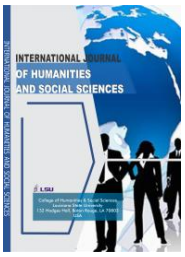
The Effects of Flooding on Tourism Development in Port Harcourt Metropolis, Rivers State, Nigeria



Ogan Sonny Sample PhD[1] & Ogan Nkem Millicent [2]
[1]*Department of Geography and Environmental Studies, Ignatius Ajuru University of Education, Port Harcourt, Nigeria.*

[2]*Rivers State Ministry of Education, Nigeria.*

Abstract

This study examined the effects of flooding on tourism development in Port Harcourt Metropolis, Rivers State, Nigeria. Flooding represents an important environmental hazard in the Niger Delta and has the potential to affect tourism development through damage to infrastructure, disruption of accessibility, deterioration of visitor experience and disruption of tourism-related business activities. The study therefore examined the frequency and characteristics of flooding in selected tourism destinations assessed its effects on tourism infrastructure and facilities, determined its effects on accessibility, examined its influence on visitor experience and satisfaction, assessed its effects on tourism businesses and patronage, and identified measures for reducing its negative impacts. A cross-sectional survey design was adopted for the study. Data were obtained primarily through structured questionnaires administered to visitors, tourism operators and relevant personnel associated with selected tourism destinations and facilities in Port Harcourt Metropolis. Secondary information was obtained from textbooks, journal articles, reports and other relevant documentary sources. The questionnaire employed a five-point Likert scale. Data were analysed using frequencies, percentages, mean scores and standard deviations, while Pearson Product Moment Correlation and regression analysis were used to examine the relationships between flooding and tourism development indicators. The findings indicate that flooding constitutes a significant constraint to tourism development in the study area. Flooding affects tourism infrastructure and facilities, reduces accessibility to tourism destinations, creates inconvenience and safety concerns for visitors, and negatively affects tourism-related businesses and patronage. The study further indicates that drainage improvement; regular clearing of drainage channels, improved waste management, flood-resilient infrastructure, improved access roads, early-warning systems and emergency preparedness are important measures for strengthening the resilience of tourism destinations. The study concludes that sustainable tourism development in Port Harcourt requires greater integration of flood-risk management into tourism planning and destination management. It recommends improved drainage infrastructure, regular maintenance of drainage systems, flood-resilient tourism facilities, effective waste management, early-warning systems, emergency preparedness and stronger collaboration among tourism, environmental and disaster-management authorities.

Keywords: *Flooding, Tourism Development, Tourism Infrastructure, Accessibility, Visitor Experience, Tourism Businesses, Port Harcourt.*

I. Introduction

Background to the Study

Tourism is an important component of socioeconomic development because it stimulates economic activities, creates employment opportunities, generates income, promotes cultural interaction and encourages the development of infrastructure and services. Tourism development involves the planning, provision and improvement of facilities, services and attractions required to support the movement and stay of visitors at a destination. These include transportation, accommodation, recreation, hospitality, information services, utilities, security and other facilities that contribute to the attractiveness and functionality of tourism destinations. In many developing regions, tourism is increasingly regarded as an avenue for economic diversification and local development, particularly where destinations possess natural, cultural and recreational resources.

The development of tourism, however, depends not only on the availability of attractions but also on the environmental conditions within which tourism activities take place. Tourism destinations are vulnerable to a variety of natural and human-induced hazards, including flooding, coastal erosion, storms, landslides, drought, pollution and insecurity. Such hazards can damage tourism infrastructure, disrupt transportation, reduce accessibility, affect tourist safety and negatively influence the overall

visitor experience. Consequently, disaster risk and environmental hazards have become important considerations in the planning and sustainable development of tourism destinations.

Flooding is one of the major environmental hazards affecting urban and coastal areas around the world. It occurs when water accumulates on land that is normally dry as a result of excessive rainfall, overflowing rivers and drainage channels, storm surges, inadequate drainage and other hydrological processes. In urban areas, the problem can be intensified by rapid urbanization, inadequate drainage infrastructure, blocked drainage channels, increased impervious surfaces and poor land-use planning. Flooding can therefore become more than a temporary environmental problem; repeated flooding can affect economic activities, infrastructure, mobility and the quality of life of residents and visitors.

The relationship between flooding and tourism is particularly important because tourism depends heavily on accessibility, infrastructure and environmental quality. When flooding affects roads, bridges, waterfronts, recreational facilities, hotels, restaurants, parks and other tourism-related facilities, the ability of tourists to access and enjoy destinations may be reduced. Flooding may also cause temporary closure of attractions and businesses, damage tourism infrastructure, increase maintenance costs and create perceptions of insecurity or inconvenience among visitors. In severe cases, repeated flood events may affect the image and competitiveness of a destination.

Nigeria experiences flooding in several parts of the country, with the problem being particularly significant in the southern and coastal areas. The Niger Delta region, including Rivers State, has environmental characteristics that can increase vulnerability to flooding. Rivers State contains extensive rivers, creeks, wetlands and low-lying areas, while Port Harcourt and its surrounding urban settlements have experienced considerable urban expansion. High rainfall, inadequate drainage, alteration of natural drainage systems and increasing urban development can contribute to flood risk in different parts of the metropolis.

Port Harcourt Metropolis is an important urban and economic centre in Rivers State and also contains a variety of tourism and recreational resources. These include waterfront areas, parks, recreational centres, hospitality establishments, cultural attractions, beaches and other facilities that can support tourism activities. The city's location within the Niger Delta environment gives it both tourism opportunities and environmental challenges. Its extensive built-up areas and increasing population create substantial demand for roads, drainage, water, waste management, accommodation and recreational infrastructure.

Flooding within Port Harcourt can have implications for these tourism resources and activities. During periods of intense rainfall, some roads and streets become temporarily inundated, potentially affecting movement to tourism and hospitality facilities. Poor drainage and blocked waterways may prolong the duration of flood events. Where tourism facilities are located in flood-prone areas, flooding can affect buildings, recreational spaces, access routes, parking areas, electricity supply and other services required by visitors. Such conditions can influence tourists' perceptions of destination quality, convenience, safety and attractiveness.

The effects of flooding on tourism development can also extend beyond direct physical damage. A destination that frequently experiences flooding may develop a negative image among potential visitors, particularly when information and images of flood events circulate through social media and other communication channels. Visitors may avoid destinations perceived as difficult to access or unsafe during particular periods. Tourism operators may consequently experience reductions in patronage and revenue. Furthermore, repeated flood damage may discourage investment in tourism facilities or increase the cost of maintaining existing facilities.

Nevertheless, flooding does not necessarily mean that tourism development must decline permanently. Effective disaster risk reduction, flood preparedness, drainage improvement, land-use planning, early-warning systems and resilient tourism infrastructure can reduce the vulnerability of destinations. Tourism operators and destination managers can also develop measures to protect visitors, provide timely information and maintain tourism activities during periods of environmental stress. Understanding the relationship between flooding and tourism development is therefore important for developing appropriate adaptation and management strategies.

