

**EXPLORING THE PERSPECTIVES OF PRIMARY SCHOOL CHILDREN ON
DISASTER RISK REDUCTION AND ADAPTATION: A CASE STUDY OF FLOOD
EXPERIENCES IN MAMELODI EAST**

BY

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I declare that this mini dissertation is my original work. Where secondary material is used, this has been carefully acknowledged and referenced following the university requirements.

I understand what plagiarism is and am aware of university policy and its implications in this regard.



Signature

04 December 2024

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Resilience theory as this study's theoretical framework is no accident due to the journey of achieving this dream and mid-term professional goal. I've had to keep going through loss, laughter, love, and learning which developed my character. Having said that, this journey could have taken a rockier turn without a few gatekeepers. I would like to acknowledge:

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ABSTRACT

EXPLORING THE PERSPECTIVES OF PRIMARY SCHOOL CHILDREN ON DISASTER RISK REDUCTION AND ADAPTATION: A CASE STUDY OF FLOOD EXPERIENCES IN MAMELODI EAST

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Floods have affected the community of Mamelodi East twice in less than four years (Mahlokwane, 2023), resulting in property loss, loss of life, and displacement. The local government has been accused of making empty promises regarding the relocation of families to alternative spaces (Mabona, 2022; Mahlokwane, 2023), raising concerns about what might happen if the community is affected again. Children, as a particularly vulnerable group, are affected by floods through loss, injury, and illnesses, yet they are seldom meaningfully consulted in decisions related to disaster risk reduction (DRR). The study used resilience theory as its theoretical framework, emphasising how vulnerabilities and protective factors affect the community's preparedness for floods and adaptation strategies. The goal of the study was to explore the perspectives of primary school children on DRR and adaptation through a case study of their flood experiences in Mamelodi East.

The study employed a qualitative research approach and used participatory action research as a subtype of applied research. The research design was an exploratory case study. Purposeful sampling was used to select four learners from grades four, five, and six at Viva Independent School as participants. Data were collected through photovoice and semi-structured one-on-one interviews. The data were analysed using the six phases of the reflexive thematic approach.

The findings indicate that human behaviours, such as waste dumping in the river and vulnerable infrastructure, contribute to flooding in the community. This results in deaths and injuries, destruction of assets and infrastructure, adverse effects on livelihoods, and forced displacement. The findings further suggest that the community's resilience

is undermined by systemic issues such as poverty, inadequate access to resources, infrastructure vulnerabilities, safety during floods, and the lack of early warning systems, factors that all affect the community's preparedness for future floods.

The study concluded that behaviour modification, especially in waste management, along with good governance, could reduce the factors contributing to floods. Furthermore, limited awareness of DRR and structural issues contributes to the disproportionate impact experienced by the community during floods. Additionally, a comprehensive pathway for strategic changes such as "building back better," should be implemented with meaningful community participation.

The study recommends comprehensive education on DRR, key partnerships, and sustainable development as strategies to enhance the community's preparedness for future floods. Social work can play a role through systemic planning and interventions aimed at integrating the developmental approach in disaster risk reduction. This includes advocacy for improved service delivery on basic needs by local government, such as the relocation of informal dwellers living along floodplains, and the implementation of measures to prevent new residents from settling in vacated areas.

KEYWORDS:

Children's perspectives, Disaster risk reduction, Flood adaptation strategies, Mamelodi East, Resilience, Viva Independent School

ABBREVIATIONS

CAP- Climate Action Plan

COT: City of Tshwane

CRC: United Nations Convention of the Rights of the Child

CRS- Climate Response Strategy

CRVA- Climate Risk and Vulnerability Assessment

DMA: Disaster Management Act

DRR: Disaster Risk Reduction

ESPACE: European Spatial Planning: Adapting to Climate Events

IASSW: International Association of Schools of Social Work

ICSW: International Council on Social Welfare

IDP: Integrated Development Plan

IFRCS: International Federation of Red Cross and Red Crescent Societies

IFSW: International Federation of Social Workers

IPCC: Intergovernmental Panel on Climate Change

MSW: Master of Social Work Students

NCPF- National Child Participation Framework

PAR: Participatory Action Research

P-I-E: Person in Environment

RDP: Reconstruction and Development Programme

SDGs: Sustainable Development Goals

SERI: Socio-Economic Rights Institute of South Africa

UN: United Nations

UNDP: United Nations Development Programme

UNDRR: United Nations office for Disaster Risk Reduction

UNFCCC: United Nations Climate Change Conference

UNICEF: United Nation Children's Fund

USA: United States of America

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CHAPTER ONE: GENERAL INTRODUCTION OF THE STUDY¹

1.1 Introduction

The rise in natural disasters, including floods, droughts, mudslides, water scarcity, and spread of vector-borne diseases are linked to changing climate conditions (International Save the Children Alliance, 2008:5). South Africa is now also experiencing the impacts of climate change, as evidenced by the recent flooding in Kwa-Zulu Natal (Ngcamu, 2022:58) and Gauteng, home to Mamelodi township. The families residing along the banks of the Pienaar's River in Mamelodi have been affected and continue facing the threat of flooding since 2019 (Mabona, 2022; Mahlokwane, 2023; Mothiba, 2022). Despite some efforts to relocate these families to safer areas, community members continue to accuse the City of Tshwane of failing to deliver on promises of relocation ahead of future floods (Mabona, 2022; Mahlokwane, 2023; Mothiba, 2022). Developing nations like South Africa are particularly vulnerable to climate change due to their limited resources for adapting to such environmental shifts (Alston, 2015:356).

There is an inseparable connection between climate change and poverty (Save the Children, 2015:5). The poor and marginalised populations tend to live in areas prone to disaster risk, and they are disproportionately affected because they are “the least able to withstand, cope, respond and recover in the long term” (United Nation Children's Fund [UNICEF], 2016:2). Children are among the most severely impacted by natural disasters (International Save the Children Alliance, 2008:5). The risks they face include death, injuries, diseases related to malnutrition, inadequate water and sanitation, as well as psychological trauma and its long-term effects. Additionally, children from poor households are often more vulnerable to abuse, exploitation, trafficking, and disruption in their education (UNICEF, 2016:2). Although children are not responsible for climate change, they are forced to live with its impacts, which challenge their human rights and future prospectives (Save the Children, 2015:5). According to Butcher, Seballos and Whitehead (2010:vii), “The impact of climate

¹ The study formed part of a group research topic which was investigated by the 2022 MSW Social Development & Policy course work programme. The general introduction of the study, the problem statement and rationale of the study, the goal and objectives, the research questions and sub-questions and the research methods of the study was similarly described by the eight researchers. Each student conducted an independent study.

change lays a heavy burden on the shoulders of today's children; it affects their lives today, and it will transform their lives as adults”.

Children have the right to be involved in decision-making “on issues that impact them now and will shape their future”, with climate change being one such issue (Save the Children, 2015:7). Additionally, they are entitled to opportunities to voice their views on disaster risk reduction (DRR) and climate change adaptation (International Save the Children Alliance, 2008:5). Engaging children in climate change discussions is in line with the core principles of the United Nations Convention of the Rights of the Child (CRC), which include protection, survival, development, and participation (International Save the Children Alliance, 2008:5). Recognising children's rights to participate means acknowledging their vulnerability while also focusing on building their capacity. This is achieved when they have access to child-friendly information and resources and are able to take part in decision-making processes where they feel safe (Save the Children, 2015:7). Inequity plays a significant role in “shaping vulnerability and resilience”, as seen in how children use early warning information to assess a situation and their ability to influence decisions and activities that affect their lives (such as choosing to stay in school, moving their household to a safer location, or evacuating before a disaster) (UNICEF, 2016:2).

When children participate, they want to feel that their voices are heard and that their needs and abilities are considered when planning and executing interventions at all levels to influence decisions and change (Save the Children, 2015:7). Children's awareness, engagement, and empowerment are crucial for them to become effective agents of change in their communities and to adopt the right strategies for addressing DRR (International Save the Children Alliance, 2008:5). For children to have meaningful participation in DRR and climate change adaptation efforts, they must have access to knowledge, a platform to express their views, and opportunities to take action. To achieve this, DRR strategies should be both child-centered and child-led. Child-centred DRR interventions mean that children's needs are considered in the design and execution of all interventions. On the other hand, child-led DRR goes a step further by involving children directly in the planning and implementation of DRR activities (Back, Cameron & Tanner, 2009:6). This shift occurs along a continuum, moving from *Knowledge, Voice, and Action*, to *Action* that influences and ultimately transforms (Back et al., 2009:37). In a study by Back et al. (2009:6) which explored

child-focused and child-led DRR interventions through case studies, the focus was more on the early stages of the continuum—emphasising the expansion and sharing of *Knowledge* and amplifying *Voice*— while *Action* at the *Protect* level was also a key priority. Another important observation was the increasing focus on involving more youth in DRR activities, often at the expense of children under 18 years, who have unique needs and a right to shape the world they will inherit as adults (Back et al., 2009:7).

The study was conducted in collaboration with the Viva Foundation of South Africa [hereafter Viva Foundation], whose vision is to be central to the transformation of informal settlements into safe and sustainable communities where the community can thrive (Viva Foundation). The study focused on children attending the Viva Independent School, located within the communities (see Mamelodi East below) where the children both live and go to school. The Viva Foundation's approach is to address the community's identified needs by establishing a secure centre within an informal settlement, grounded in traditional values, specifically the 'village' concept (Viva Foundation). As a service hub, Viva Foundation aligns with the criteria set by Butcher et al. (2010:vii) for an organisation that champions fairness and social justice, aiming to protect the children who are most impacted and advocate for them to drive change at all levels. Child protection involves prioritising children in climate change adaptation efforts, as they are vulnerable to climate shocks, and their futures are increasingly uncertain due to growing poverty, hunger, disease, and limited access to education (Save the Children, 2009:1). Although children experience climate change and disasters in diverse ways, their perspectives are rarely considered on DRR and adaptation planning (Save the Children, 2009:1).

This study is based on the idea that children are not passive victims of climate change but rather "powerful agents of change" who should be active participants at all levels—community, national, and international (Save the Children, 2015:7). Moreover, children can play a crucial role in risk reduction and adaptation efforts, as well as in building the resilience of their communities, provided they have access to knowledge and opportunities for skills development (Save the Children, 2015:7). This will enable them to take *Action* that influence and lead to transformation (Back et al., 2009:33). All initiatives aimed at improving child well-being, must consider the impacts of climate change to ensure they lead to sustainable outcomes (Save the Children, 2015:3). Risk

reduction and resilience are closely linked, and while it is the government's duty to integrate risk reduction and resilience into development programmes—an approach referred to as the “mainstreaming of child-centred adaptation into development processes” (Save the Children, 2015:3)—this has not yet been effectively implemented. The Viva Foundation South Africa is well-positioned to address this gap. As Butcher et al. (2010:vii) note, leaders have failed in their responsibility towards “our children and our environment”, and the response from the voluntary sector to mitigate the impacts of climate change, “will reflect how much we value children and young people”. Children’s perspectives on DRR and adaptation are crucial for building their resilience and ensuring sustainable futures (Butcher et al., 2010:vii).

The key concepts relevant to the study are as follows:

- **Children’s perspectives**

Article 12 of the United Nations Convention on the Rights of the Child (1989) highlights the value of child perceptions and participation in matters that affect their lives. In this study, children’s perspectives refer to how they experience and understand the DRR situation and climate change adaptation in the community. Furthermore, it implies giving and supporting children to participate and formulate their views in a child-focused manner that is determined by their age and level of maturity to accommodate their unique needs. In this study, child participation refers to DRR measures that are not an event but an ongoing process of respectful interactions between adults and children, the results of these interactions taking into account the perspectives of both adults and children (UN, 2009:3).

- **Disaster Risk Reduction**

DRR can be defined as orderly steps taken to avert the occurrence of disasters as well as to minimise the extent of disaster damages (United Nations Educational, Scientific and Cultural Organization, 2023). The United Nations Office for Disaster Risk Reduction (2023) cites risks such as loss of life, physical injuries, and damage to infrastructure. DRR is therefore concerned with minimising these risks (Twigg, 2015:6). This study explored children’s views on mentioned environmental risks, how they contribute to floods in Mamelodi East based on lived experiences and what could be done to reduce these risks.

- **Flood adaptation strategies**

The IPCC asserts that some degree of climate change consequences is already unavoidable due to past emissions (IPCC, 2014). Floods as a climate change consequence have been on the rise (Memon & Sharjeel, 2015:73), it is therefore just that measures are developed to reduce the risk of flooding and associated damages. Flood adaptation strategies include things such as the development of new infrastructure to protect against sea level rise or drought, changing agricultural practices to adapt to changing temperatures and precipitation patterns, or developing early warning systems for extreme weather events (United Nations Climate Change Conference [UNFCCC], 2015). In this study, flood adaptation strategies refer to children's perspectives on how behaviour, attitudes, and systems can be changed to be prepared for or reduce risks of actual or expected climate change impacts.

- **Mamelodi East**

Mamelodi East is part of the Mamelodi township, an apartheid establishment which falls in the City of Tshwane Metropolitan Municipality in the Gauteng Province. The Pienaars River flows in front of Viva Foundation and floods the community when the riverbanks overflow. Informal settlements in Mamelodi East include Lusaka, Phumolong and Alaska². The Eerste Fabriek and Riverside informal settlements in Mamelodi East are among the informal settlements in Mamelodi township which have experienced severe floods since 2019. Both Eerste Fabriek and Riverside are situated along the Moretele River (a short section of the Pienaars River). Homes in these areas have been frequently badly damaged by flooding since December 2019. During the 2019 floods, residents lost their belongings, including birth certificates, identifying documents, furniture and entire homes (Mabona, 2022). In the Riverside communities, 1,500 people were affected, 74 homes were destroyed, and 240 homes were flooded (Rafapa, 2021). The residents indicated that they have been struggling for better service delivery since 2007 when the Alaska informal settlement was established (Selaluke, 2021). The living conditions are not favourable for residential occupation, as shacks are erected on the mountain and riverbanks. There is no running water,

² See website:

<https://www.google.com/search?q=mamelodi+east+is+part+of+mamelodie+township&og=Mamelodi+east+is+part+of+mamelodie+township&ags=chrome.0.69i59.3595j1j7&sourceid=chrome&ie=UTF-8>

sewerage facilities and electricity. The residents have made illegal electricity connections, making it unsafe for all residents, especially children (Selaluke, 2021).

- **Viva Independent School**

Viva Independent School is part of the Viva Foundation non-profit organisation based in South Africa that aims to empower vulnerable communities and individuals through different developmental programmes. The school's Mamelodi Campus is in Alaska, an informal settlement in the Far East of Mamelodi (Mamelodi Mappers, 2015). It is situated at the edge of the Magaliesburg mountain (Madubedube, Rautenbach & Coetzee, 2018) and it serves learners from the greater Mamelodi community. The school is one of Viva Foundation's focuses alongside early childhood development, nutrition, security, development of the arts and music, enterprise development and sexual violence prevention and response. The organisation's programmes are designed to address the root causes of poverty, inequality, and social injustice, and to provide support and assistance to those in need. Viva Foundation's 'village' concept builds community resilience of their own culture and values (Viva Foundation). This concept is supported by Motsa and Morojele's (2017:159) idea of 'making individual communities' cultures and social relationships responsible for how people perceive, construct and approach challenges in life'. The researcher supports this approach in this study.

