

Preparing Vulnerable Communities for Adaptation and Mitigation of Climate-Induced Flooding through Mock Drills and Interpersonal Communication in Anambra State

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Abstract

Despite recurring interventions by government and humanitarian agencies, community-level preparedness for flood adaptation and mitigation remains generally low, largely due to weak risk communication and limited practical exposure to emergency response procedures. This study examined the role of mock drills and interpersonal communication in preparing vulnerable communities in Anambra State for the adaptation and mitigation of climate-induced flooding. Anchored on Protection Motivation Theory and Diffusion of Innovation Theory, the study adopted a descriptive survey research design. The population comprised adult residents of flood-prone communities across three flood-prone local government areas in Anambra State, from whom a sample was drawn using multi-stage and purposive sampling techniques. A structured questionnaire was used to elicit data on residents' exposure to mock drills, patterns of interpersonal flood-risk communication, and their level of flood adaptation and mitigation practice. Data were analysed using mean, standard deviation, and Pearson Product Moment Correlation at the 0.05 level of significance. Findings revealed that exposure to mock drills and active interpersonal communication among community members were both significantly and positively associated with improved flood adaptation and mitigation practices, although actual community exposure to organised mock drills remained considerably low compared to informal interpersonal channels such as town union meetings, religious gatherings, and household-to-household communication. The study concluded that structured mock drills, when combined with existing interpersonal communication networks, hold strong potential for strengthening community resilience to climate-induced flooding in Anambra State. It was recommended that government and disaster management agencies institutionalise periodic community-based mock drills and deliberately integrate trusted local communication structures into flood early-warning and preparedness campaigns.

Keywords: Climate-induced Flooding, Community Preparedness, Mock Drills, Interpersonal Communication, Adaptation, Mitigation, Anambra State

1.0 Introduction

Climate change has intensified the frequency, unpredictability, and severity of extreme weather events across the globe, with flooding emerging as one of the most disruptive hydro-meteorological hazards confronting developing countries, including Nigeria. Anambra State, situated within the lower Niger basin and traversed by the River Niger and River Anambra, is particularly susceptible to seasonal and, increasingly, climate-induced flooding, with communities in Ogbaru, Anambra West, Ayamelum, and parts of Onitsha North and Awka South local government areas experiencing recurrent and often catastrophic inundation. The 2012 and 2022 floods, in particular, displaced hundreds of thousands of residents, destroyed farmlands, homes, and public infrastructure, and disrupted livelihoods across the state, underscoring the urgent need for effective community-level preparedness mechanisms (NEMA, 2022).

Preparedness for disaster events, including flooding, is widely recognised as a critical determinant of the extent of loss and disruption a community experiences (Perry & Lindell, 2003). Two strategies that have received growing attention in disaster risk reduction literature are mock drills and interpersonal communication. Mock drills, also known as simulation exercises, involve the organised rehearsal of emergency response procedures, enabling community members to practically internalise evacuation routes, early-warning signals, and appropriate response behaviours before an actual disaster occurs (Emergency Management Australia, 2009). Interpersonal communication, on the other hand, refers to the direct, often informal exchange of information between individuals or within small groups, including household members, neighbours, town unions, religious congregations, and community associations, and has been found to be a particularly trusted and influential channel for disseminating risk information in many African rural and semi-urban settings (Ajaero & Onokala, 2013).

Despite periodic flood warnings issued by the Nigerian Meteorological Agency and the National Emergency Management Agency, and despite recurring flood disasters in Anambra State, community-level preparedness remains generally weak, with many residents relying on reactive rather than anticipatory responses to flooding. This study, therefore, investigates the extent to

which mock drills and interpersonal communication contribute to preparing vulnerable communities in Anambra State for the adaptation and mitigation of climate-induced flooding.

1.1 Statement of the Problem

Communities in the flood-prone areas of Anambra State continue to experience significant loss of lives, property, and livelihoods to recurrent climate-induced flooding, despite the existence of early-warning systems and periodic government and non-governmental interventions. A recurring observation in post-flood assessments is that many affected residents lack practical knowledge of evacuation procedures, early-warning signal interpretation, and appropriate adaptive behaviour, suggesting that existing risk communication approaches, which tend to rely heavily on mass media announcements and one-off sensitisation campaigns, may be insufficiently embedded within community practice. Mock drills, which offer experiential and practice-based learning, and interpersonal communication, which leverages trusted local networks, are believed to hold considerable potential for bridging this preparedness gap. However, there is limited empirical evidence within the Anambra State context on the extent to which these two strategies actually influence community-level flood adaptation and mitigation practices. This study addresses this gap by empirically examining the relationship between mock drills, interpersonal communication, and flood preparedness among vulnerable communities in the state.

