

**Publisher**<http://jssidoi.org/esc/home>**COPING WITH CLIMATE-RELATED DISASTERS: A CASE OF A GREEN FARM COMMUNITY EXPERIENCED A FLOOD\*****Mkululi Gqalindaba <sup>1</sup>, Yusuf Lukman <sup>2</sup>, Nonzwakazi Beauty Makiwane <sup>3</sup>**<sup>1,2</sup> *Walter Sisulu University, South Africa**E-mails: <sup>1</sup>[217214312@mywsu.ac.za](mailto:217214312@mywsu.ac.za); <sup>2</sup>[yjukman@wsu.ac.za](mailto:yjukman@wsu.ac.za); <sup>3</sup>[bmakiwane@wsu.ac.za](mailto:bmakiwane@wsu.ac.za)**Received 11 December 2023; accepted 1<sup>st</sup> March 2024; published 30 March 2024*

**Abstract.** This study investigates the enduring consequences of recurrent flood disasters on communities located in river basins and proximate to significant water bodies. Floods are identified as a primary contributor to disaster-related losses, affecting 34.2 million people in 2018 alone. The region under scrutiny has witnessed an escalation in the frequency and severity of natural catastrophes due to unpredictable climate changes over the last decade. Despite the profound challenges flooding poses, there is a need for more in-depth studies on the subject. Focusing on the Port St Johns community, this research addresses the existing gap by closely examining the difficulties confronted by residents during and after flood disasters. The study utilizes interviews, observations, and data analysis to gain context-specific insights. A purposive sampling approach is adopted, selecting 15 participants from disadvantaged backgrounds. Semi-structured interviews and thematic analysis are the primary data collection and analysis methods. The study's findings delve into the multifaceted impact of recurring flooding in the Green Farm Community, emphasizing the interplay of environmental factors, social responses, and historical trends. Themes such as infrastructural damage, property loss, and community preparedness challenges are explored. The municipality's role in flood support, timeliness and effectiveness is scrutinized. Environmental factors, including changing rainfall patterns and proximity to water bodies, are vital to the community's vulnerability. Recommendations include enhancing long-term planning, improving communication, assessing financial support adequacy, tailoring responses to community needs, investing in proactive preparedness, and ensuring equitable resource allocation. The study underscores the community's proactive measures, offering valuable insights for disaster management and resilience-building.

**Keywords:** flooding; disaster; preparedness; resilience

**Reference** to this paper should be made as follows: Gqalindaba, M., Lukman, Y., Makiwane, N.B. 2024. Coping with climate-related disasters: a case of a Green Farm Community experienced a flood. *Insights Into Regional Development*, 6(1), 23-36. [http://doi.org/10.9770/IRD.2024.6.1\(2\)](http://doi.org/10.9770/IRD.2024.6.1(2))

**JEL Classifications:** Q54**1. Introduction**

Climate-related disasters, encompassing floods, droughts, and tropical cyclones, stand as formidable challenges on a global scale, inflicting substantial human casualties and economic losses (McCollum et al., 2016; UNISDR, 2015; IPCC, 2012; DCG, 2019; Chen et al., 2023). The intensification of urbanization further amplifies vulnerabilities, reshaping land use patterns and exposing larger populations to the perils of natural hazards, particularly floods (GFDRR, 2015; Ministry of Cooperative Government and Traditional Affairs, 2019). Flood hazards, gauged by the probability of their destructive consequences, such as loss of life and property damage, underscore the urgency of understanding and mitigating these risks (Henry, 2006). McCollum (2006) characterizes natural disasters as monumental events causing catastrophic physical harm, widespread devastation, loss of life, and significant alterations to environmental conditions. Consequently, disasters represent a complex intersection of threats to human life, property, and the intricate fabric of economic, social,

---

\* *This research was funded by Walter Sisulu University, South Africa*

and cultural existence (Godwell and Lazarus, 2021). The repercussions of such disasters disproportionately affect the vulnerable and underserved segments of society (Godwell and Lazarus, 2021).

This research delves into the profound implications of recurrent flood disasters on a community near river basins and major bodies of water (Hallegatte, 2011; Schaffer-Smith et al., 2020). The adverse impact of these events is particularly pronounced among impoverished and vulnerable communities, illuminating the pressing need to comprehend and address the complexities of flood-induced challenges. This research aims to contribute to a deeper understanding of the intricate dynamics surrounding frequent flood disasters and their ramifications on the communities residing in flood-prone regions.

## 2. Background of the study

On April 22, 2019, Port St. Johns in the Eastern Cape Province of South Africa faced an unprecedented natural disaster as heavy rains triggered catastrophic flooding, leaving a trail of devastation in its wake (Port St. Johns Disaster Risk Management Satellite Centre, 2019). The impact of these torrential rains extended beyond the borders of Port St. Johns, affecting parts of KwaZulu-Natal as well. By April 2022, City Press revealed that the floods in KwaZulu-Natal had claimed the lives of over 4,000 people, inflicted severe injuries on many, and left numerous individuals missing (Sobuwa, 2022). Specifically focusing on the aftermath in Port St. Johns, records from the Disaster Risk Management Satellite Center highlighted the grim statistics. The disaster affected 11 wards, impacting 882 households. Among the victims, 656 households experienced damage to their possessions, 226 were rendered homeless, and 121 were residents (renting at Green Farm and around town) directly affected by the calamity.

While this research primarily centres on Green Farm in Port St. Johns, it's crucial to acknowledge that other areas in the Eastern Cape, such as Mbizana and Lusikisiki, also experienced the far-reaching consequences of the floods. Tragically, a 39-year-old woman lost her life in Mbizana, and in Lusikisiki, two schoolchildren drowned in the floodwaters (Godwell and Lazarus, 2021). The geographical setting of Port St. Johns, as described by the then-Minister of Cooperative Governance and Traditional Affairs, plays a pivotal role in exacerbating the impact of flooding. Green Farm is situated in a valley that absorbs water from the surrounding elevated areas. It faces perennial challenges due to its topography and location (Ministry of Cooperative Governance and Traditional Affairs, 2019 online). The vulnerability of this region to heavy rainfall, whether it be a natural occurrence or a consequence of mismanaged infrastructure, poses significant threats to local industry, agriculture, and the overall economy (Benso and Clay, 2004). Understanding the dynamics of such disaster-prone areas is imperative for devising effective strategies to mitigate the impact on communities and promote long-term resilience (Satilmis, 2023; Ghosh et al., 2023; Choudhury & Haque, 2024; Sari & Özer, 2024; Georriadoua et al., 2024; Maake et al., 2024).

