Community-Based Flood Adaptation Strategies in Ekeremor, Ekeremor Local Government Area, Bayelsa State, Nigeria

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Abstract
Flooding is one of the most recurring disasters in Nigeria, and riverine communities in Bayelsa State carry a heavy share of the loss. This study examined community-based flood adaptation strategies in Ekeremor, Ekeremor Local Government Area of Bayelsa State. It had four objectives: to identify the causes of flooding, to assess its effects, to examine the adaptation strategies used by residents, and to find the challenges that limit these strategies. A descriptive survey design was used. Data were collected from 192 household heads through a structured questionnaire on a five-point Likert scale. The data were analysed with frequency, percentage, mean, median and mode, while the four hypotheses were tested with one-sample t-test at 0.05 level of significance. The findings showed that heavy rainfall and river overflow were the major causes of flooding (grand mean = 3.68), that destruction of property and loss of farmlands were the most serious effects (grand mean = 4.01), and that residents relied mainly on evacuation by canoe, help from relatives and groups, and temporary relocation (grand mean = 3.71). Poor funding and weak government support were the main challenges (grand mean = 3.76). All the null hypotheses were rejected. The study recommends stronger community flood committees, better early warning, and more support from government and partners so that local efforts can last.

Keywords: *flooding; community-based adaptation; resilience; riverine communities; Ekeremor; Bayelsa State*

Background to the Study

Flooding has become one of the most common natural hazards in the world, and its reach keeps growing. Satellite records show that the number of people living in flood-exposed areas has increased over the past two decades (Tellman et al., 2021). In Nigeria the pattern is the same, as floods now occur almost every year in different parts of the country, with big flood years such as 2012 and 2022 still fresh in the minds of many households (Umar & Gray, 2023).

The causes of flooding in Nigeria are both natural and human. Heavy rainfall, overflowing rivers and low-lying land are the natural drivers, while blocked drains, poor land-use planning and building on flood plains make the problem worse (Komolafe et al., 2015). The Niger Delta, where Bayelsa State lies, is especially exposed because of its flat land, many creeks and tidal influence, and the 2012 flood showed how weak the capacity of the region to cope was (Amangabara & Obenade, 2015). The effects of flooding are wide. Houses, farmlands, roads and schools are destroyed, and many families lose their means of living and are forced to leave

their homes (Echendu, 2020). Poor households suffer most because they have fewer things to fall back on, and floods push many of them deeper into poverty (Rentschler et al., 2022). Because help from government often comes late, communities have learnt to protect themselves. Community-based adaptation is an approach in which local people use their own knowledge, labour and social networks to prepare for floods, respond during floods and recover afterwards. When households can draw on their assets and local groups, they are better able to absorb shocks (Tanner et al., 2015). Local measures such as raised houses, early warning by community leaders and sharing of canoes can reduce losses and help people to survive flooding, especially when they are backed by wider support (Hallegatte et al., 2017). It is against this background that this study examined community-based flood adaptation strategies in Ekeremor, Bayelsa State.

Statement of the Problem

Ekeremor is a riverine community in Bayelsa State that is flooded almost every year when the rivers rise. In every flood season, houses go under water, farms and fishing nets are lost, and families move to higher ground or to the houses of relatives. The Nigeria Hydrological Services Agency has continued to warn that parts of Bayelsa fall within areas of high flood risk (Nigeria Hydrological Services Agency [NIHSA], 2022). However, much of what exists on flooding in Nigeria focuses on cities, flood modelling or national policy, and little attention is given to what ordinary people in small riverine communities do for themselves (Nkwunonwo et al., 2020). As a result, it is not clear which community-based strategies residents of Ekeremor use, how well these strategies work, and what stops them from working better. This gap is what the study sets out to fill.

Aim and Objectives of the Study

The aim of the study was to examine community-based flood adaptation strategies in Ekeremor, Ekeremor Local Government Area, Bayelsa State. The specific objectives were to:

1. identify the causes of flooding in Ekeremor;
2. assess the effects of flooding on residents of Ekeremor;
3. examine the community-based adaptation strategies used by residents of Ekeremor; and
4. find out the challenges that limit the effectiveness of these strategies.

Research Questions

1. What are the causes of flooding in Ekeremor?
2. What are the effects of flooding on residents of Ekeremor?
3. What community-based adaptation strategies are used by residents of Ekeremor?
4. What challenges limit the effectiveness of community-based adaptation strategies in Ekeremor?

Hypotheses

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

H_{01}: Natural and human factors are not significant causes of flooding in Ekeremor.

H_{02}: Flooding has no significant effect on the livelihoods and well-being of residents of Ekeremor.

H_{03}: Residents of Ekeremor do not make significant use of community-based flood adaptation strategies.

H_{04}: There are no significant challenges limiting the effectiveness of community-based adaptation strategies in Ekeremor.

Significance of the Study

The study is important to different groups of people. To the residents of Ekeremor, it brings together the measures they already use and shows which ones are working, so that these can be strengthened and shared with neighbouring communities. To community leaders and local flood committees, it gives a clear picture of the gaps in preparation, early warning and response. To the Bayelsa State government, the local government council and agencies responsible for emergency management, it provides evidence that can guide planning, funding and support for riverine settlements. Non-governmental organisations and development partners can also use the findings to design programmes that fit the real needs of the people. Finally, the study adds to the small body of work on flooding in the Niger Delta and offers a base for further research by students and scholars. Lastly, it supports the wider effort to reduce the loss of lives, property and income in flood-prone parts of Nigeria, since the lessons from Ekeremor can be useful to other riverine communities facing similar problems.

