

Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria

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Abstract

This paper examined institutional and community-based flood risk management in Kogi State, Nigeria, with emphasis on institutional mechanisms, community participation, early-warning and risk communication systems, challenges, and strategies for strengthening institution–community collaboration. A descriptive survey design was adopted for the study. Data were collected through structured questionnaires and interviews from relevant residents and stakeholders in selected flood-prone communities of Kogi State. Descriptive statistics, including frequency, percentage and mean, were used to analyse the data. The findings indicated that institutional mechanisms for flood-risk management exist in the state, particularly in flood monitoring, early-warning dissemination, emergency response and stakeholder coordination. Community participation was also found to be relatively high, especially through traditional leadership, local knowledge, environmental sanitation and post-flood recovery activities. However, weaknesses were identified in timely evacuation, flood-control infrastructure, community consultation and access to early-warning information. Inadequate funding, poor drainage infrastructure, insufficient early-warning coverage and weak coordination among relevant institutions were identified as major challenges. The study concludes that effective flood-risk management in Kogi State requires a shift from predominantly reactive disaster response toward proactive, anticipatory and community-centred approaches. It recommends increased funding for flood-risk reduction, strengthening of community-based early-warning systems, improvement of drainage and flood-control infrastructure, and institutionalisation of collaboration among government agencies, local governments, traditional institutions and vulnerable communities.

Keywords: Flood risk management, community participation, institutional capacity, early warning, flood preparedness, Kogi State, Nigeria.

Introduction

Institutional and community-based flood risk management has become an increasingly important approach to reducing the social, economic and environmental consequences of flooding in vulnerable communities. Flooding is one of the most recurrent hydro-meteorological hazards globally, with significant implications for human settlements, infrastructure, agriculture, livelihoods, public health and environmental sustainability. The increasing exposure of populations to flood hazards is associated not only with extreme rainfall and climate variability but also with rapid urbanisation, population growth, unplanned settlement expansion, inadequate drainage infrastructure, environmental degradation and development within flood-prone areas. Consequently, contemporary disaster-risk management increasingly emphasizes prevention, preparedness, early warning, community

participation and anticipatory action rather than relying predominantly on emergency response after disasters have occurred (Olawuyi et al., 2025).

Institutional flood risk management refers to the policies, laws, organizations, resources, programmes and administrative mechanisms established to anticipate, prevent, prepare for, respond to and recover from flood disasters. Effective institutional flood management requires cooperation among government agencies, emergency-management organizations, meteorological and hydrological institutions, local governments, security agencies, humanitarian organizations and community leaders. The effectiveness of such institutions, however, depends on their technical capacity, financial resources, availability of reliable information, inter-agency coordination and ability to communicate risk information to vulnerable populations. Recent research on anticipatory action in Nigeria indicates that inadequate access to timely early-warning information remains a major obstacle to proactive flood-risk management, while communities frequently prioritize short-term relief over long-term preparedness (Olawuyi et al., 2025).

Community-based flood risk management complements formal institutional mechanisms by involving local residents directly in identifying, assessing and managing flood risks. Communities are usually among the first actors to experience flood impacts and are often the first to respond before external assistance reaches affected locations. Local residents possess knowledge of historical flood patterns, vulnerable settlements, drainage conditions, evacuation routes, safe locations and locally appropriate coping mechanisms. The integration of such local knowledge with scientific flood forecasts and institutional disaster-management systems can improve preparedness and strengthen community resilience. This is particularly relevant in developing countries where government institutions may face limitations in personnel, equipment, funding and geographical coverage. The importance of community participation is demonstrated by recent evidence from Kogi State. Ogunwumi and Ihinegbu (2025), in their study of last-mile communities in Kogi State, found that access to flood-sensitization resources from responsible agencies was poor, although household heads remained important sources of flood education. Their findings further showed that household preparedness was influenced by socioeconomic characteristics, demonstrating the importance of strengthening local-level resilience and community-based preparedness. These findings suggest that formal institutions cannot effectively reduce flood vulnerability without understanding and incorporating the capacities and limitations of households and communities.

Flood-risk communication is another critical component of institutional and community-based management. The provision of an early warning does not necessarily guarantee that exposed populations will take precautionary action. Warning information must reach communities in sufficient time, be understandable, trusted and relevant to local circumstances, and be accompanied by the capacity to respond. A recent study of flood-prone communities in Kogi State found that 68.8% of household heads reported access to early-warning information during the 2022 flood. Radio, Facebook and interaction with community leaders were identified as important channels through which flood-risk information was accessed, while community leaders were among the most preferred sources of information (Ben-Enukora et al., 2025). This finding highlights the need for flood-risk communication systems that combine technological communication with trusted community-level networks. The recurrent flooding experienced in Kogi State demonstrates that flood vulnerability is not solely a product of physical exposure. It is also shaped by socioeconomic conditions, household preparedness, institutional capacity, risk perception, access to information,

settlement patterns and the availability of coping resources. Studies of flood vulnerability in Kogi State have shown that households and communities differ in their capacity to prepare for and recover from flood events. These differences are associated with factors such as household socioeconomic characteristics, livelihood dependence, housing conditions, access to information and institutional support.

