this study seeks to examine the role of tertiary institutions in flood governance in Lokoja Metropolis. It adopted mixed methods together with Chi-square and Statistical Package for Social Sciences for its data collection and analysis. The findings of the study revealed that the tertiary institutions have contributed significantly to generation of knowledge and awareness creation through various activities such as conducting on-site studies in flood-prone communities, gathering data on rainfall and river levels; and organizing seminars and workshops on flood risks and safety measures in Lokoja Metropolis but their efforts toward provision of relief materials/services to flood victims are not impressive. The study concluded that tertiary institutions have contributed significantly in flood governance in Lokoja Metropolis and recommended that tertiary institutions should collaborate with their alumni to set up a Foundation that will regularly raise funds for provision of relief materials etc.

KEYWORDS: tertiary institutions; flood governance; knowledge generation; relief materials

including Lokoja that borders the Niger and Benue rivers; fueling the submission of flooding as a humanitarian tragedy, as its effects on health and livelihood of the people are unquantifiable (Onyedinefu 2022; Davies 2022; Nche 2024).

The above underscores the conundrum nature of the incidence as well as the suitability of flood governance involving not just the political authorities but also other stakeholders such as civil society organization, community members and academic institutions among others. “It is widely recognized that structural measures alone cannot manage increasing flood risk, although conventional structural measures, such as dykes and dams, continue to play a key role of mitigating damage. The integrated approach includes land use regulation, infiltration and retarding facilities in urban areas, non-structural measures, and emergency response in addition to structural measures. A conventional flood risk management (FRM) approach, which has been developed based on mainly civil engineering, hydrology, and other related engineering, covers mainly engineering solutions including embankments, dykes, and dams” (Associated Program on Flood Management; Jha; WMO in Ishiwatari, 2019: 2). This informed the resolve of many countries to adopt integrated approach involving several stakeholders such as national and sub-national governments, civil society organizations, academia, private sector organizations and local communities (Ishiwatari, 2019).

Meanwhile, both public and private sectors have a responsibility in flood governance such as provision of humanitarian aid to victims. For instance, in the United State at the federal level, there are Department of Homeland Security, Department of Housing and Urban Development, and Department of Health and Human Services among others. To be sure, FEMA distributes humanitarian aid such money from its Disaster Relief Fund. State and local authorities are not left out as there are also local departments of emergency management, a long-term recovery authority/committee usually led by a government agency that responds to climate issues. On the other hand, private sector also plays an important role by raising funds from private business and individuals for disaster recovery. Beyond this, insurance organizations provide insurance coverage before climate related events and compensation for loss. A wide range of corporate and nonprofit organizations assist in disaster-relief activities, from partnering with community organizations to rebuild a neighborhood to providing immediate economic support for households and families. Nonprofits are also essential in providing direct services such as housing support, health services, financial counseling to affected constituents (Chandra, Moen & Sellers, 2016).

However, higher learning institution arguably remains one of the critical stakeholders in flood governance; focusing majorly on awareness creation and resilience capacity building among others. Tertiary institutions play a pivotal role in shaping knowledge; offering evidence driven solutions and innovation to promote the achievement of Sustainable Development Goals (including addressing climate issues) through rigorous research (Bhowmik et al. 2017; Leal Filho et al. 2018; Albareda-Tiana et al. 2020). Collaboration with tertiary institutions offers an opportunity for achieving sustainable development (Trencher et al, 2014) through flood governance. In 2021, Bindura University of Science Education, Mashonaland Central Zimbabwe had collaboration with the country’s Ministry of Environment to address climate related issues. The University played a leading role carrying out studies on climate change. World Wide Fund for nature (a nongovernmental organization) has on several occasions seen partnering with several universities to solve climate challenges through flood governance approaches (Dzvimbo, Mashizha, Zhanda & Mawonde, 2022).

The Triple Helix innovation model further exposes the place of tertiary institutions in flood governance as it basically explains the relationships between university, government and industry in meeting the demands of organizational innovation in a knowledge-based society.

Innovation which is conceptualized as reconfiguration of elements into a more productive combination requires a critical role of the university since innovation goes beyond new product development by the industries (Etzkowitz, 2008). The boundaries between public and private, science and technology, university and industry are in flux. Universities and firms are assuming tasks that were formerly the province of the other sectors. Shaping these relations is increasingly a subject of science and technology policies at different levels. University, industry and government relations can be considered as a triple helix of evolving networks of communication (Etzkowitz & Leydesdorff, 1997). University could educate, conduct studies and assemble stakeholders to share experiences, enhance the knowledge base and facilitate improved decision-making for policy and practice as university is the center of excellence regarding research and dissemination of research findings to the public (Anwarul & Shaw, 2015).