Literature Review

Conceptualization of Terminologies

A flood is the covering of land that is normally dry by water from rivers, rainfall, tides or other sources, and it becomes a disaster when it meets people who are exposed and cannot cope (Ighile et al., 2022). Vulnerability, in this study, means the degree to which a household or community is likely to be harmed by flooding, and this depends on exposure, sensitivity and the ability to adapt (Smit & Wandel, 2006). A riverine community is a settlement located along rivers, creeks or other water bodies, where life and livelihood are tied to the water, as in Ekeremor. Adaptation refers to the adjustments that people make to reduce harm from a changing climate and its hazards. Community-based adaptation places local people at the centre, so that their knowledge, priorities and decisions guide the action taken (Kirkby et al., 2018). It is built on the belief that people who live with flooding know it best, although it also needs support from outside agencies and policy makers to succeed (Dodman & Mitlin, 2013). Resilience is the ability of a community to absorb the shock of a flood, recover and adjust afterwards. It rests on the resources and capacities that residents can call upon together (Norris et al., 2008). Social capital, such as trust, cooperation and neighbourly help, is an important part of this ability (Aldrich & Meyer, 2015). The conceptual framework of this study, shown in Figure 1, links the causes of flooding to its effects, and shows that community-based adaptation strategies, shaped by enabling and limiting factors, lead to reduced vulnerability and stronger resilience.

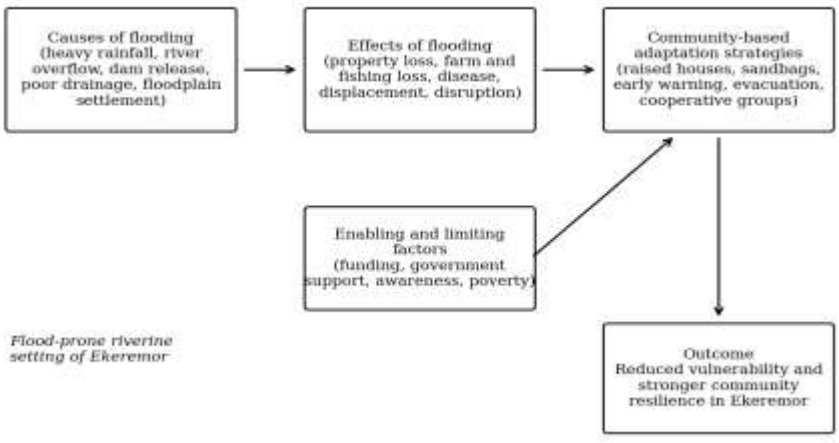

Figure 1: Conceptual framework of the study

Theoretical Framework

Community Resilience Theory guides this study. The theory sees a community as a system whose ability to deal with a hazard depends on its resources, social networks, local knowledge and capacity to learn and change (Berkes & Ross, 2013). It also holds that resilience can be understood through indicators of social, economic, institutional, infrastructural and environmental conditions, and that these differ from place to place (Cutter et al., 2008). Applied to Ekeremor, the theory suggests that households cope better with flooding where there are strong local groups, shared knowledge of the river, access to boats and different sources of income, and support from outside. It therefore supports the focus of this study on community-based strategies and on the factors that help or limit them.

Trends of Flooding in Nigeria

Flooding in Nigeria has followed an upward pattern in both frequency and the areas affected. Studies that use satellite data have helped to map large flood extents in developing regions, including Nigeria, and show how flat land along big rivers is easily covered during heavy events (Ekeu-wei & Blackburn, 2018). Global assessments also project that heavy rainfall and sea level rise will increase flood hazard in many low-lying coastal and delta areas in the coming decades (Intergovernmental Panel on Climate Change [IPCC], 2022). For Bayelsa State, this means that major flood years such as 2012 and 2022 may come again more often.

The Causes of Flood in Riverine Communities

In riverine communities, flooding comes from the meeting of natural conditions and human actions. Flood risk is made up of the hazard itself, the exposure of people and property, and their vulnerability, so poor settlement planning and weak drainage raise risk in the same way heavy rain does (Rana & Routray, 2018). In coastal and delta settings, human changes to the environment, such as clearing of vegetation, also reduce natural protection and increase exposure to hazards (Adger et al., 2005). In places like Ekeremor, rainfall, overflow of the river, release of water from dams upstream, tidal surge and houses built close to the water are the common causes.

The Effect of Flood

The effects of flooding are felt in health, livelihood, housing and education. In Nigeria, floods have been linked with injuries, deaths and diseases, and they also weaken health services (Olanrewaju et al., 2019). Evidence from Kenya shows that flooding is associated with outbreaks of infectious diseases such as cholera, typhoid and malaria (Okaka & Odhiambo, 2018). For people in Ekeremor whose income comes from farming and fishing, the loss of crops, farmland and fishing gear means loss of income and food.

The Need for Adaptation Strategy

Adaptation is needed because flooding cannot be fully stopped, especially in low-lying riverine areas. Good practice in disaster risk reduction stresses that people at risk should take part in reducing the risk, since they are the first to respond when floods come (Twigg, 2015). Resilience and poverty reduction are also linked, because households that are able to adapt are less likely to fall into long-term poverty after a shock (Béné et al., 2014). For Ekeremor, adaptation is therefore a matter of survival and not just a choice.

Forms of Adaptation Strategies

Adaptation to flooding takes many forms. Reviews of adaptation across the world show that people adjust through structural measures such as raising houses and building barriers, and

through non-structural measures such as early warning, change of livelihood and temporary movement (Berrang-Ford et al., 2011). Community-level measures such as clearing drains, forming local flood committees, planning evacuation and sharing resources are part of wider efforts to build resilience for disaster risk reduction (Etinay et al., 2018). In riverine places like Ekeremor, these include stilt houses, sandbags, canoes for evacuation, and cooperative or savings groups.

