



Socioeconomic impacts of flooding in South-Eastern Nigeria: Causes, coping strategies, and flood control measures

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ABSTRACT

The occurrence of floods in Nigeria, particularly in the South-Eastern zones, has resulted in significant socioeconomic losses and continues to be a recurring hazard. This study aims to investigate the socioeconomic impacts of flooding in the region, identify causes and coping strategies, suggest measures for flood control, and evaluate the role of the government in flood management. The study collected data through a questionnaire distributed to 200 respondents and analyzed it using simple percentages, frequency distribution tables, and bar charts. The findings reveal that the incidence of flooding has a significant impact on the socioeconomic activity of the affected communities. To address this issue, proactive and reliable measures are necessary, such as reviewing urban plans and policies, establishing state response desks and relief centers in flood-prone areas, etc. These steps can provide long-term results and promote socio-economic growth in the region. Overall, the study highlights the need for effective flood management strategies to minimize the negative effects on communities and foster sustainable development in Nigeria.

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INTRODUCTION

Floods represent one of the most prevalent natural hazards-caused disasters in Nigeria. The occurrence of floods is typically associated with an excessive amount of rainfall or precipitation, combined with low absorption rates, which results in the overflow of river or sea banks beyond their normal bounds (Echendu, 2021). The increasing precipitation levels resulting from climate change have led to a rise in the frequency of yearly floods during Nigeria's rainy seasons, affecting the majority of the country's states (Agbonkhese et al., 2014). Unlike certain natural disasters, rainfall flooding can be effectively managed through appropriate planning and infrastructure

development (Ebuzoeme, 2015). However, flooding in Nigeria is primarily attributed to anthropogenic causes, exacerbated by inadequate urban design practices and insufficient environmental infrastructure. Nigerian cities have undergone extensive physical development, including the construction, reconstruction, and modernization of roads, offices, markets, stores, manufacturing industries, and other industries, without adequate infrastructure, such as road drainage and canals to support them. As a result, floods have become a significant problem, particularly in several communities in the south-eastern part of the country (Nkwunonwo, 2016).

The primary cause of flooding in Nigeria is human-made, resulting from poor urban planning practices, inadequate drainage systems, and a lack of effective water channels/gutters, which exacerbate the problem (Arnell & Gosling, 2016). Most residential areas in Nigeria lack proper drainage systems and instead rely on natural drainage channels. Inadequate waste management systems and poor attitudes towards trash disposal also contribute to flooding (Ajiboye & Orebiyi, 2022). Nigeria's urban planning is inadequate, and the lack of proper planning is a significant contributor to floods, exacerbated by corruption and poor enforcement of planning legislation. The absence of a National Flood Risk Management (FRM) plan or comprehensive flood risk maps is indicative of Nigeria's neglect of the flood problem (Arnell & Gosling, 2016). Therefore, it is imperative to develop and implement adequate FRM plans that include proper spatial planning and infrastructure to manage floods, which have long-term detrimental effects on Nigeria's development (Nnadi et al., 2019). Previous studies suggest that communities need to be educated about disaster risk, State Response Desks and Relief Centers established in high-risk areas, disaster mapping conducted, and community coping mechanisms improved (Arnell & Gosling, 2016).

Flooding is excess water flowing onto the normally dry ground (Djimesah et al., 2018), for instance when rainfall exceeds the soil's capacity to absorb it. This results in serious effects on the environment (Nwachukwu et al., 2018). Floods in Nigeria are largely predictable, occurring as periodic flash floods throughout the rainy season, particularly along the coast, riverbanks, canals, and estuaries. Rainfall flooding, unlike certain natural disasters, may be managed with adequate planning and the installation of appropriate infrastructure (Satterthwaite, 2017). The primary natural source of floods triggered by climate change is excessive precipitation (MacLeod et al., 2021). Rather than maximum precipitation, (Tramblay et al., 2021) associate flood occurrence with the highest level of soil moisture. The saturation of the wetlands in riverine areas as well as the general global rise in sea level caused by global warming (Echendu, 2021). Floods are natural events, according to (Blöschl et al., 2015), and man does not cause them, however, his actions in deforestation and agricultural operations, particularly in flood-prone areas, have increased flood incidence over the world.

