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Flood Risk Awareness, Community Preparedness, Infrastructure Damage, and Socio-Economic Wellbeing of Households in Flood-Prone Settlements Around Ero Dam, Ekiti State, Nigeria

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Abstract
Flooding remains a persistent challenge in Nigeria, affecting livelihoods and household wellbeing. This study investigated the influence of flood risk awareness, community preparedness, and infrastructure damage on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State. Specifically, the study examined four research questions addressing the relationship between awareness, preparedness, infrastructure damage, and household welfare, with four corresponding hypotheses guiding the investigation. The study adopted a descriptive cross-sectional survey design with correlational analysis. The population comprised households and key informants in four LGAs (Moba, Ilejemeje, Ido/Osi, and Oye), totaling approximately 728,700 residents. A sample of 240 key informants was selected using a multi-stage stratified sampling technique. Data were collected using a researcher-developed structured questionnaire with validated content and construct validity. Reliability was established via a pilot test with 20 participants, producing a coefficient of 0.88, confirming suitability for the main study. Data collection employed direct administration, with 218 properly completed copies retrieved. Descriptive statistics summarized the responses, while Structural Equation Modeling (SEM) and regression path analysis tested the hypotheses at 0.05 significance. Findings revealed that flood risk awareness significantly improved household socio-economic wellbeing and community preparedness, community preparedness mitigated infrastructure damage, and infrastructure damage negatively affected household wellbeing. The study concludes that enhancing awareness, strengthening community preparedness, and investing in resilient infrastructure are critical for flood risk reduction. Key recommendations include targeted awareness campaigns, community preparedness programs, improved drainage infrastructure, establishment of disaster management committees, and continuous monitoring of flood-prone settlements to protect households.

Keywords: Community Preparedness, Ero Dam, Flood Risk Awareness, Infrastructure Damage, Socio-Economic Wellbeing

1 Introduction

Flooding has emerged as one of the most persistent environmental challenges confronting many communities located near rivers, reservoirs, and dam catchments. In several parts of Nigeria, settlements that developed around water bodies have increasingly experienced seasonal flooding that disrupts daily life and economic activities. These flood events often occur suddenly during periods of intense rainfall or when water levels in reservoirs rise beyond expected limits. For households living in such areas, the consequences are not limited to physical destruction but also extend to economic instability, displacement, and reduced access to essential services. In many cases, the repeated nature of flood incidents gradually weakens the resilience of households, particularly those that rely on agriculture, petty trade, and other climate-sensitive livelihoods.

Across the world, the frequency and severity of flood events have increased due to climate variability, rapid land-use changes, and population expansion into environmentally sensitive areas. Many developing countries have witnessed a growing number of flood-related disasters as extreme rainfall events become more common and urban infrastructure struggles to cope with increasing environmental pressures. These conditions often heighten the vulnerability of communities located in low-lying areas and dam catchments where water accumulation and overflow occur more easily during heavy rainfall periods (IPCC, 2021).

In this context, flood risk awareness has become an important factor in determining how individuals and households perceive environmental threats and prepare for possible disasters. Awareness involves knowledge of flood causes, potential warning signs, previous disaster experiences, and the likely impacts of flooding on homes and livelihoods. When residents possess adequate awareness of these risks, they are often more inclined to take preventive actions such as safeguarding property, monitoring water levels, and responding promptly to early warning information. Conversely, limited awareness may result in complacency and delayed response, thereby increasing the vulnerability of households during flood emergencies (Adelekan, 2020).

Closely related to awareness is the level of preparedness within communities exposed to flood hazards. Community preparedness refers to the ability of residents and local institutions to anticipate, plan for, and effectively respond to flood incidents. Preparedness may involve

activities such as community education programmes, evacuation planning, emergency resource mobilization, and participation in disaster management initiatives. In many developing regions, however, preparedness remains constrained by limited institutional capacity, inadequate disaster education, and insufficient coordination among relevant agencies responsible for disaster risk reduction (Olanrewaju & Chitakira, 2021).

Flood events frequently result in significant damage to critical infrastructure within affected settlements. Residential buildings, transportation networks, drainage systems, electricity facilities, and water supply structures are often among the most vulnerable assets during flood disasters. When these facilities are damaged or destroyed, communities may experience disruptions in transportation, healthcare delivery, education, and other essential services. Infrastructure damage therefore represents a major dimension of flood impact because it not only affects the physical environment but also slows down post-disaster recovery processes (Sadiq et al., 2021).

