Community Responses to Floods: A Case Study of Thornwood Township, Mariannhill, KwaZulu-Natal, South Africa

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Abstract

This study explores the community response to flooding in the Thornwood area, with particular focus on the 2022 flood in Thornwood Township, KwaZulu-Natal. A qualitative research approach was employed, utilizing in-depth semi-structured interviews and focus group discussions. A total of 33 participants took part: 13 individual interviews and 20 across four focus groups, each comprising five participants. Findings indicate that the 2022 flood had a severe impact on the Thornwood community, presenting numerous challenges. The study also revealed that residents employed various coping strategies, which many found helpful. However, these strategies had notable limitations, leaving the community vulnerable to the continued effects of flooding. Additionally, the study found a lack of external support, particularly from government institutions, in assisting the affected community.

Keywords: Disaster, Flooding, Africa, Community response, Government response

1   Introduction

Flooding is a recurrent and destructive natural disaster that continues to affect individuals across all walks of life, despite numerous studies, recommendations, and government interventions. Globally, floods are among the most damaging natural disasters, causing extensive human, economic, and environmental losses (Olanrewaju & Reddy, 2022). In Africa, severe floods have affected over one million people across more than 20 countries in recent decades, resulting in the loss of approximately 500 lives (Braimah et al., 2014). Reports by the World Bank (2021) indicate that flood events in Africa have increased by over 200% since the 1980s, while OCHA (United Nations Office..., 2022) notes that more than 3.4 million people were affected by floods across the continent in a single year. Environmental degradation, rapid urbanization, and inadequate infrastructure have further heightened flood risks, particularly in low-income urban areas (Di Baldassarre et al., 2010; Douglas et al., 2008). Country-specific examples, such as the 2022 Nigeria floods that killed over 600 people and displaced more than a million, illustrate the urgent need for adaptive responses across the continent.

In Southern Africa, countries such as Mozambique, Malawi, and South Africa experience severe flooding annually (Madzivhandila & Maserumule, 2022). In South Africa, climate change has intensified extreme precipitation events, exemplified by the April 2022 floods in KwaZulu-Natal (Ziervogel et al., 2022). These floods caused significant loss of life, widespread displacement, and infrastructure damage. Scientific studies explain that as temperatures rise, the atmosphere can hold approximately 7% more water vapor per 1°C increase, contributing to intense precipitation events even without a change in overall rainfall frequency (Trenberth, 2011). Between 1980 and 2011, South Africa experienced 77 major flood events, resulting in 1,068 deaths and economic damages of approximately USD 1.1 billion (Zuma et al., 2012). More recent extreme weather events, including heavy rainfall and droughts, have disrupted livelihoods and urban agriculture (Munyai et al., 2021).

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The April 2022 floods severely impacted the Eastern Cape and KwaZulu-Natal provinces, destroying thousands of households, power lines, and road infrastructure, and causing property losses estimated at R17 billion (Mashao et al., 2023; Ngcamu, 2022). Thornwood township, part of Mariannhill in the eThekwini Municipality, was among the areas most affected and was selected as the focus of this study due to the scale of damage and community disruption. The South African government declared the floods a national disaster, highlighting the severity of flooding as a national threat (Aiseng & Gamede, 2023; Mashao et al., 2023). Despite formal disaster response frameworks, communities often rely on indigenous knowledge to cope with and recover from floods, employing strategies such as predicting short-term weather changes, terracing, planting native vegetation, and seeking higher ground during flood events (Auliagisni et al., 2022; Ringo et al., 2016; Ziervogel et al., 2022).

Flooding remains a pressing concern in South Africa, exacerbated by climate change, rapid urbanization, and vulnerable infrastructure. The April 2022 KwaZulu-Natal floods, which caused extensive fatalities, displacement, and economic losses, underscore the urgent need to understand effective disaster response strategies. While formal government interventions exist, the role of community-based coping mechanisms and indigenous knowledge in recovery remains underexplored. This study focuses on Thornwood township to examine how community and government responses interacted during the disaster, providing unique insights into flood resilience and adaptive strategies. By highlighting practical lessons from both formal and local approaches, the study contributes to improving disaster preparedness and resilience in vulnerable communities in South Africa.

