Effects of Flooding on Tourists' Hotel Accommodation in Lokoja Town, Kogi State, Nigeria

[*1]Zhiya Joyce Sheria and **Idoko Ojochenemi (Ph.D),**
Geography and Environmental Science,
Prince Abubakar Audu University, Anyigba, Kogi State
happysherry01@gmail.com / 07030488192

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ABSTRACT
This study investigated the effects of flooding on tourist hotel accommodation in Lokoja Town, Kogi State, Nigeria. The study examined the level of vulnerability, and identified challenges hindering the implementation of flood resilience measures. The study used descriptive survey research design. A sample of 182 out of 340 persons involved in the hospitality industry at 12 flood vulnerable hotels was selected. A structured questionnaire was used to collect data from 10 participants, who were also interviewed using an in-depth interview guide. Descriptive statistics like frequency, percentages and mean were used to analyze quantitative data, and thematic analysis was used to complement the survey results with qualitative data. The results showed that the majority of the hotels at Lokoja are highly exposed to flooding, which is mainly attributed to the poor siting of hotels near the River Niger, poor drainage system and weak adherence to building regulations. The study also determined that lack of sufficient funds, technical expertise, and government support are significant challenges for effective flood resilience. It arrives at the conclusion that the vulnerability of hotels in Lokoja is as a result of environmental exposures and poor institutional capacity. The study suggests greater urban planning, building code enforcement, financial support and disaster preparedness training to increase the resilience of the hospitality industry.

Keywords: Effect, flooding, tourists, hotel, accommodation

Introduction

Accommodation infrastructure is an essential player in the tourism supply chain as it is the physical and service-platform that brings the tourist to a destination. The role that hotels, guesthouses and other lodging establishments play is not limited to providing shelter and amenities, it also directly impacts on the length of stay, destination competitiveness, local employment and visitor satisfaction (Idoko, Ogunkolu & Idakwoji, 2025). The ability of tourism dependent towns' accommodation to withstand external shocks is therefore of major importance. Flooding is one of these external shocks and is an ever-growing hazard in many parts of the world with direct impacts on tourism businesses (Southon & van der Merwe, 2018). Flooding can occur in a variety of forms such as riverine overflow, surface (pluvial) flooding, coastal inundation, blocked urban drainage and its impact on the built and service environment is considerable. In the context of tourism accommodation, floods can lead to physical damage of buildings and furniture, interruption of utilities (electricity, water, internet), closure of rooms or facilities, evacuation of guests, reputational damage, decreased bookings and extended recovery times (Pinto & Gutiérrez-Arroyo, 2018). Case studies in Limpopo province in South Africa, for instance, showed that the tourist accommodation industry in flood vulnerable areas experienced a decrease in bookings, longer downtime, and limited adaptation planning (Southon & van der Merwe, 2018). This provides an example of the vulnerability of

accommodation infrastructure to flooding being a combination of exposure (location, drainage, elevation) and organisational/business resilience (back-up systems, insurance, contingency planning).

Flooding continues to be a growing problem particularly along river/confluence lines and slum areas in urban areas in Nigeria where development has not taken into account drainage planning. For instance, the national flood event of 2022 was projected to cover vast lands, damage assets and drive thousands of households away. (Abu & Ibebuchi, 2025) The study revealed that the business activities in Lokoja Metropolis, localised, experienced significant impact with small businesses having a higher impact than larger businesses (Emmanuel et al., 2024).

The town of Lokoja is the capital of Kogi State and lies in an interesting geographical location at the confluence of the Niger and Benue Rivers. This site has a natural vulnerability to flooding from the river, and exacerbated by the urban development that has taken place on the floodplains, confined drainage, increased rainfall intensity and poor flood-mitigation infrastructure. The vulnerability of the tourism sector in Lokoja with respect to flooding is of particular interest because of its potentials as a tourism destination (heritage sites, river front scenery, historical significance, etc.). Continued disruption to hotels and guesthouses will not only drive up repair and business interruption costs but will also have a negative impact on the town's ability to be a welcoming destination for tourists.