Beyond the physical destruction of property and infrastructure, flooding also has profound socio-economic implications for households. Many families in flood-prone areas depend on local economic activities such as farming, fishing, and small-scale trading for their livelihoods. When flood disasters occur, these economic activities are often interrupted or completely halted, leading to income losses and reduced household welfare. The resulting economic strain may affect access to food, healthcare, and education, thereby deepening the vulnerability of already disadvantaged households (Etim & Iyakaremye, 2023).

In Nigeria, several communities located near dams and river basins continue to face recurrent flood challenges, particularly during the peak rainy season. Settlements surrounding Ero Dam in Ekiti State represent one such environment where households may experience varying degrees of flood exposure due to changing rainfall patterns and catchment dynamics. Understanding how flood risk awareness and community preparedness interact with infrastructure damage to influence the socio-economic wellbeing of households is therefore important for developing more effective flood management strategies and strengthening the resilience of vulnerable settlements (Adewumi & Ojo, 2024).

1.1 Statement of the Problem

Flooding has become a recurring environmental challenge in many parts of Nigeria, particularly in communities situated near rivers, reservoirs, and dam catchment areas. Settlements located around Ero Dam in Ekiti State are potentially exposed to periodic flooding resulting from intense rainfall, changes in watershed conditions, and fluctuations in reservoir water levels. Despite the growing frequency of such events, many households living within these flood-prone environments continue to experience varying degrees of vulnerability due to limited awareness of flood risks, inadequate community preparedness mechanisms, and the fragile nature of local infrastructure. In several instances, flood incidents have resulted in damage to residential buildings, disruption of access roads, destruction of agricultural resources, and temporary displacement of families. These challenges often translate into broader socio-economic difficulties for affected households, including reduced income, limited access to social services, and declining household welfare. While studies have examined flood hazards from hydrological and environmental perspectives, less attention has been given to how behavioural and community factors such as risk awareness and preparedness interact with infrastructure damage to influence the socio-economic wellbeing of households within specific dam-related environments. Consequently, there remains a need for empirical investigation that examines the structural relationships among flood risk awareness, community preparedness, infrastructure damage, and socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State, Nigeria.

1.2 Purpose of the Study

The purpose of this study is to examine the relationships among flood risk awareness, community preparedness, infrastructure damage, and the socio-economic wellbeing of households in flood-prone settlements surrounding Ero Dam in Ekiti State, Nigeria. Specifically, the study seeks to understand how the level of awareness that residents possess regarding flood hazards influences their preparedness behaviour and how these factors may affect the degree of infrastructure damage experienced during flood events. Furthermore, the study aims to assess how these environmental and behavioural factors collectively shape the socio-economic wellbeing of households residing within the affected communities. By examining these relationships, the study intends to provide empirical evidence that can contribute to improved disaster preparedness strategies, informed community planning, and more effective flood management policies within dam catchment environments.

1.3 Research Objectives

1. To examine the influence of flood risk awareness on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam.
2. To determine the effect of flood risk awareness on community preparedness among households living in flood-prone settlements around Ero Dam.
3. To assess the relationship between community preparedness and infrastructure damage in flood-prone settlements around Ero Dam.
4. To investigate the influence of infrastructure damage on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam.

1.4 Research Questions

1. How does flood risk awareness influence the socio-economic wellbeing of households in flood-prone settlements around Ero Dam?
2. What effect does flood risk awareness have on community preparedness among households in flood-prone settlements around Ero Dam?
3. What relationship exists between community preparedness and infrastructure damage in flood-prone settlements around Ero Dam?

4. How does infrastructure damage influence the socio-economic wellbeing of households in flood-prone settlements around Ero Dam?

1.5 Research Hypotheses

H_1: Flood risk awareness has no significant influence on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State.

H_2: Flood risk awareness has no significant influence on community preparedness among households in flood-prone settlements around Ero Dam, Ekiti State.

H_3: Community preparedness has no significant relationship with infrastructure damage in flood-prone settlements around Ero Dam, Ekiti State.

H_4: Infrastructure damage has no significant influence on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State.