Challenges with Adaptation Strategies in Flood Prone Environments

Adaptation in flood-prone environments faces many challenges. Households often do not take action because they underestimate the risk or believe they cannot afford protection, and risk perception, past experience and income all shape the choices people make (Bubeck et al., 2012). At the institutional level, adaptation can be slowed by weak governance, lack of funds and political barriers that favour short-term relief over long-term change (Pelling, 2011). These challenges are likely to be stronger in remote riverine communities, where roads, information and public services are limited.

Empirical Studies

Ajibade et al. (2013) studied flooding in Lagos and found that the vulnerability of women was shaped by poverty, gender roles and weak access to resources, while their resilience came mainly from social networks and neighbourly support. In another Nigerian study, Adekola and Lamond (2018) examined how flooding is reported in the media and showed that the way it is framed shapes public ideas about who should respond, which has meaning for policy.

In Zimbabwe, Mavhura (2017) applied a systems approach to community resilience in the Muzarabani district and found that poverty, dependence on rain-fed farming and weak infrastructure were among the factors that drove flood vulnerability. Dube et al. (2018) also showed that flooding and poverty are closely related in Tsholotsho district, with floods making poor rural households poorer. These studies agree with the Nigerian evidence, yet none looked at community-based strategies in Ekeremor, which is the gap this study fills.

Methodology

The study used a descriptive survey design and was carried out in Ekeremor, Ekeremor Local Government Area of Bayelsa State, in 2026. The population was made up of household heads in the community. Using simple random sampling, 200 copies of a structured questionnaire were shared, and 192 correctly filled copies were returned and used, which is within the range recommended for a community survey of this type (Taherdoost, 2016). The questionnaire had a demographic section and four sections matching the research questions, with items rated on a five-point Likert scale of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). The instrument was checked by experts, and a reliability test gave a Cronbach alpha of 0.82. Frequency, percentage, mean, median and mode were used to answer the research questions, with 3.00 as the decision point, since ordinal Likert items are best described with these measures (Sullivan & Artino, 2013). The four hypotheses were tested with one-sample t-test at 0.05 level of significance.

Results and Presentation of Data

Table 1: Demographic characteristics of respondents (N = 192)

Variable	Frequency	Percentage (%)
Gender: Male	105	54.7
Female	87	45.3
Age group: 18-30 years	48	25.0
31-40 years	60	31.2
41-50 years	53	27.6
51 years and above	31	16.1
Occupation: Fishing	56	29.2
Farming	46	24.0
Trading	41	21.4
Civil service/teaching	28	14.6
Others	21	10.9
Years of residence: Below 10 years	35	18.2
10-20 years	61	31.8
Above 20 years	96	50.0

Source: Field survey, 2026

Table 1 shows that 54.7% of the respondents were male and 45.3% were female. Most of the respondents were between 31 and 40 years (31.2%) and 41 and 50 years (27.6%). In terms of occupation, fishing (29.2%) and farming (24.0%) were the most common, and 50.0% had lived in Ekeremor for more than 20 years. This means that most of the respondents had lived through several floods and depend directly on the river and the land for a living, so they were in a good position to give useful answers.

Research Question 1: What are the causes of flooding in Ekeremor?

Table 2: Mean ratings, median and mode on the causes of flooding in Ekeremor (N = 192)

S/N	Item	SA	A	U	D	SD	Mean	Median	Mode	Decision
1	Heavy and prolonged rainfall in the rainy season	98 (51.0%)	71 (37.0%)	11 (5.7%)	11 (5.7%)	1 (0.5%)	4.32	5.0	5	Agreed
2	Overflow of the River Niger, its creeks and tributaries	109 (56.8%)	55 (28.6%)	13 (6.8%)	9 (4.7%)	6 (3.1%)	4.31	5.0	5	Agreed

S/N	Item	SA	A	U	D	SD	Mean	Median	Mode	Decision
3	Blocked or poor drainage channels in the settlement	56 (29.2%)	76 (39.6%)	16 (8.3%)	30 (15.6%)	14 (7.3%)	3.68	4.0	4	Agreed
4	Building houses on flood plains and river banks	44 (22.9%)	66 (34.4%)	21 (10.9%)	46 (24.0%)	15 (7.8%)	3.41	4.0	4	Agreed
5	Release of water from upstream dams	61 (31.8%)	68 (35.4%)	30 (15.6%)	18 (9.4%)	15 (7.8%)	3.74	4.0	4	Agreed
6	Sea level rise and tidal surge from the Atlantic	38 (19.8%)	56 (29.2%)	37 (19.3%)	44 (22.9%)	17 (8.9%)	3.28	3.0	4	Agreed
7	Clearing of mangrove and river bank vegetation	44 (22.9%)	61 (31.8%)	31 (16.1%)	31 (16.1%)	25 (13.0%)	3.35	4.0	4	Agreed
8	Sand mining and dredging along the river channels	40 (20.8%)	64 (33.3%)	26 (13.5%)	47 (24.5%)	15 (7.8%)	3.35	4.0	4	Agreed
Grand mean							**3.68**			**Agreed**

Key: SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree.
Decision rule: mean of 3.00 and above = Agreed.
Source: Field survey, 2026