Despite the importance of tourism to economic and social development, relatively limited

attention has been given to the specific effects of urban flooding on tourism development in Port Harcourt Metropolis. Much of the discussion of flooding in Rivers State focuses on residential areas, transportation, health, agriculture, infrastructure and general socioeconomic impacts. There is therefore a need to examine flooding from a tourism perspective, particularly its implications for tourism infrastructure, accessibility, visitor experience and tourism-related activities.

This study therefore examines the effects of flooding on tourism development in Port Harcourt Metropolis, Rivers State, Nigeria. The study seeks to assess the extent to which flooding affects tourism facilities, accessibility to tourism destinations, visitor experience and tourism-related activities, and to identify measures that could enhance the resilience and sustainable development of tourism in the metropolis.

Statement of the Problem

Port Harcourt Metropolis possesses considerable potential for tourism development because of its location, cultural diversity, recreational facilities, waterfront environment and concentration of hospitality and tourism-related businesses. The metropolis serves as an important gateway to several tourism resources within Rivers State. However, the development and effective utilization of these tourism resources can be constrained by environmental challenges, among which flooding is an important concern.

Flooding has become a recurring environmental problem in many urban areas of Rivers State. In Port Harcourt, intense rainfall combined with inadequate drainage, blocked drainage channels, urban expansion and modifications to natural drainage systems can result in the accumulation of water on roads and built-up areas. The consequences may include traffic disruption, restricted movement, damage to buildings and facilities, interruption of business activities and deterioration of environmental quality.

The tourism sector is particularly vulnerable to these effects because tourists require safe and convenient access to destinations. Flooded roads may make tourism sites difficult to reach, while flooded recreational areas, hotels, restaurants and other facilities may experience temporary closure or reduced patronage. Damage to tourism infrastructure can also increase operational and maintenance costs for tourism businesses. Where flooding occurs frequently, tourism operators may face uncertainty regarding business operations and revenue.

Another concern is the possible effect of flooding on visitor experience. Tourism is not based solely on the existence of attractions; visitors also evaluate destinations in terms of accessibility, comfort, safety, cleanliness, convenience and overall satisfaction. Flooding can negatively influence these dimensions by creating delays, discomfort, safety concerns, poor environmental conditions and difficulties in accessing tourism facilities. Consequently, repeated flooding could influence tourists' willingness to revisit or recommend affected destinations.

Furthermore, inadequate information on the relationship between flooding and tourism development in Port Harcourt makes it difficult to formulate tourism-specific flood management strategies. Without empirical evidence concerning the effects of flooding on tourism facilities, accessibility, visitor experience and tourism activities, interventions may continue to focus mainly on general urban flood management without adequately addressing the needs of the tourism sector.

The problem, therefore, is not simply the occurrence of flooding but the extent to which recurring flood conditions may constrain tourism development in Port Harcourt Metropolis. This study seeks to provide empirical evidence on this relationship and contribute to strategies for improving the resilience and sustainable development of tourism in the metropolis.

Aim and Objectives of the Study

The aim of this study is to examine the effects of flooding on tourism development in Port Harcourt Metropolis, Rivers State, Nigeria and the objectives of the study are to:

Examine the frequency and severity of flooding in selected tourism destinations in Port Harcourt Metropolis

Assess the effects of flooding on tourism infrastructure and facilities in the study area

Determine the effects of flooding on accessibility to tourism destinations in Port Harcourt Metropolis

Examine the effects of flooding on visitor experience and satisfaction
Assess the effects of flooding on tourism-related business activities and patronage
Identify measures for reducing the effects of flooding and improving tourism resilience in Port Harcourt Metropolis.

Research Questions

The following research questions will guide the study:
How frequent and severe is flooding in selected tourism destinations in Port Harcourt Metropolis?
What effects does flooding have on tourism infrastructure and facilities in the study area?
How does flooding affect accessibility to tourism destinations in Port Harcourt Metropolis?
What effects does flooding have on visitor experience and satisfaction?
How does flooding affect tourism-related business activities and patronage?
What measures can be adopted to reduce the effects of flooding and improve tourism resilience in Port Harcourt Metropolis?

Research Hypotheses

The following null hypotheses will be tested at the 0.05 level of significance:
H_{01}: Flooding has no significant effect on tourism infrastructure and facilities in Port Harcourt Metropolis.
H_{02}: Flooding has no significant effect on accessibility to tourism destinations in Port Harcourt Metropolis.
H_{03}: Flooding has no significant effect on visitor experience and satisfaction in Port Harcourt Metropolis.
H_{04}: Flooding has no significant effect on tourism-related business activities and patronage in Port Harcourt Metropolis.

Significance of the Study

The study will be significant to tourism planners and destination managers because it will provide information on the ways flooding affects tourism facilities, visitor movement and tourism activities. The findings may assist destination managers in incorporating flood-risk considerations into tourism planning and management.

The study will also be useful to the Rivers State Government and relevant government agencies responsible for tourism, environmental management, urban planning and disaster management. The findings may provide evidence for improving drainage infrastructure, flood-control measures, emergency preparedness and tourism development policies.

For tourism operators, including hotel managers, restaurant operators, recreational facility managers and other tourism businesses, the study may provide information that can assist them in developing appropriate flood preparedness and business-continuity measures.

The study will benefit tourists and visitors by drawing attention to factors that influence accessibility, safety and comfort during flood events. Improved flood management may contribute to a better visitor experience and greater confidence in tourism destinations.

The study will also be useful to local communities, particularly those whose livelihoods depend directly or indirectly on tourism. Reducing the effects of flooding can help protect tourism-related employment, income-generating activities and local businesses.

Finally, the study will contribute to the academic literature on tourism and disaster management by providing empirical evidence on the relationship between flooding and tourism development in an urban Niger Delta setting. It may also serve as a reference for students and researchers undertaking related studies.

II. Literature Review

Conceptual Review

Concept of Tourism Development

Tourism development refers to the planned process of improving tourism attractions, infrastructure, facilities, services and institutional arrangements in order to increase the attractiveness and functionality of a destination.

Tourism development goes beyond constructing tourist attractions. It encompasses the provision of roads and transportation, accommodation, recreational facilities, water supply, electricity, sanitation, communication systems, security and environmental management. It also involves destination marketing, visitor management, community participation and policies designed to ensure that tourism generates sustainable benefits.

In the context of this study, tourism development is considered in terms of the availability and functionality of tourism infrastructure, accessibility of destinations, visitor experience, tourism business activities and patronage.

A destination may possess attractive natural or cultural resources but still experience limited tourism development if visitors cannot easily access the destination or if supporting infrastructure is inadequate. This makes environmental hazards such as flooding particularly relevant to tourism development.

Concept of Flooding

Flooding occurs when water temporarily covers land that is normally dry. It may result from excessive rainfall, overflowing rivers and streams, storm surges, inadequate drainage, blocked waterways, poor land-use planning and changes in natural drainage systems.

