Assessment of Governmental and Non-Governmental Policies on Flood Disaster Management in the Federal Capital Territory Abuja, Nigeria

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DOI: https://doi.org/10.47772/IJRISS.2026.1014MG0111

Received: 05 May 2026; Accepted: 11 May 2026; Published: 01 June 2026

ABSTRACT

Flood disasters have increasingly become a major environmental and socio-economic challenge in the Federal Capital Territory (FCT) Abuja, Nigeria, resulting in loss of lives, displacement of residents, destruction of infrastructure, and disruption of economic activities. This study examined governmental and non-governmental policies on flood disaster management in the FCT Abuja with the aim of assessing institutional interventions, spatial flood vulnerability, and factors influencing flood risks within the study area. The study adopted a mixed-method research design involving questionnaire administration, field observations, institutional assessment, and Geographic Information System (GIS)-based spatial analysis. A total of 286 respondents were sampled from selected flood-prone communities across the FCT. Data obtained were analyzed using descriptive statistics, mean ranking, and spatial vulnerability mapping techniques. The findings revealed that governmental flood disaster management policies are primarily implemented through the National Emergency Management Agency (NEMA) and the Federal Capital Territory Emergency Management Agency (FEMA), with interventions focused mainly on emergency response, evacuation, relief distribution, and early warning dissemination. However, the effectiveness of these policies is hindered by inadequate funding, weak enforcement of land use regulations, poor urban planning practices, and limited institutional capacity. The study also found that non-governmental organizations, particularly the Nigerian Red Cross Society, play significant complementary roles through community sensitization, disaster preparedness training, humanitarian assistance, and resilience-building initiatives at the grassroots level. The study concludes that flood disaster management efforts in the FCT Abuja remain largely reactive rather than preventive. It recommends improved institutional coordination, stricter enforcement of environmental regulations, sustainable urban planning, enhanced community participation, and greater investment in long-term flood mitigation and preparedness strategies to reduce future flood risks.

Keywords: Flood disaster management, governmental policies, non-governmental organizations, flood vulnerability, GIS, Abuja, Nigeria.

INTRODUCTION

Flood disasters remain among the most devastating natural hazards globally, causing extensive human, economic, environmental, and infrastructural losses. They are regarded as the most frequent and deadliest weather-related natural disasters worldwide, and their occurrence has increased considerably in recent decades due to climate change, rapid urbanization, environmental degradation, and other anthropogenic activities (IPCC, 2012; Kundzewicz et al., 2014). Beyond the immediate destruction of lives and properties, floods disrupt transportation systems, interrupt commercial activities, damage critical infrastructure, and weaken socio-economic development. Flash floods, which account for nearly 85% of flooding events, are particularly destructive because of their sudden occurrence and limited warning time (ClimaCell, 2019). In many developing countries, traditional flood forecasting methods still rely mainly on rainfall accumulation and river-level observations, limiting the effectiveness of early warning and preparedness systems.

Globally, the impacts of flood disasters have continued to intensify. Flood events affect approximately 520 million people annually and are responsible for as many as 25,000 deaths worldwide (Gore, 2010). Some of the most catastrophic floods in recent history include the Pakistan floods of 2010, which affected more than 20 million people and caused damages estimated at about $10 billion (Webster et al., 2011), and the Colorado floods in the United States in 2013, which resulted in over $2 billion in damages and several fatalities (Gochis et al., 2015). Similarly, severe flood disasters in India, Bangladesh, Brazil, Nigeria, and other countries have demonstrated the growing vulnerability of both developed and developing nations to flood hazards. Studies have linked the increasing frequency and severity of floods to climate variability, environmental mismanagement, and rising human vulnerability (Dong & Frangopol, 2016; Ayal et al., 2018; Istifanus et al., 2023).