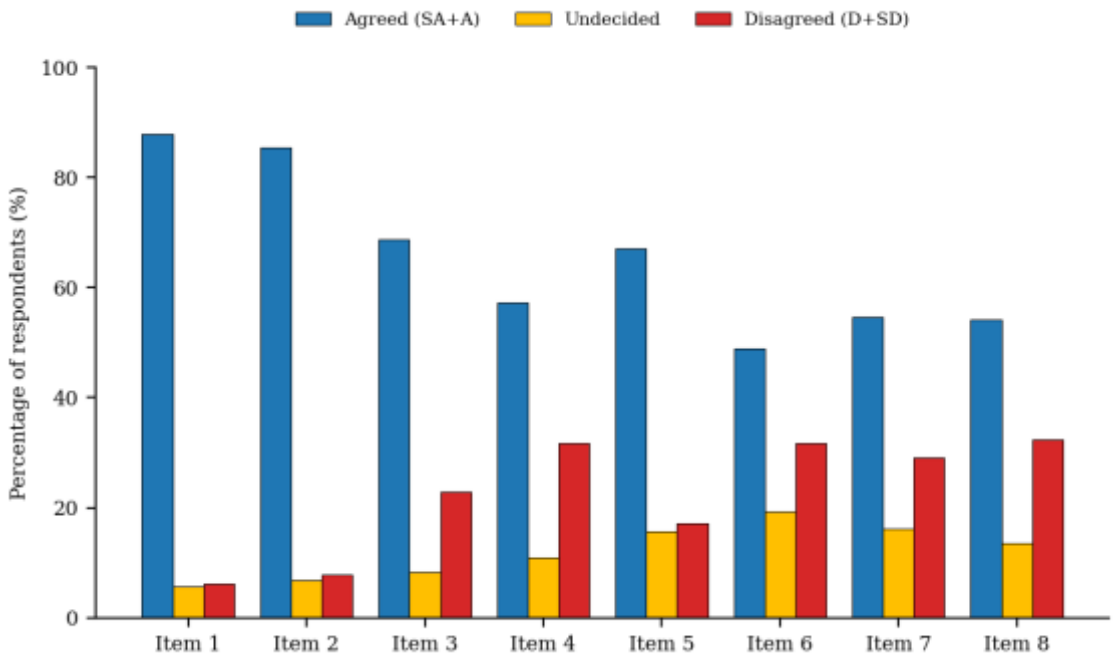

Figure 2: Percentage of respondents who agreed, were undecided or disagreed on the causes of flooding in Ekeremor

Source: Field survey, 2026

Table 2 and Figure 2 present the responses on the causes of flooding in Ekeremor. All 8 items had mean scores above the decision point of 3.00, and the grand mean of 3.68 shows that respondents agreed with the items as a whole. The highest rated item was "heavy and prolonged rainfall in the rainy season" (mean = 4.32; median = 5.0; mode = 5), with 88.0% of respondents agreeing, followed by "overflow of the River Niger, its creeks and tributaries" (mean = 4.31; 85.4% agreed). The lowest rated item was "sea level rise and tidal surge from the Atlantic" (mean = 3.28), but even here 49.0% agreed against 31.8% who disagreed. The tall blue bars in Figure 2 for every item confirm that agreement was higher than disagreement and undecided responses throughout, and the median and mode of 4.0 or 5.0 for most items show that most respondents chose Agree or Strongly Agree. This answers Research Question 1.

Looking at the items one by one, 2 of the 8 items were agreed to by 70% or more of the respondents. The items in between were "release of water from upstream dams" (3.74); "blocked or poor drainage channels in the settlement" (3.68); "building houses on flood plains and river banks" (3.41); "clearing of mangrove and river bank vegetation" (3.35); "sand mining and dredging along the river channels" (3.35), and these also stayed above the decision point. The item with the largest share of undecided respondents was "sea level rise and tidal surge from the Atlantic" (19.3%), which suggests that some residents are not sure about this point or have limited direct experience of it. Across the table, the percentage of respondents who strongly disagreed was small for every item, which shows that the responses were fairly consistent and that the grand mean of 3.68 is a fair picture of the views of the respondents in Ekeremor.

Research Question 2: What are the effects of flooding on residents of Ekeremor?

Table 3: Mean ratings, median and mode on the effects of flooding on residents of Ekeremor (N = 192)

S/N	Item	SA	A	U	D	SD	Mean	Median	Mode	Decision
1	Destruction of houses and household property	113 (58.9%)	60 (31.2%)	3 (1.6%)	9 (4.7%)	7 (3.6%)	4.37	5.0	5	Agreed
2	Loss of farmlands, crops and livestock	107 (55.7%)	59 (30.7%)	6 (3.1%)	13 (6.8%)	7 (3.6%)	4.28	5.0	5	Agreed
3	Disruption of fishing and other trading activities	84 (43.8%)	75 (39.1%)	9 (4.7%)	16 (8.3%)	8 (4.2%)	4.10	4.0	5	Agreed
4	Outbreak of water-borne diseases such as cholera and typhoid	73 (38.0%)	55 (28.6%)	18 (9.4%)	31 (16.1%)	15 (7.8%)	3.73	4.0	5	Agreed
5	Displacement of households from their homes	77 (40.1%)	71 (37.0%)	15 (7.8%)	20 (10.4%)	9 (4.7%)	3.97	4.0	5	Agreed
6	Disruption of school attendance and movement by road or boat	64 (33.3%)	87 (45.3%)	17 (8.9%)	13 (6.8%)	11 (5.7%)	3.94	4.0	4	Agreed
7	Higher cost of food and transport after floods	82 (42.7%)	62 (32.3%)	11 (5.7%)	25 (13.0%)	12 (6.2%)	3.92	4.0	5	Agreed
8	Damage to roads, bridges and jetties	69 (35.9%)	67 (34.9%)	15 (7.8%)	29 (15.1%)	12 (6.2%)	3.79	4.0	5	Agreed
Grand mean							**4.01**			**Agreed**

Key: SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree.
Decision rule: mean of 3.00 and above = Agreed.
Source: Field survey, 2026