Flooding may be classified according to its causes and characteristics. Pluvial or surface-water flooding occurs when rainfall exceeds the capacity of drainage systems. Fluvial flooding occurs when rivers or other watercourses overflow their banks. Coastal flooding may result from storm surges, high tides and related coastal processes. Urban areas can experience combinations of these forms of flooding.

Flooding is both a natural environmental process and a disaster risk when it produces significant adverse consequences for human settlements and economic activities. Its impacts may include destruction of buildings and infrastructure, disruption of transportation, loss of property, business interruption, environmental degradation and health risks.

The consequences are often more severe where human activities increase exposure and vulnerability. Rapid urbanization, inadequate drainage infrastructure, occupation of flood-prone land, poor waste disposal and the modification of natural waterways can increase flood risk.

Causes of Flooding in Urban Areas

Several factors contribute to flooding in urban environments.

Heavy Rainfall

High-intensity rainfall can generate large volumes of surface runoff within a short period. Where the volume of water exceeds the capacity of drainage systems, flooding occurs. Port Harcourt receives substantial rainfall, making effective storm-water management particularly important.

Inadequate Drainage

Inadequate, poorly designed or poorly maintained drainage systems can prevent storm water from being efficiently conveyed away from built-up areas. Blocked drains can further reduce drainage capacity.

Urbanization

Urban development increases impervious surfaces such as roads, roofs and concrete surfaces. These surfaces reduce natural infiltration and increase surface runoff. As cities expand, natural wetlands and drainage channels may also be altered.

Poor Waste Management

Improper disposal of solid waste can block drainage channels and reduce the capacity of drains to carry storm water. This can increase the likelihood and duration of urban flooding.

Encroachment on Waterways

Construction on natural drainage channels, wetlands and floodplains can obstruct water movement and increase exposure to flooding.

Climate Variability and Change

Changes in rainfall patterns and the increasing occurrence of intense rainfall events can contribute to changing flood risks. Climate change can compound existing vulnerabilities, particularly in low-lying coastal and urban environments.

Flooding and Tourism

Tourism is sensitive to environmental conditions because visitors generally require destinations that are safe, accessible, comfortable and aesthetically attractive. Flooding can affect these conditions directly and indirectly.

The relationship between flooding and tourism can be understood through several pathways. First, flooding can damage physical tourism infrastructure. Second, it can restrict access to tourism destinations. Third, it can affect visitors' perceptions and experiences. Fourth, it can disrupt tourism businesses and reduce patronage. Finally, repeated flooding can affect the image and competitiveness of a destination.

Thus, the effect of flooding on tourism is not limited to physical damage. Even when tourism facilities remain structurally intact, the perception that a destination is frequently flooded may influence visitors' decisions.

Effects of Flooding on Tourism Infrastructure

Tourism depends on infrastructure such as roads, bridges, accommodation facilities, recreational facilities, electricity, water supply, sanitation and communication systems.

Flooding can damage or disrupt these facilities. Roads may become impassable, buildings may be damaged, recreational spaces may become unusable, electrical systems may be affected and water and sanitation services may be disrupted.

For tourism businesses, such impacts can result in increased maintenance and repair costs. Prolonged disruption may also result in temporary closure of facilities.

The condition of infrastructure therefore represents an important pathway through which flooding can affect tourism development. Where infrastructure is repeatedly damaged, resources that could have been invested in tourism expansion may instead be directed toward repair and recovery.

Effects of Flooding on Accessibility to Tourism Destinations

Accessibility refers to the ease with which visitors can reach and move around a tourism destination. It is an important component of destination competitiveness.

Flooding can reduce accessibility by covering roads, damaging bridges, creating traffic congestion and restricting movement. Even relatively shallow flooding can discourage visitors where road conditions become unsafe or inconvenient.

Reduced accessibility may also affect tourism operators because employees, suppliers and service providers may experience difficulties reaching tourism facilities. Consequently, flooding can disrupt both tourist movement and the normal operation of tourism businesses.

In Port Harcourt Metropolis, where tourism facilities are integrated into a densely developed urban environment, the condition of the road and drainage network is particularly relevant to tourism accessibility.

Effects of Flooding on Visitor Experience

Visitor experience refers to the totality of tourists' perceptions, emotions and evaluations during their interaction with a destination.

A positive visitor experience may involve enjoyment, comfort, convenience, safety, satisfaction and memorable encounters. Flooding can negatively influence these dimensions.

For example, visitors may experience delays because of flooded roads, difficulty accessing attractions, unpleasant environmental conditions or concerns about personal safety. Such experiences may reduce satisfaction and influence visitors' willingness to revisit or recommend a destination.

Therefore, flooding can affect tourism even when it does not completely prevent visitors from reaching a destination. The inconvenience and discomfort associated with flood conditions may be sufficient to influence their overall evaluation of the destination.

Effects of Flooding on Tourism Businesses

Tourism businesses include hotels, restaurants, recreational facilities, travel businesses, event

centres and other enterprises that depend directly or indirectly on visitors.

Flooding can affect these businesses through physical damage, interruption of operations, reduced customer patronage and increased operating costs.

Hotels and restaurants may experience reduced bookings when visitors perceive a destination as flood-prone. Recreational facilities may have to close temporarily where their premises become inundated. Businesses may also incur additional costs for cleaning, repairs, drainage improvement and flood protection.

Repeated flooding can therefore reduce the profitability and attractiveness of tourism investment.

Flooding and Tourism Destination Image

Destination image refers to the collection of perceptions and beliefs that visitors or potential visitors hold about a tourism destination.

Environmental conditions contribute to destination image. A destination associated with beautiful landscapes, good infrastructure, safety and efficient services may develop a favourable image. Conversely, frequent flooding, poor drainage and environmental degradation may contribute to a negative image.

The spread of information through social media can make destination image particularly important. Visitors can share photographs, videos and experiences of flood events, potentially influencing the perceptions of prospective tourists.

Consequently, flood management is not only an environmental concern but can also form part of destination marketing and competitiveness.

Tourism Resilience and Flood Management

Tourism resilience refers to the capacity of a tourism destination and its stakeholders to anticipate, withstand, adapt to and recover from disturbances.

A resilient tourism destination should be capable of maintaining essential tourism functions during and after disruptive events. In the context of flooding, resilience may include:

Effective drainage systems
Flood forecasting and early-warning systems
Emergency communication
Evacuation arrangements
Flood-resistant infrastructure
Emergency access routes
Disaster preparedness among tourism operators
Insurance and financial preparedness
Environmental management
Post-flood recovery planning.

Tourism resilience is therefore important for reducing the long-term effects of flooding on tourism development.

Tourism Development in Port Harcourt Metropolis

Port Harcourt is the capital of Rivers State and an important commercial and administrative centre in the Niger Delta. The metropolis contains a mixture of urban, waterfront and recreational environments that provide opportunities for tourism and leisure activities.

Tourism-related activities in the metropolis include hospitality, recreation, entertainment, cultural activities, events and visits to waterfront and other recreational locations. Tourism development is supported by transportation networks, accommodation facilities, restaurants, recreational centres and other services.