Furthermore, the effects of physical vulnerability, economic impact and adaptive capacity (resilience) of accommodation businesses in the Nigerian setting is not well understood particularly in Lokoja. Empirical frameworks found in other parts of the world focus on three interrelated aspects: (i) infrastructure vulnerability; (ii) direct and indirect impacts; and (iii) adaptive/resilience measures (Pinto & Gutiérrez-Arroyo, 2018). The application of such a framework in Lokoja thus provides descriptive snapshot of the impact of flooding on the hotel and prescriptive insight into how the interventions for accommodation providers, local authorities and tourism managers could be prioritised.

The study thus assumes a stake among the physical vulnerability evaluation and economic influence evaluation for the tourism industry, more particularly tourist accommodation in Lokoja town. The research will quantify infrastructure vulnerability and explore challenges to the implementation of resilience measures providing evidence for targeted interventions by hoteliers, local authorities and development partners.

Statement of the Problem

Tourism accommodation is a linchpin for destination viability, underpinning visitor experience, revenue generation, employment and broader local economic development. But in flood prone places, accommodation infrastructure and operations are at higher risk of disruption, damage and loss of value. These risks are intensified in urban areas like Lokoja where geographic vulnerability to river flooding, coupled with urban drainage problems and development pressures, is felt. In the recent past, flooding in Lokoja in 2022 was observed to have negative effects on businesses, with the patronage of businesses declining and operating cost of businesses increasing particularly for smaller businesses, which were statistically significant (Emmanuel et al., 2024). The accommodation-tourism segment is not yet sufficiently studied in terms of business risk.

In particular, there are no empirical studies that specifically address the impacts of flooding on hotel infrastructure (such as increase in foundation and drainage issues, closures and downtime, loss of occupancy and revenue, recovery time, implementation of flood resistant measures

(raise floors, raise utilities, business continuity planning)). In the Nigerian tourism literature, problems like infrastructure and transport have been associated with the tourism development (Imikan & Ekpo, 2012), however, flooding effects on the lodging sub-sector have not been well documented. Furthermore, the tourism accommodation literature has defined the impacts of floods as direct/tangible, indirect/tangible, and intangible losses, but this classification has rarely been applied to Nigerian hotels as described by (Pinto & Gutiérrez-Arroyo, 2018).

This lack of analysis also means that local hotel operators and tourism planners in Lokoja have no targeted information about vulnerability hot-spots (which hotels are most vulnerable and why), economic losses (loss of occupation, loss of repair cost, loss of revenues), and vulnerabilities to adaptation (financial, technical, and insurance). As a result, resilience investments can be under-prioritized or underfunded, and the tourism industry can become a hindrance to the growth of destinations. This implies that the research about the flooding impact on accommodation in Lokoja lacks in detail and a specific destination.This means that there is a lack of detailed, destination-specific research on the impact of flooding on accommodation in Lokoja. The overall aim of this study is thus to address this gap by assessing the vulnerability of the infrastructure, measuring the physical and economic impacts and identifying the adaptation challenges of hotel accommodation providers in Lokoja.

Research Questions

The following research questions will guide the study:

i. To what extent are tourist accommodation infrastructures in Lokoja vulnerable to flooding?

ii. What key challenges do tourist accommodation providers face in implementing flood resilience measures in Lokoja?

Objectives

The main purpose of this study is to examine the effects of flooding on tourists' hotel accommodation in Lokoja Town, Kogi State, Nigeria. Specifically, the study seeks to:

i. Assess the vulnerability of tourist accommodation infrastructure to flooding in Lokoja.

ii. Identify the key challenges faced by tourist accommodation providers in implementing flood resilience measures in Lokoja.

Area of the Study

The study was carried out at Lokoja, Kogi State, Nigeria. Lokoja is located in the heart of Nigeria at the southern part of the Federal Capital Territory. It absolute location is between Latitudes 7º 45' 27" – 7º 51' 22" N and Longitudes 6º 41' 19" – 6º 45' 00" E, with a total land area of 3,180 km^2. Relatively, it is bounded to the East by Benue State, to the South by Adavi and Okehi LGAs and to the west by Kabba LGA. The projected population of Lokoja is estimated to be 319,763.