The increasing occurrence of flood disasters has attracted significant global attention toward disaster management policies and institutional responses. Governments and non-governmental organizations (NGOs) have introduced several measures aimed at mitigating flood risks and improving emergency response capacities. These measures include the development of early warning systems, flood-control infrastructure, emergency preparedness plans, evacuation systems, and post-disaster rehabilitation programs (UNISDR, 2015; Kapucu, 2008). Despite these efforts, concerns persist regarding the effectiveness of disaster management policies, particularly in developing countries where institutional weaknesses, inadequate funding, poor coordination, and limited community participation often undermine disaster response efforts (Alexander, 2013; Smith, 2013).

Nigeria has experienced recurrent flood disasters over the years, with severe consequences for human lives, infrastructure, and national development. The 2012 flood disaster remains one of the most devastating in the country's history, affecting over 30 states, displacing more than two million people, and causing hundreds of deaths (NEMA, 2013). Flood disasters in Nigeria are influenced by factors such as inadequate drainage systems, poor urban planning, indiscriminate waste disposal, deforestation, and climate-related changes in rainfall intensity (Istifanus et al., 2023). In response to these challenges, the Nigerian government established several institutions and policy frameworks to strengthen disaster management. Agencies such as the National Emergency Management Agency (NEMA), the Federal Environmental Protection Agency (FEPA), and the Federal Ministry of Environment were created to coordinate environmental management, disaster preparedness, response, and recovery activities (NEMA, 2013).

Within the Federal Capital Territory (FCT) Abuja, the Federal Capital Territory Emergency Management Agency (FEMA) serves as the primary institution responsible for disaster and emergency management. FEMA coordinates disaster preparedness, risk assessment, emergency response, evacuation, and rehabilitation activities within the FCT. In addition to governmental agencies, several NGOs and community-based organizations, including the Red Cross and the Salvation Army, contribute to flood disaster management through humanitarian assistance, emergency relief services, public sensitization, and community support initiatives (FEMA, 2024). The collaboration between governmental and non-governmental organizations is increasingly recognized as essential for effective disaster management and community resilience.

Despite the presence of these institutions and policies, flood disaster management in the FCT Abuja continues to face several challenges. Studies have identified poor coordination among stakeholders, inadequate funding, weak policy implementation, insufficient technical capacity, and limited community involvement as major obstacles to effective disaster management (Akpan et al., 2018; Alat, 2019). In many cases, disaster management efforts remain largely reactive, with greater attention placed on post-disaster relief rather than preventive and mitigation measures. This situation raises concerns regarding the effectiveness of existing governmental and non-governmental policies on flood disaster management in the FCT Abuja.

Effective flood disaster management requires a comprehensive and integrated policy approach involving preparedness, mitigation, response, and recovery. Community participation is also increasingly viewed as a critical component of disaster resilience, as local knowledge and grassroots engagement can improve preparedness and reduce vulnerability (Drake et al., 2016). Consequently, evaluating the policies and roles of governmental and non-governmental organizations in flood disaster management is necessary to identify institutional strengths, existing gaps, and opportunities for improvement. Such evaluation may contribute to the

development of more effective and sustainable flood disaster management strategies capable of reducing the impacts of future flood events in the FCT Abuja and Nigeria at large.

MATERIALS AND METHODS

Study Area

This study was conducted in the Federal Capital Territory (FCT), Abuja, Nigeria, located in the Guinea savannah ecological zone. Abuja lies approximately between latitude 9°04′N and longitude 7°29′E and covers an estimated land area of about 8,000 km². The territory experiences recurrent flooding due to intense seasonal rainfall, undulating topography, rapid urbanization, and inadequate drainage infrastructure. Flood-prone districts within the municipal area include Wuse, Maitama, Garki, Asokoro, Lugbe, Apo, Kubwa, and Dagiri, which have experienced repeated flood events in recent years.

Research Design

A qualitative research design was adopted to evaluate the roles, effectiveness, and coordination of governmental and non-governmental organizations (NGOs) involved in flood disaster and emergency management in the FCT. The design survey methods employed interviews and field observations to ensure methodological triangulation and enhance reliability.