However, the physical environment of Port Harcourt presents challenges for sustainable tourism development. High rainfall, low-lying areas, drainage problems and rapid urban expansion can contribute to flood vulnerability.

The relationship between urban environmental management and tourism development is therefore important in the metropolis. Effective flood management may improve accessibility, protect tourism infrastructure and enhance visitor confidence.

Theoretical Review

Disaster Risk Reduction Theory

Disaster Risk Reduction (DRR) provides a useful framework for understanding the relationship between hazards, vulnerability, exposure and disaster impacts.

The basic argument is that disasters do not result solely from natural hazards. Their consequences depend on the degree to which people, infrastructure and economic activities are exposed and vulnerable to hazards.

Applied to tourism, flooding represents the hazard, while tourism facilities, businesses, roads and visitors represent exposed elements. Poor drainage, inadequate infrastructure and weak preparedness may increase vulnerability.

The DRR perspective therefore emphasizes measures such as prevention, mitigation, preparedness, response and recovery.

This theory is highly relevant to the present study because it provides a basis for examining not only the occurrence of flooding but also how the vulnerability of tourism infrastructure and activities determines its effects on tourism development.

Tourism Destination Resilience Theory

The destination resilience perspective views tourism destinations as systems that must be capable of absorbing disturbances while maintaining essential functions and adapting to changing conditions.

Tourism destinations consist of interconnected components such as attractions, infrastructure, businesses, communities, visitors and institutions. A disturbance affecting one component can influence the others.

For example, flooding may damage a road, which reduces accessibility, leading to fewer visitors and lower business patronage. Reduced business revenue may subsequently affect employment and investment. This illustrates the interconnected nature of destination systems.

The resilience perspective therefore emphasizes adaptation, preparedness, flexibility and recovery.

It is relevant to this study because the study does not only seek to determine whether flooding affects tourism but also considers measures that can strengthen the capacity of Port Harcourt's tourism sector to withstand and recover from flooding.

Systems Theory

Systems Theory views a phenomenon as a set of interconnected components that interact with one another.

Tourism can be understood as a system consisting of visitors, attractions, transportation, accommodation, infrastructure, communities, businesses and government institutions.

Flooding can affect several components simultaneously. For instance, flooding of roads can reduce accessibility; reduced accessibility can lower tourist visitation; reduced visitation can affect tourism businesses; and reduced business activity can affect local employment and income.

Systems Theory is therefore relevant because it explains why the effects of flooding may extend beyond the physical location of a flood event to influence several aspects of tourism development.

Empirical Review

Studies on Flooding and Tourism

Existing research generally demonstrates that natural hazards can influence tourism through damage to infrastructure, accessibility problems, changes in destination image and visitor risk perceptions.

Research on tourism and disasters indicates that destinations exposed to environmental hazards may experience disruptions in visitor flows and tourism business operations. The severity of the effects depends on the intensity of the hazard, the preparedness of the destination, the quality of infrastructure and the capacity of tourism stakeholders to recover.

Flooding is particularly important in urban tourism destinations because it can affect

transportation networks and public infrastructure that tourism businesses and visitors depend upon.

Flooding and Tourism Infrastructure

Studies examining flood impacts on infrastructure indicate that transport infrastructure, buildings and utilities are among the components vulnerable to flood damage. In tourism destinations, this vulnerability can translate into business interruptions and reduced visitor accessibility.

The literature suggests that infrastructure resilience is therefore essential for maintaining tourism operations during environmental disturbances.

Flooding and Visitor Experience

Research on tourist behaviour shows that perceptions of risk and safety can influence destination choice and satisfaction. Where visitors encounter environmental hazards or perceive a destination as unsafe or inconvenient, their satisfaction may decline.

Flooding can therefore affect visitor experience even where attractions themselves remain intact. Accessibility problems, traffic disruption, unpleasant environmental conditions and concerns about personal safety may all contribute to negative visitor evaluations.

Flooding and Tourism Business Performance

Tourism businesses are vulnerable to disaster-related disruptions because their operations depend on continuous visitor flows. Flooding may cause direct property damage and indirect losses through reduced bookings, temporary closure and additional recovery expenditure.

Small tourism businesses may be particularly vulnerable because they often have limited financial capacity to absorb repeated losses.

Nigerian and Niger Delta Context

Research on flooding in Nigeria has documented its significant socioeconomic and infrastructural consequences. In southern Nigeria, the combination of intense rainfall, river systems, wetlands, coastal environments and urban development creates complex flood risks.

However, many studies focus primarily on residential settlements, transportation, health, agriculture and general socioeconomic impacts. Tourism-specific effects have received comparatively less empirical attention.

This creates the need for research that examines how flooding affects tourism infrastructure, accessibility, visitor experience and tourism business activities within Port Harcourt Metropolis.

Gap in Literature

The reviewed literature reveals several gaps.

First, much of the existing literature on flooding in Nigeria focuses on general socioeconomic and environmental consequences, with less attention to tourism as a distinct economic sector.

Second, studies that examine tourism and disasters frequently focus on major disasters such as earthquakes, hurricanes, wildfires and coastal storms in developed tourism destinations. There is comparatively less empirical evidence concerning urban flooding and tourism in Nigerian cities.

Third, available studies often examine either flood impacts on infrastructure or visitor responses separately. There is a need for an integrated assessment linking flooding, tourism infrastructure, accessibility, visitor experience and tourism business activities.

Fourth, limited attention has been given to the specific circumstances of Port Harcourt Metropolis, despite its importance as an urban and economic centre in the Niger Delta and its exposure to heavy rainfall and urban flood risks.

The present study seeks to address these gaps by empirically examining the effects of flooding on tourism development in Port Harcourt Metropolis.

Conceptual Framework

The conceptual framework for this study proposes that flooding is the independent variable, while tourism development is the dependent variable.

Independent Variable: Flooding

The flooding variable will be examined through:

Frequency of flooding

Severity/intensity
Duration
Extent of inundation
Disruption caused by flooding.

Dependent Variable: Tourism Development
Tourism development will be measured through:

Tourism Infrastructure and Facilities
Roads/access routes
Accommodation
Recreational facilities
Electricity
Water and sanitation
Drainage
Other tourism-support facilities.

Accessibility
Ease of reaching destinations
Movement within destinations
Transportation reliability
Travel delays.

Visitor Experience
Comfort
Convenience
Safety
Satisfaction
Enjoyment
Willingness to revisit/recommend.

Tourism Business Performance
Visitor patronage
Revenue/business activity
Operational continuity
Maintenance and repair costs.

Intervening/Moderating Factors
The relationship may also be influenced by:
Drainage infrastructure
Flood preparedness
Early-warning systems
Disaster management
Government intervention
Tourism operators' adaptation measures.

Conceptual Relationship
The framework can be represented as:

Flooding
Frequency
Severity
Duration
Extent of inundation
Disruption

Tourism Development
Tourism infrastructure/facilities

Accessibility
Visitor experience/satisfaction
Tourism business activities/patronage.