2 Theoretical approach

This study is based on the Sustainable Livelihoods Approach (SLA), which aligns with the research questions, aims, and objectives. The study explores and examines the community's response to the 2022 floods in Thornwood Township, specifically focusing on the impact of the disaster on livelihoods. The key research question investigates how the floods affected the community's livelihoods in Thornwood, an urban area on the edge of Pine Town, transitioning from rural to urban, as noted by Cross et al. (1992).

Urban areas, especially those prone to natural hazards, often experience concentrated social vulnerability, and their infrastructure struggles to cope with the growing effects of climate change (Williams et al., 2018). The study emphasizes how external shocks, such as the 2022 floods, can disrupt livelihoods, following the DFID (1999) framework, which highlights trends, shocks, and seasonality as factors beyond individuals' control. The research specifically examines how the floods in Thornwood affected the socio-economic livelihoods of the local population.

The SLA highlights the importance of various assets in resilience building, including financial, physical, social, human, and natural assets, forming the 'asset pentagon.' A recent addition to the framework is the political asset, creating the 'asset hexagon' (Ludi & Slater, 2007). The framework encourages collaboration between local government, municipal authorities, and communities in decision-making, policy formulation, and implementation (Majale, 2002).

Hammill et al. (2005) stress that understanding the livelihoods of vulnerable groups, particularly the poor, is essential for developing effective resilience strategies against climate-related shocks. This insight can help in designing successful adaptation strategies, considering how these communities will be affected by climate change, how they can respond using available resources, and how these responses can be strengthened. Therefore the SLA is an appropriate framework for this study, as it helps explore the vulnerabilities of communities like Thornwood and informs the creation of effective adaptation measures.

3 Methodological approach

This study employed a qualitative research design to investigate the impact of the 2022 floods on the Thornwood community in KwaZulu-Natal, focusing on both community-level experiences and the responses of government structures. Qualitative research was chosen for its capacity to provide a nuanced, in-depth understanding of individuals' subjective experiences, social dynamics, and the broader contextual realities in

which these occur (Moriarty, 2011). This approach was particularly well suited to the study's aims, which required exploring the lived experiences of those affected by the floods, as well as critically assessing the perceived adequacy of both local and institutional responses.

The research was conducted in Thornwood, a township within the Mariannhill area, which was among the communities most severely affected by the 2022 floods. The choice of Thornwood was purposive, driven by the community's high exposure to flood-related damage and its relevance to broader issues of urban vulnerability, infrastructural deficits, and disaster response capacity.

A purposive sampling strategy was adopted to ensure that participants were those most capable of providing rich, relevant, and diverse insights aligned with the study's objectives (Obilor, 2023). Participants were required to be residents of Thornwood and aged 18 or above, ensuring they had the maturity and legal capacity to provide informed consent and meaningfully reflect on the events. The study included 33 participants, a sample size deemed sufficient for qualitative research as it allowed for saturation of key themes while remaining manageable for in-depth analysis. Participants represented varied experiences and roles in the community, including homeowners, renters, informal traders, and local leaders.

Data collection involved a combination of in-depth semi-structured interviews and focus group discussions. Thirteen participants engaged in individual interviews, allowing for detailed personal narratives, while 20 participants took part in four focus groups, each consisting of five participants. This combination facilitated both individualized accounts and collective perspectives, enhancing the depth and breadth of the data. Focus groups were particularly valuable in exploring community-level perceptions and dynamics, enabling participants to reflect and build on one another's insights. Secondary sources, including government documents, policy reports, academic articles, and media publications, were also consulted to triangulate findings and provide broader contextual understanding of the floods and responses.