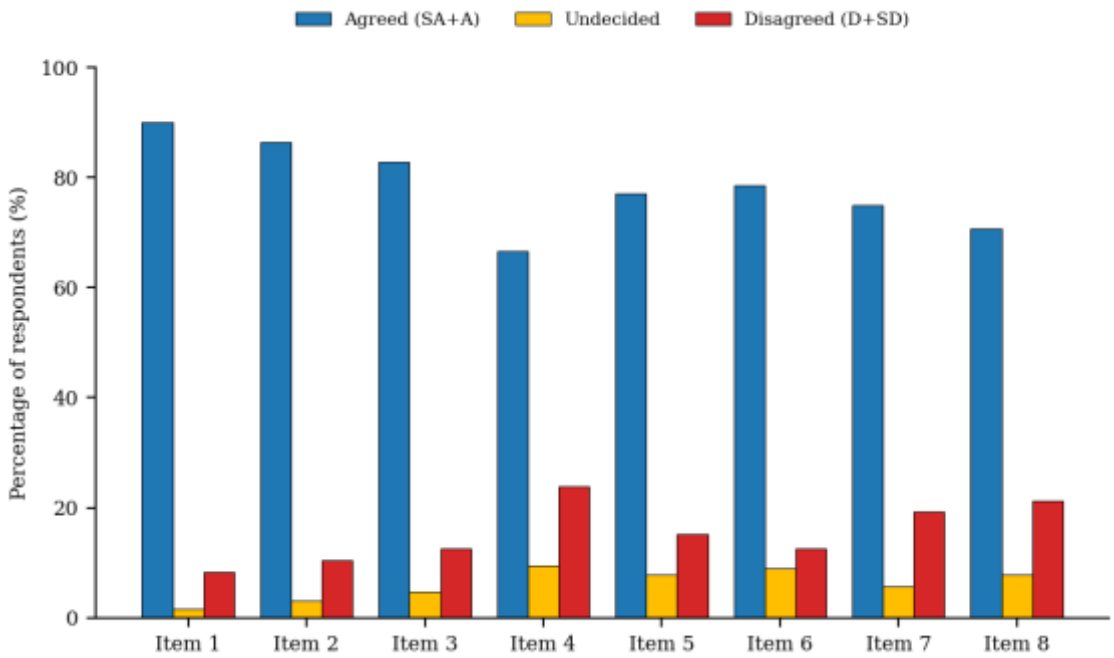

Figure 3: Percentage of respondents who agreed, were undecided or disagreed on the effects of flooding on residents of Ekeremor

Source: Field survey, 2026

Table 3 and Figure 3 present the responses on the effects of flooding on residents of Ekeremor. All 8 items had mean scores above the decision point of 3.00, and the grand mean of 4.01 shows that respondents agreed with the items as a whole. The highest rated item was "destruction of houses and household property" (mean = 4.37; median = 5.0; mode = 5), with 90.1% of respondents agreeing, followed by "loss of farmlands, crops and livestock" (mean = 4.28; 86.4% agreed). The lowest rated item was "outbreak of water-borne diseases such as cholera and typhoid" (mean = 3.73), but even here 66.6% agreed against 23.9% who disagreed. The tall blue bars in Figure 3 for every item confirm that agreement was higher than disagreement and undecided responses throughout, and the median and mode of 4.0 or 5.0 for most items show that most respondents chose Agree or Strongly Agree. This answers Research Question 2.

Looking at the items one by one, 7 of the 8 items were agreed to by 70% or more of the respondents. The items in between were "disruption of fishing and other trading activities" (4.10); "displacement of households from their homes" (3.97); "disruption of school attendance and movement by road or boat" (3.94); "higher cost of food and transport after floods" (3.92); "damage to roads, bridges and jetties" (3.79), and these also stayed above the decision point. The item with the largest share of undecided respondents was "outbreak of water-borne diseases such as cholera and typhoid" (9.4%), which suggests that some residents are not sure about this point or have limited direct experience of it. Across the table, the percentage of respondents who strongly disagreed was small for every item, which shows that the responses were fairly consistent and that the grand mean of 4.01 is a fair picture of the views of the respondents in Ekeremor.

Research Question 3: What community-based adaptation strategies are used by residents of Ekeremor?

Table 4: Mean ratings, median and mode on the community-based adaptation strategies used in Ekeremor (N = 192)

S/N	Item	SA	A	U	D	SD	Mean	Median	Mode	Decision
1	Building houses on raised platforms or stilts	55 (28.6%)	84 (43.8%)	12 (6.2%)	29 (15.1%)	12 (6.2%)	3.73	4.0	4	Agreed
2	Using sandbags and local embankments to hold back water	47 (24.5%)	82 (42.7%)	10 (5.2%)	35 (18.2%)	18 (9.4%)	3.55	4.0	4	Agreed
3	Moving temporarily to higher ground or relatives' houses	74 (38.5%)	88 (45.8%)	8 (4.2%)	10 (5.2%)	12 (6.2%)	4.05	4.0	4	Agreed
4	Early warning through community leaders, radio and phone calls	48 (25.0%)	84 (43.8%)	16 (8.3%)	30 (15.6%)	14 (7.3%)	3.64	4.0	4	Agreed
5	Using canoes and boats for evacuation and movement	91 (47.4%)	69 (35.9%)	10 (5.2%)	14 (7.3%)	8 (4.2%)	4.15	4.0	5	Agreed
6	Communal clearing of drains and creeks	33 (17.2%)	64 (33.3%)	32 (16.7%)	48 (25.0%)	15 (7.8%)	3.27	4.0	4	Agreed
7	Diversifying livelihoods and joining cooperative or savings groups	49 (25.5%)	60 (31.2%)	28 (14.6%)	33 (17.2%)	22 (11.5%)	3.42	4.0	4	Agreed
8	Storing food and important documents in safe places before the rains	48 (25.0%)	72 (37.5%)	21 (10.9%)	42 (21.9%)	9 (4.7%)	3.56	4.0	4	Agreed
9	Seeking help from relatives, churches and community groups	80 (41.7%)	71 (37.0%)	21 (10.9%)	12 (6.2%)	8 (4.2%)	4.06	4.0	5	Agreed
Grand mean							**3.71**			**Agreed**