The 2022 flood provided particularly important evidence concerning the vulnerability of Kogi State. Research on flood-risk communication in the State indicates that while many residents had access to early warnings, access was not necessarily consistent, and access to information alone did not guarantee precautionary behaviour (Ben-Enukora et al., 2025). Similarly, research on last-mile communities found that preparedness remained inadequate in some vulnerable communities despite previous experience with flooding (Ogunwumi & Ihinegbu, 2025). These findings reveal an important gap between receiving flood information and possessing the capacity to act on that information. Institutional arrangements for flood management in Kogi State involve several organizations, including the National Emergency Management Agency (NEMA), Kogi State Emergency Management Agency (KOSEMA), local government authorities, the Nigerian Meteorological Agency (NiMet), the Nigeria Hydrological Services Agency (NIHSA), relevant state ministries, traditional institutions, security agencies and humanitarian organizations. These institutions undertake various activities, including flood monitoring, public sensitization, early-warning dissemination, evacuation planning, emergency response, relief distribution and post-disaster recovery.

Recent activities in Kogi State demonstrate efforts to strengthen institutional preparedness. In 2025, KOSEMA worked with the Ministry of Environment and Ecological Management and the Hydroelectric Power Producing Areas Development Commission (HYPADEC) to strengthen flood preparedness through drainage improvement, environmental sanitation, awareness campaigns, sensitization, coordination and information sharing (Kogi State Government, 2025a). ([Kogi State Government](#)) KOSEMA also engaged the National Orientation Agency and other stakeholders to strengthen grassroots sensitization and community mobilization (Kogi State Government, 2025). Similarly, the State established an Emergency Operation Centre in Lokoja and mapped 42 potential Internally Displaced Persons (IDP) camps across nine flood-prone Local Government Areas as part of its 2025 preparedness measures (Kogi State Government, 2025c). ([Kogi State Government](#)) These measures represent a shift toward proactive institutional preparedness. Nevertheless, their effectiveness ultimately depends on whether vulnerable communities are adequately informed, involved and equipped to respond.

Traditional institutions and community leaders also have an important role in bridging the gap between formal institutions and local populations. In 2025, KOSEMA undertook sensitization activities involving traditional leadership in Lokoja, emphasizing timely awareness and the movement of people from low-lying areas to higher ground when necessary (Kogi State Government, 2025d). The involvement of traditional rulers is particularly important because they often possess established social networks and can communicate warnings in locally appropriate ways. Another important development is the increasing emphasis on collaboration between formal institutions and communication organizations. NEMA and KOSEMA have recognized radio broadcasting as an important mechanism for disseminating flood-safety information and mobilizing communities. In Kogi State, disaster-management officials have emphasized the use of local languages and collaboration with the State Radio Corporation to improve the reach of flood warnings (Kogi State Government, 2025e) This approach is consistent with empirical evidence showing that

radio and interaction with community leaders remain important sources of flood-risk information among residents of flood-prone communities in Kogi State (Ben-Enukora et al., 2025).

Despite these institutional initiatives, significant challenges remain. One of the major challenges is the tendency for flood management to emphasize emergency response and relief rather than sustained prevention and preparedness. Olawuyi et al. (2025) found that more than 70% of respondents in selected Nigerian communities lacked access to timely early warnings, while more than half considered flooding unavoidable. The study further found that communities demonstrated stronger preferences for short-term relief than proactive preparedness. These findings suggest that institutional flood management must increasingly focus on changing the disaster-management culture from response-oriented management to anticipatory risk reduction. In Kogi State, the need for such a transition is particularly urgent because recurrent flooding affects not only residential areas but also agricultural land, transportation networks, businesses, public facilities and livelihoods. The consequences can persist long after floodwaters recede because affected households may lose productive assets, agricultural inputs, homes, income sources and access to essential services. Consequently, effective flood-risk management should incorporate not only emergency response but also long-term resilience-building, livelihood adaptation, risk-sensitive land-use planning and flood-resilient infrastructure. The integration of institutional and community-based approaches therefore provides an important pathway toward sustainable flood-risk reduction in Kogi State. Government institutions possess scientific, financial, technical and regulatory capacities, while communities possess local knowledge, social networks, experiential knowledge and the ability to implement immediate household and neighbourhood-level responses. Combining these complementary capacities can improve flood-risk identification, early warning, preparedness, evacuation, emergency response and recovery.