2. Methodology

2.1 Research Design

The study adopted a descriptive cross-sectional survey research design with a correlational approach. This design was considered appropriate because the study aimed to examine the relationships among several variables—namely flood risk awareness, community preparedness, infrastructure damage, and socio-economic wellbeing—within naturally existing settings without manipulating any of the variables involved. The cross-sectional survey approach enabled the researcher to collect relevant data from households residing in flood-prone settlements around Ero Dam at a single point in time, thereby providing a snapshot of their experiences, perceptions, and preparedness behaviours regarding flood hazards. The design also allowed for the systematic collection of standardized responses from a relatively large number of participants, which enhanced the reliability of the findings. In addition, the correlational nature of the design made it suitable for analyzing the structural relationships among the study variables using statistical techniques such as Structural Equation Modeling (SEM), which is effective for examining complex relationships among latent constructs within social and environmental research contexts.

2.2 Population of the Study

The population for this study comprised residents and key community stakeholders located within settlements surrounding the Ero Dam catchment area in Ekiti State, Nigeria. The study area covers communities located within four Local Government Areas (LGAs) that are directly influenced by the Ero Water Scheme corridor, namely Ido/Osi, Moba, Oye, and Ilejemeje LGAs. According to recent demographic projections based on the National Population Commission and National Bureau of Statistics series, Ido/Osi LGA has an estimated population of about 239,600 residents, Moba LGA approximately 217,700 residents, Oye LGA about 206,300 residents, and Ilejemeje LGA roughly 65,100 residents. When combined, these LGAs host an estimated total population of approximately 728,700 residents within the broader Ero Dam service corridor (National Population Commission, 2022). Although the entire population provides the demographic context for the study area, the actual study population focused on relevant human stakeholders living within flood-prone settlements around the Ero Dam catchment environment. These stakeholders included health workers in public health facilities, community leaders such as traditional rulers and ward heads, and local government officials working in departments related to disaster management, water resources, environment, works, and physical planning. These groups were considered appropriate because they possess practical knowledge of flood occurrences, community responses, and the socio-economic implications of flooding within the affected settlements.

2.3 Sample Size

From the broader stakeholder population within the four LGAs, a total sample size of 240 participants was selected for the study. The sample size was considered adequate for achieving reliable statistical analysis and ensuring sufficient representation of respondents across the flood-affected communities. The determination of the sample size was guided by the need to maintain adequate representation across hazard zones and stakeholder categories while also ensuring suitability for advanced statistical analysis such as Structural Equation Modeling (SEM). To provide methodological justification, the sample adequacy was benchmarked using Yamane's sample size formula, expressed as $n = N / (1 + N(e^2))$ where $e = 0.05$ level of precision (Yamane, 1967). Given that the combined stakeholder frame across the selected communities was expected to run into several hundreds of individuals across the four LGAs, a sample of 240 respondents exceeded the minimum threshold required for a 95 percent confidence level and a 5 percent margin of error. Furthermore, SEM-based studies commonly require relatively larger samples to ensure stability of parameter estimation and adequate statistical power when examining relationships among latent constructs (Hair et al., 2021).

2.4 Sample Distribution across the Study Area

To ensure balanced representation across the hazard gradient within the Ero Dam catchment environment, the 240 participants were distributed equally between two hazard zones identified through preliminary flood susceptibility assessment. Accordingly, 120 respondents were drawn from flood-prone settlements, while 120 respondents were drawn from relatively less-prone settlements within the four LGAs surrounding the dam. Within each zone, respondents were further categorized according to the stakeholder groups that formed the sampling frame. A proportional allocation approach was adopted to reflect the functional roles of stakeholders within community flood management structures. Based on the compiled sampling frame, the distribution followed a working ratio of 20 percent health workers, 40 percent community leaders, and 40 percent local government officials. This allocation resulted in approximately 48 health workers, 96 community leaders, and 96 local government officials participating in the study. The balanced distribution helped ensure that the study captured diverse perspectives regarding flood awareness, preparedness practices, infrastructure vulnerability, and the

socio-economic implications of flooding within the communities surrounding Ero Dam.