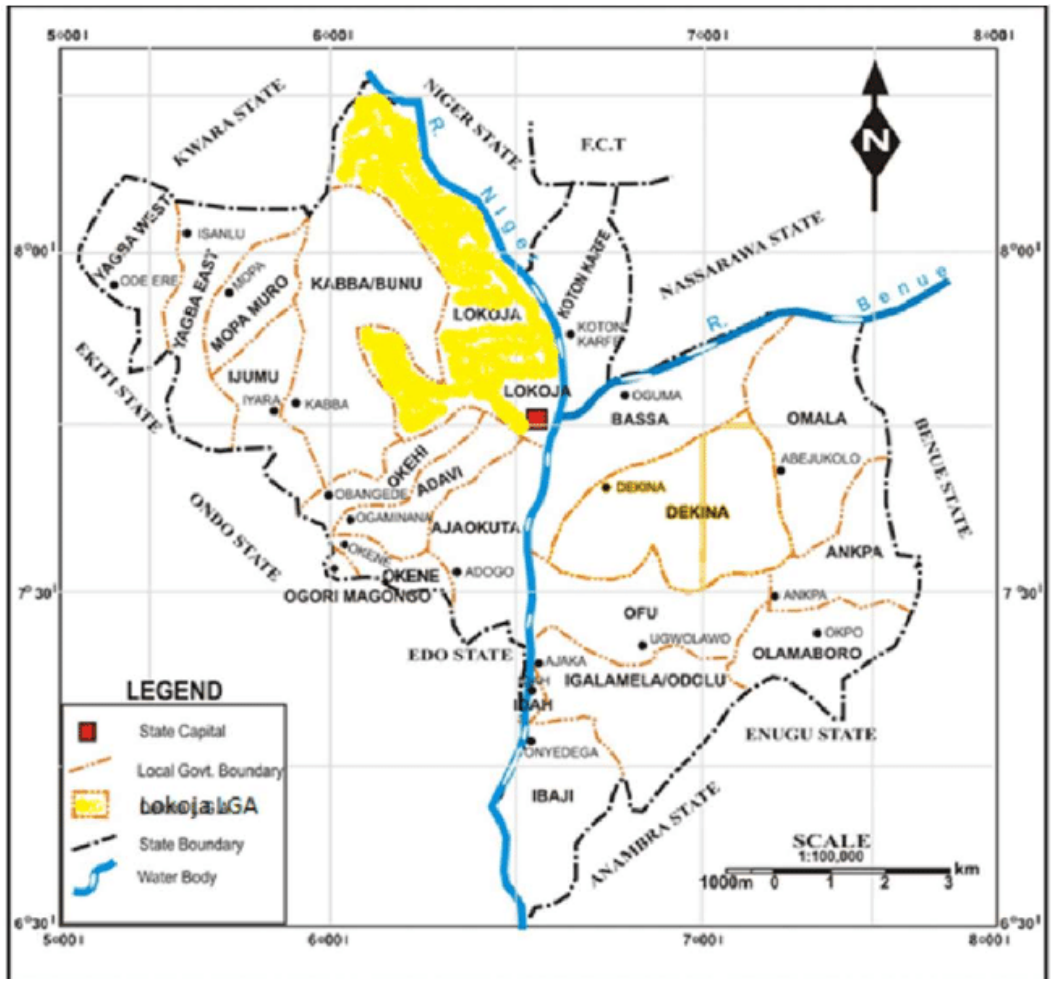

Figure1.1: Kogi State showing Lokoja
Source: Department of Geography, PAAU, Anyigba