- **Resilience**

Resilience has been defined by various authors such as Cardona (2003) and UNDRR (2005); while these definitions differ, they do agree that a system's ability to absorb and recover from setbacks such as disasters is indicative of its resilience levels. The UNDRR defines resilience as a system's, community's, or society's capacity to adapt by resisting or changing to reach and maintain an acceptable level of functioning and structure after being exposed to hazards (UNDRR, 2005). In this study, resilience refers to preparedness strategies that will enable the community to respond and recover timeously from future floods through the voices of children who have lived experiences of floods in Mamelodi East.

1.2 Theoretical framework

The recovery process following a disaster is impacted by various factors such as the assets, resilience, and resources a community has (Cutter, Barnes, Berry, & Burton,

2008:601). For a sustained impact on disaster prevention and response, it is important to understand and address the causal factors of disasters. Climate change has been cited as one of the causes of disasters (IFRCS, 2011:5). Because of past emissions, no mitigating efforts will, according to the IPCC (2014), be enough to reverse all climate change; therefore, effective adaptation strategies must be developed in response to the climate crisis. While disasters are known to impact people, the planet, and prosperity (UN, 2015a; Terblanche, De Sousa, & Van Niekerk, 2022), the severity usually differs, with the most vulnerable being mostly affected (Greene & Greene, 2009; Hawkins, 2010; UN, 2015a). To address these injustices, a framework is necessary; ideally, it should allow for a context-specific understanding of each system for the development of appropriate adaptation strategies (Cutter et al., 2008; Terblanche et al., 2022).

Resilience theory served as the study's framework since it views adaptation to change as a continuous process rather than an occasion (Terblanche et al., 2022:2). This framework is appropriate to understand the ever-changing nature of disasters, climate change, and the impact on human rights, especially on those who are most vulnerable. Resilience theory assesses the system's interaction of risk, resources, opportunities, and vulnerabilities (Cannon, 2008:65), and it presupposes that increased protective factors lead to minimised vulnerabilities (Greene & Greene, 2009; Cutter et al., 2008; Terblanche et al., 2022), which increases a system's ability to "re-organise, change, and learn" from disasters (Cutter et al., 2008:558). The framework allows for economic, social, and environmental assessments that align with economic, social, and environmental injustices imposed by disasters (UN, 2015a). Resilience concerning the study is discussed further in Chapter Two.

1.3 Problem statements and rationale for the study

Climate change plays a significant role in the rising frequency of natural disasters worldwide, including floods, droughts, and mudslides (International Save the Children Alliance, 2008; Ngcamu, 2022). In South Africa, floods have emerged as a major natural disaster in recent years (IFRCS, 2011; Shokane, 2019). The impact of these disasters is disproportionately felt, with children being the most severely affected, as such events not only disrupt their daily lives but also shape their futures. Families and children living in poverty are particularly vulnerable, as they are more likely to reside in high-risk areas, such as near riverbanks, and in the event of a flood, they risk losing

their belongings and facing challenges like food insecurity and water scarcity, among other basic amenities.

In accordance with the CRC (1989), children have the right not only to be protected, but also to develop their agency by expressing their views on how they are impacted by climate change and how they envision shaping their future. However, children require support, resources, and opportunities to engage in discussions and decision-making processes concerning climate change and related risks. As agents of change, children can make meaningful contributions to DRR and adaptation efforts, helping to build resilience both for themselves and their own communities, enabling better preparedness for future disasters.

In the impacted areas of Mamelodi East, children at the Viva Independent School face the hardships of living in poverty and the consequences of flooding on their families, homes, and the broader community. In addition to these challenges, they attend a school setting that not only acknowledges their need for protection but also emphasises the importance of providing access to knowledge, skills, and empowerment to help develop their agency while actively participating in building a sustainable future. Viva Foundation South Africa is a child-centered organisation, with a focus on addressing the needs of children at the heart of its programmes.

The study was a research project aimed at developing strategies for working with children, their families, and the community to build resilience in risk reduction and adaptation to flooding. It focused on the *Knowledge*, *Voice*, and *Action-Project* levels of participation, with the results intended to create procedures that will empower children, families, and the community to shift towards *Action* that influences and transforms. The goal is for children at Viva Independent School to become change agents within their community, while Viva Foundation South Africa contributes to promoting sustainable living and uses climate-smart approaches to enhance the well-being of children and their families.

The research question for the study was as follows:

What are primary school children's perspectives on disaster risk reduction and adaptation concerning flood experiences in Mamelodi East?

Underpinning sub-questions for the research question were the following:

- How are communities in Mamelodi East affected by floods?
- What factors contribute to floods in communities in Mamelodi East?
- How can risk factors for floods be reduced in your community?
- What can your community do to be better prepared for future floods?
- How can your school and learners work together with families and communities in reducing risks for floods and develop adaptation strategies in case of future floods?

1.4 Goal and objectives of the study

The goal of the study was:

To determine the perspectives of primary school children on disaster risk reduction and adaptation concerning flood experiences in Mamelodi East.

The objectives of the study were to:

- Explore how communities in Mamelodi East are affected by floods.
- Determine the factors that contribute to floods in communities in Mamelodi East.
- Determine how risk factors for floods can be reduced in Mamelodi East.
- Explore how communities in Mamelodi East can be better prepared for future floods.
- Make recommendations on procedures for learners, their families, the school and the community to work together on reducing risks for floods and developing adaptative strategies to cope and recover thereafter.

1.5 Research methodology

This section briefly outlines the research methodology used in the study; a comprehensive account is presented in Chapter Three. A qualitative approach was used in line with the exploratory nature of the study. The subject being explored was primary school children's perspectives on DRR and adaptation strategies concerning flood experiences in Mamelodi East. Qualitative research refers to a research approach that uses words to gain an in-depth understanding of the phenomenon being studied (Nieuwenhuis, 2020:59), and it allows for the subjectiveness of reality given by people based on unique experiences while interacting with the world (Cropley,

2022:9). The constructivism paradigm of the study allowed the researcher to interpret how participants developed the unique meanings of their experiences with floods and possible DRR and adaptation strategies through complex views as opposed to minimising it “into a few categories or ideas” (Creswell, 2014:8).

Applied research was the type of research used, particularly participatory action research [hereafter PAR], which is an extension of action research that is known for its collaborative mode of inquiry (Ebersöhn, Eloff, & Ferreira, 2019:156). The researcher and participants collaborated on exploring the issue of floods affecting the community; moreover, the child participants were allowed to have a voice on issues that affect them (Alaca, Rocca, & Maggi, 2017; Save the Children, 2015). The participants shared real-life experiences (Nieuwenhuis, 2020:89) on how floods impact them, which adopted a case study research design. Various authors agree that the case study design helps obtain in-depth insight into a particular situation (Kramer, Fynn, & Laher, 2019; Leedy & Ormrod, 2015). More specifically, the exploratory case study design was used in exploring the case study, as neither a clear nor a single set of outcomes was anticipated (Lucas, Fleming, & Bhosale, 2018:216). Four participants were purposefully selected from the study population for the characteristics that the researcher was interested in (Makofane & Shirindi, 2018:34). The sampling method allowed for inclusion and exclusion criteria, which are detailed in Chapter Three (see section 3.5.1). Data collection methods included photovoice, a data collection method that entails photos representing the participants’ experiences (Delgado & Wester, 2020:193), and semi-structured one-on-one interviews (see section 3.5.2). An interview schedule with open-ended questions that allowed for probing and clarification (Nieuwenhuis, 2020:108) guided the interview process. The collected data were analysed by using the six phases of reflexive thematic analysis as proposed by Terry, Hayfield, Clarke, and Braun (2017:31). The study ensured data quality by following Lincoln and Guba’s (1985) four trustworthiness criteria, namely credibility, dependability, transferability, and confirmability (see section 3.5.4). The study adhered to ethical considerations for research which are discussed in Chapter Three (see section 3.7).

1.6 Division of chapters

The chapter outline of the study is as follows:

Chapter One: General introduction and orientation to the study

The chapter presents the context and background of the study. It includes the key concepts relevant to the study, the theoretical framework for the study, the rationale and problem statement for the study, the research question, the goal and objectives of the study, a brief overview of the research methodology and the structure of the research report.

Chapter Two: Literature review

The literature review includes a discussion on climate change, inequality and poverty, policies and legislation concerning disaster management, disaster risk reduction and disaster risk reduction management. Furthermore, it covers child participation in relation to disaster management, disaster risk reduction, and adaptation strategies with an emphasis on floods. Resilience is discussed as the theoretical framework for the study. The chapter also covers the role of developmental social work in disaster management about climate change and partnerships in mitigating risks and developing adaptation strategies.

Chapter Three: Research methodology

The research methodology chapter includes the research approach and paradigm; the type of research; the research design; the research methodology which includes the population and sample method of the study, data collection methods, data analyses, trustworthiness of the study and the pilot study; the ethics relevant to the study, and the limitations of the study.

Chapter Four: Empirical findings and discussion

The study's findings are presented and discussed in this chapter. The chapter includes the biographical details of participants, the selected pictures and narratives, and the themes and sub-themes that emerged from the photo-voice and semi-structured one-on-one interviews.

Chapter Five: Key findings, conclusions, and recommendations

The final chapter describes how the study's goals and objectives were met. The study's main findings are presented along with conclusions drawn from the findings. Finally, recommendations are made derived from the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Climate change, nature loss, and pollution are the triple planetary crises (Limon, 2022:1). The complex nature of these three pressures prompted the need to protect universally recognised human rights, primarily linked to the UN's 2030 Agenda for Sustainable Development and its seventeen Sustainable Development Goals (SDGs) (Leino & Winiecki, 2019:2), a framework for sustainable development. The UN, when formulating the SDGs, highlighted the need to protect previously disadvantaged, overlooked, and marginalised groups (UN, 2017:12). This central and transformative promise (UN Women, 2020) of leaving no one behind assumes a humanistic approach to development where the needs of those in the most vulnerable situations should be considered in all decision-making processes, interventions, and activities (UN, 2015a; Leino & Winiecki, 2019).

Climate change and many of its impacts will be felt in the future (Treichel, 2020:30). It is therefore vital that vulnerabilities are minimised especially for marginalised populations such as children (Martin, 2010:1360). In line with the United Nations Development Programme (UNDP) parameters for determining vulnerability, which are gender, disability, age, income disparity, language, literacy, or family status (UNDP, 2017:12), children are a vulnerable population. Benevolenza and DeRigne (2019:268) share a similar conclusion: in addition to age, additional parameters such as race, socioeconomic status, gender, and cognitive or physical abilities may contribute to children's level of hardship due to increased vulnerability. The preferred outcome is the conversion of identified vulnerabilities into protective factors for increased resilience within communities.

To contribute to resilient communities, the meaningful participation of children needs to be exercised, as it aims to replace the previous assumption that children's role remains passive (UNICEF, 2019:2). The principle of child participation has been encouraged in all matters concerning children, including in the academic world, where the shift from conducting research on children to conducting research with children occurred as aligned with the right to participate found in the CRC (Alaca et al., 2017:1096). This inclusion of children is vital as the effects of climate change pose risks to their education, health, family security, safety, and survival (Treichel, 2020:26).

The chapter focuses on reviewing existing literature on the topic of DRR and adaptation of children. Resilience theory provided a suitable framework for this study since it emphasises the need to eliminate vulnerabilities within the community to reduce the probability of disaster. Since resilience is thought of as the opposite of vulnerability, lessening vulnerabilities increases resilience, which makes a system better prepared to adapt to shocks and recover from them (Chelleri, Waters, Olazabal, & Minucci, 2015:182). The researcher integrated resilience theory throughout the chapter as applicable to the discussions in the particular sections.

The first part of the chapter looks at the evolution of climate patterns as a macro phenomenon and its impacts on different levels of society, as it is impacting society from macro to micro levels (Sanson & Burke, 2020:343). This part takes a closer look at how climate change affects children, poverty, and the inequality gap. A review of policies and legislation on DRR and adaptation follows, looking at how these policies highlight the value of resilience, the need to acknowledge vulnerable groups such as children as partners in disaster management, and the DRR interventions needed to contribute to sustainable development.

The third part includes a discussion on meaningful children's participation in DRR and adaptation, followed by the role of developmental social work in increasing resilience for communities and children. The discussion focuses on the relationship between DRR and vulnerabilities and protective factors. Lastly, a summary with concluding remarks will complete the chapter.

2.2 Climate change, inequality, and poverty

The principle of leaving no one behind proposes development where marginalised groups are central to decisions made (UN, 2015a; Leino & Winiecki, 2019). Literature and publications on disaster management emphasise the empowerment of marginalised groups who are disproportionately affected due to poverty, gender, and age amongst other classifiers (UN, 2015a; Save the Children, 2015; UNDRR, 2015; UNDP, 2017). This section examines how vulnerabilities which may be along racial, gender, and socioeconomic lines play a role in climate injustice. The effects of climate change on the marginalised is a human rights concern (UNDP, 2015; Save the Children, 2015). It is therefore worth exploring these risk inducing vulnerabilities in the fight for social, economic, environmental, and climate justice.

2.2.1 Climate change and justice

The UN outlines five targets deemed to be crucial for the achievement of SDG 13, dedicated to DRR and mitigating the effects of climate change (UN:2015a). The Department of Environment Affairs (2011:8) describes climate change as "an ongoing trend of changes in the earth's general weather conditions because of an average rise in the temperature of the earth's surface". Climate change is a worldwide problem, however, the poor and vulnerable are usually affected the most (Hawkins, 2010:74). Children have been mentioned among those who are disproportionately affected through death, injury, hunger, and loss of property (Wisner, 2004; Martin, 2010). In addition to the microstructures of society, similar trends at a macro level between developing and developed countries are visible, with the former being significantly affected (Bartlett, 2008; Hattingh, 2019).

The need for climate justice remains a topic of discussion in various publications. Sultana (2022:118) argues that climate justice involves engaging with the nuances of climate impact by paying attention to how people are affected differently, unevenly, and disproportionately. The redress process is encouraged by enhancing equity and justice for the marginalised, exploited, and oppressed (Sultana, 2022:118). In agreement with the redress process, various authors urge increased attention to how the poorest nations are affected by climate change in comparison to the wealthiest nations while factoring in how each side contributes to the phenomenon (Miller, Hayward & Shaw, 2012; Stapleton, 2019). Climate justice's ability to put a human face on the impact of climate change remains one of its most powerful aspects (Stapleton, 2019:734). The impact of climate change results in compromised human rights. Disasters are caused either by natural or human-made hazards (Martin, 2010:1356). However, the distinction does not negate the impact the phenomenon has globally, including in Africa and South Africa (Shokane, 2019:1).