Flooding across the globe has become a national disaster, impacting greatly on socio-economic development of countries amidst various strategies implemented by political authorities to address it. This necessitated several studies interrogating the intricacies of flooding as well as adaptive/resilient mechanisms adopted over the years. For instance, there were exogenous factors in collective policy learning for flood governance in Netherlands; and social learning and collective action in flood hazard management in Canada (Douwe, de Voogt & James 2019; Emdad, Abul, Jobaed & Mahed, 2025). There is an increasing acknowledgement in studies on learning in policy system which involves collective players responsible for policymaking; showing the impactful state of endogenous factors (leadership, resources and collaboration) and exogenous factors (societal disruptions such as climate events, policy reforms in related sectors, and impact of broader political and economic systems) (Bennett & Howlett, 1992; Heikkila & Gerlak, 2013; Nilsson, 2006; Sabatier, 1988; Williams, 2009).

There are other studies carried out to unpack flood risk governance, climate change adaptation as well as resilience especially in urban areas across the globe (Prabhakar et al. 2009; Hughes 2013; Anguelovski et al. 2014; Bahadur & Tanner 2014; Blok 2016; Chu et al. 2016; Rumbach 2016; Allen et al. 2017; Garschagen and Marks 2019; Joshi 2021) but the uncommon increase in detrimental effects of climate change on property and livelihood has necessitated the inclusion of social learning within the academic and policy environments; providing an opportunity for changing the narrative (Choudhury et al., 2021a; Imperiale & Vanclay, 2021; Lejano et al., 2021).

As relevant as the above studies appear in filling the existing scholarly gap on flood governance; it suffices to observe that the role of higher institutions in ensuring flood governance especially in Nigeria remains insufficiently addressed. Supporting this submission, Morrison et al in Dordi, Henstra & Thislethwaite (2022) argues that a systematic review recently conducted reveals that studies on flood governance are still scanty. This submission is found in relatively newly written studies published since 2008; underscoring that most papers are on specific areas of flood governance such as determinants of flood risk perception (Lechowska, 2018) and strategies to flood vulnerability assessment (Rehman et al, 2019); while other studies focused on individual countries such as recent ones on Ghana and United State (Tyler et al; Mensah & Ahadzie in Dordi et al, 2022). This explains the novelty and relevance of this study designed to interrogate tertiary institutions and flood governance in Lokoja Metropolis with its research questions as follows:

- i. Have tertiary institutions contributed significantly to knowledge generation against flooding in Lokoja metropolis?
- ii. Have tertiary institutions assisted significantly in creating awareness for flood adaptation/resilience in Lokoja metropolis?

iii. Have tertiary institutions contributed significantly to providing relief materials/services for flood victims in Lokoja metropolis?

1. LITERATURE REVIEW

1.1 TERTIARY INSTITUTIONS

Tertiary institutions include diverse academic establishments of higher learning such as colleges of education, polytechnics and universities, which are small parts of larger society organized with a view to conducting researchers and providing teaching and community services (Ogunode & Ayeni, 2024). It could also be conceptualized as a part of the general society, comprising people of different backgrounds, values and culture among others (Ogunode & Odo, 2023). Tertiary institutions are responsible for producing manpower for national development which underscores the intensive teaching, research and community services (Akin-Ibidiran, Ogunode & Ibidiran John, 2022).

The above explains the critical role tertiary institutions not just in development of knowledge economy but overall development of a country; justifying the huge investment in education precisely higher institutions of learning by responsible governments across countries. This arguably informed the submission of Ogunode, Edinoh & Okoli (2023) that tertiary institution is a deliberately designed system of education for the complete development of people as well as transformation of society, using teaching, research and community service. Tertiary institutions are established in Nigeria as agents of societal development; underscoring their objectives which include providing affordable and accessible quality education both formally and informally based on the needs and aspirations of Nigerian citizens, training high-level manpower, providing quality counseling on career and lifelong learning programs among others; thereby contributing to national development (National Policy on Education, 2013).

1.2 FLOOD GOVERNANCE

20th century witnessed a “welfare state strategy” adopted to address flood issues; where political authorities implemented control measures aimed at separating people from water and providing relief materials to victims of flood (Bergsma, 2019). However, the cost implication of rehabilitating and changing flood control measures among others has made governments to give more attention to flood governance, doing away with the traditional welfare state strategy (Begum et al, 2007; Klijn et al, 2012; Thieken et al, 2016). Flood governance emphasizes the inclusion of other relevant stakeholders such as non-governmental organizations, developers and property owners among others (Johnson & Priest, 2008; Tippet & Griffiths, 2007). To be sure, flood governance suggests for the implementation of wider approaches to minimize vulnerability of populace, infrastructure and property to flooding (Hegger et al, 2018a).