Study Population

The study population comprised:

- Government agencies responsible for flood disaster and emergency management in the FCT (e.g., NEMA, FCT Emergency Management Agency, FCDA).
- Non-governmental organizations (e.g., Nigerian Red Cross Society, Oxfam).
- Community leaders and flood-affected residents within flood-prone districts.

Sampling Technique and Sample Size

A combination of purposive and random sampling techniques was employed:

- Purposive sampling was used to select government agencies and NGOs directly involved in flood disaster and emergency management.
- Random sampling (random number table method) was used to administer questionnaires to respondents.

A total of 300 structured questionnaires were administered, of which 286 were successfully completed and returned. Additionally, 10 key informants were purposively selected for in-depth interviews based on their institutional roles and experience in flood disaster management.

Data Types

The study collected data on:

- Roles and responsibilities of government and non-governmental organizations
- Level of coordination and collaboration among organizations
- Effectiveness of flood preparedness, response, and recovery activities
- Challenges and opportunities for community participation in flood disaster management

Sources of Data

Primary Data

Primary data were obtained through:

- Structured questionnaires administered to government officials, NGO personnel, and community members
- Semi-structured interviews with key informants from relevant institutions
- Direct field observations of flood disaster and emergency management activities using an observation checklist

Secondary Data

Secondary data sources included:

- Reports and publications from NEMA, FCT Emergency Management Agency, Nigerian Red Cross Society, and Oxfam
- Government policy documents and flood management reports
- Peer-reviewed journal articles related to flood disaster risk reduction and emergency management
- Satellite imagery and geospatial datasets used in previous flood vulnerability studies
- Online databases and institutional websites relevant to flood disaster management

Research Instruments

The instruments used for data collection included:

- A structured questionnaire consisting of both closed-ended and open-ended questions
- A semi-structured interview guide for key informants
- An observation checklist for assessing on-site flood management activities

A pilot study was conducted to test the instruments, after which necessary revisions were made.

Data Analysis

Quantitative data from the questionnaires were analyzed using SPSS software, employing descriptive statistical techniques such as:

- Frequencies and percentages
- Means and standard deviations
- Tables, bar charts, and pie charts

Qualitative data from interviews and observations were analyzed thematically using contextual and content analysis, allowing identification of recurring patterns and themes related to institutional roles, coordination mechanisms, and operational challenges.

Ethical Considerations

Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and anonymity and confidentiality of responses were strictly maintained. Data were securely stored and used solely for academic purposes.

RESULTS

Governmental and Non-Governmental Flood Disaster Management Policies

The results show that flood disaster management in the Federal Capital Territory (FCT), Abuja is guided primarily by governmental policy frameworks, particularly the National Disaster Risk Management Policy (NDRMP, 2018) implemented through the National Emergency Management Agency (NEMA). Respondents identified government policy focus areas to include preparedness, early warning dissemination, emergency response coordination, relief distribution, drainage rehabilitation, and public sensitization. However, respondents also indicated that the effectiveness of these governmental policies is constrained by inadequate funding, weak enforcement of land-use regulations, poor urban planning compliance, and limited local institutional capacity. Despite institutional frameworks being in place, policy implementation at the community level remains uneven.

Non-governmental organizations (NGOs), particularly the Nigerian Red Cross Society, were identified as key actors complementing government policies through community-based disaster risk reduction (DRR), humanitarian relief, preparedness training, and advocacy. NGO interventions were reported to be more visible at the grassroots level, especially in informal settlements and flood-prone communities.

Rate of Flood Vulnerability

Analysis of questionnaire responses (n = 286) indicates a generally high level of flood vulnerability in the FCT. The results show:

- Very high flood vulnerability (Mean = 1.55; SD = 0.50)
- High flood vulnerability (Mean = 3.40; SD = 0.91)
- Low and very low vulnerability categories recorded higher mean values (Mean = 5.00), indicating fewer areas with low exposure

These results demonstrate that a significant proportion of respondents reside in or have experienced flooding in high-risk environments, confirming widespread vulnerability across the study area.