In 2011, the IFRCs predicted that increased climate change would eventually lead to more experiences with natural disasters in different parts of South Africa (IFRCs, 2011:5), which has been the case. UNICEF (2022), in their reporting of the KwaZulu-Natal disaster, notes that floods affected the province between April 8 and 11, claiming more than 430 lives, a total of 67 of whom were children. They further reported that over 40,000 people were still residing in temporary shelters after losing their homes (UNICEF, 2022). Like the impact of climate change felt by developed and developing

countries, children, despite their minimal contribution to climate change, will be affected long into the future (Back et al., 2009:7; Treichel, 2020:26). The cycle of unequal distribution of contribution and impact will be perpetuated according to levels of poverty and inequality, a pattern linked to structural issues such as development, citizenship, international politics, and histories" (Sultana, 2022:122).

On a global scale, through their publication, *Unless We Act Now*, UNICEF highlights that children globally are impacted by this injustice, which results in the deepening of existing inequalities (UNICEF, 2015:6). It is further reported that the year 2022 brought overwhelming flooding to at least 27.7 million children in 27 countries worldwide (UNICEF, 2022). The relationship between vulnerability and the intensity of the disaster experienced has been highlighted as one of the issues to be understood and addressed (Wisner, 2004; Martin, 2010). The need to understand the link between disasters and levels of vulnerability reflects how poor individuals are prone to disasters, moreover, their capacity to recover after a disaster is limited for various reasons. Although climate change is not to be blamed for poverty, it does contribute to the loss of housing, food, and security (Alston, 2015; Sultana, 2022). It is therefore, an act of justice to understand and address poverty in the fight against climate injustice.

2.2.2 Poverty and inequality on increased vulnerability

South Africa's oppressive past left the country grappling to redress the disparities caused by the apartheid system, such as unequal access to basic resources, including human settlement infrastructure, basic services, and economic opportunities (Ngcamu, 2022:58). Depending on where people find themselves on the privilege scale, protective factors and vulnerabilities usually influence the level to which the unplanned (apparent or not) event affects the life, livelihood, property, and other assets of those affected (Wisner, 2004; Martin, 2010). Resilience is the ability of a system, by processes of both resistance and adaptation, to recover to some equilibrium state following a crisis (Noris et al., cited in Mayer, 2019:167). As mentioned in Section 2.1, when it comes to communities experiencing disasters, vulnerability is a major factor.

Vulnerability is a measure of the propensity of an object, location, individual, community, country, or other entity would experience the effects of a hazard (Coppola, 2015:33). Cutter et al. (2008:8) define vulnerability as pre-event and inherent components of a social system that make it prone to harm, the understanding of pre-

disaster circumstances, whether they are macro structures or individual perspectives, is significant. These features influence an entity's ability to anticipate, cope with, resist, and recover from the impact of an unplanned event (Wisner, 2004:11). Vulnerabilities are context-dependent and by design have different implications on communities globally.

The impact of inequality and poverty on vulnerability to disasters is highlighted by Martin (2010:1358), using Bangladesh, a developing country, and the United States of America (USA), a developed country, as examples. Resilience levels of both countries are not the same and this inequality makes Bangladesh prone to being disproportionately impacted by a disaster due to fewer protective factors. For example, an analysis of Bangladesh and the USA between 1980 and 2000 confirmed that what turns a hazard into a disaster is their level of vulnerability or preparedness. Bangladesh, as a developing country, was affected 3.4 times by tropical cyclones, and the country's death toll was found to be over 7,000 annually (Martin, 2010:1358). On the other hand, the USA, as a developed country, reported just over 200 lost lives annually after being affected 12.1 times by the same disaster as their counterpart (Martin, 2010:1358). In light of this, prevention and preparation measures could lessen the effects of a disaster.

Disasters are vulnerability-related, and they contribute to the existing inequality gap, which does not serve the poor and marginalised (Hawkins, 2010; Alston, 2015; Hattingh, 2019). Moreover, disasters and development are connected (Martin, 2010:1359; UNICEF, 2015:11) in that limited development increases a community's vulnerability. The studied community still lags on development matters as it is constituted of mainly informal settlements. The township parts of the community are still struggling with high poverty rates, unemployment, and deficient education, a legacy left by apartheid (Moloisane, 2017:26). The studied community has been affected by floods twice in less than four years (Mahlokwane, 2023). In addition to floods, the studied community is further compromised by existing socioeconomic circumstances such as poverty and governance limitations. Poverty is "a constant, ongoing disaster in its own right" which exacerbates the problems of poor people when disaster strikes (Dominelli, 2012:3). The deep-seated inequalities contribute to poverty, and they affect the community's ability to rebuild better and more quickly.

Children, as a vulnerable group, are at risk due to sociological factors such as the community and family they are born into, which usually limit their political power and leave them struggling for basic needs (Alston, 2015:356). The relationship between poverty and larger societal structures in the political, social, and economic spheres cannot be denied (Martin, 2010:1359), which affects children's quality of life. This argument is supported by other authors who assert that vulnerability accrues from the various components that comprise a given society, such as social, economic, and political structures (Ronoh, Gaillard & Marlowe, 2015:39). The social construct of children and childhood, for example, is emphasised as a possible area of vulnerability for children (Viviers & Lombard, 2013:11). If adults view children as passive objects, the likelihood of them being unconsciously silenced remains high. The children of the studied community, in addition to age and race, have compounding issues at a macro level that have an impact on their lives. The raised arguments highlight the systemic nature of climate change and how it impacts various members of society unequally. The claim is not that climate change leads to inequality, rather, the events surrounding climate change lead to increased food, water, and safety insecurity (Alston, 2015:356), which exacerbates inequality. In response to such a complex and systemic issue, policies have been developed to guide DRR and adaptation on both a global and national level so that no one, especially the poor and marginalised, is left behind.

2.3 Intergovernmental policies and legislation on disaster management

The 2030 Agenda outlines seventeen SDGs aimed at achieving social, economic, and environmental justice (UN, 2015a). Frameworks, treaties, and policies have been developed across various levels of government to ensure context-specific responses to disasters. These policies are aimed at minimising the frequency of natural disasters through increasing resilience, so no one is left behind (UN, 2015a), moreover, they all recognise the different roles of children in disaster management. DRR and resilience-building strategies have been included as fundamental components and preconditions of sustainable development in recent intergovernmental declarations, such as the Addis Ababa Action Agenda (Addis Agenda) (2015), the Paris Agreement on Climate Change (2015), the New Urban Agenda (2016), and the 2030 Agenda (2015) (Staupe-Delgado, Kruke, Ross & Glantz, 2018; Imperiale & Vanclay, 2021).

The Addis Agenda stresses the significance of finances for development in the attempts to advance the progress of the 2002 Monterrey Consensus. The Addis

Agenda emphasises that for sustainable development to occur, economic growth, environmental protection, and social inclusion are all necessary (UN, 2015c). In addition to highlighting the value of finances on development, the Addis Agenda acknowledges the relationship between equity and leaving no one behind where vulnerable groups are concerned (UN, 2015c:3). Article 7 places emphasis on investing in children as a crucial protective factor to achieve inclusive, equitable, and sustainable development (UN, 2015c:3).

The Paris Agreement is a legally binding international treaty on climate change that aims to strengthen global responses and increase resilience against this threat (UNFCCC, n.d.). It set goals toward lowering global warming to well below 2°C over pre-industrial levels, and preferably to 1.5°C, in addition to its mitigation aim of global climate change adaptation (Ferreira Júnior & Argollo Ferrão, 2021). The Paris Agreement further mandates all parties and sectors to move away from fossil fuels, while encouraging financial spending that aligns with climate-resilient and low in greenhouse gas emissions development (UNFCCC, 2016:4). This agreement aims to increase global resilience while not neglecting the equity principle as it acknowledges that national circumstances should be considered in DRR implementation due to unequal capabilities (UN, 2015b:2).

Consistent with earlier declarations, the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR, 2015) recommends that to enhance DRR and build community resilience, all states should enhance efforts in four priority areas:

- (a) understanding risk in all its multiple dimensions.
- (b) strengthening disaster risk governance.
- (c) investing in DRR for resilience; and
- (d) enhancing preparedness and build back better in response, recovery, and reconstruction actions.

The Sendai Framework also outlines roles for various stakeholders where it asserts that as change agents, children and youth should be allowed the time and resources to reduce the risk of disasters in line with national policies, laws, and curriculum (UNDRR, 2015:23). This emphasis on children as partners aligns with the argument

that DRR implementation should “recognise the value of increased engagement of children in risk reduction processes” (Save the Children, 2015:11).

The theme of partnerships and inclusive participation extends to other global documents such as the 2030 Agenda, which provides a comprehensive global policy framework towards ending all forms of poverty, hunger, and inequalities among and within countries (based on gender and other socioeconomic indicators), tackling environmental degradation, and climate change while ensuring “no one is left behind” (UN, 2015a). The successful implementation of these goals towards the process of sustainable development will positively impact DRR, as increased resilience will allow people to better cope with the impacts of a disaster (Wisner, 2004; Martin, 2010).

South Africa’s disaster management system was established under the Disaster Management Act 57 of 2002. It categorises the many disasters, examines funds for disaster recovery, and presents techniques for policy formation related to disaster management. Along with building preparedness plans and appropriate responses in the event of a disaster, the DMA also emphasises disaster prevention and mitigation (Humby, 2012:3). Disaster management is divided into four phases, namely mitigation, preparedness, response and recovery; the first two phases form part of the pre-disaster stage, while the last two fall under the post-disaster stage (Sim, He & Dominelli, 2021:311; UNDRR, 2017). Mitigation refers to the strategies that are implemented to lessen the severe effects of a disaster; preparedness suggests increasing government, professional, and individual hazard capacity; response describes the emergency services needed during and immediately after a disaster, and recovery denotes restoring and providing professional support to the victims of the disaster (Sim et al., 2021:311). These phases are interactive, and Sim et al. (2021:311) emphasise that they frequently cross over, and that how long each phase lasts impacts the severity of the disaster. According to Humby (2012:27), South Africa’s strategies for disaster management contain three levels. Creating policies that are specifically focused on disaster management is the first tier; handling specific disasters, such as floods or fires, is the second tier; and discussing policies relating to the environment, disaster risk reduction, response, and recovery is the third tier.

The City of Tshwane (CoT) followed suit and developed localised strategies and policies to respond to climate change issues, these policies include an Integrated

Development Plan (IDP), The Climate Risk and Vulnerability Assessment (CRVA), The Climate Response Strategy (CRS), and Climate Action Plan (CAP) just to name a few. Flooding is one of the eight priority risks listed in the CRVA report (CoT, 2015:8). The document also emphasises how the poor and vulnerable people are particularly impacted by the apartheid government's spatial planning, which resulted in their placement in flood- and disaster-prone areas, including region 6 (studied community) (CoT, 2015:5). The CRS seeks to provide the context for climate action based on the profile, risks, and hazards of present emissions (CoT, 2017:3). The third proposed intervention out of ten aims to create climate-resilient communities (CoT, 2017:19) by identifying at-risk groups and establishing mitigation plans (CoT, 2017:23). The report emphasises that both the wealthy and the less fortunate are impacted, but that the former group has means to support themselves during their recovery phase (CoT, 2017:22). This observation adds credibility to the conclusion made by Adger et al. (2005) in Chelleri et al. (2019:181), stating that "the more resilient, the less vulnerable."

The CAP offers a route as well as several strategies for reducing the effects of climate change and enhancing resilience (CoT, 2021:1). Incorporating social, economic, and environmental justice is a goal of this plan's contribution to sustainable development which aligns with various authors' submissions (UN, 2015a; Jayaraman, 2019; Lombard, 2022). The objective of the strategy, according to Williams (2021:vii), is to achieve net-zero carbon emissions by 2050 and to increase human, economic, and environmental resilience to changes in climate. To strengthen resilience and promote sustainable development, the text suggests ten solutions that consider people, prosperity, and the environment. Collaborations are highlighted in the section on enabling mechanisms (CoT, 2021:124). The emphasis on partnerships underscores the need for a holistic view of justice (Lombard, 2022:46) and is in line with the 2030 Agenda which emphasises people, prosperity, and the planet (UN, 2015a).

DRR interventions shall, as far as possible, align with the SDGs in promoting social, economic, and environmental justice (UN, 2015a, CoT, 2022) as well as achieving the CoT strategic goals. In addition, the CoT emphasises that DRR interventions shall, where possible, give attention to key vulnerabilities due to "climate change, informal settlements, child- and female-headed households, illiteracy rates, unemployment, households living below the poverty line, and high-density areas" (CoT, 2022:194). Interventions with these vulnerable individuals increase their resilience and ability to

cope with various shocks. The CoT's development of context-specific policies aligns with the place-based model recommended for understanding community resilience to natural disasters (Cutter et al., 2008).

The harmony of these policies is that resilience is a key feature of DRR and adaptation (Wisner, 2004; Martin, 2010; Terblanche, De Sousa & Van Niekerk, 2022). Social, economic, and environmental justice are emphasised, moreover, the inclusion of marginalised and vulnerable groups is central to ensuring no one is left behind (UN, 2015a). Children as a vulnerable group must be allowed to participate in matters concerning them as their opinions are crucial to the implementation of these agreements, and as Save the Children (2015:7) notes, more work is needed to include children's voices in platforms for decision-making, under their right to "contribute to creating the future they want as partners in policymaking and implementation" as stated in Article 12 of the CRC.

2.4 Children's rights and meaningful participation in DRR

Children are the face of the "generation most affected" by climate change (Cocco-Klein & Mauger, 2018:90) and it is only just that their voices are heard on decisions taken on the matter. The shift from tokenistic to meaningful participation in DRR matters has been encouraged repeatedly (Alaca et al., 2017; UNICEF, 2019) and it aligns with the CRC's participation rights, moreover, the National Child Participation Framework [NCPF] defines child participation as an "active involvement of children in the decisions, processes, programmes and policies that affect their lives" (NCPF, 2018:9), the NCPF asserts that confidence and interpersonal skills are positive consequences of child participation. In the DRR context, meaningful child participation has the potential to be lifesaving and offers a base for lifelong learning on the climate crisis. An example of how the empowerment of children may manifest itself dates to 2004 in Thailand, when a 10-year-old girl alerted adults of a possible tsunami after identifying early warning signs as covered in her geography class weeks earlier (Martin, 2010), resulting in hundreds of lives saved. The involvement of children in DRR matters has been given various terms such as child-led and child-focused (Amri, Haynes, Bird & Ronan, 2018:240). Although these terms are phrased differently, they all favour child participation which may be achieved in different ways. Child-focused participation in DRR recognises the specific needs of children during the design and implementation processes, including protection needs and rights which may be led by adults with

children's involvement (Back et al., 2009:7). When children are given the freedom and chance to identify issues that affect them, take the lead on activities, and make decisions for themselves, this is known as child-led participation (Mateos-Blanco, Sanchez-Lissen, Gil-Jaurena, & Romero-Perez, 2022:34). This form of participation could manifest itself as child-led mobilisation, research, accountability, or social accountability (Mateos-Blanco et al., 2022:34).