Key: SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree.
Decision rule: mean of 3.00 and above = Agreed.
Source: Field survey, 2026

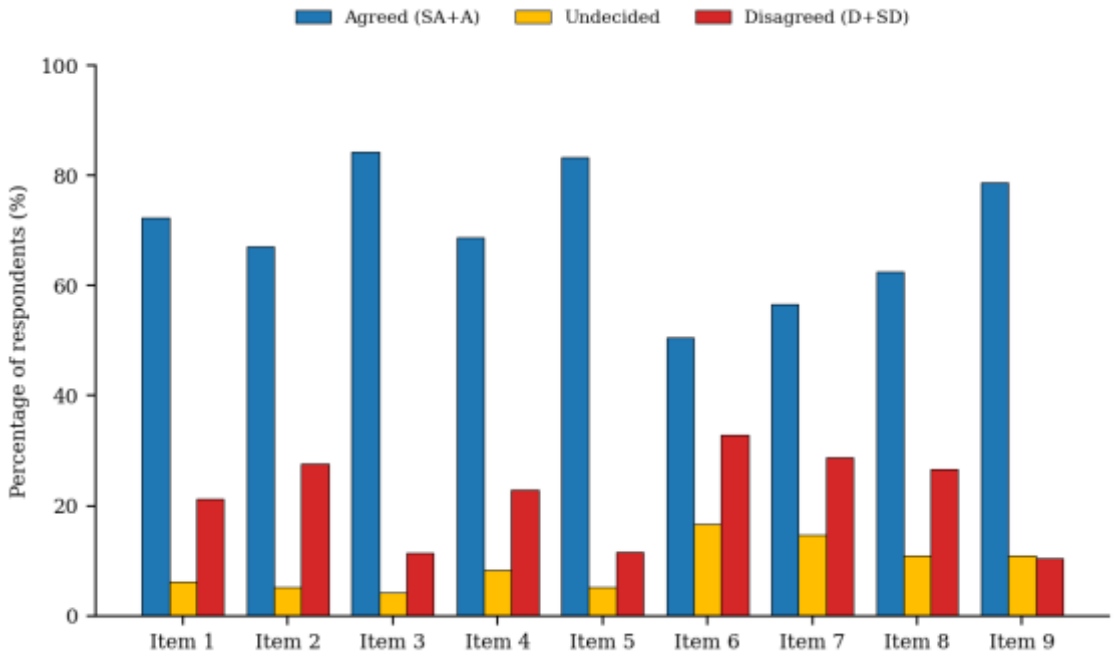

Figure 4: Percentage of respondents who agreed, were undecided or disagreed on the community-based adaptation strategies used in Ekeremor
Source: Field survey, 2026

Table 4 and Figure 4 present the responses on the community-based adaptation strategies used in Ekeremor. All 9 items had mean scores above the decision point of 3.00, and the grand mean of 3.71 shows that respondents agreed with the items as a whole. The highest rated item was "using canoes and boats for evacuation and movement" (mean = 4.15; median = 4.0; mode = 5), with 83.3% of respondents agreeing, followed by "seeking help from relatives, churches and community groups" (mean = 4.06; 78.7% agreed). The lowest rated item was "communal clearing of drains and creeks" (mean = 3.27), but even here 50.5% agreed against 32.8% who disagreed. The tall blue bars in Figure 4 for every item confirm that agreement was higher than disagreement and undecided responses throughout, and the median and mode of 4.0 or 5.0 for most items show that most respondents chose Agree or Strongly Agree. This answers Research Question 3.

Looking at the items one by one, 4 of the 9 items were agreed to by 70% or more of the respondents. The items in between were "moving temporarily to higher ground or relatives' houses" (4.05); "building houses on raised platforms or stilts" (3.73); "early warning through community leaders, radio and phone calls" (3.64); "storing food and important documents in safe places before the rains" (3.56); "using sandbags and local embankments to hold back water" (3.55); "diversifying livelihoods and joining cooperative or savings groups" (3.42), and these also stayed above the decision point. The item with the largest share of undecided respondents was "communal clearing of drains and creeks" (16.7%), which suggests that some residents are not sure about this point or have limited direct experience of it. Across the table, the percentage of respondents who strongly disagreed was small for every item, which shows that the responses were fairly consistent and that the grand mean of 3.71 is a fair picture of the views of the respondents in Ekeremor.

Research Question 4: What challenges limit the effectiveness of community-based adaptation strategies in Ekeremor?