Data analysis followed a thematic approach. All audio-recorded interviews and focus groups were transcribed verbatim, after which transcripts were systematically coded to identify recurrent patterns, categories, and themes relevant to the research questions. Initial coding was followed by iterative review and refinement to consolidate themes, ensuring that both explicit and implicit meanings in participants' narratives were captured. Triangulation across individual interviews, focus groups, and secondary sources enhanced the credibility and validity of the findings.

Ethical considerations were strictly observed throughout the study. Informed consent was obtained from all participants, who were briefed on the study's objectives, methods, and their rights, including the right to withdraw at any point without penalty. Consent forms and interview guides were provided in IsiZulu to ensure comprehension and cultural relevance. All sessions were audio-recorded after obtaining permission to ensure accuracy in transcription and analysis.

This methodological framework enabled the study to capture a rich tapestry of experiences and critically assess both the immediate and long-term implications of the floods on the Thornwood community, as well as the perceived effectiveness of institutional responses.

4   Results

The April 2022 floods had a devastating impact on Thornwood Township, a vulnerable settlement in the Mariannhill area. This study draws on first-hand accounts from affected residents, supported by existing literature, to explore the wide-ranging effects of the disaster and the community's responses. The findings reveal that the floods caused extensive damage to homes and infrastructure and led to prolonged economic hardship, food and water insecurity, health risks, and psychological trauma. With minimal government intervention, residents relied on improvised coping strategies and mutual aid. These experiences expose both the physical and systemic vulnerabilities of flood-prone communities like Thornwood and highlight the urgent need for comprehensive disaster preparedness, resilient infrastructure, and effective institutional support.

4.1   Effects and challenges of the April 2022 floods on Thornwood Township

Thornwood Township in the Mariannhill area was severely impacted by the April 2022 floods, which caused widespread disruption to residents' lives. This study, based on participant testimonies and supporting literature, identifies the main challenges experienced: property loss, infrastructure damage, economic hardship, health risks, psychological distress, and service disruptions.

Loss of personal property was one of the most severe and commonly reported effects. Residents described significant damage to homes, furniture, clothing, and groceries due to floodwaters entering and saturating their houses. These losses were emotionally and financially devastating, especially for low-income families who had accumulated belongings over years. Literature supports these findings. Badamosi et al. (2024) found that 48 percent of Nigerian respondents experienced structural damage, and 35 percent lost personal items. Hooli (2016) and Davies and Black (2020) emphasize the disproportionate impact of flooding on property in vulnerable communities.

The floods disrupted employment and income. Many residents could not work due to damaged infrastructure, including roads, bridges, and workplaces, and rising food prices worsened financial strain. One participant stated, "We couldn't go to work. Financially, I don't have money." This aligns with studies by Badamosi et al. (2024), Diakakis et al. (2020), and Pant et al. (2018), which highlight how damaged infrastructure leads to job losses and long-term economic instability, especially among households with limited financial resilience.

Many participants reported trauma and emotional distress, having witnessed people being swept away or discovering bodies. The psychological impact remains severe long after the event. One participant explained, "Even now we still have trauma of seeing people being flooded away." Hooli (2016) and Davies and Black (2020) similarly report that exposure to floods exacerbates mental health challenges, particularly among disadvantaged populations.

Flooding led to increased respiratory illnesses, particularly among children. Damaged homes and inaccessibility to hospitals, some of which were closed, worsened health outcomes. One resident shared, "We couldn't even go to the hospitals because they were closed." These issues reflect findings by Burton et al. (2016) and Diakakis et al. (2020), who link infrastructure failure to health service disruptions and increased vulnerability.

The findings reveal that hunger and water shortages were among the most severe consequences of flooding experienced by residents in Thornwood. Many participants reported that they had no access to food due to the destruction of critical infrastructure. Roads and bridges were damaged, preventing movement and access to markets. One participant stated: "Roads were closed due to bridges that were damaged, so we could not make any movement." Electricity outages lasting several months made it impossible for residents to cook, forcing many to rely on bread and sugar water for sustenance.