2.5 Sampling Technique

A multi-stage sampling technique combining stratified, purposive, and systematic random sampling methods was employed to select participants for the study. In the first stage, the study area was stratified into two major zones—flood-prone settlements and less-prone settlements—using preliminary flood susceptibility maps generated from Machine Learning and GIS-based modeling as well as historical flood records within the Ero Dam catchment environment. This stratification ensured that the sampling process reflected the environmental risk gradient that characterizes the study area.

In the second stage, sampling frames were compiled for each stakeholder group within the selected communities. These frames were obtained from relevant institutional records, including lists of personnel from primary health facilities, registers of community leadership structures such as traditional councils and ward heads, and duty rosters of Local Government Departments responsible for environment, works, water resources, physical planning, and disaster management. The lists were organized according to Local Government Area and community location to facilitate systematic selection of respondents.

Table 1: Population Context and Sample Distribution for the Study

Local Government Area	Estimated Population	Hazard Zone	Health Workers	Community Leaders	LGA Officials	Total Sample
Ido/Osi	239,600	Flood-Prone	6	12	12	30
Moba	217,700	Flood-Prone	6	12	12	30
Oye	206,300	Less-Prone	6	12	12	30
Ilejemeje	65,100	Less-Prone	6	12	12	30
Ido/Osi	239,600	Flood-Prone	6	12	12	30
Moba	217,700	Flood-Prone	6	12	12	30
Oye	206,300	Less-Prone	6	12	12	30
Ilejemeje	65,100	Less-Prone	6	12	12	30
Total	**728,700**	—	**48**	**96**	**96**	**240**

Source: National Population Commission Population Projections (2022); Author's Field Sampling Design (2026).

In the third stage, respondents were selected using systematic random sampling within each stakeholder quota to minimize selection bias and enhance representativeness. Where the available list of eligible respondents was relatively small, simple random sampling was applied instead. In rare cases where a selected respondent was unavailable or unwilling to participate, purposive replacement was applied to select another participant within the same category and community.

2.6 Research Instrument for Data Collection

Data for the study were collected using a structured questionnaire titled "Flood Risk Awareness, Community Preparedness, Infrastructure Damage and Socio-Economic Wellbeing Questionnaire (FRACPISWQ)." The instrument was researcher-developed to obtain standardized responses from stakeholders residing in flood-prone settlements around Ero Dam in Ekiti State. The questionnaire was designed in five sections to align with the research questions guiding the study. Section A focused on respondents' biodata and contained 6 items covering basic demographic characteristics such as Local Government Area, stakeholder category, years of residence or service in the community, educational level, and gender. Section B measured Flood Risk Awareness and consisted of 6 items that explored respondents' knowledge of flood causes, warning signs, past flood experiences, and understanding of flood risks within their communities. Section C measured Community Preparedness and contained 6 items designed to assess preparedness actions such as participation in awareness programmes, existence of community emergency plans, availability of evacuation strategies, and responsiveness to early flood warnings.

Section D focused on Infrastructure Damage and consisted of 6 items examining the extent to which floods affect physical structures such as residential buildings, roads, drainage systems, electricity supply, and water facilities within the settlements. Section E addressed Socio-Economic Wellbeing and comprised 6 items that assessed the economic and social consequences of flooding on households, including income stability, livelihood disruption, access to services, and general household welfare. Altogether, the questionnaire contained 30 items excluding biodata items. Responses to Sections B–E were structured using a four-point Likert scale format of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). This format enabled respondents to express the degree of their agreement with each statement and allowed the researcher to generate quantitative data suitable for statistical analysis of the relationships among the study variables.

2.7 Validity of the Instrument

The research instrument used in the study was the *Flood Risk Awareness, Community Preparedness, Infrastructure Damage and Socio-Economic Wellbeing Questionnaire (FRACPISWQ)*, a researcher-developed instrument consisting of 30 items designed to measure the key constructs of the study. Prior to its administration, the instrument was subjected to validation procedures to ensure that the items adequately represented the variables being investigated. The instrument was assessed for face validity, content validity, and construct validity. To achieve this, the questionnaire was submitted to three experienced academic experts for critical review. These validators included one senior lecturer in Surveying and Geoinformatics with

specialization in environmental and spatial analysis, one lecturer in Disaster Risk Management/Environmental Studies, and one lecturer in Measurement and Evaluation within the field of Educational Research Methods. The experts carefully examined the wording, clarity, relevance, and adequacy of the items in relation to the research objectives and constructs of the study. Their suggestions regarding wording improvements, item alignment, and structural clarity were incorporated into the final version of the questionnaire, thereby ensuring that the instrument appropriately captured the dimensions of flood risk awareness, community preparedness, infrastructure damage, and socio-economic wellbeing.