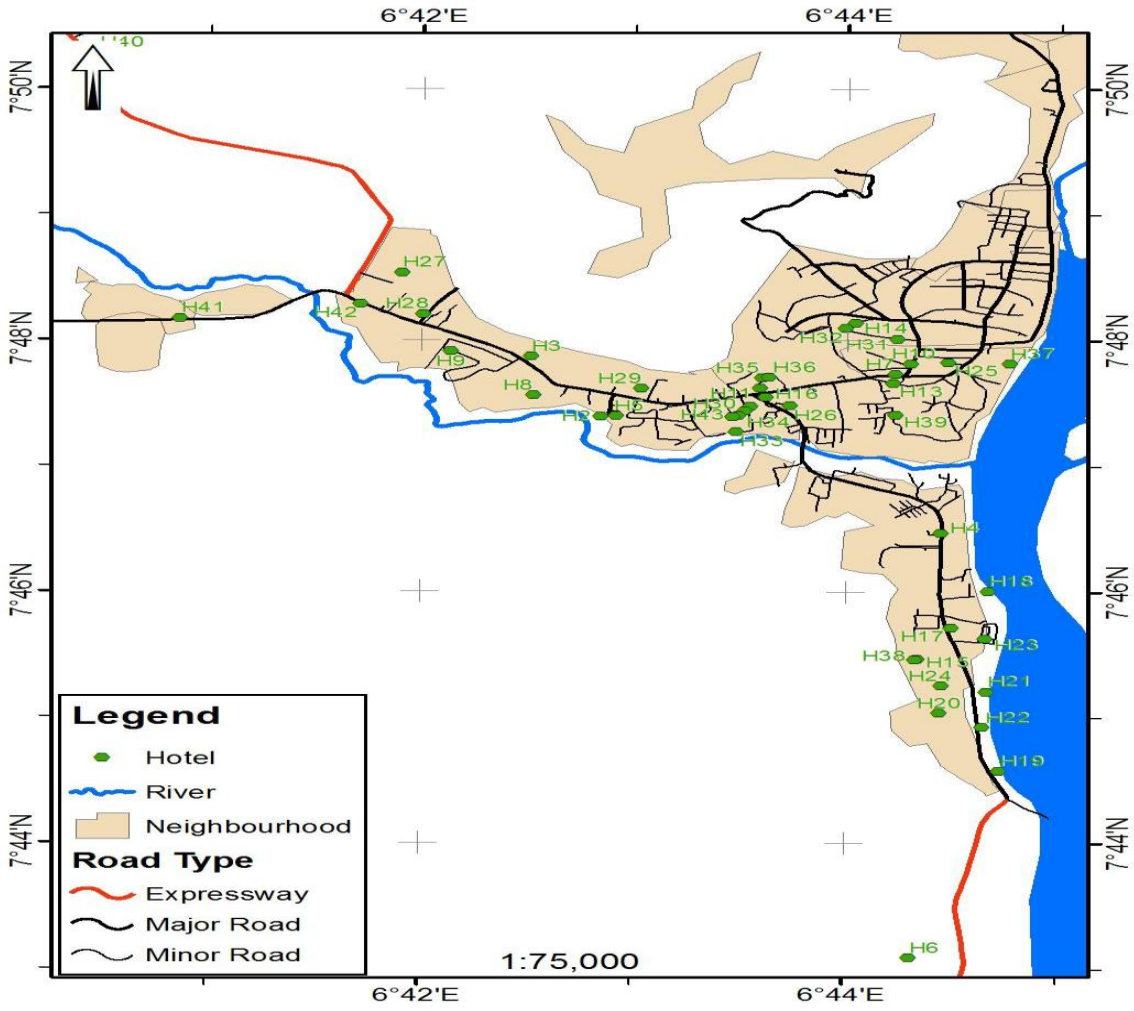

Figure 1.2: Locations of Hotels (in codes) in Lokoja.
Source: Fieldwork analysis, 2026