By fostering artificial conditions that might result in excessive run-off, which is the primary cause of flooding, humans seem to be exacerbating the issue. Human activities, such as the construction of impervious surfaces made of concrete and asphalt, have altered the natural landscape by replacing naturally occurring soils and rocks that are capable of absorbing water like sponges. These impervious surfaces prevent the percolation of water into the ground, resulting in an increased amount of surface runoff. This increase in surface runoff can lead to flash floods and other forms of flooding, which can cause significant damage to both human and natural systems. The replacement of natural surfaces with impervious surfaces is a form of land use change that can have far-reaching impacts on the hydrological cycle and other ecosystem processes warming (Ajiboye & Orebiyi, 2022). In addition, humans are also a big contributor to the issue in many watersheds since their usage of dams, canals, and irrigation systems occasionally worsens the circumstances that cause droughts and floods (Parsons, 2022). Flooding has immediate socioeconomic consequences since it affects day-to-day operations and activities (Arnell & Gosling, 2016). A previous study on the socioeconomic impacts of flooding in the metropolis of Port-Harcourt opined on the aggressive review of the state master plan and the implementation of development control (Ikechukwu, 2015).

This study represents a pioneering effort that comprehensively examines the phenomenon of flooding across the entire South-eastern region of Nigeria, which includes Abia, Anambra, Ebonyi, Enugu, and Imo. While a considerable body of research has been undertaken regarding flooding incidents in Nigeria, studies specifically examining the socioeconomic impacts of flooding across the South-eastern states are limited. The present study seeks to fill this critical gap by investigating the broad-ranging socioeconomic effects of flooding across the entire South-eastern region of Nigeria.

The objective of this study is to identify and analyze the causes and impacts of floods and to assess the coping strategies utilized by the communities affected by floods. Additionally, the study aims to suggest measures for flood control and to evaluate the role of the government in flood management in the study area.

RESEARCH METHOD

The study area is the States in the South-Eastern part of Nigeria (Figure 1). It includes Abia, Anambra, Ebonyi, Enugu, and Imo states. The Eastern region of Nigeria was geographically located in South-Eastern Nigeria. It is bordered by the river Niger in the West and has an administrative and cultural border with the Northern region of Nigeria to the north. The southern shore runs along the Gulf of Guinea, and the eastern boundary is located between the borders of Nigeria and Cameroon. The area's total surface area was about 76,145.65 square km (29,400 square mi).

In this region, humidity is high, ranging from 80 to 85% during the rainy season and 60% during the dry season (Nnadi et al., 2019). These events are responsible for the study area's high annual rainfall, which is concentrated in one season and ranges from 1,400 mm to 2,500 mm with only around four months of dryness, from November to February. Because of this, the study's natural vegetation is tropical dry or deciduous, which once consisted of large trees, dense undergrowth, and numerous climbers.

The South-eastern region of Nigeria is located within a belt of forest and grassland, a significant portion of which has been converted to agricultural land, mainly for the cultivation of oil palm trees. Agricultural practices in the region are heavily dependent on seasonal rainfall patterns, which are typically characterized by seven months of intense tropical rains from April to October, followed by five months of water scarcity from November to March. The region is also impacted by the Harmattan, a dry and dusty wind that typically arrives in late December or early January, resulting in reduced visibility and blocked sunlight.

Local inhabitants rely on crop farming, livestock rearing, fishing, and small-scale trading for their livelihoods, with both men and women typically engaged in multiple low-volume income-generating activities. The main food crops grown in the region include yam, cassava, rice, plantains, and vegetables, while the most significant cash crops are palm oil, rubber, coconuts, and cocoa.



Figure 1. Map of the study area (NEMA, 2012)

The area is characterized by compound farms with semi-domesticated trees such as breadfruit, wild mango, African oil bean tree, and African pear. Livestock rearing includes chickens, goats, sheep, and miniature cattle, while commercial poultry farming is also significant. The extraction of mineral resources such as coal, limestone, zinc, lead, iron, and crude oil is an important economic activity, providing both skilled and unskilled labor opportunities. The region is also home to a thriving manufacturing industry, and petty trade is a common form of exchange for locally produced and imported goods. Urban areas provide employment opportunities in the public and private sectors of the health, financial, educational, and other industries (Danladi et al., 2015; Okpa, 2022).