1.2 Objectives of the Study

The general purpose of this study is to examine the role of mock drills and interpersonal communication in preparing vulnerable communities for the adaptation and mitigation of climate-induced flooding in Anambra State. Specifically, the study seeks to:

1. determine the level of exposure of residents of flood-prone communities to organised mock drills;
2. examine the patterns and channels of interpersonal communication on flood risk among residents of flood-prone communities in Anambra State;

3. assess the relationship between exposure to mock drills and the level of flood adaptation and mitigation practice among residents; and
4. assess the relationship between interpersonal communication and the level of flood adaptation and mitigation practice among residents.

1.3 Research Questions

1. What is the level of exposure of residents of flood-prone communities to organised mock drills?
2. What are the patterns and channels of interpersonal communication on flood risk among residents of flood-prone communities in Anambra State?
3. What is the relationship between exposure to mock drills and the level of flood adaptation and mitigation practice among residents?
4. What is the relationship between interpersonal communication and the level of flood adaptation and mitigation practice among residents?

1.4 Research Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

HO1: There is no significant relationship between exposure to mock drills and the level of flood adaptation and mitigation practice among residents of flood-prone communities in Anambra State.

HO2: There is no significant relationship between interpersonal communication and the level of flood adaptation and mitigation practice among residents of flood-prone communities in Anambra State.

1.5 Significance of the Study

This study will be of significant value to the Anambra State Emergency Management Agency, the National Emergency Management Agency, and other disaster risk management bodies in designing more effective, community-embedded flood preparedness programmes. Traditional

rulers, town union leaders, and religious bodies will find the findings useful in appreciating their strategic role as trusted interpersonal communication channels in disaster risk messaging. Residents of flood-prone communities stand to benefit from improved preparedness programming that may result from the study's findings, while the academic community will benefit from an empirically grounded contribution to the literature on community-based disaster risk communication in the Nigerian context.

1.6 Scope of the Study

This study is delimited to adult residents of flood-prone communities in three local government areas of Anambra State that experience recurrent climate-induced flooding, namely Ogbaru, Anambra West, and Ayamelum. The study focuses on exposure to mock drills, interpersonal communication practices, and their relationship with flood adaptation and mitigation behaviour, and does not extend to institutional or infrastructural flood control measures.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Climate-Induced Flooding and Community Vulnerability

Climate-induced flooding refers to flooding events whose frequency, intensity, or extent has been altered by climate change, particularly through increased and more erratic rainfall patterns, sea-level rise, and the intensification of river discharge (IPCC, 2022). Vulnerability, in the context of flooding, describes the degree to which a community is susceptible to, and unable to cope with, the adverse effects of flood hazards, and is shaped by physical exposure, socioeconomic conditions, and the adequacy of adaptive capacity (Rufat, Tate, Burton, & Maroof, 2015). Communities along the Niger and Anambra river floodplains are considered highly vulnerable due to their low-lying topography, dependence on flood-prone agricultural land, and limited structural flood defences (Ogbuene, Igu, Oti, & Nzeadibe, 2021).

2.1.2 Mock Drills as a Preparedness Strategy

Mock drills, or disaster simulation exercises, involve the structured rehearsal of emergency response actions such as evacuation, use of early-warning signals, first aid, and shelter procedures, typically conducted under realistic but controlled conditions (Emergency Management Australia, 2009). The experiential nature of mock drills is believed to enhance retention of preparedness knowledge and build the confidence and practical competence needed for appropriate action during an actual flood event, consistent with the principles of social cognitive and self-efficacy-based learning (Bandura, 1986).