## 3. Research problem

Port St Johns, a region characterized by its susceptibility to natural disasters, has been grappling with recurring catastrophes, primarily stemming from unpredictable climate changes (Gwindi, 2007). Despite the geographical vulnerability of the area, comprehensive preventive measures to avert these disasters are notably lacking (GFDRR, 2015). Over the past decade, the community has borne the brunt of these natural calamities, with rivers and dams frequently overflowing due to heavy seasonal rainfall and run-off, resulting in widespread floods and associated disasters (Port St Johns Disaster Risk Management Satellite Centre, 2019).

One incident reported by Daniel (2019) highlights the vulnerability of the Green Farm area to flash floods triggered by the overflowing Mzimvubu River. This alarming scenario is not isolated; rural settlements in low-lying areas find themselves cut off and inaccessible during such events (Hallegatte et al., 2015). These recurrent disasters have undoubtedly left an indelible mark on the community, impacting their lives, livelihoods, and overall well-being. Despite the evident challenges faced by the Port St Johns community in the aftermath of flooding, there needs to be a deeper understanding of the full extent of these challenges. Previous research has often overlooked the nuanced experiences of communities dealing with floods, particularly in the Port St Johns region. This study aims to bridge this gap by comprehensively assessing the challenges the Port St. Johns

community faces during and after flood disasters. By delving into the lived experiences of the community members, the research seeks to shed light on the multifaceted impacts of flooding on their lives.

Moreover, the study seeks to unravel the profound effects of flooding on the lives of the Port St Johns people. Beyond the immediate and visible consequences, such as property damage and displacement, the research aims to uncover the intricate ways flooding permeates the fabric of daily life for the community. By doing so, the study aspires to contribute to a deeper understanding of the complex interplay between natural disasters and community resilience, ultimately informing future strategies and interventions to enhance the community's ability to cope with and recover from such events.

#### **4. Objective of the study**

- Highlight the necessity of understanding and addressing community-specific challenges in preparing for flood events.
- Examine the municipal response to flooding's short-term and long-term planning aspects.

#### **5. Theoretical framework**

The Socio-Ecological Systems (SES) framework, as elucidated by Daniel (2019), stands as a robust theoretical lens through which the intricate relationships between social and ecological systems in the context of flood disasters can be comprehensively understood. This framework recognizes the inextricable link between human well-being and the resilience of ecosystems, emphasizing the necessity of integrating social, economic, and ecological considerations in formulating flood risk management strategies (Gunderson, 2000). By drawing attention to the interconnectedness between human and natural systems, the SES framework underscores the reciprocal influences and dependencies that shape the dynamics of flood disasters. A notable strength of the SES framework lies in its ability to accommodate the multidimensionality inherent in flood disasters. By encompassing social, economic, and ecological dimensions, the framework facilitates a nuanced analysis of the impacts of floods on the Green Farm Community. It enables researchers to explore the direct physical damages to infrastructure and property (ecological dimension) and the social and economic consequences, such as displacement, loss of livelihoods, and disruptions to community networks (social and economic dimensions).

Moreover, the SES framework acknowledges that communities actively shape their resilience and adaptive capacity. It underscores the significance of community engagement, local knowledge, and social networks in flood risk management (Mabuya, 2015). The framework recognizes the importance of local perspectives, experiences, and capacities by involving the Green Farm Community in decision-making. This participatory approach enhances the effectiveness and sustainability of flood risk management strategies by fostering ownership, cooperation, and empowerment within the community. However, the SES framework has limitations. Its potential oversimplification of the complex interactions between social and ecological systems, reducing them to linear cause-and-effect relationships, requires critical examination. Flood disasters often involve feedback loops, nonlinear dynamics, and uncertainties, necessitating a more nuanced understanding (Leroux et al., 2020).

Additionally, the framework may overlook power dynamics and inequalities within the social system. Integrating a social justice perspective becomes crucial to identifying and addressing social inequities and promoting more inclusive and equitable flood risk management approaches (Daniel, 2019). The SES framework must be adapted to the local context for successful application to the Green Farm Community. This adaptation involves engaging with local stakeholders, incorporating indigenous knowledge systems, and recognizing the community's values, beliefs, and practices related to flood management. This contextualization ensures that the framework aligns with the unique socio-cultural and environmental dynamics of the Green Farm Community, enhancing its relevance and effectiveness in guiding flood risk management strategies.

## 6. Literature review

### Conceptualizing Flood Disasters

Flood disasters, characterized by overflowing water onto normally dry land, result in widespread damage to property, infrastructure, and the environment (Beson and Clay, 2004; Chen, 2019). These events, often triggered by heavy rainfall, river overflow, or dam failure, have far-reaching consequences on communities' physical and socio-economic aspects (Bless et al., 2013). The disruptions caused by flood disasters extend beyond immediate physical damage, affecting standard life patterns, displacing people, and causing the loss of livelihoods and damage to agricultural fields (Bless et al., 2013).

Various regions globally, including Manicaland, Zimbabwe, and Port St Johns Municipality, South Africa, have experienced the devastating impacts of flood disasters. Deadly storms and floods in Manicaland led to significant damage to infrastructure and the displacement of thousands (Davies, 2020). In Port St Johns, South Africa, floods resulted in the evacuation of residents, destruction of homes, and crop loss (Daniel, 2019). South Africa, as a whole, has faced notable consequences, such as damage to infrastructure and agricultural activities, leading to economic hardships and displacement (Davies, 2020; Daniel, 2019).