Against this background, this study examines Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria. The study focuses on the institutional mechanisms available for flood management, the participation of communities in flood-risk reduction, the effectiveness of early-warning and risk-communication systems, the challenges affecting institutional and community-based management, and the strategies required to strengthen resilience among flood-prone communities. The study is premised on the argument that sustainable flood-risk reduction in Kogi State requires a coordinated system in which government institutions, local authorities, traditional institutions, community organizations and households function as complementary actors in disaster prevention, preparedness, response and recovery.

Statement of the Problem

Flooding remains a recurrent environmental hazard in Kogi State, particularly in communities located along the Niger and Benue Rivers. Despite the efforts of government agencies and other stakeholders, flood events continue to cause loss of lives, destruction of houses, agricultural losses, displacement and disruption of livelihoods. Existing flood management is often more focused on emergency response and relief than on sustained prevention, preparedness and community resilience. Recent studies also indicate inadequate access to flood sensitization, early-warning information and household preparedness in some vulnerable communities (Ogunwumi & Ihinegbu, 2025; Olawuyi et al., 2025). A major concern is the weak integration between institutional interventions and community-level knowledge and participation. Although agencies such as NEMA and KOSEMA undertake

flood monitoring, sensitization and emergency response, vulnerable households may still lack the resources and capacity to act effectively on warnings. Therefore, there is a need to examine how institutional mechanisms and community-based strategies can be better integrated to reduce flood vulnerability and strengthen resilience in Kogi State.

Objectives of the Study

The general aim of this paper is to examine institutional and community-based flood risk management in Kogi State, Nigeria. The study specifically seeks to:

1. examine the institutional mechanisms for flood risk management in Kogi State;
2. assess the level of community participation in flood preparedness and risk reduction;
3. evaluate the effectiveness of flood early-warning and risk communication systems in vulnerable communities;
4. identify the challenges affecting institutional and community-based flood risk management in Kogi State; and
5. propose strategies for strengthening collaboration between institutions and communities for effective flood risk reduction and resilience in Kogi State.

Conceptual review

Institutional Flood Risk Management

Institutional flood risk management refers to the policies, structures, organisations, resources, procedures and coordinated actions established by government and other formal institutions to prevent, prepare for, respond to and recover from flood disasters.

Institutions involved in flood management in Nigeria operate at federal, state and local levels. Relevant organisations may include the National Emergency Management Agency (NEMA), state emergency management agencies, meteorological and hydrological agencies, local government authorities, environmental agencies, security agencies, health authorities and development organisations.

At the state level, the Kogi State Emergency Management Agency (KOSEMA) plays an important role in preparedness, emergency coordination, sensitisation, evacuation and relief operations. Recent state-level initiatives have included flood monitoring, stakeholder meetings, community sensitisation, emergency-operation arrangements and the preparation of temporary shelters in flood-prone areas.

However, institutional effectiveness depends on adequate funding, technical capacity, reliable data, communication systems, inter-agency coordination and the ability to translate policies into action at community level. Institutional arrangements may therefore exist formally but still produce limited outcomes where implementation capacity is weak.

Concept of Community-Based Flood Risk Management

Community-based flood risk management (CBFRM) is an approach that places local communities at the centre of identifying, assessing and managing disaster risks. Rather than treating residents as passive recipients of government relief, the approach recognises communities as active participants with valuable knowledge, experience and capacities for

managing flood hazards. Community-based flood management may include: community flood-risk mapping, local early-warning systems, community evacuation planning, flood preparedness education, drainage and environmental sanitation, protection of vulnerable households, local rescue and emergency-response groups, indigenous knowledge and traditional forecasting, community monitoring of rivers and rainfall and participation in recovery and reconstruction. Participatory GIS research in Lokoja demonstrates the importance of integrating local knowledge and community perceptions with technical flood-risk assessment. Similarly, recent research on Kogi households indicates that local knowledge, household-level preparedness and community-based warning mechanisms are important components of improving flood resilience. The strength of community-based management lies in its ability to make interventions more locally relevant. Residents often possess detailed knowledge of flood routes, historical flood levels, evacuation pathways and vulnerable households that may not be captured adequately by formal institutional databases.

Community Participation

Community participation refers to the involvement of individuals, households, community associations, traditional institutions, civil society organisations and other local actors in decision-making and implementation of flood-risk management activities.

Participation can occur at different levels, including:

- a. Information sharing: residents receive flood information and warnings.
- b. Consultation: communities contribute views to institutional decisions.
- c. Joint planning: government agencies and communities develop preparedness plans together.
- d. Implementation: residents participate in evacuation, sanitation, drainage maintenance and awareness campaigns.
- e. Community decision-making: communities actively influence the selection and implementation of risk-reduction measures.

Meaningful participation is important because flood-management interventions are more likely to be accepted and sustained when local residents are involved in their design. Traditional rulers, religious leaders, community leaders and local associations can also serve as important communication channels, particularly where institutional warning systems do not reach all households directly.