Primary data were collected using a structured online questionnaire survey, which included demographic and socioeconomic information as well as flood occurrence data. The questionnaire was distributed to 200 respondents across the five states comprising the study area in southeast Nigeria, allowing for a broad range of perspectives. The data collection process was conducted electronically via email and WhatsApp, with respondent contact information retained for potential data clarification and validation. Additionally, secondary data sources were utilized, including previous research works, seminars, interviews, books, journals, newspapers, and the bureau of statistics. These sources provided a comprehensive understanding of the flood situation and its socio-economic impacts in the study area.

Table 1. Questionnaires Distribution

No	States	Number of samples	Percentage
			%
1	Abia	29	14.5
2	Anambra	62	31.0
3	Ebonyi	33	16.5
4	Enugu	42	21.0
5	Imo	34	17.0
	Total	200	100.0

Table 1 shows a breakdown of the 200 questionnaires distributed in the study area, where 14.5% of the questionnaires were distributed in Abia state, 31% in Anambra state, 16.5% in Ebonyi state, 21% in Enugu state, and 17% in Imo state were returned.

The data gathered from the respondents were combined and analyzed. To improve the strategy for disaster management approach in the research region, recommendations were given to stakeholders and the Government at various levels to take into consideration those effects in the study to be employed in their disaster risk reduction measures. The data collected were checked for errors, then inputted into Microsoft Excel and SPSS, then arranged and sorted using the selected variables to get cross-tabulation. Statistical analysis was carried out and interpreted to determine the significance of the variables.

RESULT AND DISCUSSION

Overview of Respondents' Demography

The majority of the respondent (38.5%) are within the age bracket of 20-29 years, and more than half of the respondents (58%) are graduates, while 67.5% of the respondents are civil servants (See Table 2).

Table 2. Respondents' Demography

No	Characteristic	Frequency	Percentage
			%
1	Educational		
	No Formal	4	2
	Primary	58	29
	Secondary	22	11
	Tertiary	116	58
2	Age		
	20-29	77	38.5
	30-39	70	35
	40-49	40	20
	Above 50	8	4
	Below 20	5	2.5
3	Marital Status		
	Divorce	1	0.5
	Married	119	59.5
	Single	78	39
	Widowed	2	1
4	Occupation		
	Artisan	33	16.5
	Civil Servant	135	67.5
	Entrepreneur	20	10
	Trader	12	6
5	Gender		
	Female	73	36.5
	Male	127	63.5

Level of Exposure to Flooding

The findings of the present analysis indicate that the surveyed participants reported the occurrence frequency of flood events in the studied region.

Specifically, a considerable proportion of respondents (68%) reported that floods take place intermittently, while 62% reported that they occur frequently. Moreover, a significant number of participants (60%) reported that floods always occur in the studied area. In contrast, only a minority of respondents (7% and 3%) reported that flood events are rare or have never occurred in their respective states.

Table 3 shows the causes of flood in the study area and its distribution among the respondents, 28.5% of the respondents attributed the cause of flood to haphazard dumping of solid waste, 28% of the respondents reported that encroachment of river valley, 19% reported the cause to be deforestation and inappropriate agricultural use, while 24% of the respondents linked it to lack of stormwater drainage system.

Table 3. Causes of Flood

No	Cause of Flooding	Frequency	Percentage %
1	Deforestation and inappropriate agricultural use'	38	19.0
2	Encroachment of river valley	56	28.0
3	Haphazard dumping of solid waste	33	28.5
4	Lack of stormwater drainage system	48	24.0

The results of this study reveal important insights into the causes and impacts of floods in the study area, as well as the coping strategies and flood control measures adopted by the communities. This study found that a significant proportion of respondents attributed the cause of flood to haphazard dumping of solid waste and encroachment of river valley. Deforestation and inappropriate agricultural use were also reported as contributing factors, as well as the lack of a stormwater drainage system. Previous studies also stated various factors that contribute to floods, such as land use changes, deforestation, urbanization, and climate change. They also suggest different approaches to flood management, including structural measures such as drainage systems, dams, and embankments, and non-structural measures such as flood forecasting and warning systems, land-use planning, and community-based approaches (Waghwal & Agnihotri, 2019; Yildirim & Demir, 2021).