2.1.3 Interpersonal Communication in Disaster Risk Reduction

Interpersonal communication, involving direct, face-to-face or small-group exchange of information between trusted individuals, has been identified as a particularly effective channel for disaster risk communication in contexts where formal institutional trust may be limited (Paton, 2003). In many Nigerian rural and semi-urban communities, information relayed through town union meetings, religious congregations, market associations, and household networks tends to carry greater credibility and behavioural influence than mass media announcements alone (Ajaero & Onokala, 2013).

2.2 Theoretical Framework

This study is anchored on Protection Motivation Theory (Rogers, 1975) and the Diffusion of Innovation Theory (Rogers, 2003). Protection Motivation Theory explains how individuals' perception of the severity of, and their vulnerability to, a threat, combined with their perceived ability to cope, shapes their motivation to adopt protective behaviour. Applied to this study, the theory helps explain how experiential learning through mock drills can heighten residents' perceived coping efficacy, thereby increasing their motivation to adopt flood adaptation and mitigation practices. The Diffusion of Innovation Theory, on the other hand, explains how new ideas, practices, or behaviours spread through a social system over time, with interpersonal channels and opinion leaders playing a critical role in the adoption process, particularly at the persuasion and decision stages. This theory provides a useful framework for understanding how

flood preparedness practices diffuse through community interpersonal networks such as town unions and religious groups.

2.3 Empirical Review

Nnamdi and Ololo (2019) examined perception and adaptation strategies to flood hazards among riverine communities in Anambra State and found that while awareness of flood risk was generally high, practical adaptation measures such as raised foundations, early relocation, and stockpiling of emergency supplies remained low, largely attributable to limited exposure to structured preparedness training. Okoye and Ojike (2020) studied perception and adaptation strategies of flood victims in the state and reported that community members who had participated in some form of organised disaster response sensitisation exhibited significantly higher adaptive capacity than those who had not. Ogbuene et al. (2021) similarly found that informal community communication networks played a stronger role than formal government channels in shaping residents' flood risk perception and response behaviour within the lower Niger basin communities. These findings collectively suggest that experiential preparedness strategies and trusted interpersonal channels are important, and possibly underutilised, levers for strengthening community flood resilience.

2.4 Gap in Literature

Although the reviewed studies provide valuable insight into flood perception and adaptation in Anambra State, few have specifically examined the joint contribution of structured mock drills and interpersonal communication to community-level flood preparedness. This study addresses this gap by empirically assessing both variables in relation to flood adaptation and mitigation practice among vulnerable communities in the state.

3.0 Methodology

3.1 Research Design

This study adopted a descriptive survey research design, appropriate for describing the existing preparedness practices, communication patterns, and perceptions of the study population without manipulation of variables.

3.2 Population of the Study

The population of the study comprised adult residents (aged 18 years and above) of flood-prone communities in Ogbaru, Anambra West, and Ayamelum local government areas of Anambra State.

3.3 Sample and Sampling Technique

A multi-stage sampling technique was employed. At the first stage, the three most flood-prone local government areas were purposively selected based on historical flood incidence records. At the second stage, two communities were randomly selected from each local government area. At the final stage, household heads or their adult representatives were selected using systematic random sampling to constitute the study sample.

3.4 Instrument for Data Collection

A structured questionnaire titled "Mock Drills, Interpersonal Communication and Flood Preparedness Questionnaire (MDICFPQ)" was used to collect data, covering respondents' exposure to mock drills, patterns of interpersonal communication on flood risk, and their level of flood adaptation and mitigation practice, structured on a four-point rating scale.

3.5 Validity and Reliability

The instrument's face and content validity were established through expert review by specialists in disaster risk management and communication studies. Reliability was established through a pilot test and computation of Cronbach's Alpha, yielding a coefficient considered adequate for the study.

3.6 Method of Data Analysis

Research questions were answered using mean and standard deviation, with a criterion mean of 2.50 applied for decision-making. The formulated hypotheses were tested using Pearson Product Moment Correlation Coefficient (PPMC) at the 0.05 level of significance.

4.0 Results and Discussion

4.1 Research Question 1: Level of Exposure to Mock Drills

Table 1: Mean Responses on Level of Exposure to Mock Drills

S/N	Item	Mean	SD	Decision
1	I have participated in an organised flood mock drill	2.11	0.86	Disagreed
2	My community regularly organises flood evacuation simulations	1.98	0.79	Disagreed
3	I know the designated evacuation routes in my area	2.42	0.83	Disagreed
	Grand Mean	2.17		Disagreed

Table 1 shows a grand mean of 2.17, below the criterion mean of 2.50, indicating that residents' exposure to organised mock drills remains generally low across the flood-prone communities studied, consistent with the observation of Nnamdi and Ololo (2019) that structured preparedness training is limited in the state's riverine communities.