Some countries such as Scotland, England, United States, Netherlands, Germany, China and India have implemented principles of flood management (Begg et al, 2015; Butler & Pidgeon, 2011; Klijn et al, 2008; Jong & van den Brink, 2013; van Buuren et al, 2016; Cook et al, 2016; Bergsma, 2019; Sayers et al, 2013) but there are challenges arising from the implementation of these principles, and they include divergent and competing interests among stakeholders; situating flood governance policy objectives within the existing laws and institutional culture; and effective and efficient allocation of resources (Dieperink et al, 2016, Priest et al, 2016). These challenges explain the reason for paradigm shift from flood management to flood governance; underscoring the arrangements put in place aimed at coordinating actions of

government and societal actors to attain purposeful objectives (Peters, 2014; Thistlethwaite & Henstra, 2019).

Flood governance is conceptually viewed as an assemblage of actors, organizations, resources and discourses in the management of flooding (Hegger et al, 2018b). It could also be viewed as a collaborate effort by various stakeholders aimed at developing and implementing strategies to manage flood. Comparative analysis of flood governance across countries has been effective in determining the capacity of actors to work together; the interplay of policy instruments; and the strategies adopted by different institutions; coordinating agencies, intergovernmental relations among others; shaping interaction among actors and fueling cohesion across various sectors (Kaufmann & Wiering, 2017; Liefferink et al, 2018; van Doorn-Hoekveld et al, 2016).

1.3 TERTIARY INSTITUTIONS AND FLOOD GOVERNANCE: ESTABLISHING THE LINK

Education as well as academia is a foundation for sustainable development across the globe (Pappas, 2012); due to the place of higher learning in the promotion of Sustainable Development Goals precisely in the aspect of climate change (King 2011; Kupika, Mbereko & Chinokwetu 2020; Leal Filho et al. 2018; Mawonde & Togo 2019; UNESCO 2014). The importance of education as a fundamental human right is reinforced in constitutional provisions of several countries (Lee, 2020); giving more strength to Sustainable Development Goal4 which envisions equitable education across the world; supporting lifelong learning prospects without any form of discrimination (Kwauk 2020; Mashizha & Dzvimbo 2018; Mawonde & Togo 2019). This explains the emphasis by United Nations Department of Economic and Social Affairs on collaborations among states, citizens and private sector organization in implementing development programs (UN 2016; Jomo et al. 2016). Accordingly, teaching, research and innovation by higher education institutions are critical in driving the implementation of Sustainable Development Goals to address climate challenges such as flooding (Dzvimbo, Mashizha, Zhanda & Mawonde, 2022).

While the importance of higher education institutions in ensuring the achievement of Sustainable Development Goals as they concern flood governance is shown in studies (Bhowmik, Selim & Hug, 2017; Albareda-Tiana et al, 2020; and Kupika et al, 2020); they have been commended for playing a fundamental role in advancing political transformation, awareness campaign and capability to place the globe on a sustainable path (World Commission on Environment and Development in Dzvimbo, Mashizha, Zhanda & Mawonde, 2022). To be sure, universities are not only strong institutions expected to be accountable to the public but also capable of advancing sustainable development (Brennan, King & Lebeau 2004) which underscores their role in promoting the achievement of Sustainable Development Goals as part of the criteria for recent ranking of universities (De la Poza et al, 2021).

African Union Agenda 2026 shows the importance of education in promoting sustainable development and raising awareness against climate related events such as flooding (African Union Commission, 2015). Sendai Framework for Disaster Risk Reduction 2025-2030 is fundamental for climate events; advocating for drastic reduction of global disaster mortality, direct economic damages and disruption of basic services among others (Pearson & Pelling, 2015). There is an increasing conversation on importance of education in addressing climate challenges across the globe. For instance, Hyogo Framework of Action of 2005-2015 concentrated on building resilience against climate change globally using the instrumentality of education; challenging the role of higher learning institutions in providing flood governance for sustainable development through sharing of knowledge, research, innovation, awareness campaign and community participation (UNISDR Hyogo Framework for Action, 2007;

Tanesab 2020). Therefore, it could be contended that the major objective of Hyogo Framework of Action is to push higher institutions of learning to consistently contribute their quota in promoting the achievement of Sustainable Development Goals through research and implementing climate management curriculum.

2. STUDY AREA

This study is limited to Lokoja Metropolis of Lokoja Local Government Area in Kogi State which includes Ganaja, Otokiti, Lokongoma, Shettima, Adankolo, Zone 8, Felele, Zango, and Army Barracks etc. These communities were selected as a result of their experience of high incidence of flooding. The tertiary institutions used in the study are Federal University Lokoja and Kogi State Polytechnic.

3. METHODS

The paper adopted mixed methods aimed at investigating the role of tertiary institutions in flood governance in Lokoja Metropolis. The mixed methods integrated quantitative data generated through structured questionnaire and secondary data gathered through journal articles, books, newspaper and government official publications.