Conceptual Clarifications

Concept of flooding

Flooding is an inundation of dry land by water caused by either natural or anthropogenic events that cause the environment to become overwhelmed and unable to hold or absorb the water. It is one of the most common and devastating natural risks that impact human settlements around the world (World Meteorological Organization, 2022). Flooding is not just excess water but it is a hydrologic phenomenon that causes environmental imbalance, damage to infrastructures and socio-economic activities (Adebayo, 2023). Ezenwa and Musa (2021) define flooding as a temporary inundation of land with water due to heavy rainfall, overflow in rivers, dam breakage or failure of drainage systems. It covers both hydro-physical and human aspects of accumulation and flow of water and is an important environmental and developmental problem. Flooding may be described as a phenomenon of the environment that occurs when water covers the land normally covered with dry soil, either caused by natural forces like rainfall, melting snow, storm surges or human activities like poor urban planning, deforestation etc. (Okonkwo & Adewale, 2022). It can be sudden such as flash floods, or over time, such as riverine flooding. According to the United Nations Office for Disaster Risk Reduction (UNDRR, 2023), flooding is the inundation of land that is usually dry, whether caused by overflowing rivers, lakes or

oceans or by rain, run-off or groundwater seepage. This definition highlights that flooding is a natural phenomenon, and a hazard when people and property are affected.

According to Aliyu and Tanko (2024), floods manifest in different forms such as fluvial (river) floods, pluvial (surface runoff) floods, coastal floods, and urban floods. Riverine flooding happens when rivers breach their banks, causing them to inundate floodplains; pluvial flooding is caused by heavy rains causing surface drainage systems to overflow; and coastal flooding is caused by storms causing sea-level rise or storm surges. Poor drainage, unplanned settlements and blocked waterways are common causes of urban flooding, which is often found in rapidly developing towns. These multiple forms highlight the hydrological complexity of flooding and its dependence on environmental and anthropogenic factors.

Concept of tourists' hotel accommodation

Hotel accommodation for tourists means the variety of accommodation and services that are available and are specially designed to serve the temporary house needs of tourists for recreational, commercial or other purposes. It is one of the key parts of the tourism system as a functional need and an experience of travelling (UNWTO, 2023). As per Olatunji and Akande (2022), hotel accommodation involves all establishments that offer paid lodging services, which include hotels, guest houses, resorts, lodges and serviced apartments. These facilities play an important role in the tourism value chain and impact on tourists' satisfaction levels, locality image and the overall competitiveness of a tourist destination.

According to Eze and Musa (2021), hotel accommodation is the provision of lodging facilities and complementary services like food, recreation services, security etc. to guests who stay outside their house of residence. It not only provides a place to rest, but also to interact with others, find comfort, and enjoy cultural experiences. In this way, hotels can be considered as economic enterprises as well as social institutions that shape the tourists' perception of the destination. Nwankwo and Abiola (2023) posited that accommodation facilities provide the backbone of the tourism industry because it will lead to longer stay, increase spending by visitors and boost employment opportunities. Therefore, the quality, availability and resiliency of the tourist accommodation is a key element in the sustainability of tourism in any region.

According to United Nations World Tourism Organization (UNWTO, 2023), tourist accommodation, as one of the key factors affecting tourist flow and satisfaction, expresses the level of infrastructural development and hospitality standard in the destination. There are a number of different types, sizes and classes of hotel establishments from budget fit in motels to luxurious resorts and every kind serves a different kind of travellers. In the Nigerian setting, lodging services are included in the hospitality and tourism industry that generates substantial national GDP and job.Lodging services are considered part of the hospitality and tourism industry in Nigeria, where it plays a significant role in the growth of the nation's GDP and employment (National Bureau of Statistics, 2024). The sector has been closely associated with the transport, communication and service infrastructure, which have improved accessibility and competitiveness of tourist centres.

Vulnerability of tourist accommodation infrastructure to flooding

Tourist accommodation infrastructure is an integral part of the tourism sector, playing a vital role in making the facilities available to the visitor and ensure their comfort, safety and satisfaction. But these infrastructures are becoming more susceptible to environmental hazards, especially flood. Flooding is one of the most destructive natural disasters and can be a threat to hotels, guest houses, lodges and resorts in flood-prone areas. The vulnerability of the accommodation facilities in Nigeria, which being located near the river basins and coastal

areas, has been a major concern (Akinyemi & Iwuanyanwu, 2022). Vulnerability of such infrastructures is affected by various factors including location, building design, drainage system and disaster preparedness.