The inclusion of children in learning and practising DRR from a tender age has social and economic benefits as they are likely to adopt changed behaviour, maintain it in their adult lives, and possibly pass it on to subsequent generations (Back et al., 2009:10). The CRC contains four core themes on the rights of children, namely survival, development, protection, and participation rights, which recognise children's active role in their communities and societies by allowing them to freely express their views and have a say on matters affecting their lives (Abrar & Sidik, 2019:185).

The balance between protecting and empowering children during disasters is encouraged (Bartlett, 2008; Martin, 2010; Alaca et al., 2017). Children have special needs and capabilities, and all forms of child participation should consider this because, when harnessed, their capabilities may reveal children as functioning and resilient agents who actively contribute when faced with adversity, including DRR (Bartlett, 2008; Martin, 2010). Climate change decisions made currently will determine the lives of children far into the future; it is only just that children are invited to contribute (Cocco-Klein & Mauger, 2018; Sanson & Burke, 2020), as this will impact the sustainability of decisions taken.

The study focused on children between the ages of 8 and 12 years, who, a decade from now, will be between the ages of 18 and 22 years. Due to exposure, meaningful participation, and lessons acquired from the study, they will be young adults whose understanding of the topic places them at an advantage. However, this empowerment process known as child participation is not without concerns, such as whose best interest is served during its facilitation and whether facilitators are empowered enough to identify and deal with the complexities of appropriate, meaningful, and authentic child participation (Viviers & Lombard, 2013:8). It is therefore vital that appropriate measures are employed to eliminate tokenism and ensure a just representation of what children have to say. Competent adults are vital for successful navigation through

the various dynamics of child participation (Viviers & Lombard, 2013:11), which is a form of support by adults. This support extends to the voluntary nature of participation, which remains a right but never an obligation, this means that a child is allowed to choose not to exercise that right (UN, 2009:6), at a national level, the NCPF on voluntary child participation asserts that “Children should never be coerced into expressing views against their wishes and they should be informed that they can cease involvement at any stage (NCPF,2018:22). Their best interest should take precedence which requires adequate information and support from adults. When supported adequately by adults, children can “substantively contribute to confronting climate change and fostering social transformation” as seen in the USA when a group of 21 children aged between 8 and 19 were supported to sue the US government “for violating their constitutional rights to life, liberty and property, and their right to essential public trust resources” by enabling the continued use of fossil fuels (Cocco-Klein & Mauger, 2018:91).

This study supports the model developed by Alexander Ballard Ltd. and Hampshire Country Council as part of the ESPACE project (European Spatial Planning: Adapting to Climate Events) for engaged child participation on matters involving children, as it was the case in this study. According to the model, developing climate change solutions requires the interaction of awareness, agency, association, action, and architecture. The first three As are prerequisites that must be met for action to occur. Information or understanding of climate change refers to awareness, which should be complemented by knowledge of possible and meaningful responses to it, which is known as agency. The model also emphasises the need for partnerships which it refers to as association and how awareness of these partners is needed to execute the chosen responses (Butcher, Seballos & Whitehead, 2010:3). It is only after these three actions are realised that action can be executed, that the model discourages projects and encourages the adoption of architecture in advancing climate change interventions (Butcher et al., 2010:3). The model centres DRR interventions around children's awareness, knowledge, partnership, and action. Social workers can also participate as stakeholders in climate change interventions within the association component. Lastly, the "architecture-over-projects" rationale advances the same cause for social "re-engineering" and transformative social policy as a means of addressing persisting issues (Noyoo, 2016). The involvement of children in all disaster

management phases has always been encouraged (International Save the Children Alliance, 2008:18; Martin, 2010:1360) and this model allows for it. Participation starts with understanding children's perspectives on various components of the phenomenon, as they should be viewed as experts in identifying their needs, capacities, and risks (Save the Children, 2015).

The term "child" refers to all persons under the age of 18 in South Africa by the Children's Act No 38 of 2005. This may lead to children being viewed as a homogenous group, which is discouraged (Viviers & Lombard, 2013; UNICEF, 2016). The need for context-specific considerations when child participation is exercised is encouraged. Meaningful child participation is about recognising that children's needs and capabilities differ across age, gender, geography, and socio-economic status, consequently, this needs to be reflected in DRR activities, so no child is left behind (Save the Children, 2015:3). This is affirmed by Viviers and Lombard (2013) in principle six of ethics of child publication, when they argue that diversity must be respected when inclusion is to be achieved while working with children, such as those with disabilities or who form part of minority groups (Viviers & Lombard, 2013:15).

When tokenistic child participation takes place, consequences vary depending on vulnerability. For example, children with disabilities in schools managed by an Indonesian society caring for children with disabilities in Banda Aceh were all killed by a tsunami (CIR 2005, in Ronoh et al., 2015:40) due to a disregard for meaningful participation and how it impacts DRR. Children are noted as a vulnerable group amid a disaster, however, children living with disabilities are often excluded from participating in DRR activities (Ronoh et al., 2015:39). For meaningful child participation, skilled adults who will work alongside children need to be conscious of context-specific determinants for sustained and appropriate results. This will aid in human rights protection and ensure partnership in the promotion of human rights. Section 7 of the Children's Act in the South African context details the best interest of the child principle, which should be considered on matters concerning children, including age, family, cognitive, and disability factors as some of the issues highlighted (Children's Act, 2005:38-40).

Preparedness is the acknowledgement of the system children exist in and how they influence each other before, during, and after a disaster. On this background, a

person-in-environment (P-I-E) approach is fitting for minimised risk and increased resilience. The P-I-E approach has always been adopted by the social work profession in all its interventions (Gray, Coates & Hetherington, 2013; Lombard & Twikirize, 2014; Alston, 2015). The P-I-E approach is founded on the ability to understand individuals and the relationship shared with their environment (Mathende & Nhapi, 2017; Van Breda, 2019). The limitation of the P-I-E approach is its focus on just the social dimension when considering a person's environment (Van Breda, 2019:2), the developmental approach on the other hand looks at the social, economic, and environmental dimensions in line with sustainable development (Lombard, 2019:53). Due to its systemic and non-reactive nature, the developmental approach offers the social work profession pathways to engage in significant disaster management activities like DRR. The developmental approach underscores resilience because it recognises how societal components such as the economy affect the quality of life and human rights, particularly of the marginalised, it reduces dependency by advocating for interventions that enhance protective factors at the micro and macro levels (Patel, 2015; Lombard, 2019). It shares the UN's sentiments on partnerships and participation to ensure that no one is left behind (UN, 2015a; Gray, Agllias, Mupedziswa & Mugumbate, 2018).

2.5 Developmental social work as a pathway to increased resilience

Resilience is a multifaceted phenomenon which is key to DRR and adaptation (Greene & Greene, 2009; Terblanche et al., 2022). When disaster strikes, it affects humans on a personal level; moreover, it spills into various systems and structures that are paramount to their livelihoods. The impact of disasters on multiple systems within a society prompts holistic interventions post-disaster (Wilkinson, 2012; Terblanche et al., 2022). The level of severity varies across social classes, and the marginalised are usually hit the hardest due to high levels of poverty, injustice, and fewer protective factors, which translate to human rights violations. Social workers have always embraced the interdependent nature of the relationship between human beings and their environment (Gray et al., 2013:11). The inclusion and importance of the natural environment have been emphasised as a tool in the protection of human rights (Alston, 2015; Save the Children, 2015; Van Breda, 2019). The social work profession values social justice, equality, and human rights (Alston, 2015; Jayaraman, 2019). Disasters are known to violate these values and, by extension, demand the social work

profession to take a radical role in responding to environmental crises that disproportionately affect the marginalised (Hawkins, 2010; Sultana, 2022). The studied community struggles with high unemployment rates, poverty, and limited quality of education (Moloisane, 2017:26), which translates into decreased resilience levels. Social work as a profession remains dynamic by responding to evolving and complex human challenges (Maripe & Sinkamba, 2014:23). This response is seen through frameworks such as green social work, which advocates for protecting human rights, and the environment, and increasing resilience (Dominelli, 2012; Breen, Greig & Wu, 2023). As pointed out earlier, the studied community has been affected at least twice by floods, which have worsened their already compromised quality of life (Mahlokwane, 2023). Disasters lead to continued inequality, vulnerabilities, and injustices (Hawkins, 2010; Alston, 2015; Hattingh, 2019). This means that the studied community's resilience levels were weakened, their human rights violated, and the environment further degraded.

The success of DRR and adaptation does not require subjective engagement; it is increasingly clear that resilience does not only depend on the individual; it is also affected by larger systems, structures, and society (Ungar, 2012; Van Breda, 2019). This means that people impacted by disasters will have individual responsibilities; however, additional systems within the community should be included in all resilience-building interventions. The developmental approach remains the most suitable pathway to increased resilience and, in turn, positively contributes to DRR and adaptation strategies. It assumes a holistic justice stance by upholding human rights and enforcing justice interventions that are cognisant of the human-nature nexus and incorporate social, ecological, and environmental justice (Lombard, 2022:50), Jayaraman (2019:16) refers to this as equality enforcement. In the disaster management process, the developmental approach allows social workers to intervene through non-reactive, preventative, and mitigating measures, which are increasingly desired (Mizutori, 2019:2). Individual (micro) and collective (macro) rights and responsibilities, the intertwined relationship between economic and social development, the role of partnership and democracy as empowerment tools, and resilience-building principles are core to the developmental approach (Patel, 2015; Lombard, 2019). The argument for holistic interventions and how they improve human resilience and livelihoods has been emphasised by various authors (Patel, 2015;

Lombard, 2019; Terblanche et al., 2022). The common argument made by the mentioned authors is that the developmental approach has pillars which have a transformative element and increase resilience. These pillars will next be discussed.

2.5.1 Rights-based interventions and increased protective factors

In unison with the Constitution of the Republic of South Africa, the developmental approach argues for access to social justice, a minimum standard of living, and equal access to resources and opportunities (Patel, 2015:58). Disasters are a human rights issue (Save the Children, 2015; Romero-Lankao, Gnatz, Wilhelmi & Hayden, 2016) due to the instability imposed on the basic needs of those affected. The repeated occurrence of floods in Mamelodi East communities (Mahlokwane, 2023) leads to compounding human rights violations, including safety, access to housing and clean water. The devaluing of human life and biodiversity in economic balance sheets and government decision-making is highlighted as a pitfall that holds back the resilience building needed for sustainable development (Ferreira Júnior & Argollo Ferrão, 2021:6). Lombard (2019), and Sewpaul (2016) advances the argument made by the United Nations Declaration of Human Rights (1948) of three generations of human rights. A person's civil and political rights are the focus of the first generation, followed by social, economic, and cultural rights in the second, and finally environmental rights in the third (UN, 1948; Sewpaul, 2016:20; Lombard, 2019:56).

Social work practice should be centred on protecting all three generations of human rights, access to human rights increases capabilities, and resilience and it aligns with leaving no one behind (Patel, 2015; Lombard, 2019). This rights-based approach argument contributes to resilience building (Matoso & Jobbins, 2017:1). Specific to the child participants in the studied community, as a vulnerable group, they were meaningfully consulted on matters affecting them as they are more susceptible to indirect effects of climate change, such as food shortages, intergroup conflict, economic dislocation, and migration (Akresh, 2016:51), all of which impact the three generations of human rights. The social work profession's success in promoting human rights in all interventions will lead to communities that are more resilient and therefore have increased chances to recover more easily and better from a disaster. The developmental approach's provision for human rights protection enables the social work profession to contribute to the 2030 Agenda and leave no one behind (UN,

2015a). Environmental racism violates collective human rights, and a rights-based approach to DRR aims to redress the effects of structural barriers on the marginalised during a disaster (Breen et al., 2023:4). The relationship between humans and the environment, which factors in the natural environment, is critical in managing the effects of climate change on human rights (Lombard, 2015; Mathende & Nhapi, 2017) because if unaddressed, it will negatively impact global efforts made thus far to deal with poverty (McKinnon, 2008:263). Environmental racism, which is any policy, practice, or directive that disadvantages individuals, groups, or communities based on race or colour (Bullard, 2001:160), is highlighted within the green social work framework.

The ability of good governance to provide for individual and collective rights increases resilience and promotes DRR and adaptation. Matoso and Jobbins (2017:1) agree by claiming that the delivery of necessities such as health, education, and water is a critical component of community resilience. Neoliberal social development that temporarily benefits the elite while draining resources for future generations is one example of an unsustainable method of human rights protection that Dominelli and Ku (2017:11) warn against. To promote sustainable development, it is suggested that social workers adopt a holistic perspective in partnership with service users in their pursuit of development, where social and economic advancement coexist peacefully with the entire environment.

2.5.2 Socio-economic development in harmony with the natural environment

Moloisane (2017:26) points out that the studied community is characterised by high unemployment rates, extreme poverty, and deficient education and that informal settlements dominate as a form of housing. These characteristics reveal vulnerabilities that violate human rights and compromise the resilience levels of the studied community. Sewpaul (2016) and Lombard (2019) concur that the second generation of human rights is concerned with social security which includes things such as reasonable levels of education, adequate healthcare, housing, and employment opportunities. The studied community is therefore disproportionately affected by disasters because of social and economic circumstances which correlates with the conclusion that environmental justice is not possible if people do not have social and economic power (Hawkins, 2010:74). These systemic vulnerabilities globally widen

the gap between privileged and underprivileged members of society (Hawkins, 2010; Alston, 2015; Hattingh, 2019). While social and economic development may be discussed separately, they are two sides of the same coin when it comes to development. It is therefore vital that economic growth be converted to economic development through wealth redistribution across various social structures, which is likely to improve the standard of living of citizens (Patel, 2015:61). The 2030 Agenda placed increased emphasis on protecting the planet in the process of sustainable development (UN, 2015a), it argues that economic, social, and environmental justice are equally important.

Due to climate change exacerbating already existing inequalities and poverty among vulnerable groups (Alston, 2015; Sanson & Burke, 2020; Sultana, 2022), the role of social work is to advocate for justice and contribute to just, fair, and sustainable communities where children can thrive and have a future. The studied community occupies informal settlements which have been associated with susceptibility to flood incidents because of their dense population and often poor construction (Risi, Jalayer, De Paola, Iervolino, Giugni, Topa, Mbuya, Kyessi, Manfredi, & Gasparin, 2013:1003). This structural vulnerability emphasises the need for meaningful participation because climate change adaptation and DRR strengthen resilience (Fakhruddin, Kirsch-Wood, Niyogi, Guoqing, Murray & Frolova, 2022:3). The social and economic development pillar is supported by the indicators under social and financial capabilities, which are recommended as resilience builders for DRR and adaptation (Terblanche et al., 2022:7-8). The UNDRR (2015:24) encourages the assessment of social vulnerability levels, especially for those who are likely to be disproportionately affected due to existing circumstances such as age, gender, race, disability, social isolation, and medical illness (UNDRR, 2015:24). In addition to assessing their vulnerability levels, marginalised groups should be allowed to participate meaningfully in all decision-making processes.