2.8 Reliability of the Instrument

To determine the reliability of the instrument, the questionnaire was pilot tested prior to the main study. The pilot study involved 20 participants drawn from similar communities within the study area who were not included in the final sample of the research. These participants were selected to reflect the major stakeholder groups within the study context, including health workers, community leaders, and local government officials. The responses obtained from the pilot test were analyzed using the Cronbach's Alpha reliability estimation method to determine the internal consistency of the items contained in the instrument. The analysis produced an overall reliability coefficient of 0.88, indicating a high level of internal consistency among the questionnaire items. Since the reliability coefficient exceeded the commonly accepted threshold of 0.70 for social science research, the instrument was considered reliable and suitable for use in the main study.

3. Methodology

3.1 Method of Data Collection

Data for the study were collected using the Flood Risk Awareness, Community Preparedness, Infrastructure Damage and Socio-Economic Wellbeing Questionnaire (FRACPISWQ), a validated 30-item structured questionnaire specifically developed for the study. Prior to its administration, the instrument had undergone expert validation to ensure that the items adequately reflected the constructs of flood risk awareness, community preparedness, infrastructure damage, and socio-economic wellbeing. A total of 240 copies of the questionnaire were administered to 240 selected participants drawn from flood-prone settlements within the four Local Government Areas surrounding the Ero Dam catchment corridor in Ekiti State, namely Ido/Osi, Moba, Oye, and Ilejemeje LGAs. The administration of the instrument was carried out primarily through a direct in-person approach, which enabled the researcher to explain the purpose of the study and guide respondents where necessary in completing the questionnaire.

Out of the 240 copies of the questionnaire administered, 218 copies were properly completed and returned, while 22 copies were either incompletely filled or not retrieved, resulting in a 90.8 percent retrieval rate. The retrieved responses were considered sufficient for the analysis of the study variables. The distribution of the retrieved questionnaires across the study area showed that 55 valid responses were obtained from Ido/Osi LGA, 54 from Moba LGA, 55 from Oye LGA, and 54 from Ilejemeje LGA, making a total of 218 usable responses. The administration and retrieval of the instrument were conducted over a period of three weeks, during which the researcher visited the selected communities and relevant stakeholder groups to ensure adequate participation and accurate completion of the questionnaire items.

3.2 Method of Data Analysis

The data collected from the respondents were carefully coded and analyzed using appropriate descriptive and inferential statistical techniques. In addressing the research questions, descriptive statistics such as frequency counts, percentages, mean scores, and standard deviations were employed to summarize respondents' perceptions regarding flood risk awareness, community preparedness, infrastructure damage, and socio-economic wellbeing within the flood-prone settlements around Ero Dam. These descriptive measures provided a clear understanding of the distribution and general patterns of responses obtained from the participants.

On the other hand, the formulated hypotheses were tested using Structural Equation Modeling (SEM) supported by regression path analysis in order to examine the structural relationships among the study variables. Specifically, Hypothesis One (which examined the influence of flood risk awareness on socio-economic wellbeing) was tested using SEM path analysis to determine the strength and significance of the direct relationship between the two constructs. Hypothesis Two, which investigated the influence of flood risk awareness on community preparedness, was also tested using SEM regression path estimation. Hypothesis Three, which explored the relationship between community preparedness and infrastructure damage, was analyzed using SEM correlation and path analysis techniques to determine the direction and magnitude of the association between the variables. Finally, Hypothesis Four, which examined the influence of infrastructure damage on socio-economic wellbeing of households, was tested using SEM structural path modeling. All hypotheses were tested at a 0.05 level of significance, and the results were interpreted based on the magnitude and significance of the estimated path coefficients in the structural model.

4. Data and Results Presentation

Research Question 1

How does flood risk awareness influence the socio-economic wellbeing of households in flood-prone settlements around Ero Dam?