Flood vulnerability for the purpose of this study is defined as the extent to which hotel structures and operations can be affected by flooding and disrupted. This involves physical, economic and operational aspects. Tourist lodgings near rivers or low-lying areas are more vulnerable both physically and structurally to inundation, resulting in structural damage, loss of equipment, and deterioration of building materials. Risk is increased due to poor construction practices, blocked drainage channels and inadequate flood control mechanisms. Empirical research has demonstrated that poorly constructed or non-construction of hotels following a flood resistant design has experienced high losses during flood events (Okonkwo & Chukwuma, 2023).

Floods can create significant business disruption, loss of income and heightened maintenance costs for accommodation providers from an economic perspective. After flood incidents, tourist demand tends to drop drastically as tourists are reluctant to go to what is considered unsafe or inaccessible areas. This, apart from the impact on occupancy rates, has a negative effect on the income of local businesses that rely on the tourism industry, especially restaurants, transport operators and tour guides (Adewale & Ajayi, 2021). Flooding has also affected the functioning of hotels in the flood-risk area, causing some to close for periods, resulting in the loss of jobs and money, and affecting the owners of the hotels. The financial burden of damage and loss of tourist self-confidence compounds the vulnerability of the tourism industry, thereby hindering sustainable tourism development.

Social vulnerabilities and operational vulnerabilities are echoed in the vulnerabilities of tourist accommodation infrastructure in terms of safety of guests and workers. Floods may block access roads and pollute water supplies and harm power systems, making it unsafe for visitors and employees alike. The effects of flood crises on hotels have been exacerbated by the lack of early warning systems and inadequacy in emergency response mechanisms in many of the Nigerian towns (Eze & Abubakar, 2022). Further, loss of tourists due to flood can lead to bad publicity and thus decrease the attractiveness of the tourist destination. Thus, it is necessary for effective flood risk management to have not only physical adaptation but also to have institutional preparedness and public awareness building activities, ensuring safety for all the stakeholders.

Spatially, the location of the accommodation infrastructure is very important to consider when assessing its level of exposure and vulnerability. Hotels constructed in floodplains or in close proximity to drainage channels may be at regular risk of inundation, particularly if the enforcement of urban planning laws and regulations is lax. Flood-prone areas provide space for hotels in many cities in Nigeria, with the development and planning of these spaces being unregulated (Olowolemi & Akande, 2023). This is reflected in Lokoja where the geographical location of the town at the junction of the Niger and Benue rivers makes the town susceptible to flooding in the rainy season. Although the concentration of tourist facilities around the water is very attractive, this also increases the risk of flooding.

Research Methodology

This study used a descriptive survey research design with tourist hotels in flood prone areas of Lokoja town in Kogi State. The respondents were selected by multi-stage sampling technique which involved stratified, purposive and simple random sampling. There were 340 employees of 12 registered hotels and guest houses in vulnerable areas. The Krejcie and Morgan (1970) table was used to select a sample size of 182 respondents.

The data was gathered through a structured questionnaire and interviews conducted with the hotel managers, owners and employees. It has been validated by experts and proved to be reliable by conducting a pilot study, which gave a Cronbach's Alpha coefficient of 0.82. Data were analyzed using the frequency, percentage, Mean and Standard Deviation with the use of SPSS Version 26.0. Responses were reported on a 4-point Likert scale and a score of 2.50 was used as the decision criterion.**Data Analysis and Interpretation**

Presentation of data on research question 1: To what extent are tourist accommodation infrastructures in Lokoja vulnerable to flooding?