Table 5: Mean ratings, median and mode on the challenges limiting community-based adaptation in Ekeremor (N = 192)

S/N	Item	SA	A	U	D	SD	Mean	Median	Mode	Decision
1	Poor funding and lack of money for adaptation	86 (44.8%)	72 (37.5%)	9 (4.7%)	20 (10.4%)	5 (2.6%)	4.11	4.0	5	Agreed
2	Weak support from government and relevant agencies	87 (45.3%)	62 (32.3%)	11 (5.7%)	24 (12.5%)	8 (4.2%)	4.02	4.0	5	Agreed
3	Low awareness and poor access to flood information	36 (18.8%)	78 (40.6%)	27 (14.1%)	32 (16.7%)	19 (9.9%)	3.42	4.0	4	Agreed
4	High level of poverty among households	83 (43.2%)	59 (30.7%)	9 (4.7%)	32 (16.7%)	9 (4.7%)	3.91	4.0	5	Agreed
5	Poor roads, no access and weak communication	58 (30.2%)	77 (40.1%)	11 (5.7%)	33 (17.2%)	13 (6.8%)	3.70	4.0	4	Agreed
6	Floods are too frequent and heavy for local measures	63 (32.8%)	67 (34.9%)	15 (7.8%)	28 (14.6%)	19 (9.9%)	3.66	4.0	4	Agreed
7	Lack of safe shelters and relief materials	65 (33.9%)	74 (38.5%)	21 (10.9%)	21 (10.9%)	11 (5.7%)	3.84	4.0	4	Agreed
8	Weak cooperation and leadership at community level	42 (21.9%)	63 (32.8%)	36 (18.8%)	38 (19.8%)	13 (6.8%)	3.43	4.0	4	Agreed
Grand mean							**3.76**			**Agreed**

Key: SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree.
Decision rule: mean of 3.00 and above = Agreed.
Source: Field survey, 2026

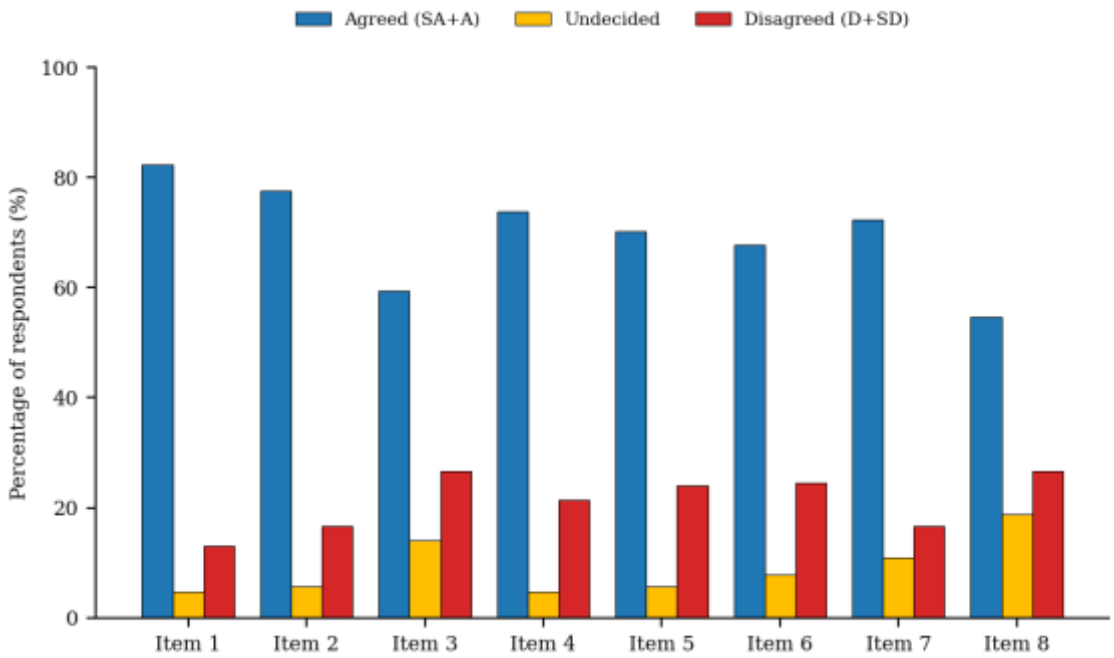

Figure 5: Percentage of respondents who agreed, were undecided or disagreed on the challenges limiting community-based adaptation in Ekeremor

Source: Field survey, 2026

Table 5 and Figure 5 present the responses on the challenges limiting community-based adaptation in Ekeremor. All 8 items had mean scores above the decision point of 3.00, and the grand mean of 3.76 shows that respondents agreed with the items as a whole. The highest rated item was "poor funding and lack of money for adaptation" (mean = 4.11; median = 4.0; mode = 5), with 82.3% of respondents agreeing, followed by "weak support from government and relevant agencies" (mean = 4.02; 77.6% agreed). The lowest rated item was "low awareness and poor access to flood information" (mean = 3.42), but even here 59.4% agreed against 26.6% who disagreed. The tall blue bars in Figure 5 for every item confirm that agreement was higher than disagreement and undecided responses throughout, and the median and mode of 4.0 or 5.0 for most items show that most respondents chose Agree or Strongly Agree. This answers Research Question 4.

Looking at the items one by one, 5 of the 8 items were agreed to by 70% or more of the respondents. The items in between were "high level of poverty among households" (3.91); "lack of safe shelters and relief materials" (3.84); "poor roads, no access and weak communication" (3.70); "floods are too frequent and heavy for local measures" (3.66); "weak cooperation and leadership at community level" (3.43), and these also stayed above the decision point. The item with the largest share of undecided respondents was "weak cooperation and leadership at community level" (18.8%), which suggests that some residents are not sure about this point or have limited direct experience of it. Across the table, the percentage of respondents who strongly disagreed was small for every item, which shows that the responses were fairly consistent and that the grand mean of 3.76 is a fair picture of the views of the respondents in Ekeremor.