Relationship Between Topography, Urban Development, and Flood Risk

Findings indicate that topography and land-use patterns strongly influence flood vulnerability. Locations such as Kubwa, Nyanya, Jabi, Gwagwalada, and Bwari are characterized by flat terrain, valleys, or floodplains, which increase runoff during heavy rainfall.

Respondents and field observations identified encroachment on floodplains, blockage of drainage channels, soil sealing, and construction on wetlands as major contributors to flooding. The presence of rivers such as the Lower Usuma River further increases vulnerability in adjacent communities.

Governmental Interventions in Flood Disaster Management

Results from institutional assessment show that NEMA and the FCT Emergency Management Agency (FEMA) are the primary governmental actors coordinating flood disaster response. Key interventions reported include:

- Emergency rescue and evacuation
- Relief material distribution
- Early warning dissemination using NiMet and NIHSA data
- Simulation exercises and staff training
- Inter-agency coordination with military Disaster Response Units

Quantitative assessment of intervention types (Table 4.4) indicates that emergency response and relief ranked highest (Mean = 1.49), while environmental conservation and post-disaster recovery planning ranked lowest (Mean = 5.00), suggesting limited long-term mitigation focus.

Non-Governmental Organizations' Interventions

NGO activities in the FCT were primarily concentrated in preparedness, response, and recovery phases. The Nigerian Red Cross Society was the most prominent NGO identified, with interventions including:

- Community sensitization and early warning dissemination
- First aid, rescue, and evacuation support
- Distribution of food and non-food items
- Water, sanitation, and hygiene (WASH) programs
- Psychosocial support and community resilience building

NGOs were reported to have higher levels of community trust and accessibility, particularly in informal settlements.

DISCUSSION

The findings of this study reveal that flood disaster management in the Federal Capital Territory (FCT), Abuja is largely driven by governmental policy frameworks, particularly the National Disaster Risk Management Policy implemented through the National Emergency Management Agency (NEMA). This finding aligns with earlier studies which noted that disaster management in Nigeria is predominantly centralized within government institutions responsible for preparedness, response, and recovery coordination (NEMA, 2013; Adeleke et al., 2018). The emphasis on emergency response, relief distribution, early warning dissemination, and public sensitization observed in this study reflects the conventional disaster management structure adopted in many developing countries where immediate response activities often receive greater policy attention than long-term mitigation measures (Kapucu, 2008).

However, despite the existence of institutional frameworks, respondents indicated that the effectiveness of governmental policies remains constrained by inadequate funding, weak enforcement of land use regulations, and poor urban planning compliance. This finding supports the observations of Akpan et al. (2018), who argued that weak institutional coordination and insufficient implementation mechanisms significantly undermine disaster management effectiveness in Nigeria. Similarly, Alat (2019) reported that poor enforcement of environmental and urban planning regulations contributes substantially to flood vulnerability in rapidly urbanizing Nigerian cities. The persistence of flooding in the FCT despite policy frameworks may therefore suggest that policy formulation alone is insufficient without effective implementation, monitoring, and institutional accountability.

The study further revealed that non-governmental organizations (NGOs), especially the Nigerian Red Cross Society, play significant complementary roles in flood disaster management through community-based disaster

risk reduction, humanitarian relief, preparedness training, and advocacy. This finding is consistent with the work of Drake et al. (2016), who emphasized the importance of community engagement and grassroots participation in enhancing disaster preparedness and resilience. NGOs were perceived as more visible and accessible within informal settlements and flood-prone communities, which may be attributed to their closer interaction with local populations and flexibility in humanitarian operations. Similar findings were reported by Dilshad Ahmad et al. (2022), who noted that NGOs often fill critical gaps left by governmental agencies during disaster response and recovery processes.