Socio-economic Effects of Flooding

Flooding has both immediate and long-term socioeconomic consequences that significantly impact day-to-day activities. The immediate effects of flood disasters include the destruction of homes and properties, leading to the displacement of hundreds of individuals in the study area. The flood disaster also results in significant damage to livelihoods such as farming, poultry, and animal husbandry. The medium to long-term consequences of floods include food shortages, high food costs, and the high cost of rebuilding destroyed infrastructure. Moreover, flood incidents in the region often result in the deterioration of health conditions due to water-borne diseases. It is essential to consider the immediate and long-term effects of flooding to develop effective flood management and prevention strategies that can mitigate the adverse socioeconomic impacts of flooding.

Table 4 demonstrates the significant socioeconomic impact of floods in the communities. For all of the items evaluated, exceptionally high mean response values more than a threshold of 3 served as evidence for this. The responses were skewed towards "a very strong effect" for all the items due to the low standard deviations that were very near to the mean and little variability of responses. Even though there is variation in the levels of replies for each item category, the table shows that the majority of respondents express some level of displeasure with how flooding has affected their states.

The socioeconomic impact of floods was found to be significant, with respondents expressing some level of displeasure with how flooding has affected their states. The coping strategies adopted by the communities included raising doorsteps and pit latrines, constructing protective walls, and elevating house foundations, among others. The results of this study are also in line with previous studies showing that floods can have significant socio-economic impacts on affected communities, and that communities often adopt various coping strategies to reduce these impacts, including building houses and latrines, constructing protective infrastructure, and diversify livelihoods (Mensah & Ahadzie, 2020; Mai et al., 2020; Abubakari & Twum, 2019; Munyai et al., 2019; Echendu, 2020; Khan et al., 2021; Yushanthi & Nianthi, 2021).

Table 4. The Respondents' Answers on the Effects of Flood Incidence on Socio-Economic Activities.

No	Item	High n (%)	Very High n (%)	Mean	SD
1	Farmland	74 (37)	40 (20)	33	2.456.058
2	Crops Output	70 (35)	68 (34)	22	2.616.519
3	Plants Growth	81 (40,5)	59 (29,5)	28	2.894.259
4	Economic trees	34 (17)	119 (59,5)	50	4.025.543
5	Storage Facilities	21 (10,5)	112 (56)	50	3.778.227
6	Crops Species	19 (9,5)	121 (60,5)	33	4.112.042
7	Quality of Crop	20 (10)	108 (54)	50	3.458.323
8	Untimely Harvest	20 (10)	99 (49)	33	3.584.535
9	Death of Livestock	24 (12)	99 (49,5)	50	4.788.006
10	Animal Epidemics e.g; flu	25 (12,5)	114 (57)	40	3.911.521
11	Animal Ranching	25 (12,5)	110 (55)	40	371.322
12	Fishpond	32 (16)	109 (54,5)	33	3.716.031
13	Loss of Varieties of fish Species	11 (5,5)	109 (54,5)	50	4.616.817
14	Increased in the Price of Food	17 (8,5)	116 (58)	40	4.106.093
15	Affordability	25 (12,5)	104 (52)	50	3.592.353
16	Food Scarcity	22 (11)	115 (57,5)	50	3.970.516
17	Loss of Business Partner 1	19 (9,5)	112 (56)	40	3.916.631
18	Loss of Business Partner 2	22 (11)	115 (57,5)	50	4.067.555
19	Laying off of Sales Persons	27 (13,5)	110 (55)	50	3.597.916
20	Epidemics e.g Cholera	25 (12,5)	110 (55)	40	371.322
21	Loss of Lives	31 (15,5)	119 (59,5)	50	4.021.816
22	Migration	28 (14)	102 (51)	50	3.045.488
23	Residential Houses	13 (6,5)	126 (63)	50	4.546.977
24	Household Properties	78 (39)	69 (34,5)	40	2.931.211
25	Markets	11 (5,5)	122 (61)	25	3.911.521
26	Schools	78 (39)	68 (34)	40	2.897.585
27	Roads	88 (44)	42 (21)	50	2.267.157
28	Electricity	86 (43)	55 (27,5)	50	2.540.669

According to the data analysis, majority of the respondents (44%) always raise their doorsteps and pit latrines, 36% construct protective walls and elevation of the house foundation, 9% use sandbags and tree logs, while 11% of the respondents use pipe outlets as their coping strategy. The major coping strategy utilized by the communities for flood adaptation is the construction of drainages and the building of dams/embankments (47%), and control of housing development (36%), while 17% initiate solid waste management practice. This study reveals measures for flood control in the study area. The respondents agreed that the roles played by the government include the use of community leaders (7%), government involvement (14%), and the use of media such as tv (19%), while the majority (60%) of the flood control measures is through the use of sensitization by government agencies.