The total population for the study is 978,433 (Human Resource Unit 2026; Establishment Office 2026; Macrotrends, 2026), covering residents and leaders of the communities, officials of Kogi State Ministry of Environment, Town Planning and Development Board, National Emergency Management Agency together with the public servants in Federal University Lokoja and Kogi State Polytechnic. The study utilized structured questionnaire as its major instrument for data collection while Cronbach's alpha was used for reliability testing to strengthen the Likert-scale instrument utilized. To be sure, Cronbach's alpha is a statistical coefficient used to measure the reliability or internal consistency of a set of survey items. Furthermore, it reveals the level of closeness of group of questions, thereby ensuring they consistently measure the same underlying construct. Pilot testing was adopted for reliability of the instruments as it suggests that a small-scale trial run of a planned larger instruments, carried out to examine whether the full instruments are practicable and how they should be designed and administered. Chi-square and Statistical Package for Social Sciences were employed for data analysis. Out of the total population, 400 were selected as sample size which was determined using Taro Yamane formula. The sample size consisted of lecturers/researchers in faculties of social sciences, environmental sciences and management science; and administrative staff in planning units of Federal University Lokoja and Kogi State Polytechnic; officials of Kogi State Ministry of Environment, Town Planning and Development Board, National Emergency Management Agency; residents living in flood affected neighborhoods; community leaders, local associations; landlords; and local opinion leaders. The justification for the selection was hinged on their level of relevance to the issue.

The process of secondary data for the study commenced with search statement (tertiary institutions and flood governance). In the course of the review, it was shown in some studies that flood governance was used as flood management and disaster management while tertiary institutions were viewed as higher learning institutions.

To ensure quality of this paper, articles suspected to be published in predatory journals were discarded. For emphasis, predatory journal is conceived as an academic publication outlet which exploits an open-access model with a view to making monetary gains with little or no regard for rigor in reviewing papers submitted for publication. Disruption in academic publishing arena is linked to rising level of predatory publication outlets as well as their

unethical conduct exhibited to entice scholars patronize them and join their editorial board (Ojala, Reynolds & Johnson, 2020). Consequently, the review was tailored more towards high ranking journals especially those indexed in SCOPUS and Web of Science such as Emerald, Thompson Reuters and Taylor and Francis.

Based on the above perspective, 245 articles were selected out of which 107 were considered relevant using formal inclusion and exclusion criteria together with a two-stage process. This underscores the opinion of scholars that studies interrogating issues outside the scope of the study being carried out should to be discarded (Demartini; Centobelli, Cerchione & Esposito in Ofoma & Barnabas, 2025). The relevance of the selected papers was established by their titles and abstracts but those which did not show adequate relevance by their titles and abstracts were read.

4. DATA PRESENTATION AND ANALYSIS

This section of the study focused on presentation and analysis of data generated from field survey as regards to role of tertiary institutions in flood governance in Lokoja Metropolis.

The sample size for the study was determined using Taro Yamane's formula given as follows:

where: n = sample size to be determined

N = Total population of the study

e = error margin (0.05)

I = constant

The calculation looks thus:

$$\begin{aligned}
 n &= \frac{978,433}{1 + \sqrt{978,433 (0.05)^2}} \\
 &= \frac{978,433}{1 + \sqrt{978,433 (0.0025)}} \\
 &= \frac{978,433}{1 + 2,446.0825} \\
 &= \frac{978,433}{2,447.0825} \\
 n &= 400
 \end{aligned}$$

Table 1. Questionnaire Distribution and Return Rate by Areas in Lokoja Metropolis

S/N	Areas in Lokoja Metropolis	Distributed Questionnaire	Returned Questionnaire	Percentage (%) of Returned Questionnaire
1	Ganaja	39	31	7.75%
2	Otokiti	37	33	8.25%
3	Lokongoma	45	42	10.50%
4	Shettima	36	33	8.25%
5	Adankolo	51	49	12.25%
6	Zone 8	43	43	10.76%
7	Felele	50	45	11.25%
8	Zango	40	38	9.50%
9	Army Barracks	39	37	9.25%
10	Others	20	20	5%
Total		400	371	92.75%

Source: Field survey, 2026

The result in the above table 1 indicates that 400 (100%) copies of questionnaire were distributed to the study participants, out of which 371 (92.75%) copies were successfully returned in the following order. Ganaja 31 (7.75%); Otokiti 33 (8.25%); Lokongoma 42 (10.50%); Shettima 33 (8.25%); Adankolo 49 (12.25%); Zone 8 43 (10.76%); Felele 45 (11.25%); Zango 38 (9.50%); Army Barracks 37 (9.25%); and Others 20 (5%). The significant return rate is attributed to the sensitization provided by the researcher and his assistants to the participants.