The findings on flood vulnerability indicate that a substantial proportion of respondents either reside in flood-prone areas or have previously experienced flooding events. The high mean scores recorded for flood vulnerability categories suggest widespread exposure across the study area. This finding corroborates Gore (2010), who noted that flood disasters continue to affect millions of people annually due to increasing human settlement in hazard-prone environments. The high vulnerability levels observed in the FCT may further indicate insufficient integration of disaster risk reduction measures into urban planning and housing development policies.

This study also established a strong relationship between topography, urban development patterns, and flood risk. Areas characterized by valleys, floodplains, and relatively flat terrain such as Kubwa, Nyanya, Jabi, and Gwagwalada were found to be more susceptible to flooding. Respondents identified blocked drainage channels, construction on wetlands, and encroachment on floodplains as major contributing factors. These findings align with Wisner et al. (2004), who argued that disasters are often socially constructed through unsafe development practices and poor environmental management. Similarly, Kundzewicz et al. (2014) observed that rapid urbanization without adequate drainage infrastructure significantly increases runoff intensity and urban flood occurrence.

Institutional assessment showed that NEMA and FEMA remain the principal governmental actors coordinating flood disaster response in the FCT. Key interventions identified included rescue operations, evacuation, relief distribution, simulation exercises, and inter-agency coordination. The dominance of emergency response and relief activities over environmental conservation and post-disaster recovery planning suggests that disaster management efforts in the FCT are still largely reactive rather than preventive. This finding is consistent with Tierney (2012), who argued that many disaster management systems in developing countries prioritize crisis response at the expense of long-term resilience and mitigation planning. The relatively low attention given to environmental conservation may partly explain the continued recurrence of flooding in vulnerable communities.

The study further found that NGO interventions were concentrated mainly within preparedness, response, and recovery phases. Activities such as early warning dissemination, first aid, rescue support, WASH programs, and psychosocial assistance were particularly prominent. The higher level of trust reportedly enjoyed by NGOs within communities may indicate stronger grassroots engagement and more effective communication channels compared to governmental agencies. This observation supports Alexander (2013), who emphasized that community-centered disaster management approaches tend to enhance local resilience and public confidence during emergencies. NGOs may therefore serve as critical intermediaries between vulnerable populations and formal disaster management institutions.

Overall, the findings suggest that while governmental and non-governmental organizations have made notable contributions toward flood disaster management in the FCT Abuja, significant gaps remain in policy implementation, urban planning enforcement, environmental management, and long-term mitigation strategies. The persistence of high flood vulnerability across several communities indicates the need for a more integrated and proactive disaster management framework that combines effective institutional coordination, sustainable urban planning, community participation, and continuous investment in flood mitigation infrastructure.

Limitations of the Study

This study provides important insights into the assessment of governmental and non-governmental policies on flood disaster management in the Federal Capital Territory (FCT), Abuja; however, it is subject to several

limitations. The scope of the study was constrained by the sample size and coverage, as only 300 questionnaires were distributed and 286 retrieved, focusing on selected government agencies, non-governmental organizations, and communities. This restricts the extent to which the findings can be generalized across the entire FCT or other regions in Nigeria.

In addition, the use of purposive sampling in selecting key institutions and informants may introduce sampling bias, as it primarily targeted organizations actively involved in flood disaster management, potentially excluding less visible but relevant stakeholders. The study also relied significantly on self-reported data obtained through questionnaires and interviews, which may be affected by subjectivity, response bias, and inaccuracies in recall.

CONCLUSION

This study examined governmental and non-governmental policies on flood disaster management in the Federal Capital Territory (FCT) Abuja and assessed the spatial distribution and level of flood vulnerability within the study area. The findings revealed that flood disaster management in the FCT is largely guided by governmental policy frameworks implemented through agencies such as the National Emergency Management Agency (NEMA) and the Federal Capital Territory Emergency Management Agency (FEMA). These agencies play major roles in emergency response, evacuation, relief distribution, early warning dissemination, and inter-agency coordination during flood events. However, the effectiveness of these policies and interventions remains constrained by inadequate funding, weak enforcement of environmental and land use regulations, poor urban planning compliance, and limited institutional capacity.