The government's involvement in flood control has been low as reported by the respondents. Most of the respondents (30%) agreed that the government's commitment has been mainly to public

awareness/education. In their opinion, indiscriminating dumping regulations (31%), and cleaning of drainage basins (23%) from the government are too poor, while 16% stated that they don't know about the government's efforts. Most of the respondents (11%) agreed that the government's absence plays a significant effort in terms of halting the flood menace. In their opinion, corruption (39%) and political issues (28%) are responsible for the lack of success in halting the flood menace through community efforts.

Some respondents (30%) agree that flood incidents sometimes occur in their state, 28% agreed that it often occurs, 30% of the respondents believe that there is always a flood incidence, while 8% said that it rarely occurs.

The major flood control measures identified by the respondents included the construction of drainages and the building of dams/embankments, as well as the control of housing development. However, the study found that the government's involvement in flood control has been low, with most respondents agreeing

that the government's commitment has been mainly to public awareness/education. Indiscriminating dumping regulations and cleaning of drainage basins were also reported as being too poor. Other studies also showed that while there were effective flood control measures in place, government involvement in flood management may be insufficient in some areas, with more resources needed for the actual construction and maintenance of infrastructure, and better regulations to deal with haphazard disposal and cleaning of drainage canals (Shrestha & Kawasaki, 2020; Qi et al., 2021; Rubinato et al., 2019; Mohanty et al., 2020; Campbell et al., 2019; Poku-Boansi et al., 2020; Sarma & Rajkhowa, 2021).

Overall, this study highlights the need for greater government involvement and support in flood control efforts in the study area. This may involve improving regulations and enforcement related to waste management and housing development, as well as investing in stormwater drainage systems and other flood control infrastructure. Additionally, there may be a need for increased public education and awareness campaigns to promote better flood preparedness and response among the communities.

Research Implication

This research has identified several significant consequences for local communities and economies. Floods can cause several physical losses, including damage to houses, infrastructure and public facilities. This condition certainly has a negative impact on people's daily lives, including one that makes it difficult for the community to access basic services such as clean water, electricity, and transportation. Floods also have a significant impact on the agricultural sector. The increasing frequency of floods can cause damage to crops and agricultural land. This condition contributes to decreased production and ultimately harms farmers. If this condition is not treated immediately, it will have an impact on food security and economic stability in the area.

The findings of this study have important implications for policy and practice aimed at reducing the occurrence and impact of flooding events in the studied region. Specifically, the identified causes of flooding highlight the need for targeted interventions, such as effective waste management, river valley preservation, sustainable agricultural practices, and improved infrastructure. Effective waste management has been demonstrated in previous studies to lower

the danger of floods. Several studies emphasize the value of effective sewage treatment facilities and the need to reduce water pollution to ease the burden on rivers and drainage systems (Karamouz et al., 2018; Mishra et al., 2017; Woodward et al., 2021). Reduced flooding is largely a result of regulations that carefully control waste management and robust law enforcement (Adekola et al., 2020). Additionally, protecting river valleys has shown to be a successful method of lowering the frequency of flooding (van Der Meulen et al., 2021). According to studies, actions including installing riparian vegetation, constructing dams, and changing the drainage system can assist in decreasing excessive water run-off during heavy downpours. This plan not only lessens the chance of floods but also contributes to preserving a healthy river ecology (Rideout et al., 2022).

According to previous research, sustainable agriculture methods can also significantly contribute to lessening flooding. Crop rotation, upkeep of ground cover plants, and effective irrigation management are examples of sustainable agricultural practices that can decrease soil erosion and improve water retention. As a result, the chance of flooding brought on by runoff can be significantly diminished (Basche & DeLong, 2019; Tian et al., 2021). A major factor in lowering floods is infrastructure improvement. Ample drainage channels, sturdy river embankments, and effective rainwater collection systems are only a few examples of the infrastructure that can withstand significant water flows highlighted in previous research (Chia et al., 2020; Shah et al., 2020).