4.2 Research Question 2: Patterns of Interpersonal Communication

Table 2: Mean Responses on Patterns of Interpersonal Communication on Flood Risk

S/N	Item	Mean	SD	Decision
1	I discuss flood warnings with neighbours and family	3.34	0.61	Agreed
2	Town union meetings are a source of flood information for me	3.12	0.70	Agreed
3	Religious gatherings serve as a channel for flood-risk information	2.96	0.74	Agreed
	Grand Mean	3.14		Agreed

Table 2 reveals a grand mean of 3.14, showing that residents rely strongly on interpersonal channels, particularly household discussion and town union meetings, for flood-risk information,

affirming the findings of Ajaero and Onokala (2013) on the centrality of informal networks in community information flow.

4.3 Test of Hypotheses

The two null hypotheses were tested using Pearson Product Moment Correlation at the 0.05 level of significance. Results are summarised in Table 3.

Table 3: Summary of Pearson Correlation Test of Hypotheses

Hypothesis	r-value	p-value	Decision
HO1: Mock drills and flood adaptation/mitigation practice	0.58	0.001	Rejected
HO2: Interpersonal communication and flood adaptation/mitigation practice	0.64	0.000	Rejected

Both null hypotheses were rejected, as the p-values were less than 0.05, indicating statistically significant positive relationships between exposure to mock drills, interpersonal communication, and the level of flood adaptation and mitigation practice among residents of flood-prone communities in Anambra State.

4.4 Discussion of Findings

The findings show that although residents' exposure to organised mock drills remains low, both mock drills and interpersonal communication are significantly and positively associated with flood adaptation and mitigation practice, with interpersonal communication showing a somewhat stronger association ($r = 0.64$) than mock drills ($r = 0.58$). This pattern aligns with the Diffusion of Innovation Theory's emphasis on the influence of interpersonal channels and opinion leaders in behaviour adoption, and suggests that in the study area, trusted informal networks are currently doing more preparedness work than formal simulation exercises, largely because the latter are rarely organised. Consistent with Protection Motivation Theory, it can be inferred that where mock drills do occur, they enhance residents' perceived coping efficacy and thereby strengthen adaptive behaviour, reinforcing the case for scaling up structured, community-based

simulation exercises alongside existing interpersonal communication channels rather than treating the two strategies as substitutes.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study examined the role of mock drills and interpersonal communication in preparing vulnerable communities in Anambra State for the adaptation and mitigation of climate-induced flooding. The findings established that while community exposure to structured mock drills remains low, both mock drills and interpersonal communication are significantly associated with improved flood adaptation and mitigation practice, with interpersonal networks currently serving as the dominant channel for flood-risk information exchange. The study concludes that a deliberate combination of structured, experiential mock drills with existing trusted interpersonal communication structures offers a promising and locally grounded pathway for strengthening flood resilience among vulnerable communities in the state.

5.2 Recommendations

1. The Anambra State Emergency Management Agency should institutionalise periodic, community-based flood mock drills in all identified flood-prone communities ahead of each rainy season.
2. Disaster risk communication campaigns should deliberately engage and train town union leaders, religious leaders, and other trusted local opinion leaders as interpersonal communication channels for flood early-warning messages.
3. Government and non-governmental organisations should integrate practical, hands-on evacuation and response simulation into existing community sensitisation programmes, rather than relying solely on mass media announcements.
4. Community-level disaster preparedness committees should be established or strengthened to coordinate mock drills and sustain interpersonal risk communication between flood seasons.

5. Early-warning information should be simplified and translated into local languages to enhance its effective transmission through interpersonal and community channels.

5.3 Suggestions for Further Studies

Further studies could explore the comparative effectiveness of mock drills versus mass media campaigns in flood preparedness, or examine the role of digital and social media as an emerging complement to interpersonal communication in flood-risk messaging within Anambra State and similar flood-prone contexts.

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