These experiences highlight the connection between damaged infrastructure and food insecurity. Ainehvand et al. (2019) and Badamosi et al. (2024) stress the importance of emergency food aid and note how market dependency makes urban communities more vulnerable during disasters. Participants also emphasized the lack of government support, stating that they had to fend for themselves.

Water shortages were another major issue. Participants described how floodwaters burst pipes, disrupting the municipal water supply for months. With no alternative, residents were forced to travel long distances to fetch water from rivers, often contaminated and unsafe. One participant lamented, "We had to drink the very same unhealthy water, where there were dead bodies and used pampers." These findings indicate a strong link between flood-induced infrastructure damage and the lack of access to essential services such as food, water, and electricity. The inability of local authorities to respond effectively worsened the crisis. Similar to the study by Karagiannis et al. (2019), the data show that natural disasters significantly delay recovery efforts by damaging critical infrastructure and increasing human suffering. Overall, the study underscores the urgent need for resilient infrastructure, reliable emergency response, and stronger governmental support in disaster-prone communities like Thornwood.

4.2 Community Responses to Floods and Coping Strategies in Thornwood

This section explores the community responses and coping mechanisms employed by residents of Thornwood Township during and after the April 2022 floods. The study aimed to assess the effectiveness of both community-initiated and government-supported responses in enhancing residents' capacity to cope with and recover from flood-related impacts.

Thornwood, like many vulnerable urban settlements, faces challenges such as poor drainage systems, inadequate infrastructure, and limited government support. Residents have resorted to self-devised coping strategies, often informal and immediate in nature. Abubakari and Twum (2019) observe that low-income populations in flood-prone urban areas develop both proactive and reactive coping mechanisms in the absence of systemic support. These coping mechanisms often arise from previous experiences and community-level knowledge but remain limited in terms of long-term sustainability. Similarly, Anwana and Owojori (2023) highlight that due to infrastructure gaps, residents in informal settlements often innovate their own survival methods in response to flooding. Parvin et al. (2016) stress that the economic toll of floods, particularly in rural and low-income communities, leads to significant job losses and income reductions, sometimes by as much as two-thirds. This hampers immediate recovery and undermines resilience to future disasters, pushing affected households deeper into debt and asset loss.

One of the most widely used coping strategies in Thornwood was manually opening ditches to divert floodwaters away from homes. Many participants viewed this as an effective immediate response that prevented water from entering their homes. Participant narratives:

> "We were able to be safe by opening the ditch." — Group 4, 19 May 2024

> "What helped us is that we opened the ditch so that the water does not come inside the house." — Group 1, 19 May 2024

> "Opening the drain helped a lot. Because as I was opening the ditch, my other neighbours did the same, so we managed to control water and made it flow along the drain up until it reached the main river." — Participant 2, 11 May 2024

This strategy showed moderate success, particularly when efforts were coordinated among neighbours. However, while some residents managed to divert the water, others noted its limitations.

> "It helped even though it did not really help much but it did." — Participant 10, 11 May 2024

Although effective for many, ditch-digging was not universally successful and lacked the permanence needed for future flood prevention. Its reactive nature and reliance on community mobilization highlight both its strength in emergency response and its weakness as a long-term strategy.

Another coping strategy adopted was remaining awake throughout the night to monitor flood conditions and respond as needed. Some residents reported evacuating temporarily or working through the night to manage water flow. Participant narratives:

> "What really helped us was the matter of not sleeping inside our houses. It was very hard, but we did it with some of my neighbours." — Group 4, 19 May 2024

> "We woke up at night so that we can try and control the water, we worked all night, without sleeping." — Group 3, 19 May 2024

> "Since it was at night, luckily we watched the news and heard that heavy rain is coming so we did not sleep. That is how we managed to escape." — Group 1, 19 May 2024

While this strategy reflects a high level of vigilance and responsiveness, it was physically and mentally exhausting. Its effectiveness was limited, and its sustainability was questionable.