Moreover, the severe and persistent impact of flooding events on affected communities underscores the need for emergency relief and financial assistance to support affected individuals and communities. Several studies show that flooding disrupts daily activities, such as loss of shelter, disruption of access to essential services (clean water, sanitation, and electricity), and physical and mental health losses. Floods that significantly and continuously impact the community emphasize the need for emergency assistance, including financial aid. This assistance can reduce community losses and help post-flood recovery if provided quickly and effectively—some assistance including food stocks, clean water supplies, temporary shelter, and health care services. In addition to these aids, financial assistance is also important to help individuals and communities overcome the economic losses caused by floods. Research has shown that

financial assistance can help replace property losses, restore economic activity, and support post-flood reconstruction efforts. Financial aid can also strengthen community resilience to future flooding through investments in flood-resilient infrastructure, insurance protection programs, and training in disaster risk management (Laurien et al., 2020; Dinh et al., 2021).

Despite the valuable insights provided by this study, there are several limitations that should be considered when interpreting the results. Firstly, the study utilized a relatively small sample size, limiting the generalizability of the findings. Additionally, the study relied solely on self-reported data, which may be subject to response bias and measurement error. Furthermore, the study did not account for potential confounding variables, such as climate change, which could have influenced the occurrence and impact of flooding events.

Further research could build on the present study by utilizing a larger and more representative sample size, and incorporating additional data sources and methods to triangulate the findings. Future studies could also incorporate objective measures of flood events, such as remote sensing and GIS data, to supplement self-reported data. Additionally, further research could explore the role of climate change and other potential confounding variables in the occurrence and impact of flooding events. Finally, research could explore the effectiveness of various strategies and policies aimed at mitigating the causes and adverse socioeconomic impact of flooding events in the studied region, and identify best practices for improving the resilience of affected communities.

The findings of this study have important implications for policy and practice aimed at reducing the occurrence and impact of flooding events in the studied region. Specifically, the identified causes of flooding highlight the need for targeted interventions, such as effective waste management, river valley preservation, sustainable agricultural practices, and improved infrastructure. Moreover, the severe and persistent impact of flooding events on affected communities underscores the need for emergency relief and financial assistance to support affected individuals and communities. However, the limitations of this study suggest that further research is necessary to confirm and extend these findings. Future research should aim to utilize larger and more representative samples, objective measures of flood events, and

consideration of confounding variables, such as climate change. Additionally, research could explore the effectiveness of various strategies and policies to mitigate the causes and impact of flooding events, and identify best practices for improving community resilience. Overall, this study provides a crucial foundation for future research and policy aimed at addressing the complex challenges associated with flooding events in the studied region.

CONCLUSION AND SUGGESTION

The study's findings suggest that floods in the study area are caused by haphazard dumping of solid waste (28.5%), encroachment of river valleys (28%), lack of stormwater drainage systems (24%) and deforestation and inappropriate agricultural use (19%). The study also found that floods occur frequently in the area, causing significant socioeconomic impacts on the communities. The coping strategies utilized by the communities include raising doorsteps and pit latrines (44%), constructing protective walls and elevation of the house foundation (36%), using pipe outlets (11%), and using sandbags and tree logs (9%). The major coping strategies for flood adaptation are the construction of drainages and the building of dams/embankments and control of housing development, while solid waste management practices are less utilized.

According to the findings, there needs to be more government engagement in flood mitigation and issues with unfair disposal rules and poor drainage canal upkeep. This emphasizes the requirement for better flood control practices and supervision of current infrastructure, particularly for stricter laws and vigorous law enforcement, ensuring responsible waste disposal and maintaining suitable drainage channels. In addition, problems with politics and corruption were noted as obstacles to the viability of community-based flood management initiatives. Therefore, there is a need for enhanced openness in the use of resources for flood control and changes to governance. Corruption and political difficulties, which might obstruct the implementation of practical flood remedies, should be addressed more. The results of this study's consequences highlight the significance of robust government involvement and significant commitment to flood management. Specific corrective actions are required to enhance governance, infrastructure upkeep, and regulation. Communities

may lessen the adverse social and economic effects of floods and become more resilient to these disasters by improving the effectiveness and efficiency of their flood response.

Practically, the study's findings could be utilized to inform policy decisions on flood management in the study area. The government could increase its involvement in flood control, with particular emphasis on enforcing indiscriminating dumping regulations and cleaning of drainage basins. There could also be more investment in the construction of drainages and the building of dams/embankments, as these were identified as major coping strategies for flood adaptation. Additionally, sensitization and education campaigns could be intensified to increase public awareness on flood management and prevention.

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