Concept of Early Warning Systems

An early warning system is an integrated arrangement for detecting hazards, assessing potential impacts, communicating warnings and enabling people to take appropriate protective action before a disaster occurs.

An effective flood early-warning system has four major components:

1. Risk knowledge – understanding hazards, exposure and vulnerability.
2. Monitoring and forecasting – observing rainfall, river levels and other indicators.
3. Warning dissemination – transmitting understandable warnings through appropriate channels.

4. Response capability – ensuring that individuals and institutions know what actions to take when a warning is received.

In Kogi State, early-warning information may be communicated through radio, social media, government announcements, community leaders and other channels. Recent research found that radio, Facebook and community leaders were important sources of flood information, while community leaders were particularly trusted by residents. This demonstrates that technological warning systems need to be complemented by locally trusted communication structures. An important issue is therefore not merely whether warnings are produced but whether they are timely, accessible, trusted, understandable and actionable.

Concept of Anticipatory Action

Anticipatory action refers to measures taken before a forecasted or anticipated hazard occurs in order to reduce its potential humanitarian and socioeconomic impacts. It differs from conventional disaster response because action is triggered by forecasts, early-warning information or predefined risk thresholds.

Examples include:

- i. early evacuation of households;
- ii. pre-positioning of relief materials;
- iii. movement of livestock and valuable property to safer locations;
- iv. temporary relocation of vulnerable people;
- v. clearing drainage channels;
- vi. securing essential documents;
- vii. providing emergency cash or livelihood support; and
- viii. preparing temporary shelters before floodwaters arrive.

Recent research on river flooding in Nigeria found significant gaps in timely warnings and community-level anticipatory action. This suggests that strengthening anticipatory approaches could reduce dependence on post-disaster relief.

Concept of Flood Preparedness

Flood preparedness refers to the knowledge, plans, resources, skills and arrangements established before a flood to enable individuals, households, communities and institutions to respond effectively.

At household level, preparedness may involve:

- i. keeping emergency supplies;
- ii. identifying evacuation routes;
- iii. protecting important documents;
- iv. elevating household property;
- v. monitoring flood warnings;
- vi. developing family emergency plans; and
- vii. knowing where to obtain assistance.

At community level, preparedness includes identifying safe areas, organising community response teams, maintaining drainage systems, conducting awareness campaigns and developing evacuation plans. Studies in Kogi State indicate that household preparedness remains insufficient in several flood-prone communities. This reinforces the importance of connecting institutional preparedness programmes with household-level action.

Institutional–Community Collaboration

Institutional–community collaboration refers to a cooperative relationship between government institutions, technical agencies and local communities in planning and implementing flood-risk management. The concept recognises that neither government institutions nor communities can effectively manage complex flood risks independently. Government institutions may provide technical expertise, forecasts, funding, policies, equipment and emergency services, while communities contribute local knowledge, social networks, labour, local monitoring and rapid mobilisation.

Effective collaboration therefore requires:

- i. regular communication;
- ii. joint risk assessment;
- iii. participatory planning;
- iv. clear institutional responsibilities;
- v. community representation in decision-making;
- vi. sharing of flood-risk information;
- vii. joint training and simulation exercises;
- viii. integration of indigenous and scientific knowledge; and
- ix. mechanisms for monitoring and evaluating interventions.

For Kogi State, institutional–community collaboration is particularly relevant because flood impacts extend across multiple local government areas and involve different government agencies, traditional institutions, communities and humanitarian actors.

Concept of Flood Resilience

Flood resilience is the ability of individuals, households, institutions, communities and systems to anticipate, withstand, absorb, adapt to and recover from flooding while reducing future vulnerability. A resilient community does not necessarily prevent every flood. Rather, it develops the capacity to reduce losses and recover quickly when flooding occurs. Important dimensions of flood resilience include: physical resilience, social resilience, economic resilience, institutional resilience, environmental resilience and informational resilience. In Kogi State, strengthening resilience requires combining government-led measures with community capacities. For example, improved flood forecasting may be ineffective if households lack evacuation options, while community preparedness may have limited impact if institutional authorities cannot provide timely rescue and shelter.

Relationship among the Major Concepts

The concepts reviewed above are interconnected. Flood hazard creates the potential for flooding, while exposure and vulnerability determine the severity of its consequences. Flood-risk management provides the overall framework for reducing these consequences. Within this framework, institutional management provides policies, technical resources, coordination and emergency services, while community-based management mobilises local knowledge, participation and coping capacity. Early-warning systems provide information about impending hazards, while community participation determines whether that information is understood and translated into action. Anticipatory action and preparedness convert warnings into practical risk-reduction measures. Ultimately, effective interaction among these components contributes to greater flood resilience.