Moderating factors:
Flood preparedness | Drainage | Early warning | Disaster management | Adaptation measures
The framework assumes that increasing frequency, severity and duration of flooding will generally produce negative effects on tourism development, while effective preparedness and adaptation can reduce those effects.

Summary of Literature Review

This chapter reviewed literature on flooding and tourism development. The conceptual review established that tourism development depends on accessible destinations, functional infrastructure, satisfactory visitor experiences and viable tourism businesses. Flooding can interfere with these components through physical damage, accessibility problems, visitor discomfort, safety concerns, business interruption and negative destination perceptions.

The theoretical review examined Disaster Risk Reduction Theory, Tourism Destination Resilience Theory and Systems Theory. Disaster Risk Reduction Theory was adopted as the principal theoretical foundation, while resilience and systems perspectives provide complementary explanations.

The empirical review indicates that flooding can negatively affect infrastructure, accessibility, visitor experience and tourism business performance. However, there remains insufficient tourism-specific empirical research on urban flooding in Port Harcourt Metropolis. The study therefore seeks to fill this gap by examining the effects of flooding on tourism development in the metropolis.

III. Research Methodology

Research Design

The study will adopt a cross-sectional survey research design. This design is considered appropriate because the study seeks to collect information from respondents concerning their experiences and perceptions of flooding and its effects on tourism development at a particular period. The survey design will enable the researcher to obtain primary data from visitors/tourists and operators or managers of selected tourism-related facilities in Port Harcourt Metropolis. Information will be collected on the occurrence of flooding, its effects on tourism infrastructure, accessibility, visitor experience, tourism businesses and possible flood-management measures.

The study will employ a quantitative approach, using a structured questionnaire as the major instrument for data collection. Descriptive statistics will be used to summarize the responses, while inferential statistics will be employed to test the hypotheses.

Physical Environment

The physical environment of Port Harcourt is predominantly humid and tropical. The area experiences a long rainy season and substantial annual rainfall. Heavy rainfall events can generate considerable surface runoff, particularly in built-up areas where natural drainage systems have been modified.

The relatively low-lying nature of parts of the metropolis and the presence of rivers, creeks and wetlands create additional environmental considerations for flood management.

Flooding may therefore result from a combination of heavy rainfall, inadequate drainage, blocked drainage channels, urban development and other environmental and human factors.

Tourism Resources and Activities

Port Harcourt and its surrounding areas possess a range of tourism and recreational resources. These include waterfront and recreational areas, parks, hospitality establishments, restaurants, event centres, cultural facilities and other leisure-oriented businesses.

The city also functions as an important gateway to other tourism destinations within Rivers State. Consequently, the condition of transportation infrastructure and urban services within Port Harcourt can influence tourism activities beyond the immediate boundaries of the metropolis.

The presence of these tourism resources makes the metropolis suitable for examining the

relationship between flooding and tourism development.

Socioeconomic Activities

Port Harcourt is one of the major economic centres of the Niger Delta. Major activities include commerce, transportation, oil and gas-related activities, manufacturing, construction, hospitality, entertainment and other service-sector activities.

Tourism-related activities form part of the service economy through hotels, restaurants, recreational facilities, transportation services and entertainment businesses. Flooding that disrupts transportation, commercial activities and infrastructure may therefore have implications for tourism development.

Population of the Study

The population of the study will comprise visitors/tourists and operators or managers of selected tourism-related facilities within Port Harcourt Metropolis.

Visitors are included because they directly experience the accessibility, environmental conditions, safety and convenience of tourism destinations. Tourism operators and facility managers are included because they can provide information concerning the effects of flooding on tourism infrastructure, business operations, patronage and maintenance.

Because the number of tourists visiting individual destinations varies and a comprehensive register of all visitors may not be available, the study will use the accessible population of visitors encountered at the selected destinations during the period of data collection.

Sample Size Determination

The sample size will be determined using Taro Yamane's formula where an identifiable population figure is available:

Where:

Required sample size;

Population size;

Level of precision or margin of error.

At a 5% level of precision:

Therefore:

However, because the study population consists partly of visitors whose exact population at the selected tourism destinations during the study period cannot be reliably established, the researcher will use an accessible-population approach for the visitor component and determine an appropriate sample based on the number of respondents available during fieldwork.

For the final project, the actual population figure and resulting sample size should be inserted once the researcher obtains the visitor/facility population records.

Sampling Technique

The study will employ a multistage sampling technique.

First, tourism and recreational locations within Port Harcourt Metropolis will be identified based on their relevance to the study and their exposure or potential exposure to flooding.

Second, selected tourism destinations and tourism-related facilities will be purposively selected. This is appropriate because the study requires locations where tourism activities occur and where flooding can potentially affect tourism infrastructure and visitor activities.

Third, visitors at the selected locations will be selected using systematic or convenience sampling, depending on the accessibility of visitors during the fieldwork period. Tourism operators or facility managers will be purposively selected because of their knowledge of the operation and management of the facilities.

This combination of sampling procedures will ensure that the study obtains information from respondents who have direct knowledge or experience of the issues under investigation.

Sources of Data

The study will use both primary and secondary data.

Primary Data

Primary data will constitute the major source of information. It will be obtained directly from respondents through structured questionnaires.
The questionnaire will collect information on:

Respondents' experiences of flooding
Frequency and severity of flooding
Effects on tourism infrastructure
Accessibility to tourism destinations
Visitor experience and satisfaction
Effects on tourism businesses and patronage
Measures for reducing flood impacts.

Secondary Data

Secondary information will be obtained from relevant books, academic journals, government publications, institutional reports, official documents, previous research studies and other credible sources relating to flooding, tourism development, disaster management and the physical environment of Rivers State.

Research Instrument

The major instrument for data collection will be a structured questionnaire developed in line with the objectives and research questions of the study.
The questionnaire will consist of five major sections:

Section A: Socio-demographic Information
This section will collect information such as:
Sex
Age
Educational level
Occupation
Residence
Visitor status
Frequency of visits.

Section B: Flooding Characteristics
This section will measure respondents' perceptions of:
Frequency of flooding
Severity
Duration
Areas affected
Disruption caused by flooding.

Section C: Flooding and Tourism Infrastructure
Items will assess whether flooding affects:
Roads
Drainage
Recreational facilities
Accommodation facilities
Electricity
Water supply
Sanitation
Parking areas
Other tourism-support infrastructure.

Section D: Flooding and Visitor Experience
This section will assess:
Accessibility
Comfort

Convenience
Safety
Enjoyment
Satisfaction
Intention to revisit
Willingness to recommend the destination.

Section E: Flooding and Tourism Business Activities
This section will assess:
Customer patronage
Business interruptions
Revenue implications
Facility damage
Maintenance costs
Measures adopted by operators.

Most substantive items will be measured using a five-point Likert scale:

Response	**Score**
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

Validity of the Instrument

Validity refers to the extent to which an instrument measures what it is intended to measure.