Table 2: Respondents' Perception of Flood Risk Awareness and Its Influence on Socio-Economic Wellbeing of Households

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	I am aware of the causes of flooding in my community	218	192	88.1	3.37	0.78
2	I can identify early signs of flood in my area	218	188	86.2	3.30	0.80

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
3	Previous flood experiences have increased my preparedness	218	188	86.2	3.21	0.82
4	I understand the potential economic impact of floods on my household	218	190	87.2	3.28	0.81
5	I am aware of government or local efforts to reduce flood damage	218	180	82.6	3.08	0.85
6	My knowledge of flood risks helps protect my household livelihood	218	189	86.7	3.27	0.79
	— **Grand Mean / Total**	218	—	—	3.25	0.81

The table indicates that the respondents generally possess a high level of flood risk awareness, with grand mean of 3.25 on a 4-point Likert scale. Most participants reported being aware of flood causes, early warning signs, and the socio-economic implications for households. The high frequency percentages and relatively low standard deviations suggest consistency in responses, reflecting that flood risk knowledge is widespread and contributes positively to protecting household wellbeing in the study area.

Research Question 2

What effect does flood risk awareness have on community preparedness among households in flood-prone settlements around Ero Dam?

Table 3: Respondents' Perception of Flood Risk Awareness and Community Preparedness

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	I participate in community flood preparedness programs	218	178	81.7	3.07	0.87
2	My household has an emergency plan for flooding	218	165	75.7	2.97	0.90
3	Community leaders encourage preparedness among residents	218	175	80.3	3.09	0.85
4	Early flood warning information is shared in my community	218	174	79.8	3.08	0.86
5	My knowledge of flood risks influences my participation in preparedness activities	218	175	80.3	3.09	0.86
6	Community meetings on flood risk help me plan better	218	170	78.0	3.02	0.88
	— **Grand Mean / Total**	218	—	—	3.06	0.87

Respondents indicated that flood risk awareness positively affects community preparedness, with a grand mean of 3.06. Participation in preparedness programs, emergency planning, and engagement with community meetings are generally high. The data suggests that households in the Ero Dam catchment area are more likely to prepare for floods when they understand the risks, reinforcing the need for continuous awareness campaigns.

Research Question 3

What relationship exists between community preparedness and infrastructure damage in flood-prone settlements around Ero Dam?

Table 4: Respondents' Perception of Community Preparedness and Its Relationship with Infrastructure Damage

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Community preparedness helps reduce damage to homes during floods	218	185	84.9	3.25	0.81
2	Proper drainage maintenance in my community prevents flood damage	218	168	77.1	3.07	0.85
3	Community drills and awareness programs reduce flood impact on infrastructure	218	169	77.5	3.05	0.84
4	Households follow community guidelines on flood risk management	218	170	78.0	3.09	0.86
5	Collective community action limits destruction of public infrastructure	218	168	77.1	3.07	0.85
6	Community preparedness encourages timely reporting of flood threats to authorities	218	170	78.0	3.08	0.83
	— **Grand Mean / Total**	218	—	—	3.10	0.84

The table shows that community preparedness plays a key role in mitigating infrastructure damage. With a grand mean of 3.10, most respondents agreed that preparedness activities, including drainage maintenance, community drills, and collective action, help protect homes and public facilities. These results highlight that reducing flood damage requires active community engagement, not just physical infrastructure investment.

Research Question 4

How does infrastructure damage influence the socio-economic wellbeing of households in flood-prone settlements around Ero Dam?

Table 5: Respondents' Perception of Infrastructure Damage and Its Influence on Household Socio-Economic Wellbeing

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Floods damage homes and reduce household wealth	218	188	86.2	3.31	0.78
2	Destruction of roads and bridges limits access to markets and services	218	187	85.8	3.27	0.79
3	Flooding disrupts agricultural activities and food supply	218	183	83.9	3.21	0.81
4	Damage to electricity and water facilities affects daily living	218	182	83.5	3.25	0.79
5	Infrastructure damage increases household expenditure for repairs	218	184	84.4	3.25	0.80
6	Loss of public amenities due to floods affects household wellbeing	218	180	82.6	3.20	0.81
	— **Grand Mean / Total**	218	—	—	3.25	0.80

The table indicates that infrastructure damage strongly affects household socio-economic wellbeing, with a grand mean of 3.25. Respondents reported that floods impact homes, transportation, utilities, and livelihood activities, leading to increased household costs and disrupted access

to essential services. The findings underscore the critical need for both structural resilience and community-based preparedness to protect households in flood-prone settlements around Ero Dam.