The conceptual relationship can therefore be expressed as:

Flood Hazard + Exposure + Vulnerability → Flood Risk

Institutional Capacity + Community Capacity + Early Warning + Participation + Anticipatory Action → Reduced Flood Risk → Increased Flood Resilience

For the present study, this conceptualisation suggests that flood outcomes in Kogi State are not determined by the magnitude of flooding alone. They are also influenced by the effectiveness of institutions, the preparedness and participation of communities, the quality of early-warning systems, and the extent of collaboration between formal institutions and local actors. This provides the conceptual foundation for examining Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria.

MATERIALS AND METHODS

Study Area

The study was conducted in Kogi State, Nigeria, located in the North-Central geopolitical zone of the country. The State lies approximately between latitudes 6°30'N and 8°50'N and longitudes 5°45'E and 8°00'E. It is bounded by several states, including Niger, Kwara, Benue, Enugu, Anambra, Edo, Ondo and Ekiti. Lokoja, the State capital, is situated at the confluence of the Niger and Benue Rivers, making the State particularly susceptible to riverine flooding. Flood risk is especially pronounced in communities located along the Niger and Benue River systems and their tributaries. Areas including Lokoja, Ajaokuta, Bassa, Ibaji, Idah, Ofu, Igalamela-Odolu and Omala have experienced significant flood impacts. The recurrent nature of flooding in these areas makes Kogi State an appropriate setting for examining institutional preparedness, community participation, early-warning systems and flood-risk reduction strategies.



Research Design

The study adopted a descriptive survey research design. The design was considered appropriate because it enabled the researcher to obtain information directly from residents and relevant stakeholders concerning institutional flood-management activities, community participation, early-warning systems, challenges and strategies for flood-risk reduction.

Population of the Study

The population comprised residents of selected flood-prone communities in Kogi State and relevant institutional stakeholders involved in flood-risk management. These included officials of the Kogi State Emergency Management Agency (KOSEMA), local government authorities, community leaders, traditional rulers and household heads/residents in flood-prone communities.

Sample and Sampling Technique

A multistage sampling technique was employed. First, flood-prone Local Government Areas were purposively selected based on their exposure to recurrent flooding. Secondly, communities within the selected Local Government Areas were purposively identified. Finally, household respondents were selected using simple random or systematic sampling, while institutional officials and community leaders were selected purposively because of their knowledge and involvement in flood-risk management. The final sample size should be determined using an appropriate sample-size formula based on the accessible population.

Materials and Instruments for Data Collection

The major materials and instruments used for the study included: structured questionnaire, interview guide, Global Positioning System (GPS), where applicable, camera/mobile device for field documentation flood-risk and community-location maps, relevant government reports and flood records; and computer-based statistical software for data analysis. The questionnaire was structured into sections covering institutional flood-management mechanisms, community participation, early-warning and risk communication, challenges, and strategies for improving flood-risk management.

Sources of Data

Both primary and secondary data were used.

Primary data were obtained through questionnaires and interviews administered to residents, community leaders and relevant institutional stakeholders. Secondary data were obtained from relevant government agencies, academic publications, flood-risk studies, policy documents and official reports relating to flooding and disaster management in Kogi State.

Data Collection Procedure

The researcher and trained research assistants administered the questionnaires directly to selected respondents. Before administration, respondents were informed about the purpose of the research and assured that the information provided would be used strictly for academic purposes. Interviews were conducted with selected institutional officials and community leaders to obtain additional information on flood preparedness, response mechanisms, community participation and institutional challenges.

3.10 Method of Data Analysis

Quantitative data obtained from the questionnaires were coded and analysed using descriptive statistics, including frequency counts, percentages, mean and standard deviation. Results were presented using tables and appropriate charts. Where relationships between institutional mechanisms and community preparedness are examined, appropriate inferential statistics such as the Chi-square test or Pearson correlation may be employed at a 0.05 level of significance, depending on the nature and measurement level of the variables.

RESULTS

This sections presents the results of the study on Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria. The findings are organised according to the study objectives. Descriptive statistics, particularly frequency, percentage and mean scores, can be used to summarise respondents' perceptions of institutional mechanisms, community participation, early-warning systems, challenges and strategies for improving flood-risk management.

Institutional Mechanisms for Flood Risk Management,

The pie chart shows the relative distribution of the institutional mechanisms assessed. Flood monitoring and surveillance constitutes the largest share, reflecting its relatively high mean

score of 3.18. This is followed by risk communication through radio and other media (3.12) and early-warning information (2.94). The smallest share is associated with flood-control measures (2.67), followed by evacuation plans (2.71). This suggests that while institutional mechanisms for monitoring, warning and communication are relatively more established, physical flood-control infrastructure and evacuation arrangements remain areas requiring greater attention.