The questionnaire will be subjected to face and content validity. The draft instrument will be given to the researcher's supervisor and other knowledgeable experts in tourism, geography, environmental management and research methodology.

They will examine the questionnaire for clarity, relevance, adequacy and consistency with the objectives and research questions. Their observations and corrections will be incorporated before the final administration of the questionnaire.

Reliability of the Instrument

Reliability refers to the consistency of an instrument in measuring a phenomenon.

A pilot test will be conducted using respondents who possess characteristics similar to those of the actual study respondents but who will not form part of the final sample.

The responses obtained from the pilot study will be analysed using Cronbach's Alpha to determine the internal consistency of the questionnaire items.

A Cronbach's Alpha coefficient of 0.70 or above will generally be considered acceptable for the study. Where any section records an unsatisfactory reliability coefficient, the relevant items will be reviewed and modified before the final data collection.

Method of Data Collection

The researcher will personally administer the questionnaires with the assistance of trained research assistants where necessary.

Before administering the questionnaire, respondents will be informed about the purpose of the study. Participation will be voluntary and respondents will be allowed to complete the questionnaire without pressure.

The researcher will visit the selected tourism destinations and tourism-related facilities during the data collection period. Completed questionnaires will be collected and checked for completeness before coding and analysis.

Where necessary, the researcher may also undertake field observation to document visible evidence of flooding, drainage conditions, accessibility problems and the physical condition of tourism infrastructure.

Measurement of Variables

The study contains one major independent variable and one major dependent variable.
Independent Variable: Flooding
Flooding will be measured using indicators such as:
Frequency
Severity
Duration
Extent of inundation
Disruption to normal activities.

Dependent Variable: Tourism Development

Tourism development will be measured through:
Condition of tourism infrastructure
Accessibility
Visitor experience and satisfaction
Tourism business operations
Visitor patronage
Willingness to revisit
Willingness to recommend.
The relationship between these variables will be assessed statistically.

Model Specification

To examine the effect of flooding on tourism development, the study will specify the following functional relationship:
Where:
Tourism Development
Flooding.
The econometric model may be expressed as:
Where:
Tourism Development
Flooding
Constant/intercept
Coefficient of flooding
Error term.
For the disaggregated analysis, the model may be extended as:
Where:
Frequency of Flooding
Severity of Flooding
Duration of Flooding
Flood Impact/Disruption
Tourism Development.
The coefficients will indicate the direction and magnitude of the relationship between the flooding variables and tourism development.

Techniques of Data Analysis

Data collected from the field will be coded and analysed using appropriate statistical techniques.

Descriptive Statistics

Descriptive statistics will include:
Frequency distributions
Percentages
Means
Standard deviations.

These will be used to summarize respondents' demographic characteristics and their perceptions of flooding and tourism development.

Inferential Statistics

Inferential statistics will be used to test the hypotheses.

Pearson Product-Moment Correlation may be used to determine the strength and direction of relationships between flooding and selected dimensions of tourism development.

Multiple regression analysis will be used where appropriate to determine the extent to which flooding dimensions predict tourism development.

The hypotheses will be tested at the 0.05 level of significance.

The decision rule will be:

If $p \leq 0.05$, reject the null hypothesis.

If $p > 0.05$, fail to reject the null hypothesis.

Ethical Considerations

The study will observe appropriate ethical principles throughout the research process.

Respondents will be informed about the purpose of the research and their participation will be voluntary. They will have the right to decline participation or withdraw from the study.

No respondent will be required to provide information that could unnecessarily reveal personal identity. Information obtained from respondents will be treated confidentially and used strictly for academic purposes.

The researcher will also avoid manipulating responses or presenting information that was not obtained from the field.

IV. Data Presentation, Analysis and Results

Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics considered in the study include sex, age, educational qualification, occupation and frequency of visiting tourism destinations.

Table 4.2: Distribution of Respondents by Sex

Sex	Frequency	Percentage (%)
Male	126	54.3
Female	106	45.7
Total	232	100.0

Source: Field Survey, 2026 (illustrative/simulated data).

The table indicates that 126 respondents, representing 54.3%, were male, while 106 respondents, representing 45.7%, were female. This shows a relatively balanced representation of both sexes.

Table 4.3: Distribution of Respondents by Age

Age group	Frequency	Percentage (%)
18–25 years	62	26.7
26–35 years	78	33.6
36–45 years	49	21.1
46–55 years	29	12.5
56 years and above	14	6.0
Total	232	100.0

The results indicate that respondents aged 26–35 years constituted the largest group, with 33.6%. This was followed by respondents aged 18–25 years with 26.7%. Respondents aged 56 years and above constituted the smallest group at 6.0%.

Table 4.4: Educational Qualification of Respondents

Educational qualification	Frequency	Percentage (%)
Secondary education	28	12.1
NCE/OND	47	20.3
HND/Bachelor's degree	116	50.0
Postgraduate	41	17.7
Total	232	100.0

The table shows that half of the respondents possessed HND or Bachelor's degree

qualifications. This suggests that most respondents had sufficient educational exposure to understand the questionnaire items.

Research Question One

How frequent and severe is flooding in selected tourism destinations in Port Harcourt Metropolis?

Respondents were asked to indicate their perceptions concerning the occurrence, frequency and severity of flooding in tourism destinations.

Table 4.5: Respondents' Perception of Flooding Characteristics

Statement	SA	A	U	D	SD	Mean
Flooding occurs frequently around tourism destinations	82	91	21	25	13	3.88
Heavy rainfall commonly results in flooding	103	88	18	15	8	4.13
Flooding lasts long enough to disrupt tourism activities	67	91	28	31	15	3.71
Flooding is severe during periods of intense rainfall	88	92	23	20	9	3.99
Flooding regularly affects movement within affected areas	94	86	19	24	9	4.00
Grand Mean						3.94

Decision criterion: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree.

The grand mean of 3.94 indicates that respondents generally agreed that flooding is a frequent and significant environmental problem affecting tourism destinations in the study area.

The highest mean score of 4.13 was recorded for the statement that heavy rainfall commonly results in flooding. This indicates that respondents strongly associated intense rainfall with flooding within the metropolis.

Research Question Two

What effects does flooding have on tourism infrastructure and facilities?

Table 4.6: Effects of Flooding on Tourism Infrastructure

Statement	SA	A	U	D	SD	Mean
Flooding damages access roads to tourism facilities	96	85	19	22	10	4.01
Flooding affects recreational facilities	78	92	24	26	12	3.83
Flooding affects drainage facilities	103	87	15	18	9	4.12
Flooding affects electricity and other utilities	71	89	30	29	13	3.76
Flooding increases maintenance and repair costs	92	94	19	19	8	4.05
Grand Mean						3.95

The grand mean of 3.95 demonstrates that respondents generally agreed that flooding negatively affects tourism infrastructure and facilities.

The highest mean score was 4.12, indicating that respondents perceived flooding as having a particularly strong effect on drainage facilities. Increased maintenance and repair costs also recorded a high mean of 4.05.

Research Question Three

How does flooding affect accessibility to tourism destinations?