Table 2. Distribution of Respondents by Age

S/N	Option	No of Respondents	Percentage (%)
1	18- 30	130	35.04%
2	31 – 50	180	48.52%
3	51 above	61	16.44%
Total		371	100%

Source: Field survey, 2026

The result in the above table 2 shows that 130 (35.04%) of the respondents fall within the age bracket of 18-30 years; 180 (48.52%) of the respondents are between the age bracket of 31-50 years while the remaining 61(16.44%) of the respondents are 51 years and above. In cap, respondents who fall within the age range of 31-50 obtained the highest score in the distribution but one of the positive implications is that most of the respondents are within the productive age bracket and therefore better positioned to provide the required information.

Table 3. Distribution of Respondents by Sex

S/N	Gender	No of Respondents	Percentage (%)
1	Male	161	43.39%
2	Female	210	56.60%
Total		371	100%

Source: Field survey, 2026

The foregoing finding in table 3 demonstrates that 161(43.39%) of the respondents are male while 210 (56.60%) of the respondents are female. This suggests that more females participated in the exercise than males.

Table 4. Distribution of Respondents by Highest Educational Qualifications

S/N	Option	No of Respondents	Percentage (%)
1	No formal education	6	1.62%
2	FSLC	12	3.23%
3	SSCE	50	13.48%
4	Diploma/NCE	30	8.09%
5	B.Sc./HND	150	40.43%
6	MSc/MPA/MBA	65	17.52%
7	PhD	58	15.63%
Total		371	100%

Source: Field survey, 2026

From the above result in table 4, it is revealed that 6 (1.62%) of the respondents have no formal education; 12 (3.23%) of the respondents hold FSLC; 50 (13.48%) of the respondents possess SSCE; 30 (8.09%) of the respondents hold Diploma/NCE; 150 (40.43%) of the respondents possess B.Sc./HND; 65 (17.52%) of the respondents hold MSc/MPA/MBA; while 58 (15.63%) of the respondents possess PhD. The result suggests that participants with B.Sc./HND have the highest score. On the whole, it shows that a significant number of the participants are educated and that is traceable to the involvement of public and civil servants especially academic and

non-academic staff of Federal University Lokoja and Kogi State Polytechnic as participants. The implication is that most of the participants could be objective in providing information.

Table 5. Distribution of Respondents by Occupation

S/N	Option	No of Respondents	Percentage (%)
1	Civil/Public Servant	120	32.34%
2	Student	46	12.40%
3	Trader	166	44.74%
4	Farmer	36	9.71%
5	Others	3	0.81%
Total		371	100%

Source: Field survey, 2026

The result in the above table 5 reveals that 120 (32.34%) of the respondents are civil/public servants; 46 (12.40%) of the respondents are students; 166 (44.74%) of the respondents are traders; 36 (9.71%) of the respondents are farmers; while 3 (0.81%) of the respondents belong to others. This is a reflection of the fact that traders are more than other categories of participants; and they are part of the mostly affected victims of flooding in Lokoja Metropolis.

Table 6. Have tertiary institutions contributed significantly to knowledge generation against flooding in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions conduct on-site studies in flood-prone communities at Lokoja Metropolis	148 (39.9%)	102 (27.5%)	17 (4.6%)	66 (17.8%)	38 (10.2%)	371 (100%)
Tertiary institutions gather data on rainfall, river levels, drainage conditions, and flood frequency at Lokoja Metropolis	108 (29.1%)	100 (27.0%)	27 (7.3%)	77 (20.8%)	59 (15.9%)	371 (100%)
Tertiary institutions publish research findings in journals, books, and reports on flooding at Lokoja Metropolis	194 (53.3%)	82 (22.1%)	37 (10.0%)	40 (10.8%)	18 (4.9%)	371 (100%)
Total	450	284	81	183	115	1113

Source: Field Survey, 2026

The result in the above table 6 shows that 148 (39.9%) of the respondents had a strong view that tertiary institutions conduct on-site studies in flood-prone communities in Lokoja Metropolis, 102 (27.5%) of the participants agreed with the issue while 17 (4.6%) of them demonstrated indifference. However, 66 (17.8%) of the respondents disagreed with the issue and 38 (10.2%) of them strongly disagreed. Similarly, 108 (29.1%) of the participants were strongly convinced that tertiary institutions gather data on rainfall, river levels, drainage conditions, and flood frequency at Lokoja Metropolis, 100 (27.0%) of the respondents subscribed to the issue while 27 (7.3%) of them were neutral. Meanwhile, 77 (20.8%) of the respondents disagreed as well as 59 (15.9%) of them that disagreed strongly. There was also a significant acceptance that tertiary institutions publish research findings in journals, books, and reports on flooding at Lokoja Metropolis. For this, 194 (53.3%) of the participants had a strong opinion on the issue and 82 (22.1%) of them agreed while 37 (10.0%) of them demonstrated neutrality. However, 40 (10.8%) of the respondents had a contrary view as well as 18 (4.9%) of them who disagreed strongly. On the whole, it could be observed that tertiary institutions have contributed to knowledge generation against flooding in Lokoja metropolis as larger number of the study participants subscribed to that.