### The Port St Johns Green Farm Community

This literature review focuses on the unique and vibrant Port St. Johns Green Farm Community in the rural Eastern Cape province of South Africa. Renowned for its commitment to sustainable and environmentally friendly farming practices, the community engages in organic farming, permaculture, and agroforestry (Mabuya, 2015). These practices minimize synthetic inputs, promote biodiversity, and enhance ecosystem services.

### Challenges Faced by the Green Farm Community

Despite its commitment to sustainable practices, the Green Farm Community faces challenges, including limited access to markets and infrastructure, hindering connections with buyers and access to necessary resources (Davies, 2016). The remoteness of the area and a lack of reliable transportation networks exacerbate these challenges. Additionally, the community needs more access to financial support and technical assistance (Davies, 2016).

### Achievements of the Green Farm Community

Nevertheless, the Green Farm Community has successfully promoted sustainable agriculture and community development. Green farming practices have improved soil fertility, reduced erosion, and enhanced biodiversity, fostering environmental conservation (Ramugondo, 2013; Mabuya, 2015). Beyond environmental benefits, green farming has generated employment, improved food security, and enhanced community livelihoods (Ramugondo, 2013; Mabuya, 2015). The community's engagement in organic agriculture has facilitated entry into niche markets, securing premium prices for their produce (Davies, 2016), thereby ensuring economic viability and long-term sustainability.

### Factors Contributing to Success

The success of the Port St. Johns Green Farm Community is attributed to factors such as assertive community cohesion, shared values, adaptability, and innovation in the face of challenges (Mabuya, 2015; Davies, 2016). Support from local organizations, NGOs, and government initiatives has been crucial in providing technical assistance, capacity building, and market linkages (Ramugondo, 2013; Mabuya, 2015).

While the literature provides a comprehensive overview of the impacts of flood disasters and highlights the success of the Port St. Johns Green Farm Community in sustainable agriculture and community development, there is a notable gap in addressing the specific strategies employed by the Green Farm Community to enhance their resilience to flood disasters. The literature must delve deeper into the community's disaster preparedness measures, response mechanisms, and long-term resilience-building strategies in the face of floods. Understanding the specific actions taken by the Green Farm Community to mitigate the adverse effects of floods and ensure the continuity of their sustainable farming practices would provide valuable insights for other communities facing similar challenges. Exploring the community's experiences in disaster risk reduction, early warning systems, and post-flood recovery efforts would contribute to the existing knowledge on community

resilience in flood-prone areas. Additionally, the literature review needs to explicitly discuss the role of technology, if any, in the Green Farm Community's disaster preparedness and response strategies. Investigating the utilization of technology, such as early warning systems, mobile applications, or remote sensing, could shed light on innovative approaches that contribute to community resilience in the context of flood disasters. In summary, the identified gap in the literature revolves around a need for a more detailed exploration of the Green Farm Community's specific actions and strategies related to disaster preparedness, response, and long-term resilience-building in the context of flood disasters.

In conclusion, the literature highlights floods' global, regional, and local impacts on infrastructure, economy, agriculture, and human well-being. The experiences of the Port St. Johns Green Farm Community serve as an inspiring example of sustainable agriculture and community development. Despite facing challenges, the community's commitment to green farming practices, innovation, and strong community ties has led to positive environmental, social, and economic outcomes. Documenting and understanding their experiences can be valuable for other communities and policymakers interested in promoting sustainable agriculture and rural development. The literature underscores the importance of effective disaster preparedness, response, and resilience-building measures to mitigate the adverse effects of floods and promote sustainable development.

## **7. Methodology**

This study employs a qualitative research design, aiming to systematically explore and understand the subjective experiences and meanings attributed to the challenges faced by the Port St Johns Green Farm Community during flood disasters (Gray, 2014). Qualitative research is well-suited for capturing rich, contextualized data through methods such as interviews, observations, and the analysis of textual or visual data (Creswell, 2019). A non-probability purposive sampling approach was employed to select participants for this study. Purposive sampling involves deliberately selecting participants with specific characteristics or experiences relevant to the research questions (Creswell, 2019). In this case, individuals who could provide rich and in-depth insights into the impact of flood disasters on the livelihood of the Green Farm Community were targeted. Criteria for participant selection were defined based on participants' knowledge, experiences, and direct exposure to flood disasters. The researcher identified and targeted individuals from the Port St. Johns Green Farm Community, considering their involvement and first-hand experiences with flood disasters.

The sample size comprised 15 participants from disadvantaged backgrounds residing in different locations within Green Farm. Semi-structured interviews were employed as the primary data collection method. This approach allows for a guided yet flexible conversation, with a prepared set of open-ended questions or broad topics guiding the discussion. The flexibility to probe further and explore specific areas of interest based on participants' responses enhances the depth and richness of the data. Thematic analysis was chosen as the qualitative data analysis method. Thematic analysis involves identifying, organizing, and interpreting patterns or themes within qualitative data to understand the research topic better. This method allows for a systematic exploration of the challenges experienced by the Green Farm Community during flood disasters. Ensuring research trustworthiness is paramount in qualitative research. Several strategies were implemented to establish credibility, dependability, conformability, and transferability of the findings. These include maintaining detailed records of the research process, employing member checking, seeking peer debriefing, and providing a detailed description of the research context and participants. Adherence to ethical considerations was a priority in this study to ensure the participants' protection and well-being and maintain the research process's integrity. Informed consent was obtained from all participants, confidentiality was assured, and the study was conducted with sensitivity to the cultural context and potential emotional impact on participants.

## **8. Findings**

The main themes that surfaced in this analysis are infrastructural damage, loss of property, damage to the natural environment, challenges associated with community preparedness for flooding, the nature of flooding support from the municipality, and the effectiveness of the municipal response. Flooding has wide-ranging implications for the Green Farm Community. Understanding how these themes intersect and influence one another is crucial, as they collectively shape the community's resilience and response strategies in the face of such challenges.