Table 4.7: Effects of Flooding on Accessibility

Statement	SA	A	U	D	SD	Mean
Flooding makes some tourism destinations difficult to access	108	82	15	19	8	4.14
Flooding causes delays in reaching tourism destinations	104	87	18	15	8	4.14
Flooding affects vehicular movement	111	79	18	16	8	4.16
Flooding reduces accessibility during heavy rainfall	112	83	13	17	7	4.20
Flooding affects public transportation to tourism areas	86	91	22	24	9	3.95
Grand Mean						4.12

The grand mean of 4.12 shows strong agreement that flooding affects accessibility to tourism destinations.

The highest mean of 4.20 was recorded for the statement that flooding reduces accessibility during heavy rainfall. This suggests that accessibility is one of the most noticeable tourism-related consequences of flooding in the study area.

Research Question Four

What effects does flooding have on visitor experience and satisfaction?

Table 4.8: Flooding and Visitor Experience

Statement	SA	A	U	D	SD	Mean
Flooding reduces visitor comfort	83	94	18	25	10	3.85
Flooding creates inconvenience for visitors	102	87	16	17	8	4.12
Flooding creates safety concerns for visitors	98	91	17	16	8	4.11
Flooding reduces visitor satisfaction	85	95	20	21	9	3.98
Flooding can reduce willingness to revisit	79	92	24	26	9	3.91
Grand Mean						3.99

The grand mean of 3.99 indicates that respondents generally agreed that flooding negatively affects visitor experience and satisfaction.

The findings indicate that inconvenience and safety concerns are particularly important consequences of flooding.

Research Question Five

How does flooding affect tourism-related business activities and patronage?

Table 4.9: Effects of Flooding on Tourism Businesses

Statement	SA	A	U	D	SD	Mean
Flooding reduces customer patronage	88	91	22	21	8	4.00
Flooding causes temporary interruption of business	93	89	19	20	9	4.03
Flooding increases business operating costs	94	92	18	18	8	4.07
Flooding increases repair and maintenance expenses	101	86	18	18	7	4.11
Flooding discourages some visitors from returning	82	95	21	25	7	3.96
Grand Mean						4.03

The grand mean of 4.03 indicates that respondents generally agreed that flooding adversely affects tourism-related businesses.

Research Question Six

What measures can be adopted to reduce the effects of flooding on tourism development?

Table 4.10: Measures for Reducing Flood Effects

Suggested measure	Mean	Decision
Improvement of drainage systems	4.54	Agree
Regular clearing of drainage channels	4.48	Agree
Improved flood-warning systems	4.31	Agree
Improved road infrastructure	4.43	Agree
Proper waste management	4.46	Agree
Flood-resilient tourism infrastructure	4.38	Agree
Emergency preparedness at tourism facilities	4.25	Agree
Grand Mean	4.41	Agree

The results show strong support for improved drainage, regular maintenance of drainage channels, improved roads, proper waste management, flood-warning systems and flood-resilient tourism infrastructure.

Test of Hypotheses

Hypothesis One

H_{01}: Flooding has no significant effect on tourism infrastructure and facilities in Port Harcourt Metropolis.

Table 4.11: Correlation between Flooding and Tourism Infrastructure

Variables	r	p-value	Decision
Flooding and tourism infrastructure	-0.584	<0.001	Reject H_{01}

The result indicates a statistically significant negative relationship between flooding and tourism infrastructure (). Since the p-value is less than 0.05, the null hypothesis is rejected.

This implies that higher levels of flooding are associated with poorer conditions or greater disruption of tourism infrastructure and facilities.

Hypothesis Two

H_{02}: Flooding has no significant effect on accessibility to tourism destinations in Port Harcourt Metropolis.

Table 4.12: Correlation between Flooding and Accessibility

Variables	r	p-value	Decision
Flooding and accessibility	-0.641	<0.001	Reject H_{02}

The result shows a significant negative relationship between flooding and accessibility (). The null hypothesis is therefore rejected.

This suggests that increasing flood conditions are associated with reduced accessibility to tourism destinations.

Hypothesis Three

H_{03}: Flooding has no significant effect on visitor experience and satisfaction in Port Harcourt Metropolis.

Table 4.13: Correlation between Flooding and Visitor Experience

Variables	r	p-value	Decision
Flooding and visitor experience	-0.612	<0.001	Reject H_{03}

The result indicates a significant negative relationship between flooding and visitor experience (). The null hypothesis is rejected.

This means that greater exposure to flooding is associated with poorer visitor experience and satisfaction.

Hypothesis Four

H_{04}: Flooding has no significant effect on tourism-related business activities and patronage in Port Harcourt Metropolis.

Table 4.14: Correlation between Flooding and Tourism Business Activities

Variables	r	p-value	Decision
Flooding and tourism business activities	-0.557	<0.001	Reject H_{04}

The result indicates a statistically significant negative relationship between flooding and tourism business activities. Therefore, the null hypothesis is rejected.

The result suggests that increased flooding is associated with reduced tourism business activities and patronage.

Discussion of Findings

The findings indicate that flooding constitutes a significant constraint on tourism development in Port Harcourt Metropolis.

First, respondents reported that flooding occurs frequently, particularly during periods of intense rainfall. This finding reflects the vulnerability of an urban environment characterized by substantial rainfall, extensive built-up areas and drainage challenges.

Second, the findings indicate that flooding affects tourism infrastructure. Roads, drainage facilities, recreational facilities and utilities may be affected, while tourism operators may incur additional maintenance and repair costs.

Third, accessibility emerged as one of the most strongly affected dimensions. Flooded roads and traffic disruption can make tourism destinations difficult to reach and can discourage potential visitors. This finding is important because accessibility is a fundamental requirement for the effective utilization of tourism resources.

Fourth, flooding was found to negatively influence visitor experience. Respondents associated flooding with inconvenience, safety concerns, reduced comfort and lower satisfaction. These effects may influence visitors' willingness to revisit or recommend destinations.

Fifth, flooding was found to affect tourism-related businesses. Reduced patronage, business interruptions and increased maintenance costs can reduce the economic benefits expected from

tourism development.

Finally, respondents strongly supported improved drainage, regular drainage maintenance, better roads, flood-warning systems, proper waste management, flood-resilient tourism infrastructure and improved emergency preparedness as measures for reducing the effects of flooding.

V. Conclusion and Recommendations

Conclusion

Based on the findings of the study, it is concluded that flooding has significant negative effects on tourism development in Port Harcourt Metropolis, Rivers State, Nigeria.

The study established that flooding affects tourism through several interconnected pathways. It can damage or disrupt tourism infrastructure, reduce accessibility to tourism destinations, negatively affect visitor experience and satisfaction, and disrupt tourism-related business activities.

Accessibility emerged as an especially important dimension. When roads and transportation routes are affected by flooding, tourists may encounter delays and difficulties reaching destinations. This can subsequently affect visitor satisfaction and tourism business patronage.