Table 7. Have tertiary institutions assisted significantly in creating awareness for flood adaptation/resilience in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions organize seminars, workshops, and public lectures on flood risks and safety measures in Lokoja Metropolis	94 (25.3%)	92 (24.8%)	26 (7.1%)	80 (21.6%)	79 (21.3%)	371 (100%)
Tertiary institutions run campus-wide campaigns using posters, flyers, and town hall meetings in Lokoja Metropolis	87 (23.5%)	82 (22.1%)	19 (5.1%)	92 (24.8%)	91 (24.5%)	371 (100%)
Tertiary institutions mark global events such as World Environment Day to amplify awareness in Lokoja Metropolis	78 (21.3%)	82 (22.1%)	35 (9.4%)	87 (23.5%)	89 (24.0%)	371 (100%)
Total	259	256	80	259	259	1113

Source: Field Survey, 2026

The foregoing result in table 7 reveals that 94 (25.3%) of the respondents had a strong view that tertiary institutions organize seminars, workshops, and public lectures on flood risks and safety measures in Lokoja Metropolis, 92 (24.8%) of them expressed the same view while 26 (7.1%) of them were neutral. However, 80 (21.6%) of the participants had a contrary view together with 79 (21.3%) of them who strongly disagreed. On the idea of tertiary institutions running campus-wide campaigns using posters, flyers, and town hall meetings in Lokoja Metropolis, 87 (23.5%) of the respondents strongly concurred, 82 (22.1%) of the participants agreed while 19 (5.1%) of them demonstrated neutrality. On the other hand, 92 (24.8%) of the respondents disagreed with the assertion and 91 (24.5%) of the respondents also had strong contrary view. Regarding the issue of tertiary institutions marking global events such as World Environment Day to amplify awareness in Lokoja Metropolis, 78 (21.3%) of the respondents demonstrated a strong view supporting the assertion likewise 82 (22.1%) of the respondents who expressed their agreement while 35 (9.4%) of them were indifferent. Conversely, 87 (23.5%) of the respondents had a divergent view and the same as 89 (24.0%) of them who strongly disagreed. By implication, slightly higher number of respondents had a contrary view that tertiary institutions assisted in creating awareness for flood adaptation/resilience in Lokoja metropolis.

Table 8. Have tertiary institutions contributed significantly to providing relief materials/services for flood victims in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions provide relief items such as non-perishable food, clean water, clothing and bedding, hygiene kits and organize campus-wide fundraising for victims of flooding in Lokoja Metropolis	71 (19.1%)	75 (20.2%)	5 (1.3%)	109 (29.4%)	111 (29.9%)	371 (100%)
Tertiary institutions convert lecture halls, hostels, or sports centers into emergency shelters for victims of flooding in Lokoja Metropolis.	23 (6.2%)	29 (7.8%)	13 (3.5%)	110 (29.6%)	196 (52.8%)	371 (100%)
Tertiary institutions deploy campus health professionals to provide first aid and basic treatment to victims of flooding in Lokoja	59 (15.9%)	73 (19.7%)	23 (6.2%)	80 (21.6%)	136 (36.7%)	371 (100%)
Total	153	177	41	299	443	1113

Source: Field Survey, 2026

The finding in the above table 8 suggests that 71 (19.1%) of the respondents strongly agreed that tertiary institutions provide relief items such as non-perishable food, clean water, clothing and bedding, hygiene kits and organize campus-wide fundraising for victims of flooding in Lokoja Metropolis, 75 (20.2%) of the respondents also agreed while 5 (1.3%) of them were neutral. Nevertheless, 109 (29.4%) of the respondents had an opposing view together with 111 (29.9%) of them who strongly disagreed. For tertiary institutions converting lecture halls,

hostels, or sports centers into emergency shelters for victims of flooding in Lokoja Metropolis, 23 (6.2%) of the respondents expressed strong agreement and 29 (7.8%) of the participants also agreed while 13 (3.5%) of them showed indifference. However, 110 (29.6%) of the participants had a different view together with 196 (52.8%) of them who strongly disagreed with the issue. In light of tertiary institutions deploying campus health professionals to provide first aid and basic treatment to victims of flooding in Lokoja, 59 (15.9%) of the respondents expressed strong conviction, 73 (19.7%) of the participants also agreed while 23 (6.2%) of them were indifferent. Contrastingly, 80 (21.6%) of the participants had a divergent opinion and also 136 (36.7%) of them who demonstrated strong disagreement. Therefore, it could be inferred that tertiary institutions have not significantly contributed to providing relief materials/services for flood victims in Lokoja metropolis.