Table 1: Vulnerability of tourist accommodation infrastructure to flooding

S/N	Statement	SA (4)	A (3)	D (2)	SD (1)	Total	Mean	Decision
1	Our hotel is located in a flood-prone area near the River Niger or Benue.	75 300	68 204	26 52	13 13	182 544	2.99	Accepted
2	Floodwaters have previously entered our hotel premises.	70 280	63 189	29 58	20 20	182 525	2.88	Accepted
3	Flooding often damages hotel structures such as walls, floors, and foundations.	80 320	61 183	27 54	14 14	182 547	3.01	Accepted
4	Electrical and plumbing systems are usually not affected during flooding.	30 120	38 114	66 132	48 48	182 414	2.27	Rejected
5	Hotel drainage and flood control systems are inadequate to cope with heavy rains.	55 220	58 174	40 80	29 29	182 503	2.76	Accepted
6	Flooding reduces the accessibility of our hotel for guests and suppliers.	72 288	65 195	28 56	17 17	182 556	3.06	Accepted
7	Our hotel is highly exposed due to poor siting or low elevation.	77 308	60 180	28 56	17 17	182 561	3.08	Accepted

Source: Researcher's field work, 2026

The findings in Table 4.2 revealed generally high mean scores (ranging from 2.76 to 3.08), indicating that respondents largely agreed that tourist accommodation infrastructures in Lokoja are highly vulnerable to flooding. The statements with the highest agreement were "Our hotel is highly exposed due to poor siting or low elevation" (mean = 3.08) and "Flooding reduces the accessibility of our hotel for guests and suppliers" (mean = 3.06). These results suggest that

location along low-lying river corridors and limited access during flood events are major factors exacerbating vulnerability.

Respondents also agreed that "Flooding often damages hotel structures such as walls, floors, and foundations" (mean = 3.01) and that many hotels are "located in flood-prone areas near the River Niger or Benue" (mean = 2.99). However, the relatively low mean (2.27) for the statement "Electrical and plumbing systems are usually not affected during flooding" indicates that most respondents disagreed, confirming that utilities are indeed disrupted by floods.

Thematic insights from interviews supported these quantitative findings. Several hotel managers recounted that flooding had previously inundated their premises, damaging walls, fences, and equipment. One manager in Ganaja area noted:

> "Each year when the river rises, our compound gets flooded. Even though we try to block the entrance, water still finds its way in."

Another participant emphasized the issue of location:

> "Our hotel is built close to the river because it used to attract tourists for the waterfront view, but now it is a big risk whenever there's heavy rainfall."

Overall, both data sources indicate that the siting of hotels near riverbanks, inadequate drainage, and limited flood control systems make most tourist accommodations in Lokoja physically and functionally vulnerable to recurring flood events. This aligns with Akinyemi and Iwuanyanwu (2022), who observed that hotels in Nigerian floodplains face recurrent flooding due to weak planning and enforcement of land-use regulations.

Presentation of data on research question 2: What key challenges do tourist accommodation providers face in implementing flood resilience measures in Lokoja?

Table 4.5: Challenges Faced by Hotel Operators in Implementing Flood Resilience Measures

S/N	Statement	SA (4)	A (3)	D (2)	SD (1)	Total	Mean	Decision
22	Our hotel lacks adequate funds to invest in flood resilience infrastructure.	76 304	65 195	28 56	13 13	182 568	3.12	Accepted
23	Government support for flood mitigation in tourism facilities is adequate.	34 136	42 126	60 120	46 46	182 428	2.35	Rejected
24	There is insufficient technical knowledge on how to make buildings flood-resistant.	71 284	66 198	28 56	17 17	182 555	3.05	Accepted
25	Limited awareness among staff about flood preparedness and response plans.	69 276	64 192	30 60	19 19	182 547	3.01	Accepted
26	Insurance coverage for flood damage is difficult or costly to obtain.	73 292	60 180	31 62	18 18	182 552	3.03	Accepted

27	Poor urban drainage and waste management worsen flooding around hotels.	77 308	63 189	26 52	16 16	182 565	3.10	Accepted
28	Coordination between hotel operators and disaster management agencies is weak.	72 288	65 195	28 56	17 17	182 556	3.06	Accepted
29	Our hotel lacks early warning or emergency evacuation systems.	68 272	67 201	30 60	17 17	182 550	3.02	Accepted
30	High cost of maintaining flood control systems discourages long-term planning.	75 300	64 192	27 54	16 16	182 562	3.09	Accepted

Source: Researcher's field work, 2026

As shown in Table 4.5, most items recorded high mean scores (ranging 3.01–3.12), indicating that respondents strongly agreed that multiple challenges hinder flood resilience. The most pressing constraint was "Lack of adequate funds to invest in flood resilience infrastructure" (mean = 3.12), followed closely by "Poor urban drainage and waste management worsen flooding" (mean = 3.10). This underscores how both financial limitations **and** systemic urban infrastructure weaknesses amplify hotels' vulnerability.