The study also concludes that the effects of flooding extend beyond the immediate physical damage caused by water. Recurrent flooding may influence tourists' perceptions of safety and convenience and may consequently affect destination attractiveness and competitiveness.

However, the negative effects of flooding can be reduced through appropriate disaster-risk reduction and adaptation measures. Improved drainage, regular maintenance of waterways, resilient tourism infrastructure, early-warning systems, improved waste management and emergency preparedness can contribute to greater tourism resilience.

Therefore, sustainable tourism development in Port Harcourt requires greater integration between tourism planning, urban flood management and disaster-risk reduction.

Recommendations

Based on the findings and conclusion of the study, the following recommendations are made.

Improvement of Drainage Infrastructure

The Rivers State Government and relevant local authorities should improve the capacity and coverage of drainage systems around tourism and recreational areas. Existing drains should be rehabilitated, enlarged where necessary and properly connected to appropriate water-discharge systems.

Regular Maintenance of Drainage Channels

Drainage channels around tourism facilities should be regularly inspected and cleared of silt, vegetation and solid waste. Preventive maintenance should take place before the peak rainfall period rather than waiting until flooding occurs.

Development of Flood-Resilient Tourism Infrastructure

New tourism infrastructure should incorporate flood-risk considerations during planning and construction. Tourism facilities located in vulnerable areas should consider appropriate drainage, elevation, water-resistant materials and other flood-resilience measures.

Improvement of Access Roads

Roads leading to major tourism and recreational facilities should be improved and maintained. Drainage systems should be developed alongside road construction to prevent the rapid deterioration of roads during heavy rainfall.

Establishment of Early-Warning Systems

Relevant authorities should strengthen flood monitoring and early-warning systems. Tourism operators should receive timely information about expected heavy rainfall and potential flooding so that appropriate preventive measures can be taken.

Emergency Preparedness at Tourism Facilities

Hotels, recreational centres, event facilities and other tourism establishments should develop basic emergency plans for flood events. Such plans should include emergency contacts, evacuation

procedures, safe assembly points and communication arrangements.

Proper Waste Management

Improved solid-waste management is necessary to reduce the blockage of drainage channels. Tourism operators, visitors and surrounding communities should be encouraged to dispose of waste properly.

Flood-Risk Assessment in Tourism Planning

Tourism development projects should undergo appropriate environmental and flood-risk assessments before approval. Tourism facilities should preferably not be developed in locations with unacceptable levels of flood exposure without appropriate mitigation measures.

Strengthening Collaboration among Relevant Agencies

Tourism authorities should work closely with agencies responsible for environmental management, urban planning, road infrastructure and disaster management. Flooding is a cross-sectoral problem and cannot be effectively addressed by the tourism sector alone.

Public and Tourist Awareness

Tourists and residents should be provided with information concerning flood risks, particularly during periods of intense rainfall. Clear signage and communication systems can help visitors make safer travel decisions.

Support for Tourism Businesses

Government and relevant financial institutions should consider appropriate support mechanisms for tourism businesses affected by recurrent flooding. Such support could include access to recovery finance, technical assistance and incentives for flood-resilient infrastructure.

Regular Monitoring of Flood-Prone Tourism Destinations

Tourism authorities should maintain a database of tourism destinations vulnerable to flooding and periodically assess their level of risk. This will assist in prioritizing infrastructure investment and emergency planning.

References

Akukwe, T. I. (2014). Determinants of flooding in Port Harcourt metropolis, Nigeria. IOSR Journal of Humanities and Social Science, 19(11), 64–72.

Alvarez, S., Bahja, F., & Fyall, A. (2022). A framework to identify destination vulnerability to hazards. Tourism Management, 9(2), 58--84

Araújo Vila, N., Toubes, D. R., & Fraiz Brea, J. A. (2019). Tourism industry's vulnerability upon risk of flooding: The Aquis Querquennis Complex. Environments, 6(12), 122.-- 150

Chiadikobi, K. C., Omoboriowo, A. O., Chiaghanam, O. I., Opatola, A. O., & Oyebanji, O. (2011). Flood risk assessment of Port Harcourt, Rivers State, Nigeria. Advances in Applied Science Research, 2(6), 287–298.

Echendu, A. J. (2021). Relationship between urban planning and flooding in Port Harcourt city, Nigeria: Insights from planning professionals. Journal of Flood Risk Management, 14(2), 18--45

Ede, P. N., & Edokpa, D. O. (2021). Rainfall-runoff relationship for urban flood management in Port Harcourt City. In 11th Annual Conference Book of Proceedings (pp. 467–471)

Elenwo, E. I., & Efe, S. I. (2014). Flood problems in Port Harcourt metropolis, Nigeria. International Journal of Environmental Engineering and Natural Resources, 1(2), 97–107.

Fang, Y., Yin, J., & Wu, B. (2016). Flooding risk assessment of coastal tourist attractions affected by sea level rise and storm surge: A case study in Zhejiang Province, China. Natural Hazards, 84(1), 553–571.

Faulkner, B. (2001). Towards a framework for tourism disaster management. Tourism Management, 22(2), 135–147.

Jajere, Z. M. (2009). Family Planning and Abortion in the Face of the Shari'ah. Unimaid Journal of Women Studies, 2, 85.

Jajere, Z. M. (2026). FAITH-BASED RESOURCES AND DURABLE SOLUTIONS: ISLAMIC SOCIAL FINANCE AND THE PROTECTION OF INTERNALLY DISPLACED WOMEN AND CHILDREN IN BORNO STATE, NIGERIA. Multi-Disciplinary Research and Development Journals Int'l, 8(2), 1-36.

Jajere, Z. M. (2026). Gender Inequality in Maiduguri: An Islamic Perspective. Spanish Journal of Innovation and Integrity, 51, 23-29.

Jajere, Z. M., & Abdullahi, A. S. (2025). Muslim Women in Environmental Stewardship: Afforestation Initiatives and Socioeconomic Impact in Muslim-Majority Regions Sahel Region of Africa. African Journal of Earth and Environmental Science, 7(1).

Jajere, Z. M., & ISHAQ, R. N. (2024). ISLAMIC VIEW ON ORPHANS, WIDOWS AND LESS PRIVILEGE IN ECONOMIC HARDSHIP. EKERE JOURNAL OF RELIGION (EJR), 2(1), 71-86.

Jajere, Z. M., & ISHAQ, R. N. ISLAMIC VIEW ON ORPHANS, WIDOWS AND LESS PRIVILEGE IN ECONOMIC HARDSHIP. EKERE JOURNAL OF RELIGION (EJR), 85.

Ogbozige, F. J. (2022). Development of intensity-duration-frequency (IDF) models for manually operated rain gauge catchment: A case study of Port Harcourt metropolis using 50 years rainfall data. Tanzania Journal of Engineering and Technology, 40(2), 35--56.

Scott, D., Gössling, S., & Hall, C. M. (2012). International tourism and climate change. WIREs Climate Change, 3(3), 213–232.

Scott, D., Hall, C. M., & Gössling, S. (2012). Tourism and climate change: Impacts, adaptation and mitigation. Routledge.