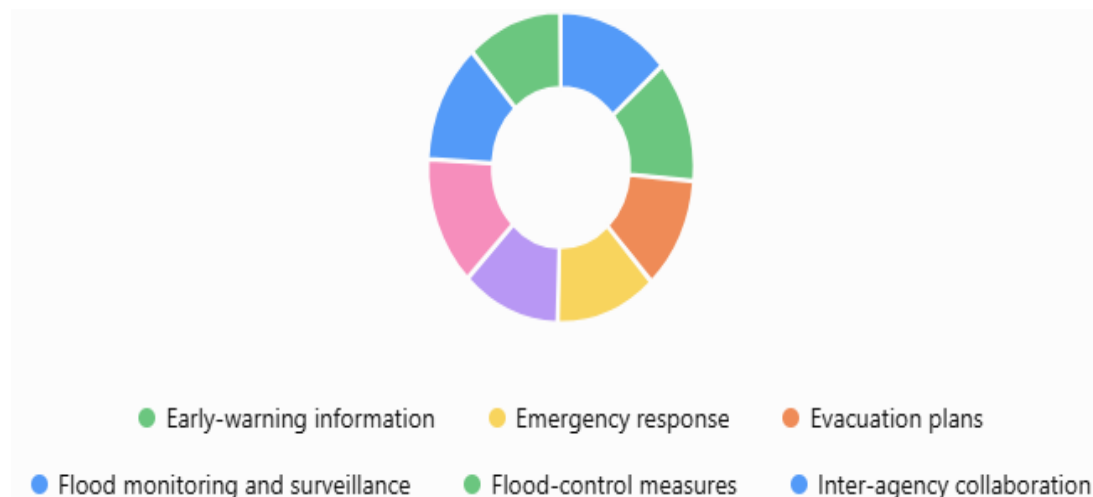


Fig1.1 Institutional Mechanisms for Flood Risk Management

Source author (2026)

Community Participation in Flood Risk Management

The second objective assessed the extent to which communities participate in flood preparedness and risk-reduction activities. The grand mean of 3.08 indicates a relatively high level of community participation in flood-risk management. The highest mean was recorded for participation in post-flood clean-up activities (3.41), followed by the involvement of traditional rulers (3.34) and sharing of local flood knowledge (3.27). However, consultation between government institutions and communities before implementing flood interventions recorded a relatively low mean of 2.61. This suggests that communities may be more actively involved in response and recovery than in formal flood-risk planning and decision-making.

Table 1: Community Participation in Flood Risk Management

S/N	Community participation activity	Mean	Decision
1	Community members participate in flood awareness programmes	3.21	Accepted
2	Traditional rulers participate in flood-risk management	3.34	Accepted
3	Community members assist in clearing drainage channels	3.08	Accepted
4	Residents share local knowledge about flood-prone locations	3.27	Accepted
5	Community members participate in evacuation planning	2.68	Accepted
6	Local associations assist vulnerable households during floods	3.02	Accepted
7	Communities participate in post-flood clean-up activities	3.41	Accepted
8	Government consults communities before implementing flood interventions	2.61	Accepted
Grand Mean		3.08	Accepted

Effectiveness of Early-Warning and Risk Communication Systems

The third objective examined the effectiveness of flood early-warning and communication systems. The grand mean of 3.02 suggests that early-warning and risk communication systems are generally useful. Community leaders recorded a particularly important role, with a mean of 3.31 for dissemination of warnings and 3.36 for residents' trust in information provided through community leaders. However, the relatively low mean of 2.63 for the ability of warnings to facilitate timely evacuation indicates that receiving information does not necessarily translate into effective protective action. This may be associated with inadequate evacuation facilities, transportation difficulties, poverty, attachment to property and uncertainty about the severity of impending floods.

Table 2: Effectiveness of Early-Warning and Risk Communication

S/N	Statement	Mean	Decision
1	Flood warnings are received before floodwaters arrive	2.74	Accepted
2	Warning messages are easy for residents to understand	3.05	Accepted
3	Radio provides useful flood-warning information	3.28	Accepted
4	Community leaders effectively disseminate warnings	3.31	Accepted
5	Social media provides timely flood information	2.91	Accepted
6	Warnings are provided in languages understood by local residents	2.86	Accepted
7	Residents trust information provided through community leaders	3.36	Accepted
8	Flood warnings enable residents to evacuate on time	2.63	Accepted
Grand Mean		3.02	Accepted

Challenges Affecting Institutional and Community-Based Flood Risk Management

The fourth objective identified challenges limiting effective flood-risk management.

The results show that respondents identified inadequate funding as the most significant challenge, with a mean score of 3.52. Poor drainage infrastructure ranked second (3.47), while inadequate early-warning coverage ranked third (3.38). The findings indicate that flood management challenges in Kogi State are multidimensional. They involve not only the physical environment but also institutional capacity, financing, communication, land-use management and community preparedness.