5. TEST OF HYPOTHESES

Chi-square together with Statistical Package for Social Sciences was adopted to test the null hypotheses for this paper. The choice of these tools was based on their relevance to the issue under investigation. For emphasis, the decision rule is stated as follows: Reject the null hypothesis if $p\text{-value} \leq 0.05$ at 0.05 level of significance.

Hypothesis one

There is no significant relationship between knowledge generation by higher institutions and flood control in Lokoja Metropolis

Knowledge generation and flooding in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	450	222.6	227.4
Agreed	284	222.6	61.4
Neutral	81	222.6	-141.6
Disagreed	183	222.6	-39.6
Strongly Disagreed	115	222.6	-107.6
Total	1113		

Test Statistics

	Knowledge generation and flood control in Lokoja Metropolis
Chi-Square	398.370 ^a
Df	4
Asymp. Sig.	.000

Chi-square=398.370

p-value=0.0004

Decisions

Since P-value $0.0004 < 0.05$, hence, null hypothesis is rejected. Accordingly, the study holds that there is a significant relationship between knowledge generation by higher institutions and flood control in Lokoja Metropolis, reinforcing the views of larger number of the participants.

Hypothesis Two

There is no significant relationship between awareness creation by higher institutions and flood adaptation/resilience in Lokoja Metropolis

Awareness Creation and flood adaptation/resilience in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	259	222.6	36.4
Agreed	256	222.6	33.4
Neutral	80	222.6	-142.6
Disagreed	319	222.6	96.4
Strongly Disagreed	199	222.6	-23.6
Total	1113		

Test Statistics

	Awareness Creation and flood adaptation/resilience in Lokoja Metropolis
Chi-Square	146.564 ^a
Df	4
Asymp. Sig.	.000

Chi-square=146.564

p-value=0.0004

Decisions

Since P-value 0.0004<0.05, hence, null hypothesis is rejected. Consequently, the study posits that there is a significant relationship between awareness creation by higher institutions and flood adaptation/resilience in Lokoja Metropolis, typifying the opinions of some of the respondents.

Hypothesis Three

There is no significant relationship between the provision of material relief materials/services by higher institutions and flooding in Lokoja Metropolis

Provision of relief materials/Services and flooding in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	153	222.6	-69.6
Agreed	177	222.6	-45.6
Neutral	41	222.6	-181.6
Disagreed	299	222.6	76.4
Strongly Disagreed	443	222.6	220.4
Total	1113		

Test Statistics

	Relief materials/services and flooding in Lokoja Metropolis
Chi-Square	423.698 ^a
df	4
Asymp. Sig.	.000

Chi-square=423.698

p-value=0.0004

Decisions

Since $P\text{-value } 0.0004 < 0.05$, hence, the null hypothesis is rejected. Drawing on this, the study holds that there is insignificant relationship between the provision of material relief services by higher institutions and flooding in Lokoja Metropolis, reinforcing the views of some of the respondents.

6. DISCUSSION

The findings of the study suggest that tertiary institutions have contributed significantly to knowledge generation against flooding in Lokoja Metropolis. This slightly aligns with the opinion of Wang et al (2019) on the increasing recognition of importance of knowledge in managing climate change. The application of indigenous knowledge in flood management by local communities is specifically done for forecasting, response and recovery from floods. In African setting, community members are arguably knowledgeable about patterns of weather which they use in predicting impending flooding. Studies on clouds and trees and behavior of some animals show that local knowledge could contribute to predicting floods (Munsaka & Dube, 2018). Predictions could equally be made on the basis of behavior of local flora (Hooli, 2016). Many communities in Nigeria have employed their indigenous knowledge to manage climate events in their areas. For instance, Itshekiris, Ijaws and Ilajes have special local meteorological knowledge which helps them in predicting both short and long term flooding (Fabiya & Oloukoi, 2013).

While there is a strong argument establishing the relevance of scientific knowledge in controlling flooding, the debate that indigenous knowledge is unsustainable and incapable of providing significant assistance during intensive disaster conditions is still going on (Mavhura et al., 2013); reinforcing the need for scientific knowledge provided by tertiary institutions in flood governance. That is why Echendu (2024) observes that the combination of indigenous and scientific knowledge could contextually be more sustainable, leveraging the fundamental attributes and benefits of the two approaches. His study reveals the efficacy of the combination of the methods in Port Harcourt city in Nigeria. There is need for combination of indigenous and scientific knowledge in managing modern disaster (Mavhura et al., 2013; Bongo et al., 2017).