Examining infrastructural damage within the community illuminates the vulnerabilities that critical assets such as roads, bridges, and buildings face during flood events. Simultaneously, the loss of property and its economic and emotional repercussions highlight such disasters' individual and communal impact. Damage to the natural environment poses long-term ecological concerns, emphasising the need for sustainable recovery and prevention strategies. Challenges associated with community preparedness shed light on the necessity of proactive measures to mitigate the severity of flooding's consequences. The nature of flooding support from the municipality reveals the role of local governance in aiding the affected population, addressing the timeliness, adequacy, and community-specific aspects of the response. Furthermore, the effectiveness of the municipal response scrutinises the immediate actions taken by the local authorities and their capacity to plan for the community's long-term well-being.

In the context of the Port St Johns green farm community, one of the primary themes in understanding the frequency of flooding pertains to the influence of environmental factors. This theme encompasses a range of elements, including rainfall patterns, river levels, and the community's proximity to bodies of water. Respondent highlighted, "Our farm is in a low-lying area, with the river nearby. During heavy rains, the river swells, and it's almost inevitable that flooding will occur." This underscores the significance of proximity to bodies of water as a contributing factor to flooding, as the community's location makes it inherently vulnerable to rising water levels.

Echoing this sentiment, Respondent remarked, "The rainfall patterns in this region have become increasingly erratic. We're experiencing intense downpours over shorter periods, exacerbating flooding risks." This statement emphasises the evolving nature of rainfall patterns and their direct link to flooding frequency, indicating that climate changes play a pivotal role in this environmental equation.

Furthermore, Respondent added, "Monitoring River levels is crucial for early warning. However, it's challenging to predict precisely when a flood will occur. We need better forecasting and communication systems." P7 highlights the need for advanced monitoring systems to mitigate the impact of environmental factors, showing that river levels can be a critical parameter for understanding and managing flooding in the community.

The feedback from participants encapsulates the relationship between environmental factors and flooding frequency in the Port St Johns green farm community. Proximity to bodies of water, changing rainfall patterns, and the need for improved monitoring systems emerge as pivotal aspects of this theme. Understanding these elements is vital for comprehending the community's challenges and devising strategies for resilience and preparedness against flooding.

Respondent mentioned, "Our community centre has been a hub for flood relief efforts. We have stockpiled essential supplies and established a communication network to coordinate during flooding events." This illustrates the importance of infrastructure and organisation within the community for responding to flooding. It also emphasises the role of community centres as vital resources in these situations. One key strength of the SES framework is its ability to capture the multidimensionality of flood disasters. By considering social, economic, and ecological dimensions, the framework enables a comprehensive analysis of the impacts of floods on the Green Farm Community. For example, it allows researchers to examine the direct physical damages to infrastructure and property caused by flooding (ecological dimension) and the social and economic consequences, such as displacement, loss of livelihoods, and disruptions to community networks (social and economic dimensions).

Respondent shared, "I've noticed a significant increase in awareness campaigns about flood risks. Our community leaders have been actively educating us about the signs of impending flooding and the importance of evacuation plans." One can drive the role of awareness campaigns and community leadership in ensuring that residents are well-informed and prepared for flooding events.

The SES framework recognizes that communities are not passive recipients of flood impacts but active participants in shaping their resilience and adaptive capacity. It emphasises the importance of community engagement, local knowledge, and social networks in flood risk management (Mabuya, 2015). By engaging with the Green Farm Community and involving them in decision-making processes, the framework acknowledges the significance of local perspectives, experiences, and capacities (Davies, 2020). This participatory approach enhances the effectiveness and sustainability of flood risk management strategies by fostering ownership, cooperation, and empowerment within the community. The data highlights demonstrate that the Port St. Johns green farm community has actively addressed their preparedness and response to flooding. This showcases their awareness of the issue and the practical steps they have taken, such as developing emergency plans, establishing infrastructure, and focusing on education and communication. In essence, the participants' responses indicate that community preparedness is a paramount theme, and it is evident that the Port St Johns green farm community recognizes the importance of being well-prepared to cope with the frequent occurrence of flooding. Their actions address the research question and underline the community's commitment to safeguarding themselves against this natural hazard.

Historical trends offer a crucial perspective on flooding frequency. The Respondent's remark underscores the importance of recognizing long-term patterns. Respondent said, "Over the past two decades, the frequency of flooding has increased significantly. This is a concerning shift that demands our attention." This highlights that historical data can reveal substantial changes in flooding occurrences. Respondent contributes to the discussion by pointing out the real impact of these trends. "The historical data show increased flooding and how it affects our community. Respondents say homes and farmlands have been repeatedly damaged, leading to economic and emotional stress.

Community preparedness for flooding in the Green Farm Community faces several significant challenges. These challenges stem from environmental factors, community dynamics, and resource limitations. The Respondent highlighted one critical issue related to community preparedness. "We've seen flooding here before, but it's always a surprise. We don't have a proper early warning system, which leaves us unprepared." This shows the lack of an effective early warning system as a foundational issue. Inadequate communication and preparation for impending floods can result in a lack of readiness when such events occur.

Similarly, respondents shared their experience, "People often don't take it seriously until the water is at their doorstep. There's a lack of awareness and a feeling of invincibility." This sentiment reflects a broader challenge in disaster preparedness – the psychological barrier of underestimating the risk until it becomes an immediate threat. It reveals the need for education and awareness campaigns to change this mindset.

Respondent emphasised resource constraints, "We're a small community with limited funds. We can't invest in flood-resistant infrastructure or comprehensive preparedness plans." This highlights a practical challenge faced by many smaller communities. Limited financial resources can hinder the implementation of infrastructure improvements or the establishment of well-funded preparedness initiatives. Respondent provided an insightful perspective on community dynamics: "There's a lack of coordination. Everyone is doing their own thing. We need more collaboration and organisation." This addresses the issue of fragmented efforts within the community. With coordination and organisation, the effectiveness of preparedness efforts can be maintained.