4.1 Test of the Hypotheses

Hypothesis One (H_1)

Hypothesis: Flood risk awareness has no significant influence on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State.

Table 6: SEM Testing of the Influence of Flood Risk Awareness on Socio-Economic Wellbeing

S/N	Path/Relationship	β (Standardized)	Calculated t-value	Critical t-value	df	Level of Significance	Remark
1	Flood Risk Awareness → Socio-Economic Wellbeing	0.62	8.45	1.96	216	0.05	Significant

The SEM analysis shows that flood risk awareness significantly influences the socio-economic wellbeing of households, with a standardized path coefficient (β) of 0.62 and a calculated t-value of 8.45, which exceeds the critical t-value of 1.96 at 0.05 significance. This indicates a strong positive relationship: as households' awareness of flood risks increases, their socio-economic wellbeing improves through better preparedness and mitigation actions. Therefore, H_1 is rejected, confirming that flood risk awareness is an important determinant of household wellbeing in the Ero Dam catchment area.

Hypothesis Two (H_2)

Hypothesis: Flood risk awareness has no significant influence on community preparedness among households in flood-prone settlements around Ero Dam, Ekiti State.

Table 7: SEM Testing of the Influence of Flood Risk Awareness on Community Preparedness

S/N	Path/Relationship	β (Standardized)	Calculated t-value	Critical t-value	Df	Level of Significance	Remark
1	Flood Risk Awareness → Community Preparedness	0.57	7.89	1.96	216	0.05	Significant

The results indicate that flood risk awareness positively affects community preparedness, with a β of 0.57 and a t-value of 7.89 (t > 1.96). This suggests that households who understand flood risks are more likely to participate in preparedness programs, emergency planning, and collective mitigation efforts. The relationship is statistically significant at the 0.05 level, leading to the rejection of H_2, confirming that increasing awareness can directly enhance community-level preparedness in Nigerian flood-prone settlements.

Hypothesis Three (H_3)

Hypothesis: Community preparedness has no significant relationship with infrastructure damage in flood-prone settlements around Ero Dam, Ekiti State.

Table 8: SEM/Correlation Testing of the Relationship Between Community Preparedness and Infrastructure Damage

S/N	Path/Relationship	β (Standardized)	Calculated t-value	Critical t-value	Df	Level of Significance	Remark
1	Community Preparedness → Infrastructure Damage	-0.48	6.21	1.96	216	0.05	Significant

The analysis reveals a negative and significant relationship between community preparedness and infrastructure damage, with β = -0.48 and t = 6.21. This indicates that higher levels of community preparedness are associated with lower levels of infrastructure damage during floods. The negative sign reflects the protective role of community interventions such as drainage maintenance, emergency drills, and adherence to guidelines. Since the t-value exceeds the critical value, H_3 is rejected, confirming that community preparedness significantly mitigates flood-related infrastructure damage.

Hypothesis Four (H_4)

Hypothesis: Infrastructure damage has no significant influence on the socio-economic wellbeing of households in flood-prone settlements around Ero Dam, Ekiti State.

Table 9: SEM Testing of the Influence of Infrastructure Damage on Socio-Economic Wellbeing

S/N	Path/Relationship	β (Standardized)	Calculated t-value	Critical t-value	df	Level of Significance	Remark
1	Infrastructure Damage → Socio-Economic Wellbeing	-0.54	7.12	1.96	216	0.05	Significant

The table shows that infrastructure damage has a significant negative effect on household socio-economic wellbeing, with a standardized coefficient β = -0.54 and t-value = 7.12 (t > 1.96). This implies that as infrastructure damage from floods increases, the socio-economic wellbeing of households declines, affecting livelihoods, access to markets, utilities, and general welfare. Therefore, H_4 is rejected, emphasizing that reducing flood-induced

infrastructure damage is critical for maintaining household economic stability in flood-prone areas of Nigeria.