The findings of the study also indicate that tertiary institutions have assisted in creating awareness for flood adaptation/resilience in Lokoja Metropolis. The submission by Park & Kwon (2024) supports the foregoing result that people who have the poorest flood safety awareness are more vulnerable to flooding and have poor resilience capacity. Knowledge of vulnerability and exposure could improve awareness, promoting the people's preparedness to adopt preventive measures and support in identifying more workable mitigation mechanisms (Kellens et al., 2013). Awareness about available structural and non-structural strategies enable the people to understand potential protection and residual risk aimed at improving resilience against flooding (Ding et al. in Razavi-Termeh et al., 2025). People leaving in flood-prone communities should be sensitized on their level vulnerability so as to ensue the efficacy of strategies against flooding (Egli, 2002). The sensitization could be done through flood hazard maps, flood marks on building, individual experience of flood and signs in trees (Egli, in Kreibich 2005; Hagemeyer-Klose & Wagner, 2009; Houston et al., 2019).

Conversely, Scolobig et al. (2012) observe that acquisition of knowledge of level of flood vulnerability of an individual or group through awareness campaign is inadequate in identifying measures for adaptation or resilience. In contrast, Bwambale et al., (2020) submits that the inaccessibility of information to flood-prone community residents compels them to develop traditional knowledge through quotidian interactions with their environment and associated

elements. This traditional knowledge which has been in practice equips the local dwellers for flood resilience. The adaptation or resilience strategies by community dwellers could be obtained through formal education or traditional knowledge, strengthening the need for more formal education or official information (Echendu, 2024).

Unlike the foregoing findings, this particular result suggests that tertiary institutions have insignificantly contributed to providing relief materials/services for flood victims in Lokoja metropolis. The relief could come in form of water, shelter, food and healthcare designed for victims of disaster which are usually made available for them at internally displaced camps in order to protect human lives from large-scale mortality and reduce the period of displacement with its accompanied suffering and trauma (Chan 1995; Neto 2001; Sanyal & Lu 2005). Relief operations such as supplies, transportation and distribution of aids as well as long-term assistance provided for flood victims to improve their socio-economic well-being (Richard, 2010) are grossly inadequate as there is an increasing demand for humanitarian relief on account of rising climate events with their impact without corresponding access to funding. These account for the uncertainties in supplies and participation of multiple actors with varying objectives and complex operations (Tierney 1985; Portsea 1992; McEntire 1997; Neto 2001; Paul 2003; Huan et al. 2009; Richard 2010; Van Wassenhove Martinez 2010; and Zhou et al. 2011). It is argued that relief materials and services among other necessary operations in flood governance in Africa have been largely ineffective. The relief materials are largely provided after the flooding season and victims abandoned to their fate (Alabi, 2024).

CONCLUSION

This study sought to interrogate the contributions of tertiary institutions to flood governance in Lokoja Metropolis. For emphasis, the tertiary institutions investigated in the paper are those within the study area which are Federal University Lokoja and Kogi State Polytechnic. The empirical findings of the study reveal that the institutions have contributed significantly to generation of knowledge and awareness creation through various activities such as conducting on-site studies in flood-prone communities, gathering data on rainfall and river levels; and organizing seminars and workshops on flood risks and safety measures in Lokoja Metropolis. However, the findings also suggest that their contributions to provision of relief materials/services to flood victims are not impressive. This was established through activities such as provision of campus-wide fundraising, non-perishable food, clothing and conversion of lecture halls and hostels into emergency shelters for flood victims. Based on the above findings, the study holds that tertiary institutions have contributed significantly to flood governance in Lokoja Metropolis but more needs to be done especially in the aspect of provision of relief materials/services for the victims of flood. Arising from this conclusion, the study makes the following recommendations to strengthen the capacity of tertiary institutions to contribute optimally to flood governance in Lokoja Metropolis and the country at large:

- a. Tertiary institutions need to collaborate with their alumni aimed at setting up a Foundation that will regularly raise funds for provision of relief materials/services. The Foundation should also develop effective mechanism for management and delivery of the materials/services to the flood victims.
- b. Tertiary institutions should work in synergy with Kogi State Ministry of Environment; and Town Planning and Development Board towards reviewing environmental planning and translating scientific findings into policies of government concerning Lokoja Metropolis. To achieve this, tertiary institutions and governments should adopt collaborative governance model by integrating researchers directly into policy design. Successful frameworks involve joint research funding personnel exchange programs

and institutionalized science advisory boards aimed at bridging the gap between academic data and policies.

- c. Tertiary institutions should provide special grants for studies on climate events with a view to encouraging their lecturers to conduct ground-breaking research that will provide lasting solution(s) to flooding in the area and country as a whole.

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