> "It did not help that much." — Participant 8, 11 May 2024

In sum, staying awake worked as a last-resort tactic but lacked long-term viability and underscores the absence of structured early warning systems or disaster response plans. In more severe cases, residents fled their homes temporarily or permanently due to the severity of flooding and structural damage. Participant narratives:

> *"For me, running away was the solution. There was a big hole, so I did not have another option but to run away."* — Group 1, 19 May 2024

> *"I took my children, IDs, and other things and ran away."* — Participant 1, 11 May 2024

> *"At night we ran away from our houses. We slept outside in the trees and there was water everywhere."* — Group 3, 19 May 2024

While escape provided immediate physical safety, it was a temporary solution. Most participants had to return home within days, often to damaged property.

> *"We ran away from our houses to stay in other people's houses where we felt it was safe enough for three days."* — Group 3, 19 May 2024

This strategy, though essential for life preservation, offers no long-term security and exposes displaced families to further risks, including poor sanitation, exposure to the elements, and psychological stress. A few participants attempted to use household items such as blankets and clothing to block water entry into homes. Participant narratives:

> *"It was that I didn't sleep, took out blankets, and put them on the floor to block water from entering."* — Participant 7, 11 May 2024

> *"We closed with clothes."* — Participant 11, 18 May 2024

This method was largely ineffective. While it may have offered psychological comfort or limited water intrusion temporarily, it required constant effort and was ultimately unsustainable.

> *"I would say that it didn't work till the end of floods because I used to change blankets every time until the floods were over."* — Participant 7, 11 May 2024

This illustrates the desperation and lack of flood preparedness within the community. Solidarity among residents played an important role in coping with the flood's aftermath. Many participants mentioned mutual aid and collective action as key elements of their survival. Participant narratives:

> *"What I did was that I became very close with my neighbours, and they really helped me a lot until I was able to go back to my place after my things were dry."* — Participant 5, 11 May 2024

> *"When one has a problem, we all contributed to helping that person, that is how we managed to escape."* — Group 4, 19 May 2024

This strategy was among the most emotionally and practically effective. Community-based support helped fill gaps left by institutional failures.

> *"Seeking help from my neighbours did help a lot. They gave me money to buy food for my children."* — Participant 5, 11 May 2024

However, as Islam et al. (2018) note, such community-based strategies are generally short-term and driven by immediate necessity. Once the crisis subsides, the burden of recovery often falls back on individuals without long-term solutions in place.

The coping strategies used in Thornwood reflect a combination of improvisation, communal support, and individual resilience. However, most of these approaches were reactive and lacked institutional backing or infrastructural support, making them largely unsustainable. While opening ditches and community solidarity proved moderately effective, other strategies such as using blankets or staying awake highlighted the community's vulnerability and lack of preparedness. Ultimately, the study reinforces the findings of Islam et al. (2018) and Parvin et al. (2016), which emphasize that without systemic change and sustainable intervention such as infrastructure improvements, reliable early warning systems, and robust government response, communities will remain trapped in cycles of emergency responses and repeated trauma.

4.3   Government responses in Thornwood Township

The findings from the study indicate a pervasive lack of government intervention and support in Thornwood Township during and after the flooding disaster. Nearly all participants consistently expressed that no assistance was provided by government institutions, leaving residents to rely solely on community-based coping mechanisms. The participants' testimonies underscore a pattern of neglect, where official structures failed to respond to the urgent needs of the affected population. As a result, individuals and families were compelled to survive through mutual aid, community solidarity, and informal support networks. The lived experiences of the residents reflect a broader theme of community resilience in the face of institutional failure. Participant narratives:

> "No, we did not get any help, but the only help that we got was from our neighbours. No help from the government." — Group 1, 19 May 2024

> "It was just about helping yourself and helping each other as neighbours. We were just helping each other as a community. As for the government, we received no help at all." — Participant 2, 11 May 2024