4.3 Summary of the Findings

1. **Flood Risk Awareness and Household Wellbeing:** The study revealed that households with higher flood risk awareness tend to enjoy better socio-economic wellbeing, as they adopt precautionary and livelihood-protecting strategies.
2. **Flood Risk Awareness and Community Preparedness:** Findings showed that awareness of flood risks significantly motivates households to participate in community preparedness activities, such as emergency planning, drills, and early warning adherence.
3. **Community Preparedness and Infrastructure Damage:** There is a strong negative relationship between community preparedness and infrastructure damage, suggesting that proactive community actions reduce the severity of flood-related damages.
4. **Infrastructure Damage and Socio-Economic Wellbeing:** Infrastructure damage due to flooding negatively influences household socio-economic wellbeing by disrupting access to markets, utilities, and services, and increasing household expenditure for repairs.
5. **Statistical Significance of Relationships:** All four hypothesized relationships tested via Structural Equation Modeling (SEM) were statistically significant at the 0.05 level, confirming the direct influence of awareness and preparedness on outcomes, and the negative impact of flood-induced infrastructure damage.
6. **Consistency Across Communities:** The findings were consistent across flood-prone settlements in the Ero Dam catchment, reflecting shared perceptions and responses among households in Moba, Ilejemeje, Ido/Osi, and Oye LGAs.

5. Discussion of the Findings

The study demonstrated that flood risk awareness significantly improves the socio-economic wellbeing of households in flood-prone settlements around Ero Dam. Households with higher knowledge of flood risks were able to implement protective measures, reducing losses to property and income. This finding aligns with recent studies showing that disaster risk awareness empowers communities to adopt proactive strategies that enhance resilience (Adeyemi & Oladele, 2021). Practically, this implies that investment in awareness campaigns can be a cost-effective means of protecting livelihoods in flood-prone Nigerian communities.

Flood risk awareness was also found to positively influence community preparedness, with households actively engaging in emergency planning and drills. This supports the assertion by Okonkwo et al. (2022) that knowledge dissemination fosters collective action in disaster management. The implication is that enhancing flood risk communication and community education programs will directly improve local preparedness, potentially reducing disaster impact in the Ero Dam catchment.

The study established a negative relationship between community preparedness and infrastructure damage, indicating that organized community interventions, such as drainage maintenance and early warning reporting, mitigating flood impact on both public and private infrastructure. Similar outcomes were reported by Musa and Bello (2021), emphasizing the value of community-driven strategies. This suggests that integrating community preparedness into local disaster management policies can safeguard infrastructure and sustain socio-economic activities during floods.

Finally, infrastructure damage significantly reduces household socio-economic wellbeing, disrupting livelihoods, utilities, and access to markets. These findings corroborate the observations of Olufemi and Adebayo (2020), highlighting the economic vulnerabilities induced by flooding. Policymakers should therefore prioritize both structural resilience and community-led mitigation to minimize the negative socio-economic consequences of floods in Ekiti State and similar Nigerian contexts.

6. Conclusion

Flood risk awareness and community preparedness are pivotal in reducing flood impacts on households around Ero Dam. Knowledge of flood risks directly empowers residents to adopt preventive and adaptive measures, enhancing their socio-economic wellbeing.

Community preparedness activities, including emergency drills, adherence to guidelines, and collective action, were shown to mitigate flood-induced infrastructure damage, demonstrating the importance of organized community engagement in disaster risk management.

Infrastructure damage remains a major determinant of household vulnerability, as it disrupts livelihoods, increases repair costs, and limits access to essential services. Reducing such damage is essential for sustaining socio-economic stability in flood-prone settlements.

Overall, the study concludes that enhancing awareness, strengthening community preparedness, and investing in infrastructure resilience are crucial strategies to improve the socio-economic wellbeing of households affected by floods in the Ero Dam catchment.

7. Recommendations

1. Implement targeted flood risk awareness campaigns for households in Ero Dam settlements to improve early recognition and response to flood events.
2. Strengthen community preparedness programs, including emergency drills and training for local leaders, to reduce the impact of floods on residents and infrastructure.
3. Enhance drainage systems and basic infrastructure in flood-prone communities to mitigate damage and support socio-economic activities during floods.
4. Establish local disaster management committees with trained personnel to coordinate rapid responses to flood threats.
5. Promote public-private partnerships to fund resilience projects and provide resources for household-level flood protection measures.
6. Encourage continuous monitoring and evaluation of flood-prone areas using GIS and machine learning

tools to improve prediction and preparedness strategies.

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