Respondents also agreed that "Insurance coverage for flood damage is difficult or costly to obtain" (mean = 3.03) and that "Coordination between hotel operators and disaster management agencies is weak" (mean = 3.06). The only rejected item, "Government support for flood mitigation in tourism facilities is adequate" (mean = 2.35), highlights the lack of institutional assistance for hoteliers.

Interview excerpts provided further clarity. A manager at a Confluence area lodge stated:

> "We applied for insurance after the 2022 flood, but the premium was too high. Most of us can't afford it."

Another participant noted governance gaps:

> "Government only comes after the flood to assess damage; there's little support for prevention. We mostly rely on our own efforts."

A maintenance officer added:

> "Even when we try to improve drainage, blocked gutters in the whole area make it useless. Water just returns to the compound."

These narratives align with survey findings, emphasizing that financial constraints, weak institutional support, poor urban drainage, and limited technical knowledge are the core barriers to flood resilience among hotel operators in Lokoja. These findings support Adebayo and Eze (2023) and Ibrahim and Danladi (2022)**,** who identified poor funding, limited awareness, and weak institutional coordination as key obstacles to flood resilience in Nigeria's hospitality sector.

Conclusion

This study examined the effects of flooding on tourist hotel accommodation in Lokoja Town, Kogi State. The findings revealed that most hotel accommodations are highly vulnerable to flooding due to their location in low-lying flood-prone areas, inadequate drainage systems, and poor flood control infrastructure. Flood events were found to disrupt hotel operations, damage physical facilities, and reduce accessibility for guests and suppliers. The study further established that inadequate funding, limited technical expertise, poor urban drainage, weak institutional support, and the high cost of insurance constitute major challenges to the implementation of effective flood resilience measures among hotel operators.

The study concludes that the vulnerability of tourist accommodation facilities in Lokoja is driven by both environmental exposure and institutional constraints. Therefore, enhancing the resilience of the hospitality sector requires a combination of improved urban planning, stronger government support, investment in flood mitigation infrastructure, and increased disaster preparedness among hotel operators.

Recommendations

Based on the findings of the study, the following recommendations are made to reduce the impacts of flooding and enhance the resilience of tourist accommodation facilities in Lokoja:

i. The Kogi State Government and Lokoja Municipal Council should prioritize the construction and maintenance of effective drainage systems, embankments, and flood barriers around hotel clusters, particularly along Ganaja, Adankolo, and Marine Quarters.

ii. Relevant authorities such as the Kogi State Urban Development Board should ensure strict compliance with land-use and building regulations, especially in flood-prone zones, to prevent unplanned hotel construction in high-risk areas.

iii. Hotel owners should be granted access to low-interest loans, tax reliefs, or disaster recovery funds to help them implement flood resilience measures such as elevated foundations, water-resistant materials, and on-site drainage improvements.

iv. Tourism and environmental agencies should conduct training workshops and seminars for hotel staff and managers on flood risk management, emergency response planning, and sustainable environmental practices.

v. Collaboration between hotel associations, the National Emergency Management Agency (NEMA), and the Nigerian Meteorological Agency (NiMet) should be strengthened to ensure timely dissemination of flood alerts and coordinated evacuation or mitigation responses.

vi. Government and insurance firms should develop affordable flood insurance schemes tailored to hospitality businesses. Public-private partnerships should also be encouraged to fund community-level flood control projects.

vii. Flood management should be mainstreamed into the Kogi State tourism development plan, ensuring that environmental sustainability becomes a key pillar of hotel licensing, operation, and expansion strategies.

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