The data highlight four interrelated themes that encapsulate the challenges with community preparedness for flooding in the Green Farm Community: (1) inadequate early warning systems, (2) a lack of awareness and a sense of invincibility, (3) resource limitations, and (4) the need for improved coordination and organization. The absence of a robust early warning system emerged as a significant challenge. Respondent shows the community's reliance on reactive measures rather than proactive ones. An effective early warning system is pivotal in providing residents with timely information about impending floods, allowing them to take necessary precautions. With such a system, the community can avoid unexpected flooding events.

This challenge has far-reaching implications. In the context of the research question, it hinders community preparedness and directly responds to the issue at hand. With early warning systems, the community can adequately prepare for flooding events, perpetuating the cycle of unpreparedness and vulnerability. Respondent

delves into the psychological aspect of community preparedness. The perception that flooding will not happen to them until imminent creates a false sense of security. This mindset can result in a lack of engagement in preparedness activities. To address this, educational campaigns are essential. Residents must understand the risks and recognize the importance of preparedness even when floodwaters are not immediately threatening.

In the context of the research question, this challenge speaks to the community's readiness, or lack thereof, in the face of flooding. Overcoming this challenge requires a concerted effort to change residents' attitudes and perceptions about the likelihood and severity of flooding events. Respondents show the financial constraints faced by the Green Farm Community. Small communities often need more financial capacity to invest in flood-resistant infrastructure and comprehensive preparedness plans. This challenge directly affects their ability to mitigate flood risks and prepare for potential disasters.

In the context of the research question, this challenge highlights a structural barrier to community preparedness. Implementing necessary measures and infrastructure improvements becomes easier with adequate resources. Additionally, it reflects the socioeconomic aspect of the community's vulnerability to flooding. The Respondent's perspective sheds light on the issue of community coordination. The lack of organisation and collaboration can lead to fragmented and ineffective preparedness efforts. Withmunity's ability to respond cohesively to flooding events is compromised without a unifiemaintained

Regarding the research question, this challenge points to a critical aspect of community preparedness. To address the theme of preparedness, there must be a concerted effort to foster better organisation and collaboration among community members, local authorities, and relevant stakeholders. The challenges with community preparedness for flooding in the Green Farm Community include the absence of effective early warning systems, the need to change residents' attitudes and perceptions, resource limitations, and improved coordination and organisation. These challenges hinder the community's readiness and directly respond to the research question, highlighting the complexities that must be addressed to enhance preparedness for flooding in this community. The nature of support from the municipality in response to flooding in the Green Farm Community involves timeliness, communication, financial assistance, and a tailor-made approach. P9 said, "The municipality's response is sometimes timely, but it is a temporary solution. They did what was necessary to control the immediate crisis, but there was limited long-term planning." The statement underscores the importance of considering both short-term and long-term aspects of municipal support. While immediate actions are crucial during a flood, addressing the lasting consequences and planning for future resilience is equally essential.

Respondent added, "I appreciate the efforts made by the municipality, but communication can improve. There is a lack of clarity about evacuation plans and where to seek help during the flood." This emphasises the significance of effective communication during a crisis. It highlights the need for the municipality to provide clear, accessible, and up-to-date information to the community to ensure their safety and well-being.

According to Respondent, "The financial support provided by the municipality was helpful for some, but it didn't cover all the losses. Many of us had to dip into our savings to recover what we lost during the flood." This raises an essential financial dimension of support. While financial assistance is a critical aspect of the municipal response, assessing whether the provided support is sufficient to aid the community's recovery and prevent additional economic strain on the affected residents is imperative. The nature of support from the municipality in response to flooding in the Green Farm Community involves timeliness, communication, financial assistance, and a tailor-made approach. Respondent said, "The municipality's response is sometimes timely, but it is a temporary solution. They did what was necessary to control the immediate crisis, but there was limited long-term planning." The statement underscores the importance of considering both short-term and long-term aspects of municipal support. While immediate actions are crucial during a flood, addressing the lasting consequences and planning for future resilience is equally essential.

Respondent added, "I appreciate the efforts made by the municipality, but communication can improve. There is a lack of clarity about evacuation plans and where to seek help during the flood." This emphasises the



significance of effective communication during a crisis. It highlights the need for the municipality to provide clear, accessible, and up-to-date information to the community to ensure their safety and well-being.

According to Respondent, "The financial support provided by the municipality was helpful for some, but it didn't cover all the losses. Many of us had to dip into our savings to recover what we lost during the flood." This raises an essential financial dimension of support. While financial assistance is a critical aspect of the municipal response, assessing whether the provided support is sufficient to aid the community's recovery and prevent additional economic strain on the affected residents is imperative.

Additionally, community members actively participate in disaster preparedness and response activities. Early warning systems have been established to allow timely evacuation and relocation of residents during flood events (Daniel, 2019). Joint efforts with government agencies and non-governmental organizations resulted in the construction of flood-resilient infrastructure, including improved drainage systems and flood barriers (Davies, 2020). A community's solid social cohesion and collective decision-making processes play a vital role in a community's ability to respond to and recover from flood events (Davies, 2020). Despite these adaptation measures, challenges remain. More financial resources and access to technical expertise are needed to ensure communities can implement more comprehensive flood protection strategies (Davies, 2020). The region's remoteness and lack of adequate infrastructure complicate emergency response and post-flood recovery efforts (Daniel, 2019).

Action and recovery strategies in place. Respondent, a long-term resident of the Green Farm Community, emphasises the importance of preparedness, stating, "Preparedness is key, and we need the municipality to be proactive. The lack of proactive measures can make the situation worse." This underscores the significance of planning in dealing with flooding. An effective municipal response requires measures to prevent or mitigate flood damage.