The study further established that non-governmental organizations, particularly the Nigerian Red Cross Society and community-based organizations, contribute significantly to disaster preparedness, humanitarian response, community sensitization, and resilience building. NGO interventions were found to be more visible and accessible at the grassroots level, especially within informal settlements and highly vulnerable communities. This suggests that collaboration between governmental and non-governmental organizations remains essential for effective flood disaster management in the FCT Abuja.

Spatial analysis revealed that flood vulnerability is unevenly distributed across the FCT, with communities such as Gwagwalada, Kuje, Abaji, Apo Dutse, Kwali Market Area, Byazhin, Yaba, and parts of Kubwa identified as highly vulnerable flood zones. The study showed that flood vulnerability is strongly influenced by topography, proximity to rivers, poor drainage systems, rapid urban expansion, and encroachment on wetlands and floodplains. The high level of vulnerability recorded among respondents indicates that many residents continue to live within flood-prone environments with inadequate protective infrastructure and limited preparedness capacity. Overall, the study concludes that while both governmental and non-governmental organizations have made notable contributions toward flood disaster management in the FCT Abuja, current policies and interventions remain largely reactive rather than preventive. Greater emphasis is therefore needed on long-term mitigation strategies, sustainable urban planning, environmental conservation, effective policy implementation, and community participation. Strengthening institutional coordination and integrating local communities into disaster risk reduction initiatives may significantly improve flood resilience and reduce the socio-economic impacts of future flood disasters in the FCT Abuja.

Future studies should adopt longitudinal designs, larger and more diverse samples, high-resolution geospatial techniques, and deeper evaluation of institutional, socioeconomic, and climate adaptation factors to enhance the effectiveness and sustainability of flood disaster management in the FCT Abuja.

REFERENCES

1. Adelekan, I. O., & Adelekan, A. A. (2017). Flood disasters and community vulnerability in Nigeria. Journal of Disaster Risk Studies, 9(1), 1–10.
2. Adeleke, A. S., Olajide, O. T., & Aina, T. A. (2018). Effectiveness of disaster management institutions in Nigeria. International Journal of Environmental Studies, 75(4), 563–577.