2.5.3 Empowerment through democracy and participation

The developmental approach is designed to increase independence and minimise welfare reliance (Gray et al., 2018:2). This empowerment principle encourages active participation by citizens in their development as emphasised by the 2030 Agenda (Lombard, 2019:59). As a context-specific pathway, the developmental approach

seeks to involve the marginalised in decision-making on issues that will have a direct impact on their lives. This promotes active and responsible citizenry in individual and community development, enhances ownership of activities aligned with the socio-economic pillar and contributes to challenging structural barriers at a macro level which affirms social justice (Patel, 2015:64).

The value of empowering the marginalised to "demand their rights" is central to this pillar (Lombard, 2019:59). PAR makes it possible to include children in DRR and adaptation issues in a meaningful way. Processes that enable children to develop their confidence should be facilitated so they can perceive themselves as active participants with a contribution to make rather than passive bystanders (UNICEF, 2019:2). The study allowed primary school children to participate by sharing their perspectives on DRR and adaptation, this engagement is termed as one of the key factors in creating a culture of safety, risk management, and environmental sustainability in the community (Save the Children, 2015:6). Lombard (2019:59) supports this notion as she highlights that the developmental approach must incorporate the perspectives of citizens in a democracy that promotes human rights. The process of empowerment by participation makes it possible to approach development and decision-making from the bottom up.

One of the key goals of Cutter et al.'s disaster resilience of place model (2008) is social resilience, which is underpinned by the notion that decisions are place-based and provide individuals who may be impacted by them a fair chance to influence decisions taken. Democracy and non-tokenistic engagement allow people, especially the most vulnerable, like children, to see themselves as partners rather than objects (UNICEF, 2019:2). This is in line with the Agenda for Social Work and Social Development (2012) and the 2030 Agenda, where the value of collaboration is emphasised (IFSW, 2020; UN, 2015). The reduction of disaster risk shouldn't be assigned to a specific group, it is everyone's concern (Imperiale & Vanclay, 2021:901), which aligns with forming partnerships. Instead of DRR being the responsibility of all, a selected few people frequently take the lead, undermining the ability of the public to learn from previous mistakes, crises, and disasters and to change in the direction of sustainability (Imperiale & Vanclay, 2021:900) which emphasises the value of partnerships in DRR and adaptation.

2.5.4 Partnerships for development

The 2030 Agenda places a strong emphasis on holistic justice since it prioritises people (social justice), the planet (environmental justice), and prosperity (economic justice). It also emphasises the importance of partnerships between different stakeholders in attaining justice and bringing peace (UN, 2015a; Lombard & Viviers, 2020:2274). The value of partnerships is further highlighted by Gray et al. (2018:2) who define the developmental approach as a multifaceted, multisectoral approach that discourages welfare dependency and promotes active participation. The Global Agenda for Social Work and Social Development framework 2020-2030 has in its mandate the value of partnership in its overarching theme which reads, “Co-building inclusive social transformation” (IFSW, 2020), moreover, ‘Working Towards Environmental and Community Sustainability’ has been posited as one of the four priority areas in the IASSW, IFSW and ICSW (2012). Lombard (2019:59) highlights that sustainable development requires partnerships on a global, regional, national, and local level. In times of disasters, this requirement is occasionally disregarded, which results in a small number of stakeholders participating in DRR interventions (Imperiale & Vanclay, 2021:900). This needs to change because collaboration is critical for social resilience (Imperiale & Vanclay, 2021:896).

The need for a radical transformation in the management of disasters, which focuses more on prevention than reactive measures, is encouraged by Mizutori (2019:2). The author further highlights that this will require the government to be in partnership with various stakeholders, such as the private sector and affected people, who should become "drivers of change rather than remaining the receivers of it" (Mizutori, 2019:2). In addition to recognising people at a micro level as key partners, various institutions and stakeholders need to be consulted for effective DRR and adaptation. A systemic flaw in a limited partnership is noted by Fakhruddin et al. (2022:2) who argue that even though rich and quality data is available on disasters, it does not lead to quality implementation due to low synchronicity levels amongst various entities in possession of this data. This lack of partnership translates to vulnerable groups, including children from poor communities such as the studied community, being exposed to systemic risks.

The concept of partnership and how it positively impacts resilience in communities is emphasised and encouraged across institutions that may be through vertical,

horizontal, or cross-territorial interaction to ensure that community challenges are tackled systematically (Huck, Monstadt & Driessen, 2020:1). The value and implementation of key partnership collaboration will not only promote participation rights but will also empower communities by decreasing their vulnerability and improving their resilience against disasters through integrated DRR strategies for future disasters (Greene & Greene, 2009; Rapeli, 2017). This pillar recognises the value of stakeholders such as children and various social structures that each child may interact with. This connection between people and various structures of society acknowledges that policies, practices, and decisions taken at a macro level should be informed by and be in the best interest of service users at a micro level.

2.5.5 Micro and macro practice integration

The existence of micro and macro social work can be traced back at least 100 years (Austin et al., 2016:270), and they each serve a critical purpose for the profession. The disconnect and unnecessary competition between the two approaches resulted from evolutionary processes due to specialisation as each method attempted to maintain relevance in response to changing needs (Austin et al., 2016:271). The perceived separation of the two methods does not make professional sense because micro and macro social work have a shared foundation of human rights, social justice, and respect for diversity in all its forms (Reisch, 2016:261). This shared foundation means that, however different their modes of intervention are, their objectives remain the same. Integrating the two methods supports the profession's P-I-E approach because interventions will be grounded on the premise that a person (micro) exists within an environment (macro), and for sustained impact on social challenges, both systems must be targeted. This argument aligns with the notion that both micro and macro practices are important and should be used when and where the developmental approach is practised (Lombard, 2019:58). Micro social work, which focuses its interventions on individuals, groups, or families, is commonly used (Rothman & Mizrahi, 2014:92); macro practice is less popular, even in academia (Reisch, 2016; Rothman & Mizrahi, 2014); and it is social work practice with larger systems, such as communities, human service agencies, or public policy environments (Hill, Erickson, Donaldson, Fogel, & Ferguson, 2017:522). Macro social work aims to achieve social justice by promoting structural solutions to systemic inequalities and various forms of oppression that go beyond individual adaptation and resilience (Reisch, 2016:261).

This pillar emphasises the need to bridge the divide between the two modes of social work intervention (Patel, 2015:68), which has existed for decades.

While macro social work extends beyond one-on-one interventions, the methodology is often based on issues derived from micro practice (Netting, Kettner, & McMurtry, 1998; Miller et al., 2008:81), which affirms the complementary relationship between the two methods. The value of developmental social work in disaster management is affirmed in this pillar because a sustainable response to DRR must acknowledge, cater for, and bridge the gap between people and institutions. Disasters have an impact on human rights and social justice (Romero-Lankao et al., 2016; Save the Children, 2015). Due to the profession's ethical commitment to individual and social change, micro and macro social workers should therefore appreciate the connection between the two methodologies (Reisch, 2016:259). The link between DRR and climate change adaptation is embedded in seeing climate change work as changes at micro and macro levels to correct injustice (Butcher et al., 2010:2). Integrating micro and macro interventions aligns with Cutter et al.'s (2008) place-based model of community resilience because interventions or policies at a macro level will be developed in response to local conditions. This integrated approach is likely to minimise the possibilities of a new colonisation of communities through imposed macro policies (Lombard & Viviers, 2020: 64), which is desirable in DRR and adaptation.

2.6 Summary

The chapter presented an overview of existing literature on disaster risk reduction and management, incorporating resilience theory as the study's theoretical framework. The chapter explored the intersection of climate change, poverty, and inequality. It highlighted the disproportionate effects of floods on marginalised groups, framing climate injustice as a human rights issue that can be minimised through increased resilience.

The second part of the chapter discussed disaster management policy and legislation at global, regional, national, and local levels, outlining various strategies to increase resilience and establish desired timeframes. The common theme in the discussion was the aim to transform vulnerabilities into resilience through partnerships, especially with vulnerable groups, the need for financing, and a comprehensive understanding of risk to enable context-specific disaster management. The chapter also highlighted the

need for meaningful child participation and argued for the inclusion of all vulnerable groups in every phase of disaster risk reduction and management to advance climate justice. The final section of the chapter discusses the developmental approach and how it positions the social work profession to enhance community resilience. This approach offers a pathway for engagement with various societal structures to achieve social justice and uphold the core values of the profession through its comprehensive framework.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents and discusses the research methodology applied in the study to answer the research question, “What are primary school children’s perspectives on disaster risk reduction and adaptation concerning flood experiences in Mamelodi East?”.

The chapter starts with the research approach and paradigm, followed by the type of research and research design. The next discussion focuses on the population and sampling procedures, followed by the data collection methods, data analysis, trustworthiness of the data and pilot study. The ethical aspects that were taken into consideration for the study are next discussed, followed by the limitations of the study and how they were managed. Finally, the chapter ends with a summary.

3.2 Research approach and paradigm

A qualitative research approach was employed for the study. Qualitative research is defined as a research approach that uses words to gain an in-depth understanding of the phenomenon being studied (Nieuwenhuis, 2020:59). Qualitative researchers focus on the natural setting in which the phenomenon occurs (Nieuwenhuis, 2020; Cropley, 2022). Qualitative research assumes an individualistic approach which allows for subjective engagement of studied phenomenon (Cropley, 2022:9). As stated by Cropley (2022:9), each individual has a unique interaction with the world, which forms the basis for how he/she interprets his/her part in and how the world works. The exploratory study looked at children’s perceptions of how floods affect communities in Mamelodi East. According to Nieuwenhuis (2020:61), the researcher typically has limited understanding of the subject being studied, which is corroborated by Du Plooy-Cilliers, Davids, and Bezuidenhout (2014:75), who state that research projects that are focused on exploration are typically unknown to the researcher. Through conversation, the qualitative approach allowed the researcher an opportunity to explore primary school children’s perspectives on DRR and adaptation strategies.

In alignment with the qualitative approach, the research paradigm for the study was constructivism (Creswell, 2014:8). It enabled the researcher to interpret how participants develop the subjective meanings of their experiences of floods, risks, and adaptations in their community by looking at meanings from a varied and multiple-

complexity approach rather than narrowing them down “into a few categories or ideas” (Creswell, 2014:8).

3.3 Type of research

Action research, which is an extension of applied research, was utilised for the study because of its collaborative mode of inquiry (Ebersöhn, Eloff, & Ferreira, 2019:156). According to Ebersöhn et al. (2019:156), action research is effective in an educational environment and community settings, which was the focus of the study. Action research is known to promote collaboration which includes the user, and the formation of new ideas and practices (Maree, 2019).

Action research entails four types, namely: technical action research, practical action research, PAR, and emancipatory action research (Ebersöhn et al., 2019:158). In short, technical action research aims at improving the effectiveness of the practice, whereas practical action research aims at professional development. On the other hand, emancipatory action research focuses on changing the system itself, while PAR focuses on collaboration with participants and gaining community perspectives (Ebersöhn et al., 2019:159). For this study, PAR was adopted by the researcher because she collaborated with Viva Independent School's children, leading to two benefits, namely allowing participants to have a voice on issues affecting them as well as having an opportunity to share their perceptions on floods (Alaca, Rocca, & Maggi, 2017; Save the Children, 2015). The children had an input on DRR as well as adaptation strategies, which is an empowerment tool as they will be better prepared for future floods (Save the Children, 2009:1).

3.4 Research design

The chosen research design was a case study, which scientifically investigates a real-life phenomenon in depth and within its environmental context (Ridder, 2017: 282). Other authors agree that case study designs allow for a comprehensive understanding of a studied problem (Kramer, Fynn, & Laher, 2019; Leedy & Ormrod, 2015). According to Creswell (2009:1), the research topic and problem under investigation inform the research design. This study explored the issue of floods in Mamelodi East to understand its effects on the community, what vulnerabilities exist, and how they can be transformed into protective factors to enable better adaptation and recovery in the future. Case studies are based on the real-life experiences of participants

(Nieuwenhuis, 2020:89; Creswell, 2009:1). The learners of Viva Independent School were participants in this study. The chosen practices and strategies allowed the researcher to choose a specific number of participants (Zainal, 2007:1) and continuous interaction during the data collection process (Leedy & Ormrod, 2015:272). The researcher explored the views of different participants concerning floods and DRR strategies, an advantage highlighted by Lucas et al. (2018:216) on the chosen design to give various perspectives.

3.5 Research methods

In this section, the study population and sampling, data collection methods and analysis, pilot study, and trustworthiness of data are discussed.

3.5.1 Study population and sampling

Study population refers to a group of people or entities from whom information is required (Wiid & Diggines, 2013:186). The broad population of interest for this study was the children of Viva Independent School which served as the research site for all eight researchers (MSW students) conducting individual studies. The school principal arranged an event for the eight researchers (MSW students) to collectively introduce the research project to the school community and facilitate voluntary participation from learners who met the sample criteria.

Participants were sampled purposively due to shared characteristics of interest to the researcher (Makofane & Shirindi, 2018:34). Etikan, Musa and Alkassim (2016:2) agree that purposive sampling is intentional as participants are selected using judgement on a specific criterion to benefit the research process. These characteristics include information on the problem studied (Orcher, 2016:62).

For this study, learners from Viva Independent School were sampled purposively, and the following characteristics were of interest:

- Agree to voluntarily participate in the study.
- Aged 8-12 years.
- Male and female learners.
- Be affected by at least one flood in the past.

- Ability to communicate in English.
- Ability to take pictures with a smartphone.
- Willing to walk in the community to take photos of risks for flooding.

In addition to the inclusion criteria, purposive sampling allows for the researcher to exclude certain individuals from participating in the study. The study excluded potential participants whose developmental stage did not meet the age requirement, as well as those who indicated or were believed to be suffering from post-traumatic stress disorder due to floods or any other trauma. The exclusion was done as an ethical consideration to prevent further harm to participants (Maree, 2020:48). For participants in the study, the researcher offered a debriefing session after the interviews and arranged with a counsellor to be available for participants if they needed support (see section 3.7.).

As the gatekeeper, the school assisted with a list of learners in grades four, five, and six who met the inclusion criteria for the study. A total of 30 names were sampled and placed in three hats, one for each grade. Two sampled learners were excluded due to choir commitments, resulting in 28 participants between eight researchers who were further divided into groups of three or four participants for independent studies. The groups resulted from a draw by a neutral person and each researcher had participants from all three grades. This process minimised the likelihood of participants influencing each other's opinions during the data collection phase, as they would be less familiar with one another³.

The initial and collective introductory session by all researchers included an information session on DRR with all learners of the school to solicit their interest to participate in the study. The information session was conducted through a role play where the researchers explained to all the learners of the school that the study would include only a few participants who met the sample criteria. To keep the interest of all

³ Note on the theme-based research study of the 2022 MSW Social Development & Policy student cohort: This resulted in 9 or 12 one-on-one interviews per study, linked to photovoice activity based on selected photos per individual participant from an own pool of photos taken in the community. Since data collection for photos in the community took place on a single scheduled date for safety reasons, the two learners who were absent from school that day were excluded from the sample. However, this did not affect the independent studies, as each researcher required a minimum of three learners. For participants who were absent on the day of the schedule interview, the researcher arranged a follow-up date with the school and the learner to conduct the interview.

the learners of the school, the researchers undertook to give the school feedback on the outcomes of the independent studies. This promised collective feedback session took place in October 2024 in a participatory manner, by involving the learners in the discussions.