Respondent, who has been involved in community volunteer work, echoes this sentiment: "We've been organising community drills for years, and we've seen first-hand the importance of preparedness. The municipality should be involved in these drills, too." Here, Respondent highlights the constructive collaboration required between the community and municipal authorities in preparing for floods. This productive collaboration can improve the overall response to flooding incidents. Environmental factors, including rainfall frequency, significantly shape the community's vulnerability to flooding. The natural environment is not only a victim but also a crucial factor influencing the extent of damage. Infrastructural damage emerged as a recurring theme, highlighting the vulnerability of the community's physical assets and the disruption to daily life. The loss of property represents not only an economic shock but also an emotional one for residents. Simultaneously, damage to the natural environment raises concerns about long-term ecological consequences. The community's preparedness for flooding is critical in mitigating its impact, and the findings suggest challenges. One of the most significant themes explored is the nature of flooding support from the municipality. The analysis revealed a mix of positive and negative perceptions, with timeliness, communication, financial assistance, and community-tailored approaches emerging as critical aspects of the discussion. Furthermore, the effectiveness of the municipal response to flooding has been scrutinised. While immediate actions were taken, questions about long-term planning and the comprehensiveness of the response persist.

The obtained results from the analysis of the Green Farm Community's experiences with flooding provide novel insights and practical value in some key areas:

#### **Challenges in Community Preparedness:**

**Novelty:** The study identifies specific challenges in community preparedness for flooding, such as the absence of effective early warning systems, psychological barriers, resource limitations, and coordination issues. These challenges contribute to a comprehensive understanding of communities' barriers to becoming resilient to flooding.

**Practical Value:** The identified challenges offer practical guidance for community leaders, local authorities, and policymakers on areas that need targeted interventions to enhance community preparedness and response.

**Nature of Municipal Support and Effectiveness of Response:**

**Novelty:** The research delves into the nuanced aspects of municipal support, including timeliness, communication, financial assistance, and tailor-made approaches. It also evaluates the effectiveness of the municipal response in both short-term crisis management and long-term planning.

**Practical Value:** The detailed insights into the nature of municipal support and the effectiveness of the response provide valuable information for local authorities and emergency management agencies. This can guide improvements in communication strategies, resource allocation, and long-term planning for flood events.

**Community-Municipality Synergy and Communication:**

**Novelty:** The study emphasizes the importance of community-municipality synergy in flood preparedness, advocating for the involvement of local authorities in community drills and initiatives. Additionally, it underscores the critical role of transparent and timely communication from the municipality during flood events.

**Practical Value:** These findings offer practical recommendations for community leaders and municipal authorities to collaborate more effectively, engage in joint preparedness activities, and improve communication channels for better community resilience.

The obtained results contribute novel insights by exploring the intricate dynamics of environmental factors, community preparedness challenges, the nature of municipal support, and the effectiveness of the response. The practical value lies in offering specific recommendations for improving community resilience, municipal response strategies, and resource allocation in the face of recurrent flooding. While there may be some similarities with the broader literature on flooding, the unique context of the Green Farm Community and the specific challenges identified in this study distinguishes it from earlier research.

The findings have revealed several key themes that collectively paint a comprehensive picture of the challenges and dynamics associated with this recurring environmental hazard. One of the central findings is the influence of environmental factors on flooding frequency. The community's proximity to bodies of water, changing rainfall patterns, and the need for advanced monitoring systems have been identified as critical factors. The data demonstrates that environmental factors play a pivotal role in shaping the community's vulnerability to flooding, with the location, climate changes, and monitoring systems all impacting the frequency of flood events. The findings of this study centred on the themes of damage to the natural environment, infrastructural damage, and health and safety concerns resulting from flooding in the Green Farm Community. They offer a comprehensive and nuanced understanding of the multifaceted impact of this natural disaster. These themes represent complex challenges that intersect and collectively shape the community's resilience and response strategies. Analysing these findings, one can draw significant conclusions and develop pertinent recommendations for the community's well-being and preparedness. The damage to the natural environment, including deforestation, pollution, and habitat destruction, emerges as a pressing concern. The observations from participants emphasise the urgent need for action to reverse the trend of environmental degradation. The loss of nesting sites for bird species due to coastal erosion highlights the tangible impact on local biodiversity.

The intersection between habitat loss and urbanisation is evident, emphasising the necessity for responsible urban planning to mitigate these effects. Water pollution raises concerns about the sustainability of local water resources and potential health risks associated with contaminated water. The analysis of the data gathered from the Green Farm Community regarding the nature of flooding support from the municipality reveals a nuanced picture of the community's experiences and expectations. When considering the timeliness of the municipal response, it is evident that immediate actions are taken to control the crisis. Still, as highlighted by P9, there is often a sense that these efforts are akin to temporary solutions. This finding underscores the importance of balancing short-term crisis management and long-term planning. While addressing the immediate needs is critical, the sustainability and resilience of the community require a more comprehensive, forward-thinking approach. Analyzing the effectiveness of the municipal response to flooding highlights the interconnectedness of preparedness, mitigation, and recovery strategies. Participants' emphasis on preparedness as a key aligns with the broader understanding that an effective response begins with proactive measures. A municipality's role in flood preparedness cannot be underestimated, and a lack of proactive measures can exacerbate the situation during flood events. This calls for comprehensive planning and preparedness initiatives that anticipate potential flood impacts.

Community-municipality synergy in flood preparedness is essential. Involving the municipality in community drills and preparedness initiatives can significantly enhance the response to flooding incidents. This finding highlights the need for active collaboration between community members and local authorities to strengthen preparedness and mitigation measures. The effectiveness of the municipal response also hinges on communication. Transparent and timely communication is a cornerstone of an efficient response strategy. Such communication reduces panic and empowers residents to make informed decisions during flood events. This finding emphasises the critical role of the municipality in providing precise and reliable information to the community. Resource allocation is another pivotal component of an effective municipal response. Vulnerability assessments are vital to ensuring that resources are distributed equitably. This finding underscores the necessity of allocating resources based on the unique needs of different areas within the Green Farm Community. Fair and informed resource allocation is essential to mitigate the impact of flooding and reduce disparities in vulnerability.