Test of Hypotheses

Table 6: One-sample t-test summary of the hypotheses (test value = 3.00; N = 192)

S/N	Hypothesis	Mean	SD	t-value	df	p-value	Decision
1	H_{01}: Natural and human factors are not significant causes of flooding	3.68	0.42	22.62	191	< .001	Reject H_0
2	H_{02}: Flooding has no significant effect on livelihoods and well-being	4.01	0.39	35.62	191	< .001	Reject H_0
3	H_{03}: Residents do not make significant use of community-based adaptation strategies	3.71	0.42	23.67	191	< .001	Reject H_0
4	H_{04}: There are no significant challenges limiting community-based adaptation	3.76	0.43	24.53	191	< .001	Reject H_0

Source: Field survey, 2026

Table 6 shows the result of the four hypotheses. For each hypothesis, the average score of respondents was compared with the decision point of 3.00. The mean scores of 3.68, 4.01, 3.71, 3.76 for hypotheses one to four were all above 3.00, and the calculated t-values (22.62, 35.62, 23.67, 24.53) gave p-values below 0.05 in every case. The four null hypotheses were therefore rejected. This means that natural and human factors are significant causes of flooding in Ekeremor, that flooding has a significant effect on residents, that community-based adaptation strategies are significantly used, and that significant challenges limit their effectiveness.

Summary of Results

The results of the field survey can be summarised as follows. First, the major causes of flooding in Ekeremor were heavy rainfall and overflow of the river, with a grand mean of 3.68. Second, flooding had serious effects on houses, farms, fishing, health and movement, with a grand mean of 4.01, the highest of the four sections. Third, residents used many community-based strategies, mostly evacuation by canoe, help from relatives and groups, and temporary movement to higher ground (grand mean = 3.71). Fourth, poor funding, weak government support and poverty were the main challenges (grand mean = 3.76). Finally, all four null hypotheses were rejected at 0.05 level of significance. Taken together, the results show that flooding is a yearly burden on the people of Ekeremor, and that although they have developed their own ways of coping, these ways are held back by shortage of money, weak support and limited access to safe shelter and relief materials. These findings are discussed in the next section in the light of earlier studies.

Discussion of Findings

The first finding is that heavy rainfall and overflow of the river were the leading causes of flooding in Ekeremor, followed by dam release, blocked drains and building on flood plains. This shows that the problem is not only natural. It supports the view that natural hazards turn into disasters through the choices people make about where and how they live (Kelman, 2020). It also agrees with the finding that low-lying land along major river basins in Nigeria carries a high flood risk (Nkeki et al., 2013).

The second finding is that flooding mainly destroys houses and property and takes away farmlands and fishing activities, with disease and displacement also reported. This is in line with the position that the harm people suffer from climate hazards depends on social conditions such as poverty and dependence on natural resources (Thomas et al., 2019). It also supports the idea that development conditions shape how deeply shocks are felt, which explains why a farming and fishing community suffers so much (Few et al., 2017).

The third finding is that residents depend mostly on canoes for evacuation, help from relatives and community groups, and temporary movement to higher ground, while communal clearing of drains was the least common. This shows that local people act on what they know and have. It agrees with the argument that disaster risk reduction works better when local knowledge is turned into action and not ignored (Gaillard & Mercer, 2013). At the same time, adaptation measures that are left to households alone may not reduce vulnerability much without wider support (Eriksen et al., 2021).

The fourth finding is that poor funding, weak government support and poverty were the main challenges. This means that local effort is strong but not enough on its own. Measures such as sandbags and small embankments may protect one household while pushing water to another, and poorly planned adaptation can shift risk instead of reducing it (Barnett & O'Neill, 2010). Support from outside should therefore be planned with the community so that it does not create new problems (Juhola et al., 2016).

The results also show that human behaviour, and not only the physical hazard, decides how much loss a flood cause. Household decisions on where to live, when to move and what to protect are shaped by experience, income and trust in local information, and including these behaviours in flood planning gives a better picture of real risk (Aerts et al., 2018). In Ekeremor, this means that plans prepared without the views of residents may not work. Adaptation that does not match local conditions can also fail to reduce risk and may even increase it, so planners must check whether measures really protect the people they are meant for (Schipper, 2020).

The test of the hypotheses supports these findings, as all four null hypotheses were rejected. The result shows that the views of respondents were not by chance, and it confirms that residents of Ekeremor see flooding as a serious problem that they must manage with their own resources. This agrees with the view that the ability of coastal communities to adapt depends on their assets, their ability to organise and their freedom to act, and that these can be built up over time (Cinner et al., 2018). It also supports the finding that good flood information and communication through local networks help people to make better decisions before and during floods (Haer et al., 2016).

Conclusion

The study examined community-based flood adaptation strategies in Ekeremor, Bayelsa State. It found that flooding in the area is caused by both natural and human factors, that its effects on houses, farms, fishing, health and movement are serious, and that residents have developed useful local ways of coping, mainly evacuation by canoe, help from relatives and groups, and temporary relocation. It also found that poor funding, weak government support and poverty limit the effectiveness of these strategies. All four null hypotheses were rejected. It is clear that community-based adaptation is already helping the people of Ekeremor to survive flooding, but it needs to be organised, supported and funded better if it is to protect lives and livelihoods in the future. The study also shows that the people of Ekeremor are not helpless in the face of flooding. They use canoes, family and church support, temporary movement and raised houses, and many of them already work together when the water rises. What is missing is steady funding, timely information, safe shelters and a clear link between community effort and government action. Where these are put in place, local strategies can become stronger and more

lasting, and the community will be better prepared for the floods that are likely to come in the years ahead.

Recommendations

1. Community leaders should set up and train flood committees in every ward of Ekeremor to plan preparation, early warning and evacuation.
2. The Bayelsa State government and the local government council should provide timely flood information and make it available in local languages through radio, phone messages and town criers.
3. Government and partners should support households with funds, materials and training for raised houses, safe storage and flood-resistant farming and fishing practices.
4. Drainage channels and creeks should be cleared regularly through communal labour backed by the local government council.
5. Safe community shelters on higher ground, with boats, water and first aid, should be provided and kept ready before every rainy season.
6. Cooperative and savings groups should be encouraged and supported with small grants so that households can recover quickly after floods.

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