The collaborative and inclusive principles of PAR were incorporated into the process through the involvement of all learners in the information session. While twenty-eight were sampled from the entire school, it mattered that all learners felt included and engaged in the process and outcomes.

3.5.2 Data collection methods

The researcher used photovoice and semi-structured one-on-one interviews to collect data. Photovoice is a PAR method that allows community members to create alternative stories about their community (Kessi, Kaminer, Boonzaier, & Learmonth, 2022:354). It is traditionally defined as a data collection method that entails telling photos which contain participants' experiences (Delgado & Wester, 2020:193). Taylor, Bogdan and De Vault (2015:150) describe photovoice further as a "method used to have people represent their lives, experiences, and situations through photos or videos".

Photovoice is a data collection method for obtaining comprehensive and rich data (Ebrahimpour, Esmaili, & Varaei, 2018:216). Furthermore, it serves as an important tool to promote the inclusion of young children with diverse lived experiences in research (Alaca et al., 2017:1111). The method is not without limitations as it is costly when conducted with large groups (Alaca et al., 2017:1112). However, the number of research participants for this study was small, which reduced costs.

As mentioned above, all the learners in the school were introduced to the study as a starting point for data collection to solicit their interest and engagement in DRR based on the outcomes of the study. It was explained to all the learners that the study would commence as a research project with the sampled learners in the school who meet the sampling criteria. The participants had to take photos on possible risks for floods while walking in their community, which was adjacent to the school. The researcher prepared the four participants in her study for data collection, including showing them how to use a smart phone camera. They were given turns to learn how to use a smart phone camera to take good pictures. This exercise offered a chance to pilot the study

through simulation, which was a counteracting measure for the absence of a pilot study in the field. The same principle of sharing the phone was used when the participants walked in the community for data collection.

The researcher gave two smartphones to the participants to take photographs of what they viewed as flood risks in the community. As the participants walked together, it was inevitable that some of the risks would be photographed by more than one learner. However, each participant was allowed to review their portfolio of photos and select three pictures to discuss during the semi-structured one-on-one interview with the researcher. Discussing three photos per participant allowed for data saturation, meaning no new categories or themes emerged (Creswell, 2014:189). Sharing their views on the risks and adaptative strategies with the researcher enabled the participants to engage actively in decision-making and take ownership of the research process (Kessi et al., 2022:355).

The researcher also prepared them for the study by giving them an overview of the unfolding research process. The researcher also explained that the four participants would be accompanied by the researcher, a teaching assistant, and/or a teacher while walking in the community as a group to take photos. It was stated in the informed consent and assent forms that it would be in the participants' best interest for them to be accompanied by adults while using smartphones in the community for safety reasons.

The researcher used an interview schedule to guide the semi-structured one-on-one interviews (see Appendix A) which were conducted at Viva Independent School. The interviews took place a day after the photos have been taken in the community. Three participants' interviews took place on the same day (13/09/2023) while the fourth participant's interviews were five days later (18/09/2023). Each participant selected three photos to discuss which on average took thirteen minutes per photo interview. According to Nieuwenhuis (2020:108), semi-structured interviews commonly use open-ended questions allowing for probing and clarification; moreover, they are used to verify data emerging from other data sources. The advantage of semi-structured interviews is that they allow for follow-up questions based on the interview schedule (Leedy & Ormrod, 2015:389). This advantage also applied to the researcher who was able to probe further on responses given by participants. Semi-structured interviews

can be time-consuming and labour intensive (Adams, 2015:493). As indicated above, Participant four was interviewed five days after the other participants as she was absent on the first day. This required travelling close to 200 kilometres by the researcher to conduct the interviews which was time consuming. All interviews were conducted during school hours for safety reasons. The research site is in a community with high rates of criminal activities, it was therefore necessary that interviews took place in a manner that would cause no harm to the participants and the researcher. Additional information on safety concerns is further discussed under the limitations of the study (see section 3.8).

In addition to photovoice and semi-structured one-on-one interviews, the researcher observed participants' behaviour which were captured through field notes, interactions, and activities at the research site. These field observations were helpful to the researcher as she used them during the interviews to further explore the participants' perspectives when they shared the narratives of their photos.

3.5.3 Data analysis

The reflexive thematic analysis method was used to analyse the data obtained from the photovoice and semi-structured interviews. Norwell, Norris, White and Moules (2017:2) describe this method of data analysis as the process of systematically analysing information until the reporting phase of themes gathered within a data set. The method involves arranging the data, identifying themes, and reporting the results in six phases (Terry, Hayfield, Clarke, & Braun, 2017:31). These phases were implemented in the study as follows:

- In the first phase, the researcher listened to the audio recording of semi-structured interviews, reading transcripts and field notes, thus familiarising herself with the data collected, which is important for data analysis (Braun & Clarke, 2006:87). This phase included making notes (Braun & Clarke, 2006:87).
- The second phase began when the researcher was familiar with the collected data which led to initial codes being generated (Braun & Clarke, 2006:88). During this phase, colour coding was used to mark parts of data which were considered important to the research question. Finally in this stage, the codes

were linked according to their relevance to each other (Braun & Clarke, 2006:87; Norwell et al., 2017:6).

- The third phase started after coding and when all initially generated codes in the second phase were grouped, to refine and avoid duplication, the collated codes were then organised and used to develop themes (Braun & Clarke, 2006:89; Norwell et al., 2017:8). A theme consisted of dominant responses that could be perceived as possible trends identified by participants while remaining relevant to the research question (Braun & Clarke, 2006:91). At the end of the third phase, potential main themes and subthemes were identified by the researcher.
- The fourth phase of data analysis involved the review and refinement of proposed themes. This phase allowed for themes to be collapsed, merged, or deleted based on data (Braun & Clarke, 2006:92). This was done while coded themes were also reviewed for patterns and maintained meaning captured from collected data (Norwell et al., 2017:9). The reviewing process included the emergence of relevant data that was not covered by existing codes. Norwell et al. (2017:9) state that the coding process is not linear and therefore the insertion of new codes is always allowed. This guided the researcher to accommodate new themes as they emerged, provided they did not appear in any existing codes.
- The core task of the fifth phase involved identifying and collating themes and existing data based on their relevance. The researcher made decisions regarding what each aspect of the data captured and how it related to the research questions, aligning with the framework proposed by Braun and Clarke (2016), as cited in Norwell et al. (2017:10). The phrasing of themes was intentional and aimed to give the reader a sense of what was going to be discussed (Norwell et al., 2017:10). During this phase, each theme was unpacked by using data from transcribed material and field notes which included observations of participants and community dynamics.
- The concluding phase of data analysis involved written storytelling, formed through integrating the opinions, thoughts, and perspectives of participants on reducing flooding risks and adopting adaptation strategies. The story told was

made up of a thought-provoking yet brief account across themes, which maintained coherence, logic and it was non-repetitive (Braun & Clarke, cited in Norwell et al., 2017:11). The findings in this research report include the integration of literature and direct quotes from participants.

3.5.4 Trustworthiness of data

As aligned with applied research, the trustworthiness of the data was assessed to ensure the appropriateness of the data analysis (Nieuwenhuis, 2019:143). To establish data trustworthiness, the researcher considered credibility, transferability, dependability, and confirmability.

For Greenwood and Levin (2007), as cited in Burns (2015:192), credibility is concerned with the arguments and steps necessary for someone to trust the outcomes of the study. In this study, the criteria used when sampling participants, such as age and location, increased the credibility of the research findings as the participants were able to give perspectives based on personal experiences.

Transferability is concerned with the achievement of similar results when the research is conducted with different participants to prove its validity (Burns, 2015:192). Photovoicing and semi-structured one-on-one interviews can be transferred into a different group of participants with similar inclusion criteria. Participants selected photos about risk reductions for floods and adaptation for discussion, a process that allows for transferability.

The researcher provided a detailed and thick description of the methods used to guarantee the study's adherence to trustworthiness (Morse, 2015; Stenfors, Kajamaa, & Bennett, 2020). The PAR design ensured that participants were engaged in some phases of the research process such as data collection and dissemination of findings. The supervisor was involved in verifying the research processes to increase reliability. Furthermore, thick descriptions from the participants' rich data assisted with understanding the research findings (Nieuwenhuis, 2019:143). The researcher, along with fellow researchers from their respective studies, returned to the school to provide feedback to the learners on the outcomes of the study. This provided an opportunity to further involve participants in the study as the findings were disseminated in a child-friendly way using appropriate language and activities.

Lastly, confirmability is demonstrated through the research design and implementation, data gathering specifics, and the reflective appraisal of the project (Nieuwenhuis, 2019:145). An audit trail of the research process was used to meet this criterion, providing detailed descriptions of how the data were analysed, in conjunction with peer debriefing with fellow students and ongoing consultations with the research supervisor (Gunawan, 2015; Nowell et al., 2017).

3.6 Pilot study

A pilot study is a pre-test before the actual study (Makofane & Shirindi, 2018:41). The authors explain that the pilot study helps researchers make necessary adjustments to the study at large. This study did not include a full pre-test component due to safety concerns and adherence to the ethical consideration of causing no harm to participants (Babbie, 2017; Hammett, Jackson, & Bramley, 2022). To compensate for this limitation, various measures were employed throughout the research process, aimed at minimising the negative effects of not piloting the chosen research tools. In the preparation session of the participants for data collection, they had the opportunity to use the researcher's smart phones to take a few photos, and then the photos were reviewed for contrast, lighting, and focus to ensure quality photos during the actual data collection phase. This prepared participants and allowed them to test their ability to capture clear pictures to be used for data analysis (Makofane & Shirindi, 2018:41).

During the data analysis, the first interview offered an additional opportunity for adjustment because the researcher was able to note questions whose language needed modification to ensure increased understanding by participants; these changes were effected with the following participants interviewed without deviating from the intended question. The breaks taken between all interviews allowed for reflection and necessary improvements.

3.7 Ethical considerations

Adherence to ethical considerations is central to protecting the integrity of the research process. Hasan, Rana, Chowdhury, Dola and Karim (2021:1) define ethical considerations as guidelines that regulate the behaviour and actions of the researcher. Concerning this study, this ethical behaviour was aimed at minimising risks such as the manipulation of child participants by adults and exposing participants in unnecessary hazards (NCPF, 2018:14). Ethical clearance for the study was obtained

from the Faculty of Humanities at the University of Pretoria. The protocol number is HUM020/0623 (see Appendix B). The following ethical considerations applied to the study.

3.7.1 Informed consent

Signed informed consent and assent forms (see Appendixes C and D) were important to ensure that the research participants and their parents were well-informed about the research process (Babbie, 2017; Du Plooy-Cilliers et al., 2014). Information in the assent form was provided in a child-friendly format to ensure that they fully understood what the study involved (Einarsdottir, 2007:205). The informed consent and assent forms, respectively, described the goal of the study, outlined the research process, indicated that participation was voluntary, that no compensation was attached to participation, and that participants would be supported during data gathering to minimise any possible risks of walking in the community. Consent and assent forms were distributed to the learners to take home after the researcher explained it in a child-friendly way. The school assisted with collecting informed consent forms from parents and assent forms from learners, ensuring the protection and ethical treatment of the children involved in the study. Additionally, the researcher had to sign the Viva Foundation's child protection policy.

3.7.2 Voluntary participation

Participants participated voluntarily in the study. The researcher refrained from coercing participants in any way to participate in the study (Babbie, 2017:63). The researcher would have respected the decision of parents and/or children if parents granted permission, but the child chose not to participate in the study. Furthermore, participants were made aware that they could opt out of the study at any time they wished to do so without any consequences (Du Plooy-Cilliers et al., 2014; Strydom 2011:116). At the beginning of each semi-structured one-on-one interview, the researcher reminded participants about this ethical consideration. Participants were also encouraged to request bathroom or mental breaks during the interview if needed.

3.7.3 Working with gatekeepers

Permission to access participants was sought from gatekeepers (McFayden & Rankin, 2016:82). In the case of this study, the researcher was granted permission from the

Chief Executive Officer of Viva Foundation South Africa to conduct the study with learners from Viva Independent School (see Appendix E attached).

3.7.4 No harm

The researcher did not foresee any physical or psychological harm to the participants of the study; this was encouraged to ensure adherence to this ethical consideration (Babbie, 2017; Hammett, Jackson, & Bramley, 2022). However, walking around the community with a smartphone to take pictures posed a risk to participants' safety. Therefore, the four participants collected data in a group accompanied by the researcher and a teacher. Additionally, two smartphones were provided to minimise waiting time between participants. An additional layer of safety was that the children collected data in the communities they are familiar with as they live and go to school there. The research participants were debriefed after the photo-taking activities and their respective semi-structured interviews. In the case where participants needed counselling, the researcher had two social workers who were willing to volunteer their services in line with the arising issues. However, no participant indicated the need for counselling.

3.7.5 Confidentiality

The participants were known to one another and their classmates as they were involved and present during the name-drawing of participants. Furthermore, the teacher knew who participated as they also accompanied the group during the data collection process. However, measures were put in place to keep responses confidential and not to link the findings with any participant as pseudonyms were used to protect their identity (Motsa & Morojele, 2017:162). In line with Babbie (2017:65) limitations to confidentiality were shared with participants, including the importance of co-participants keeping shared information confidential. Lastly, the collected data and interview transcripts were stored in password-protected computer files, and only the researcher had access to the password and the computer. The teacher had no access to any confidential information of participants, including which photos they selected to discuss with the researcher. Hence there was no need to sign an informed consent letter.

3.7.6 Actions of the researcher

The researcher adhered to all ethical considerations by refraining from any action or behaviour that may have jeopardised the credibility of the study, such as showing bias or misrepresenting the results (Du Plooy-Cilliers et al., 2014:269). This was achieved by maintaining a collaborative relationship between the researcher and the participants during the process of data collection and interpretation as co-researchers to ensure that findings are representative of participants' views (Dockett, Einarsdottir, & Perry, 2009:283). The researcher was aware of the power differences (since the participants were children), and she refrained from any behaviour or actions that were exploitative and adhered to the principles of respect and beneficence toward the participants (Pillay, 2014:197). The principle of respect was further demonstrated in an engagement with Participant Four, who captured an interesting and unique picture during data collection. The researcher was curious about the participant's perspectives regarding this picture. When asked if she was willing to engage with the picture in addition to the chosen ones, the participant declined, and her decision was respected without question.

3.7.7 Dissemination of research findings

Research dissemination is broadly defined by Rose and Flynn (2018:28) as the distribution of research findings to those who need and can use them. This distribution should be inclusive of academic and non-academic audiences; therefore, language and distribution modalities should be customised for targeted audiences (Bartlet, 2013 in Rose & Flynn 2018:28). The final research report from this study will be uploaded to the UPSpace website. Furthermore, research findings will be submitted to a journal for possible publication and considered for a conference paper. The findings will also be disseminated to the Viva Foundation South Africa and the Viva Independent School community.