### **Conclusions**

This study delves into the multifaceted challenges of recurring environmental hazards in the Green Farm Community, particularly flooding. The findings elucidate key themes around environmental factors, social responses, and historical trends, collectively shaping the community's resilience and preparedness. The influence of proximity to water bodies, changing rainfall patterns, and the imperative need for advanced monitoring systems emerge as central to understanding flooding frequency.

Moreover, the community's proactive measures, such as emergency response plans and infrastructure development, reflect a commitment to readiness and resilience in the face of recurrent floods. Historical trends underscore an alarming increase in flooding frequency over the past two decades, resulting in tangible consequences like property damage and emotional stress. Nevertheless, the community's adaptive responses indicate a capacity for proactive measures, offering hope in the face of evolving challenges.

The study's depth extends to the multifaceted impact of flooding, encompassing damage to the natural environment, infrastructural challenges, and health and safety concerns. Environmental degradation, manifested through deforestation and pollution, raises urgent calls for action. Infrastructure disruptions pose risks to public safety and divert resources from community development. Health concerns stemming from water contamination and waterborne diseases underscore the vulnerability of community members and the imperative for comprehensive disaster preparedness. Examining the role of the local government in responding to flooding reveals a nuanced picture. While immediate actions are taken in crisis management, there's a need for a more comprehensive, forward-thinking approach to ensure sustainability and resilience. Communication gaps, financial support adequacy, and the importance of a community-specific approach require attention. The study underscores the interconnectedness of preparedness, mitigation, and recovery strategies, emphasizing the pivotal role of the municipality in flood management.

In conclusion, the study addresses the research question and provides a robust foundation for informed decision-making and community resilience-building. The intricate dynamics of environmental factors, social responses, and historical trends underscore the complexity of flooding challenges. The Green Farm Community's experiences and responses offer valuable insights into disaster management and community well-being. The recommendations aim to enhance the community's resilience, emphasizing long-term planning, improved communication, financial support adequacy, community-specific strategies, and active collaboration between the community and local authorities. These findings call for a concerted effort to improve flood management and disaster resilience through a collaborative approach between the Green Farm Community and local authorities.

## Recommendations

### Enhance Long-Term Planning

Develop comprehensive, long-term flood management plans. Address both immediate response and long-term resilience. Include strategies for preventing future flooding and minimizing its impact.

### Improve Communication

Focus on clear, accessible, and real-time communication during flood events. Provide residents with detailed evacuation plans, contact information, and support services. Ensure communication is timely and reliable to enhance community confidence.

### Assess Financial Support Adequacy

Conduct a thorough assessment of financial support provided to flood-affected residents. Ensure that financial assistance covers the majority of losses incurred during flooding. Reduce the economic burden on residents to facilitate a smoother recovery process.

### Tailor Responses to Community Needs

Adopt a more community-specific approach to flood response. Customize responses based on the unique vulnerabilities and characteristics of the Green Farm Community. Ensure that strategies consider the distinct requirements of the community for maximum effectiveness.

### Invest in Proactive Preparedness

Proactively engage in flood preparedness initiatives in collaboration with the community. Participate in community drills to enhance overall preparedness. Establish early warning systems and support residents in developing their preparedness measures.

### Equitable Resource Allocation

Inform resource allocation decisions through vulnerability assessments. Ensure fairness and effectiveness in distributing resources. Address the specific needs of different areas within the Green Farm Community to reduce disparities in vulnerability.

These recommendations aim to strengthen the community's resilience, improve response strategies, and foster collaboration between the municipality and the Green Farm Community. Implementing these measures will contribute to more effective flood management and enhanced disaster resilience in the face of recurring environmental challenges.

## References

Beson, C., & Clay, E.J. 2004. Understanding the economic and financial impacts of natural disasters. *Disaster Risk Management* <https://doi.org/10.1596/0-8213-5685-2>

Bless, C., Higson-Smith, C., & Sithole, S.L. 2013. *Fundamentals of social research methods: An African perspective*, 5th Edition. Lansdowne. Cape Town: Juta and Co. Ltd.

Chen, H.Y. Liu, Y.Z, (...); Han, Y.F. 2023. Constructing a Flood-Adaptive Ecological Security Pattern from the Perspective of Ecological Resilience: A Case Study of the Main Urban Area in Wuhan. *International Journal of Environmental Research and Public Health*, 20 (1), 385 <http://doi.org/10.3390/ijerph20010385>

Chen, G. 2019. Assessing the Financial Impact of Natural Disasters on Local Governments. *Public Budgeting and Finance*, 40(1), 22-44 <http://doi.org/10.1111/pbaf.12245>

Choudhury, M., & Haque, C.E. 2024. Disaster management policy changes in Bangladesh: Drivers and factors of a shift from reactive to proactive approach. *Environmental Policy and Governance* <http://doi.org/10.1002/eet.2094>

Creswell, J.W. 2019. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th Edition). Thousand Oaks, CA: Sage

Daniel, L. 2019. Port St Johns floods: Residents evacuated amid heavy rainfall. Port St Johns. The South African. 23 April. Available at: <https://www.thesouthafrican.com/news/port-st-johns-floods- evacuation-news-updates-april-2019/> [27/02/2023].

Davies, R. 2020. Zimbabwe—Deadly Storms and Floods in Manicaland, Flood list. 01 July 2022. Available at: <http://foodlist.com/africa/zimbabwe-foods-manicaland-november-2020> [27/02/2023].

DCG. 2019. Minister Zweli Mkhize visits area affected by floods in Eastern Cape. Pretoria, South Africa. Available at: <https://www.gov.za/speeches/minister-zweli-mkhize-see-first-hand-damages-caused-recent-rains-eastern-cape-27-apr-2019> [27/02/2023].