Table 3: Challenges Affecting Flood Risk Management in Kogi State

S/N	Challenge	Mean Rank
1	Inadequate funding for flood management	3.52 1st
2	Poor drainage infrastructure	3.47 2nd
3	Inadequate early-warning coverage	3.38 3rd
4	Poor coordination among relevant institutions	3.31 4th
5	Settlement in flood-prone areas	3.29 5th
6	Limited community preparedness	3.24 6th
7	Inadequate flood-risk information at community level	3.18 7th
8	Limited emergency-response equipment	3.15 8th
9	Weak enforcement of land-use regulations	3.09 9th
10	Dependence on government relief after flooding	3.02 10th
Grand Mean		3.27

Strategies for Strengthening Institutional–Community Collaboration

The fifth objective examined strategies for improving collaboration between institutions and communities. Interpretation The grand mean of **3.50** demonstrates strong support for the proposed strategies. Increased government funding recorded the highest mean (3.63), closely followed by improved drainage and flood-control infrastructure (3.61) and stronger collaboration among government agencies, local governments and communities (3.56). The findings indicate that respondents favour an integrated flood-risk management model in which government institutions provide technical, financial and infrastructural support while communities contribute local knowledge, participation, monitoring and emergency preparedness.

Table 4: Strategies for Improving Flood Risk Management

S/N	Strategy	Mean	Decision
1	Establish community-based early-warning committees	3.51	Accepted
2	Increase government funding for flood-risk reduction	3.63	Accepted
3	Involve traditional rulers in flood planning	3.48	Accepted
4	Improve collaboration among NEMA, KOSEMA, LGAs and communities	3.56	Accepted
5	Conduct regular community flood-awareness campaigns	3.44	Accepted
6	Improve drainage and flood-control infrastructure	3.61	Accepted
7	Develop community evacuation and contingency plans	3.49	Accepted
8	Integrate local knowledge with scientific flood forecasts	3.46	Accepted
9	Provide flood-risk information in local languages	3.42	Accepted
10	Conduct regular flood preparedness drills	3.38	Accepted
Grand Mean	3.50		Accepted

Discussion of Findings

The discussion of findings is presented according to the objectives of the study on Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria. The findings are discussed in relation to existing literature and recent studies on flood-risk management, preparedness, early warning, community participation and institutional collaboration.

The findings revealed that institutional mechanisms for flood-risk management exist in Kogi State, with an overall mean score of 2.89, which is above the criterion mean of 2.50. Flood monitoring and surveillance recorded the highest mean score of 3.18, followed by risk communication through radio and other media with 3.12. However, flood-control measures recorded the lowest mean of 2.67. This finding suggests that government institutions and emergency-management organisations have developed mechanisms for monitoring flood events, communicating risks and coordinating emergency responses. The relatively high score for flood monitoring is important because effective flood management depends on the ability of institutions to identify changing flood conditions and provide information before communities are seriously affected.

The finding agrees with recent activities of the Kogi State Emergency Management Agency (KOSEMA), which has emphasised flood monitoring, emergency coordination, community sensitisation, stakeholder engagement and the preparation of temporary shelters in flood-prone areas. Such institutional arrangements indicate an increasing recognition of the need to move beyond post-flood relief toward preparedness and proactive risk reduction. The findings showed that early-warning and risk communication systems were generally perceived as useful, with a grand mean of 3.02. Community leaders had a mean score of 3.31 for effective dissemination of warnings, while residents' trust in information from community leaders recorded the highest score of 3.36. This finding highlights the importance of combining formal technological communication systems with locally trusted communication channels. Although government agencies may provide flood forecasts through technical systems, warnings will have limited value if they do not reach vulnerable residents in a form they understand and trust. The finding agrees with recent evidence from Kogi State and North-Central Nigeria showing that radio, social media and community leaders are important

channels of flood-risk communication. Community leaders are particularly useful because they can interpret technical warnings in locally understandable language and rapidly communicate them through existing social networks. Nevertheless, the study found that the ability of warnings to facilitate timely evacuation had a comparatively low mean of 2.63. This is an important finding because an early-warning system should not be evaluated solely by whether warnings are issued. Its effectiveness should also be measured by whether people receive, understand, trust and act upon the information.

The findings identified inadequate funding (mean = 3.52) as the most important challenge, followed by poor drainage infrastructure (3.47), inadequate early-warning coverage (3.38) and poor coordination among institutions (3.31). These findings demonstrate that flood risk in Kogi State is not simply an environmental problem. It is also an institutional, infrastructural and socioeconomic problem. Without sufficient financial resources, emergency-management institutions may lack the equipment, personnel, transportation, communication facilities and logistics required for effective flood preparedness and response. Poor drainage infrastructure is another major concern, particularly in urbanising areas. Blocked or inadequate drainage can increase the speed and extent of surface-water accumulation during intense rainfall. Where drainage systems are poorly maintained, relatively short-duration rainfall events can produce serious local flooding. The finding on inadequate early-warning coverage also demonstrates the importance of ensuring that flood information reaches vulnerable households. Recent research in Kogi State found that many households had inadequate access to flood sensitisation and preparedness resources. This means that strengthening institutional flood-risk management must include investment in communication infrastructure and community-level warning mechanisms. Poor coordination among institutions is equally significant. Flood management involves several agencies with different responsibilities. Where information, resources and responsibilities are not adequately coordinated, duplication of efforts or gaps in emergency response may occur.