3.8 Limitations of the study

The research site and its socioeconomic climate, specifically crime, posed various and escalating limitations to the study processes. The level of criminal activities demanded increased adherence to the ethical consideration of ensuring no harm to participants. Therefore, an hour was allocated to the picture-taking activity of photographing flood risks, due to limited visibility in the field. This limitation impacted the diversity of settings

covered and the variety of pictures obtained. Additionally, there was no proper piloting conducted for the study. To compensate for these limitations, the researcher provided two smartphones for the participants, allowing two participants to share one phone. This saved time and fostered the PAR's principle of collaboration (Ebersöhn et al., 2019:159), not just between the researcher and participants but also among participants. Moreover, picture-taking preparation concerning the research topic was done in excess for increased confidence and familiarity in the field.

Data analysis was conducted only by the researcher, which posed a limitation by diverting from the norm of PAR which encourages a collaboration between the researcher and research participants (Norwell et al., 2017). The researcher compensated for this limitation through thick descriptions during data collection and constantly consulting the recording and transcripts to get increased clarity.

At an individual level, one participant struggled to confidently express herself in English during the semi-structured interview phase of the study, which appeared to frustrate the participant. Recording was stopped very early, and she was encouraged to use any language she was comfortable with. The participant insisted on sticking to English, and her wishes were respected (Pillay, 2014:197). To compensate for this, constant summarising and all three probing strategies as outlined by Nieuwenhuis (2020:109) were used. Lastly, the sample size was a perceived limitation due to only four participants. However, data saturation was used to ensure sufficient data was collected and shared regarding all three pictures discussed by each participant to compensate for the limitation in sample size. Data saturation refers to the discussion of the photos until no new categories of themes or data emerged (Creswell, 2014:189).

3.9 Summary

This chapter covered the study's research methods and the ethical considerations adhered to in the study. The qualitative research approach was discussed, along with the rationale for applied research and its alignment with a case study research design. Four participants were selected from the sampled group of the study population, which consisted of children enrolled in Viva Independent School. Data was gathered based on photo-voicing and semi-structured one-on-one interviews. The strategies to ensure the trustworthiness of data included credibility, transferability, dependability, and confirmability. The socioeconomic challenges at the research site resulted in a few

study limitations, such as not being able to conduct a full piloting phase, insufficient time for picture-taking, and a small geographic area for taking photos. The researcher observed that language could be a potential impediment for one participant; however, the participant's choice to continue with the interview in English was respected. Compensatory procedures were implemented to assure compliance with the ethical principles of the research, including respect for participants, avoiding harm, and ensuring voluntary participation. Both the researcher and the participants completed the research procedures and methods.

CHAPTER 4: EMPIRICAL STUDY AND FINDINGS

4.1. Introduction

This chapter presents and discusses the findings derived from the analysed data on participants' perspectives on disaster risk reduction and adaptation to flood experiences in Mamelodi East. The research question for the study was: What are primary school children's perspectives on disaster risk reduction and adaptation concerning flood experiences in Mamelodi East? The research sub-questions were:

- How are communities in Mamelodi East affected by floods?
- What factors contribute to floods in communities in Mamelodi East?
- How can risk factors for floods be reduced in your community?
- What can your community do to be better prepared for future floods?
- How can your school and learners work together with families and communities in reducing risks for floods and develop adaptation strategies to respond and cope with floods and recover afterwards?

The chapter starts with the presentation of the biographical information of the four participants in the study. In the following section, the selected photos and narratives by the participants will be presented. In the ensuing section, the themes that emerged from the narrated photos of the participants will be identified and discussed.

4.2 Biographical information of participants

The empirical study was conducted with four participants. Their age, gender, grade, location and number of floods exposed are summarised in Table 4.2.1 below. To protect the identity of the participants, they were allocated pseudo names from P1 to P4.

TABLE 4.2.1: BIOGRAPHICAL INFORMATION OF PARTICIPANTS

Participant	Age	Gender	Grade	No of floods
P1	10	Female	5	1+
P2	9	Female	4	1+
P3	11	Female	5	2+

P4	11	Female	6	1
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As indicated in the table, the participants in the study were all black females. One participant was in grade four, two were in grade five and one was in grade six. The age of the participants ranged from 9 to 11 years of whom one was respectively 10 and 9 years old while two were 11 years old. The participants come from two different parts of Mamelodi East. Three were from Alaska, where housing structures are a combination of RDP and informal settlements; Two were from Alaska (informal settlements). Informal settlements are substandard housing with the insecurity of tenure and the absence of one or more urban services and infrastructure, such as sewage treatment, plumbing, clean water, electricity, paved roads, and so on” (Davis, 2006: 7-8). One resides in Alaska (RDP), where housing structures are part of the Reconstruction and Development Programme (RDP), which is a policy framework for integrated and coherent socio-economic progress to redress the apartheid legacy (Department of Housing, 1994:7). The policy has five key programmes for meeting its objectives; the development of improved housing is included under the “meeting basic needs” programme (Department of Housing, 1994:9). One participant resides in Skirilek, which is part of Mamelodi East, and it is dominated by informal settlements. Three of the participants were exposed to floods at least once; two of them indicated exposure to floods more than once, while one experienced flooding more than two times.

4.3. Selected pictures and narratives

This section presents the selected pictures and views of participants on the environmental risks of floods and how their community is affected by floods. In pairs, participants shared a smartphone to take pictures around their community on what they believe environmental risks are for floods in the community. Participants could take up to 20 pictures each. A total of 74 pictures were taken among the four participants, of which 12 formed part of data collection and analysis. Each participant chose and narrated three pictures of their photo portfolio through one-on-one semi-structured interviews. All interviews were face-to-face, three interviews took place in one day, and the last one was conducted five days later due to absence from school

on the first scheduled date. Below is a summary of 12 pictures selected and discussed by participants.

4.3.1 Participant One

Picture 1 (P1.1)



For P1, the picture represents land pollution. She said that it relates to the topic of floods because of how the specific area was associated with loss and trauma. P1 noted that death, drowning, and hurt are some memories she associates with the picture because of past experiences during floods in the community. P1 indicated that the impact was felt by all people and children specifically, as well as animals. The researcher observed that P1 stood at a distance in comparison to other participants during the picture-taking activity. When asked about this, she reported not wanting to move closer because of what she saw during the previous floods.

Picture 2 (P1.2)



P1 focused on the polluted area in Picture 2 and how it impacts the poor and children related to the area being a playground for children. The participant noted that pre- and post-disaster, this stream is a play area for many children, and due to socio-economic limitations, many pick up items from this stream to play with and sometimes consume. P1 mentioned that the picture reminds her of the relationship between access to basic human rights by poor families, as many of them depend on the water for different uses such as drinking, bathing, and washing.

Picture 3 (P1.3)



For P1 this picture captured the value of infrastructural and social resilience during a disaster. The picture shows a road without any drainage system, which she associated

with broken, stuck, and swept-away cars during previous floods. Moreover, the picture shows an abandoned house that is currently vacant, as the owner passed on after drowning inside the house during the floods. P1 noted that the owner of the house lived alone, and when she choked on the water, there was no one to support or help her. Lastly, she mentioned that the structure of the house made the owner susceptible to increased risks.

4.3.2. Participant Two

Picture 1 (P2.1)



The participant noted that the pollution in the picture poses a danger to all biodiversity. Pollution is known to increase vulnerability during floods by blocking rivers and sometimes roads. P2 associated these conditions with vulnerabilities such as drowning and the loss of lives.

Picture 2 (P2.2)



P2 associated the open transformer box with increased vulnerability during floods because water easily gets inside, which usually leads to the entire community not having access to electricity. The participant noted that the impact for people in RDP houses is not the same as those living in the informal settlement. She proposed a padlock as a mitigating factor for future disasters.

Picture 3 (P2.P3)



P2 emphasised how the captured pollution leads to clogged up rivers during a flood which leads to vulnerabilities such as drowning of people. She is quoted saying “...these things are gonna make the floods” when talking about the picture. A make-shift bridge was recommended by the participant to enable people to safely cross the river when it is flooded.

4.3.3 Participant Three

Picture 1 (P3.1)



For P3, the picture shows polluted land which she associated with the area being susceptible to flooding and air pollution. She indicated the harm that it can cause as it poses health risks. She said that the lack of maintenance of the grass leads to the community being at risk of being attacked by wild animals such as snakes and other harmful creatures.

Picture 2 (P3.P2)



P3 highlighted that the land pollution in the picture leads to compounding issues associated with floods and other disasters. Firstly, puddles are created by land pollution blocking water flow, and they lead to air pollution around the community through foul smells, which is a health concern. Secondly, electricity shocks during a flood are the norm, and they tend to affect children more than adults. She distinguished between illegally connected and professionally installed electricity, stating that the former was associated with increased vulnerability. She said that illegally connected electricity was common, mostly in informal settlements.

Picture 3 (P3.P3)



According to P3, the makeshift bridge captured in the picture has been reconstructed at least seven times, yet it remains unstable. She said the picture shows pollution, which impacts children. It was also P3's perspective that people who stay close to the river usually have limited choices as moving requires money which they might not have. She emphasised this point by saying that "because lots of people are really struggling out there". The participant recommended a bigger bridge as well as increased grass maintenance for some of the risks in the picture.

4.3.4 Participant Four

Picture 1 (P4.P1)



P4 indicated that the picture shows a polluted river which she believes causes issues for people who rely on the water for drinking, bathing, and washing. Her main reason for capturing the picture was that she wanted to stop water pollution. Moreover, she recalled that last time it rained, houses were destroyed.

Picture 2 (P4.P2)



P4 shared that the picture shows a puddle of water with a makeshift bridge inside which was intended to help people cross over. P4 further stated that the blockage prevents people from crossing as well as cars that cannot pass and they sometimes break. The ward councillor was noted as one of the partners who assisted in erecting the makeshift bridge in the picture. P4 recommended that a bigger bridge would minimise the hazards shown in the picture.

Picture 3 (P4.P3)



P4 voiced concern for the well-being of people living in the house due to poor ventilation and the house's proximity to the river, especially during floods. The pollution around the house was the main reason for the concern as P4 associated the pollution with an unclean environment, which impacts health; moreover, during a flood, the possibility of the nearby river being flooded is high as the pollution could be swept into the river.

4.4. Themes and subthemes

Four distinct themes with related sub-themes emerged from the collective photo voice database of the four participants. These themes are discussed in this section. The discussion includes a summary of the findings on the respective themes that are substantiated by the voices of the participants using direct quotes and verified by literature. The discussion of themes expands the summarised narratives of the photos presented in sub-section 4.3 by giving an in-depth account of how each picture relates to the topic of floods and DRR which is in line with qualitative research. A summary of the themes and subthemes that emerged from the data are presented in Table 4.4.1.

Table 4.4.1: Themes and sub-themes

Theme	Subthemes
1. Factors that contribute to floods in the community.	1.1. Pollution. 1.1.1. Land pollution. 1.1.2. Water pollution. 1.2. Poor infrastructure. 1.2.1. Vulnerable bridges and roads. 1.2.2. Poor housing structures.
2. Consequences of floods in the community.	2.1. Destruction of assets, and infrastructure. 2.2. Consequences for livelihoods and forced migration.

	2.3. Loss of human life and injuries.
3. Systemic vulnerabilities and floods.	3.1. Poverty, access to resources and floods. 3.2. Infrastructure dangers and safety during floods. 3.3. Lack of early warning systems.
4. Strategies to prepare for and respond to future floods.	4.1. Sustainable development and building back better. 4.2. Community education on DRR to increase resilience. 4.3. Partnerships for increased resilience.

Theme 1: Factors contributing to floods in the community

Participants indicated a variety of risk factors that make their community vulnerable to floods. These ranged from systemic failures at a macro level such as poor municipal services and underdeveloped infrastructure to normalised behaviour at a micro level such as illegal dumping of waste by community members which leads to pollution. Two recurring subthemes emerged as factors that contribute to floods. These subthemes are pollution and poor infrastructure which are discussed next.

Sub-theme 1.1: Pollution

Participants identified pollution as a crucial contributor to floods in the community; moreover, the findings indicate an interwoven relationship between land, water, and air pollution. All participants included photos of pollution, and they agreed that household waste such as disposable nappies and used plastic dominate land and water pollution. During a flood or rainy season, participants believed that land pollutants are washed away into the river, leading to water pollution and increasing

vulnerability to floods. In some instances, pollutants lead to stagnant water on the land, thus forming puddles that emit a foul smell, and polluting the air.

1.1.1. Land pollution

The participants used phrases such as "papers," "rubbish," and "littering" to refer to land pollution and how they perceive it to contribute to floods in two main ways. Firstly, according to participants, land pollutants lead to floods following puddles that are caused by water trapped by waste on the land, including on the community road. Secondly, land pollutants are swept into the Pienaars River, which clogs and leads to flooding. Participants emphasised that removing land pollutants will minimise vulnerability to floods in the community through the following quotes:

P2: *"Because people when they throw, these things are gonna make the floods"* (See photo P2.3.)

P2: *"It (land pollution) will block the river...The water will, uh, will never, will never be able to go away"*

P3: *"I choose it because, like, you can see there's a lot of, like, land pollution on the floor and other things that are harmful..."*

P3: *"I feel like they have to remove or pick all of the trash that is happening there."*

The findings align with a conclusion by Grozavu and Mihai (2018:6), stating that there is a relationship between land pollution and floods because solid waste management remains an issue, typically in developing countries, which often leads to stagnant water and flooding of surrounding communities. As the findings indicate, humans are responsible for littering and land pollution. Savasan (2017) and Friedman (2018) concur that land pollution refers to the direct or indirect human activities of depositing liquid or solid waste material through littering and other activities, which then lead to land contamination. In this study, participants focused mostly on solid waste material as a factor in flooding through puddles or land pollutants being swept into the river.

1.1.2. Water pollution

The findings further reveal that land pollutants are sometimes naturally transferred into the water by wind or swept away during the flood, which makes it difficult for people to cross the river. As indicated by photo P2.1, waste blocks the river which leads to flooding. Furthermore, stagnant water due to a lack of drainage systems becomes muddy which further blocks the flow of water (see photo P1.3). Participants explained the blocking of the water flow as follows:

P1: *“Because here it’s mud and water they can’t pass properly here.”*

P2: *“It (waste) will block the river... the water will, uh, will never be able to go away...”*

Concerning direct human actions, participants also noted unethical waste management by municipal officials and sometimes community members who dump waste into the river, thus polluting it and increasing its vulnerability to flooding. The pollutants in the form of solid waste trap water, which leads to floods. The findings also suggest that post-flooding, the trapped water remains for a while, and due to the nature of pollutants such as used pampers and household waste, a foul smell is produced, which the participant referred to as sewage.

P1: *“They [Municipal workers] are going to throw them, but they are not throwing them at the dustbin they are just throwing here at the river.”*

P1: *“... its plastic, pampers, its all of them mam here”.* (See photo P1.1.)