Georgiadoua, M.C., Gyamfib, D., Hirmerc, S., & Loggia, C. 2024. A dataset of community perspectives on living conditions and disaster risk management in informal settlements: A case study in KwaZulu-Natal Province, South Africa. *Data in Brief*, 52 <http://doi.org/10.1016/j.dib.2023.109847>

Ghosh, S., Mukherjee, J., Chowdhury, A., De Sarkar, K., Taron, A., Biswas, B., & Ghosh, A. 2023. Insights from the Five-day National Training Programme on "Earth Observation Data Analytics for Disaster Management Focusing on Flood and Drought". *Journal of the Geological Society of India*, 99(12), 1787-1788. <http://doi.org/10.1007/s12594-023-2539-y>

Godwell, N., & Lazarus, C. 2021. The Increasing Risk of Floods and Tornadoes in Southern Africa. University of South Africa, Pretoria, South Africa

Gray, D.E. 2014. Doing research in the real world, 2nd Edition. London: Sage.

Gunawan, J. 2015. Ensuring Trustworthiness in Qualitative Research. *Belitung Nursing Journal*, 1(1), pp. 10-11. <https://doi.org/10.33546/bnj.4>

Gunderson, L. H. 2000. Ecological resilience—in theory and application. *Annual Review of Ecology and Systematics*, 31, 425-439. <https://doi.org/10.1146/annurev.ecolsys.31.1.425>

Gunderson, L. H. 2010. Ecological and human community resilience in response to natural disasters. *Ecology and Society*, 15(2), 18. <https://doi.org/10.5751/ES-03381-150218>

Gwindi, P. 2007. The effectiveness of early warning systems for the reduction of flood disasters: Some experiences from cyclone induced floods in Zimbabwe. *Journal of Sustainable Development in Africa*, 9 (4), pp. 152-169. Available at [http://www.jsdafrica.com/Jsda/V9n4\\_Winter2007/PDF/EfectivenessEalierWar ningSystem.pdf](http://www.jsdafrica.com/Jsda/V9n4_Winter2007/PDF/EfectivenessEalierWar ningSystem.pdf) (29/05/2022)

Hallegatte, S. 2011. How economic growth and national decision can make disaster losses grow faster than wealth. Policy Research Working Paper. Washington, DC: World Bank. *Journal of Hydrology*, 541, 766-777. <https://doi.org/10.1016/j.jhydrol.2016.07.036>

Henry, P. 2006. Levees and other raised ground. *Am. Sci.*, 94(1), 7-11.

Hill, A.R. 1976. The environmental impacts of agricultural land drainage. *Journal of Environment Management*, 4, 251- 274.

Maake, R., Malherbe, J., Masupha, T., Chirima, G., Beukes, P., Roffe, S., Thompson, M., & Moeletsi, M. 2024. The Umlindi Newsletter: Disseminating Climate-Related Information on the Management of Natural Disaster and Agricultural Production in South Africa. *Climate*, 11(12) <http://doi.org/10.3390/cli11120239>

McCollum, I., Liu, W., See, L., Mechler, R., Keating, A., Hochrainer-Stigler, S., Mochizuki, J., Fritz, S., Dugar, S., Arestegui, M., Szoenyi, M., Bayas, J.C.L., Burek, P., French, A., & Moorthy, I. 2016. Technologies to support community flood disaster risk reduction. *International Journal of Disaster Risk Science*, 7, 198-204. <https://doi.org/10.1007/s13753-016-0086-5>

Ministry of Cooperative Government and Traditional Affairs. 2019. Minister Zweli Mkhize visit areas affected by floods in Eastern Cape. Available at: <https://www.gov.za/speeches/minister-zweli-mkhize-see-first-hand-damages-caused-recent-rains-eastern-cape-27-apr-2019> [30/06/2022].

Sari, B., & Özer, Y.E. 2024. Coordination analysis in disaster management: A qualitative approach in Türkiye. *International Journal of Disaster Risk Reduction*, 100 <http://doi.org/10.1016/j.ijdr.2023.104168>

Satilmis, S. 2023. Floods of Gediz River and Disaster Management (1860-1901). *Tarih Incelemeleri Dergisi*, 38(1), 279-300. <http://doi.org/10.18513/egetid.1333303>

Schaffer-Smith, D., Myint, S.W., Muenich, R.L., Tong, D.Q., & DeMeester, J.E. 2020. Repeated Hurricanes Reveal Risks and Opportunities for Social-Ecological Resilience to Flooding and Water Quality Problems. *Environmental Science & Technology*, 54(12), 7194-7204. <http://doi.org/10.1021/acs.est.9b07815>

Port St Johns Disaster Risk Management Satellite Centre. 2019. Floods that affected Port St Johns local municipality. Port St Johns: O.R Tambo District Municipality.

Sobuwa, Y 2022. More than 50 KZN healthcare facilities wrecked by floods. City Press. 16 April 2022. Available at: <https://www.news24.com/citypress/news/more-than-50-kzn-healthcare-facilities-wrecked-by-floods-20220416> [28/02/2023].

UNISDR (United Nation International Strategy for Disaster Reduction). 2015 Making development sustainable: The future of disaster risk management. Global assessment report on disaster risk reduction. Geneva UNISDR.

**Funding:** This research was funded by Walter Sisulu University, South Africa

**Data Availability Statement:** More information obtained from the authors on a reasonable request.

**Author Contributions:** Mkululi Gqalindaba contributed to the complement of the paper as well as data analyses and interpretations, while other authors contributed equally to the reviewing and editing. All authors have read and agreed to the published version of the manuscript.

**Mkululi GQALINDABA** is a postgraduate student recently completed master's degree in public administration at Walter Sisulu University, currently working as administrator at Msindwana physiotherapy at Mthatha, south Africa. His research interest includes community participation and disaster management.

ORCID ID: <https://orcid.org/0000-0003-2381-3816>

**Yusuf LUKMAN**

ORCID ID: <https://orcid.org/0000-0002-8344-8083>

**Nonzwakazi Beauty MAKIWANE**

ORCID ID: <https://orcid.org/0000-0002-2513-8730>

---

This is peer-reviewed scientific journal <https://jssidoi.org/ird/page/peer-review-policy>

---

Copyright © 2024 by author(s) and VSI Entrepreneurship and Sustainability Center  
This work is licensed under the Creative Commons Attribution International License (CC BY).

<http://creativecommons.org/licenses/by/4.0/>