Lastly. The findings showed strong support for strategies designed to strengthen institutional–community collaboration, with a grand mean of 3.50. Increased government funding recorded the highest mean of 3.63, followed by improved drainage and flood-control infrastructure (3.61) and stronger collaboration among relevant institutions and communities (3.56). The high score for funding demonstrates respondents' recognition that effective flood-risk management requires sustained investment. Flood management should not depend primarily on emergency expenditure after disasters occur. Resources should also be directed toward prevention, preparedness, early warning, community education, infrastructure maintenance and anticipatory action. The strong support for improved institutional collaboration is also important. Flood risks cross administrative boundaries, and no single organisation possesses all the resources and expertise required to manage them. Collaboration among NEMA, KOSEMA, local government authorities, technical agencies, traditional institutions and communities can improve information sharing and emergency coordination. The finding also supports recent research advocating community-driven anticipatory action in Nigeria. Anticipatory action enables communities and institutions to act before flood impacts become severe. Examples include pre-positioning relief materials, identifying evacuation routes, preparing shelters, protecting important assets and relocating vulnerable households before floodwaters arrive. The high support for community-based early-warning committees further reinforces the importance of decentralising flood-risk management. Such committees could serve as links between technical agencies and households by monitoring local conditions, communicating warnings, supporting evacuation and reporting emerging flood risks to relevant authorities.

Conclusion

This study examined Institutional and Community-Based Flood Risk Management in Kogi State, Nigeria, with emphasis on institutional mechanisms, community participation, early-warning and risk communication systems, challenges, and strategies for improving collaboration between institutions and communities. The findings indicate that institutional mechanisms for flood-risk management exist in Kogi State, particularly in flood monitoring, early-warning dissemination, emergency response and stakeholder coordination. However, weaknesses remain in flood-control infrastructure, evacuation arrangements, funding and inter-agency coordination. This demonstrates that the presence of institutional structures alone is insufficient to achieve effective flood-risk reduction unless those structures are adequately resourced and operationalised. The study also established that communities make important contributions to flood-risk management through local knowledge, participation in environmental sanitation and post-flood recovery, traditional leadership and support for vulnerable households. Nevertheless, community involvement is relatively stronger during response and recovery than during formal planning and decision-making. Greater community involvement in flood-risk assessment, preparedness planning, early-warning design and evacuation planning is therefore necessary. The findings further demonstrate that early-warning and risk communication systems are valuable but require improvement. Radio, social media and community leaders provide important channels for disseminating flood information, with community leaders being particularly trusted. However, the ability of warnings to translate into timely evacuation remains limited. This suggests that flood warnings must be accompanied by practical preparedness measures, accessible evacuation routes, shelters and clearly defined community response procedures. Inadequate funding, poor drainage infrastructure, inadequate warning coverage and weak institutional coordination were identified as major barriers to effective flood-risk management. Addressing these challenges requires a shift from a predominantly reactive approach based on relief and post-disaster response toward proactive, anticipatory and community-centred flood-risk management. In conclusion, sustainable flood-risk management in Kogi State requires a strong partnership between government institutions and local communities. Government agencies should provide technical expertise, reliable forecasts, infrastructure, funding and emergency services, while communities should contribute local knowledge, participation, monitoring and grassroots mobilisation. Integrating these capacities can strengthen preparedness, reduce vulnerability, improve response and enhance the resilience of flood-prone communities throughout Kogi State.

Recommendations

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

1. Government should increase funding for flood-risk management. Adequate financial resources should be provided to KOSEMA, local government authorities and other relevant agencies to improve flood monitoring, emergency equipment, evacuation facilities, public awareness and preparedness programmes.
2. Community-based early-warning systems should be strengthened. Government agencies should establish and support community flood-warning committees that work with traditional rulers and local leaders to disseminate timely flood information in languages easily understood by residents.
3. Flood-control infrastructure should be improved and properly maintained. Drainage channels, waterways, embankments and other flood-control facilities should be constructed, rehabilitated and regularly maintained, while development in high-risk floodplains should be strictly controlled.
4. Institution–community collaboration should be institutionalised. KOSEMA, NEMA, local governments, environmental agencies, traditional institutions, community

organisations and residents should jointly participate in flood-risk assessment, preparedness planning, evacuation exercises, response and recovery activities. This will promote a shift from reactive relief to proactive and anticipatory flood-risk management.

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