> "The only help I got was from my neighbours, it was only from my neighbour." — Participant 5, 11 May 2024

> "No, but as a community we were able to help each other here and there." — Group 4, 19 May 2024

In addition to the lack of direct assistance, participants reported experiences of unfulfilled promises and inadequate follow-up from government authorities. Many expressed disillusionment over the government's initial commitments, which were never realized. This exacerbated the sense of abandonment and further burdened an already distressed population. Participant narratives:

> "Even today, after registering for losing our home, nothing has been done about it, nothing at all." — Group 3, 19 May 2024

> "After the floods, we were expecting the government to help us immediately, as promised, but we waited until we were tired. On top of it all, we were still waiting while struggling. There was no food, and we did not know what we were going to eat tomorrow." — Group 4, 19 May 2024

These accounts reveal not only the lack of material support but also the emotional and psychological toll of waiting in vain for government aid. The persistent inaction has contributed to feelings of frustration, hopelessness, and mistrust toward public institutions. The situation in Thornwood Township is emblematic of a broader systemic issue in disaster response frameworks in vulnerable communities. The findings resonate with the conclusions drawn by Islam et al. (2018):

> "Though rarely timely, a response to this threat is inevitable. Too often, preparation is lacking, and communities, overburdened by yet another calamity, must deal with the fallout. Without adequate support, those impacted must rely on their own resources, using local knowledge accumulated over decades of fighting the forces of nature."

This statement aligns directly with the experiences in Thornwood, where residents leveraged community cohesion and indigenous coping strategies to manage the immediate aftermath of the flooding. In the absence of a functioning support infrastructure, such solidarity becomes not only a survival strategy but a testament to the strength of communal bonds. However, the failure of government institutions to act decisively raises critical questions about accountability, disaster preparedness, and the marginalization of vulnerable populations. When governments fail to deliver on their promises, it undermines trust and exacerbates social inequalities, particularly in impoverished or underserved areas. While Marianhill experienced severe flooding, there were no incidents of looting reported. In response, the community came together in solidarity, working collectively to protect one another and safeguard their belongings amidst the chaos.

5   Conclusion

The April 2022 floods in Thornwood Township exposed the acute vulnerabilities of a low-income, poorly serviced urban settlement in the face of natural disasters. This study illuminates the multifaceted challenges experienced by residents, including widespread property damage, infrastructure collapse, economic disruption, health hazards, psychological trauma, and a severe breakdown in basic services such as food, water, electricity, and healthcare.

The testimonies gathered highlight a stark reality: While the physical impacts of the floods were devastating, the absence of institutional support and preparedness greatly intensified the suffering of Thornwood's residents. Critical infrastructure was not only damaged but remained unrepaired for extended periods, leaving communities isolated and dependent on fragile informal networks for survival. In the wake of the disaster, government response was not only delayed but often entirely absent, eroding public trust and reinforcing a cycle of marginalisation.

Despite these challenges, the community demonstrated extraordinary resilience. Informal coping strategies such as digging drainage ditches, remaining alert through the night, evacuating homes, and supporting one another proved crucial in mitigating immediate risks. However, these strategies were predominantly reactive, temporary, and unsustainable. They underscored the creativity and solidarity within the community but also revealed the deep systemic failures in disaster management and urban planning.

The findings affirm existing literature that warns of the disproportionate burden borne by impoverished communities during disasters and the critical role that infrastructure, governmental accountability, and preparedness play in disaster response and recovery. Thornwood's experience is a powerful reminder that resilience alone is not enough. Without proactive investment in resilient infrastructure, reliable early warning systems, and inclusive government intervention, vulnerable communities like Thornwood will continue to face repeated hardship and slow, painful recoveries.

In conclusion, the 2022 floods were not only a natural disaster but also a governance failure. Addressing future risks in Thornwood and similar communities requires urgent systemic change that focuses on the needs of the most vulnerable, builds local capacity,
and ensures that disaster response is swift, equitable, and sustained.

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