3. Akpan, E. I., Okpara, U. T., & Eze, R. C. (2018). Coordination challenges in disaster management in Nigeria. International Journal of Disaster Risk Reduction, 28, 235–243.
4. Alat, A. (2019). Flood disaster management and institutional challenges in Nigeria. Journal of Environmental Management and Safety, 10(2), 45–58.
5. Alexander, D. (2013). Resilience and disaster risk reduction: An etymological journey. Natural Hazards and Earth System Sciences, 13(11), 2707–2716.
6. Allin, S., Lopez, A. D., & Mathers, C. D. (2010). Flood disasters and global mortality patterns. World Health Organization Press.
7. Ambelu, A., Birara, M., & Tesfaye, A. (2017). Flood disasters and human vulnerability in developing countries. Environmental Hazards, 16(4), 321–336.
8. Ayal, D. Y., Radeny, M., & Desta, M. D. (2018). Climate variability and flood risk in Africa. Climate Risk Management, 19, 45–56.
9. Burke, J., Khan, A., & Khan, S. (2014). Kashmir floods and humanitarian response in India and Pakistan. Disaster Prevention and Management, 23(5), 512–525.
10. ClimaCell. (2019). Flash flood forecasting and weather intelligence report. ClimaCell Publications.
11. Daniell, J. E., Wenzel, F., & Khazai, B. (2016). Human and economic losses from natural disasters worldwide. Natural Hazards Review, 17(4), 1–10.
12. Dilshad Ahmad, M., Kanwal, M., & Afzal, M. (2022). Disaster and emergency management systems: The role of governmental and non-governmental organizations. International Journal of Disaster Risk Management, 14(2), 88–101.
13. Dong, S., & Frangopol, D. M. (2016). Probabilistic risk assessment of flood hazards under climate change conditions. Natural Hazards, 82(2), 123–140.
14. Doocy, S., Daniels, A., Murray, S., & Kirsch, T. D. (2013). The human impact of floods: A historical review of events 1980–2009 and systematic literature review. PLoS Currents Disasters, 1, 1–28.
15. Drake, K. N., Kontar, Y. Y., Eichelberger, L., Rupp, T. S., & Taylor, K. M. (2016). Community engagement and disaster preparedness in flood-prone communities. International Journal of Disaster Risk Reduction, 19, 123–131.
16. Fanta, B., Alemu, M., & Tessema, T. (2019). Flood vulnerability and adaptation strategies in developing countries. Environmental Development, 31, 100–112.
17. Federal Emergency Management Agency (FEMA). (2024). Flood disaster and emergency management report for the Federal Capital Territory Abuja. FEMA Publications.
18. Gochis, D. J., Schumacher, R., Friedrich, K., Doesken, N., Kelsch, M., Sun, J., ... & Ikeda, K. (2015). The Great Colorado Flood of September 2013. Bulletin of the American Meteorological Society, 96(9), 1461–1487.
19. Gore, A. (2010). Our choice: A plan to solve the climate crisis. Rodale Press.
20. Intergovernmental Panel on Climate Change (IPCC). (2012). Managing the risks of extreme events and disasters to advance climate change adaptation. Cambridge University Press.
21. Istifanus, A., Ibrahim, M., & Yusuf, S. (2023). Flood disasters and sustainable environmental challenges in Nigeria. Journal of Environmental Sustainability, 15(1), 55–69.
22. Kapucu, N. (2008). Collaborative emergency management and national emergency management network. Disaster Prevention and Management, 17(4), 526–539.
23. Kreft, S., Eckstein, D., & Melchior, I. (2021). Global climate risk index 2021. Germanwatch.
24. Kundzewicz, Z. W., Kanae, S., Seneviratne, S. I., Handmer, J., Nicholls, N., Peduzzi, P., ... & Sherstyukov, B. (2014). Flood risk and climate change: Global and regional perspectives. Hydrological Sciences Journal, 59(1), 1–28.
25. Lecina-Diaz, J., Alvarez, A., & Retana, J. (2021). Climate-induced disasters and human fatality projections. Environmental Research Letters, 16(4), 1–12.
26. McEntire, D. A. (2007). Disciplines, disasters, and emergency management: The convergence and divergence of concepts, issues and trends from the research literature. Charles C Thomas Publisher.
27. Mekuyie, M., Jordaan, A., & Melka, Y. (2018). Natural disasters and human fatalities in developing countries. International Journal of Disaster Risk Science, 9(2), 145–157.
28. National Emergency Management Agency (NEMA). (2013). Nigeria flood disaster situation report. NEMA Publications.

29. Ojo, O. O. (2013). Disaster management and emergency response in Nigeria: The case of the 2012 floods. International Journal of Humanities and Social Science, 3(7), 45–57.
30. Smith, G. (2013). Planning for post-disaster recovery: A review of the United States disaster assistance framework. Island Press.
31. Tierney, K. (2012). Disaster governance: Social, political, and economic dimensions. Annual Review of Environment and Resources, 37, 341–363.
32. United Nations International Strategy for Disaster Reduction (UNISDR). (2015). Sendai framework for disaster risk reduction 2015–2030. United Nations.
33. United Nations Office for Outer Space Affairs (UN-SPIDER). (2013). Northern India floods situation report. United Nations Publications.
34. Webster, P. J., Toma, V. E., & Kim, H. M. (2011). Were the 2010 Pakistan floods predictable? Geophysical Research Letters, 38(4), 1–5.
35. Wilkinson, E., Lovell, E., Peters, K., & Almeida, R. (2016). The impacts of climate change on disaster risk and vulnerability. Overseas Development Institute Report, 5(2), 1–18.
36. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). At risk: Natural hazards, people's vulnerability and disasters (2nd ed.). Routledge.