P3: *“The water can, others can stay behind. If they have a long time, they get dirty. Others, others are dirty. So, they, they, they, they make sewage in our community.”*

The findings of the study highlight the relationship between land, water, and air pollution and how it makes the community vulnerable to flooding. Khan and Ghouri (2011:280) made similar conclusions, stating that all forms of pollution are intertwined and have an impact on the welfare of communities, including negative effects that may lead to the mortality of both humans and animals. Grozavu and Mihai (2018:6) affirm solid waste management is an issue and a factor leading to flooding, especially in

developing countries. According to Grozavu and Mihai's (2018), waste management is a structural issue which could potentially lead to flooding.

Sub-theme 1.2.: Poor infrastructure

The findings on theme one further suggests that there is a relationship between poor infrastructure in the community and flooding. Communal infrastructure such as roads and bridges were noted as the first area of vulnerability while individual households were found to be an additional risk of flooding in the community. The findings show that structural integrity, location, and building material of infrastructure have the most effect on the community's vulnerability to floods.

1.2.1. Vulnerable bridges and roads

According to the study's findings, constructed infrastructure, which is generally seen as a resource, often causes flooding in the community. The results imply that the materials used to build local roads and bridges are a contributing factor to flooding. Participants described the Pienaar River bridges as unstable even though some of them had undergone many reconstructions.

P3: *"When it's raining ne, like here in Mamelodi we have a lot of floods that are happening so, this bridge has been restarted and made many times, more than 7 times."* (See photo P3.3.)

P3: *"...and the bridge is also not stable."* (See photo P3.3.)

The bridges are so instable that they give way when cars cross or even when people run across them.

P1: *"Some bridges don't help because other cars when they pass here in the bridge became broken, people when they run, the bridge be broken..."* (See photo P1.3.)

Participants were of the view that building fundamental infrastructure with alternate materials would reduce the community's risk of flooding. Participant P4 took her cues from seeing the impact of using sacks for makeshift bridges (see photo P4.2.):

P4: *"So these sacks (makeshift bridge) are making their... the water to stop."*

P4: *"They (makeshift bridge) now block the water to not pass."*

P4: *“By, by moving the, the water. And you must move the sacks (makeshift bridge) that are here by the water.”*

A similar observation to that of bridges was made on the construction of roads within the community. The findings suggest that due to non-existent drainage systems and a lack of tar roads; the community is prone to flooding. Furthermore, findings reveal that cars are damaged by water and mud on roads. The participants believed that manual strategies, including physically removing objects such as mud and water from the road, would compensate for the lack of drainage systems and as a result minimise floods in the community. They also suggested that sandy roads be rebuilt with rocks and cement.

Participants' sentiments are captured in the following words:

P1: *“We must move those muds and make this street and put rocks and cement...”* (See photo P1.3.)

P1 *“Other cars became broken because here its mud and water they can't pass properly here.”* (See photo P1.3., pointing to the side of the road.)

P4: *“And when cars pass here, they cannot pass properly. It's stuck by the road.”*

According to SERI (20018:12), “informal settlements are often built with little or no planning regarding drainage or sewage systems, which exposes residents to flooding and diseases from still water and uncollected waste”. This study's findings support this conclusion, as participants shared that roads are easily flooded due to a lack of drainage systems and tar roads. The improvement of stormwater drainage in informal settlements is encouraged and noted as an important component of community infrastructure and development (Adegun, 2015:407). The maintenance encouraged by Adegun (2015) is not possible for the studied community because there are no stormwater drainage systems along its infrastructure, which leads to flooding.

1.2.2. Poor housing structures

Housing as a part of basic infrastructure and human needs was noted by participants as a contributing factor to floods. Opinions ranged from the location of the home, material used, foundation of the house, and roofing material as some of the

determinants of vulnerability. Participants observed that when the integrity of the house is poor, the home is likely to be flooded. References were made to homes that “fly around” during floods, and windows and doors coming off their hinges, thus exposing families to floods. The findings further suggest that people who live in informal settlements are more at risk when compared to those in RDP houses. This was further affirmed by the experiences of participants in their homes; those residing in informal settlements were impacted disproportionately, while their counterparts reported no flooding within their homes. The findings further suggested an intersection between poor housing, makeshift bridges, and flooding in the community.

P4: *“What was happening is that the sacks (makeshift bridge) will get broken by the, by our houses that will come through.”* (See photo P4.2.)

P4: *“...When I experience rainfall, it was raining, and other houses were flying around.”* (See photo P4.1.)

P4: *“And when the rainfall comes, the house... will fly and gets into the river at the back of it.”* (See photo P4.3.)

P1: *“Yes, mam I am worried about this house, whoever lives in this house I am worried because the windows are broken the doors are broken...”* (See photo P1.3.)

When it comes to building factors, the results indicate that a brick house is more resilient than a corrugated iron one. In addition, attention to the foundation of the house was stressed. P3 provided the following quotes to support this finding while discussing her second photo (P3.2.):

P3: *“The shack is not that stronger, but I think that can affect a, a, a, a, brick house is that like, and get a brick, it's more harder than.”*

P3: *“The person who's building the house has to know that, Oh, I'm building onto a foundation that is like this and this and this.”*

The studied community is dominated by informal settlements, and several writers have established a link between such dwellings and inadequate planning, development, and upkeep of essential infrastructure (SERI, 2018; Malalgoda, Amaratunga, & Haigh, 2013). The studied community is susceptible to floods due to the type of housing that

lacks proper planning. According to Peacock et al. (2014), housing tenure is an important determinant of social vulnerability to disasters. The findings are consistent with Nyam, Modiba, Ojo, Ogundeji, Okolie and Selelo (2024:8) who found that the structure of a house plays a critical role during a flood because well-built houses can withstand shocks imposed by floods. Informal settlements, such as the studied community, tend to use light and inexpensive materials with minimal resilience against flood shocks. The findings confirmed that houses made from corrugated iron were disproportionately affected in comparison to those built with bricks, an observation similar to (Ahmed,2014:745) who states that informal houses, due to their weak construction are vulnerable to disasters. Rahman (2018: ii) also agrees that houses constructed from weak materials cannot withstand disaster shocks.

Theme 2: Consequences of floods in the community

The findings reveal that the consequences of floods in the community were complex and interrelated. Furthermore, findings on the consequences of floods are interconnected with factors that contribute to floods as discussed in theme one. Responses include consequences for material goods and resources, and humans. These range from the destruction of homes, and infrastructure, influencing livelihoods to short-term effects on humans such as minor injuries and time away from school, while longer-term effects include death and homes being washed away, resulting in displacement of people. These findings are discussed in three sub-themes. Three subthemes emerged which are the destruction of assets and infrastructure, consequences of floods for livelihoods, forced migration and loss of human life and injuries.

Sub-theme 2.1.: Destruction of assets and infrastructure

Participants reported that floods affect cars, houses, and electrical poles, among other assets and infrastructure. Participants indicated that during floods, houses are washed away, windows and doors come off their hinges, and electricity wires fall to the ground. The following responses highlight the destruction of houses and electricity:

P1: *“Mam last time when it was raining, the window came out and the door.”*

P3: *“...The house flooded. I mean, the house got ruined.”*

P4: *“It was raining, and other houses were flying around... the houses will get broken.”*

P1: *“...Even electricity comes down....”*

Furthermore, findings show that effects on immovable assets, such as land, have consequences for movable assets such as cars. Participants expressed their views on damaged cars in the following words:

P1: *“...Other cars became broken because here it’s mud and water they can’t pass properly here.”*

P4: *“...Other cars get broken by the water.”*

Participants were generally of the view that electricity, which is often illegally connected, becomes an area of vulnerability for the community; thus, weakening their resilience. The findings of the study correlate with the view of Cutter et al. (2009:601), stating that in studies on understanding hazards, engineered systems are mentioned across frameworks as being critical to resilience building. Similar conclusions were made by Terblanche et al. (2022), who argue that limited protective factors by cities, including critical infrastructure, lead to increased vulnerability, which limits recovery from climate shocks. From an engineering point of view, even professionally installed electricity poles are vulnerable to climate disasters (Gkika, Zacharis, Lekkas, Lizios, & Parcharidis, 2022:49). To combat electricity-related effects during a flood, developed countries are passing policies to ensure increased resilience against climate consequences by compelling distributors to develop systems resistant to severe weather (Ahmed, 2020:22). Even the most basic infrastructure is non-existent in informal settlements (Ahmed, 2012:747) and consequently, it is not possible to focus on such policies within informal settlements for the lack of infrastructure.

A survey by Augustine and Akinlolu (2015:54) confirms that in Nigeria, floods have led to the loss of human life, the collapse of buildings, and the destruction of properties. The findings of this study confirm that property destruction, falling electric poles, and cars being swept away are some of the noted consequences of floods in the community. Bocanegra, Vallés-Morán and Francés (2020:1) confirm the effects of floods on washed away cars.

Sub-theme 2.2.: Consequences for livelihoods and forced migration

The findings further reveal that floods have consequences for livelihoods because people miss work and informal traders are unable to work. In some instances, due to

the severe destruction of homes, community members find themselves homeless, and temporary shelter is sought from friends. In other instances, they are displaced permanently, which affects children's schooling. The loss of familiarity and routine for the community is experienced when they must use alternative routes to access places, thus leading to additional stressors because of the time wasted. The following quotes were shared by participants on forced migration, its impact on livelihoods, and access to routes.

P1: *"We came out and went to my mother's friend and we say can we please stay here."*

P3: *"...The house flooded. I mean, the house got ruined, and that's how they're no longer living there."*

P3: *"...Others don't go to work, they sell sphahlo [local street food made of hallowed bread with various fillings] and juba [Traditional beer] only."*

P2: *"Then the rain, and the river was full of water, and we couldn't pass here."*

P2: *"We did not be able to pass here. We were on the other side... others use alternative routes."*

The findings further indicate that pre-schooling, primary, and secondary schooling are influenced during floods as people cannot travel.

P3: *"...So, I spent almost two days not going to school."*

P3: *"So we couldn't take my little kids, my, my siblings at home, at crèche."*

P3: *"Sometimes I was here at school. Sometimes I couldn't. I couldn't come."*

The findings on the effect of floods on livelihoods and forced removal, corroborated with Ahmed's (2014:749) view that in extreme floods, people from informal settlements who are often unemployed and rely on informal trading such as selling things are forced to abandon their homes and seek shelter on roadsides, schools, or mosques, thus affecting their livelihoods. The relationship between floods and their consequence on livelihoods is also highlighted by Rahman (2018:1), who states that informal settlements, because of climate change effects, are affected negatively. Foudi et al. (2017:5831) concur with the study's findings that displacement is a consequence of floods. According to this study's findings, some families were displaced permanently,

while others sought refuge with friends and returned later to pick up the pieces of their lives. The duration of the consequences or displacement has effects on livelihoods and safety. Moser and Satterthwaite (2008), in William et al. (2019:158), affirm that loss of informal housing, injury, death, as well as disruptions to livelihoods, damage to homes, assets and public infrastructure, and population displacement, are some consequences of floods.

Sub-theme 2.3.: Loss of human life and injuries

The findings reveal a pattern of direct effects of floods in the community such as injuries and death. The unfolding discussion of this sub-theme will show how participants linked these direct consequences with the destruction of assets and infrastructure as discussed in 2.1. Deaths due to drowning, death by suicide and electrification (a person's body encounters damaged electricity lines that are or have been exposed to flood water) emerged as irreversible consequences of floods in the community. Environmental changes associated with floods were reported to be responsible for injuries such as slipping in the mud, resulting in fractured limbs.

The findings indicate that loss of human life occurs because of direct exposure in flooded areas, which is common as people are either washed away, or drown after attempting to cross a flooded area on foot, while others drown inside cars that could not successfully cross flooded areas. The following responses capture the experiences of participants on how humans are affected by floods in their community:

- P1: *"Because mam, last time when it was raining, people, kids [were] taken by water and people died."*
- P1: *"Last time here it was full of water another transport jumped the river and children died all of them because the water it was too much.... All the children died."*
- P3: *"And we have dealt with many cases where kids get drowned by this water."*
- P4: *"Because sometimes people pass, sometimes many people pass here, and other ones they fall through the water and drown."* (See area referring to in photo P4.2.)

The findings further indicate that the effects on human lives go beyond death because of the floods per se in the community. The relationship between floods and death by suicide was observed by P1 who shared how community members passed on due to not being able to cope with losing loved ones either through drowning or being washed away by floods.

P1: *"It's like a beach, but it was a big river, two died and three were alive, one of them said, me I don't want to be alive and killed herself."*

P1: *"...The mother is dead... those children took acid, pour themselves and they took a lighter and burnt themselves so the whole house became fire and there was a gas in there and it exploded."*

In addition, some deaths are caused by electrification when electricity poles fall on the ground (see sub-theme 2.1.) and connect with water.

P1: *"It's a pole mam, it just fell down and it was raining, and that rain touched that pole after a child was walking, he touched that pole, after [that] he died."*

The findings also reveal that floods in the community lead to injuries and that the risks of such injuries are ongoing. Participants associated mud on the rocky road and poorly constructed houses with such injuries. Participants voiced their concerns in the following words:

P1: *"Because there was mud and another teacher fell down and broke his hand."*

P3: *"...When it's flooding, it (poorly constructed house) can fall on top of a person and the person can get injured as well."*

The findings confirmed a trend of death through drowning, electrification, and suicide within the community. Participants' views on the death and injury effects of floods, support the findings by Memon and Sharjeel (2015:72) that floods continue to cause irreplaceable losses to human life and the environment. According to Peden, Franklin, Leggat and Aitken (2017:4), the main causes of drowning deaths associated with river floods are falling into the water, non-aquatic transport incidents, and being swept away. The finding on a swept-away car which led to the drowning of school children

corroborates the findings of a study by Bocanegra, Vallés-Morán and Francés (2020:1), that the main cause of death in cities during flood events includes cars being swept away while driven on the roads. Similarly, injuries and threats to life are noted as consequences of floods by Foudi, Oses-Eras and Galarraga (2017:5831).

Theme 3: Systemic vulnerabilities and floods

The findings demonstrate that while existing vulnerabilities do not cause floods, they intensify impact, undermine recovery processes, and perpetuate social, economic, and environmental injustices. Participants' views identified vulnerability indicators that apply to individuals such as gender and age while at a community level, limited evidence of efforts made to improve critical infrastructure, lack of access to accurate information on DRR, and limited understanding of local risks despite the community's predisposition to floods were noted. Poverty, access to resources and floods emerged as the first subtheme, infrastructure dangers and safety concerns emerged second while lack of early warning systems emerged last.

Sub-theme 3.1.: Poverty, access to resources, and floods

The findings proved that preexisting socioeconomic conditions in the community lead to increased vulnerability and severe flood shocks. Participants cited that these vulnerabilities are associated with poor service delivery and "empty promises" made by the government, as well as the lack of money and poor people having limited access to protection. These preexisting vulnerabilities result in a community with compromised critical infrastructure in the form of housing and electricity supply. The following words were used by participants to define poor service delivery:

P3: *"No they didn't do that, we just go to the municipality and just tell them, they said that they are gonna do it. They give us like empty promises."*

P1: *"They just come when if the transformer bombs but for fixing our things, no."*

The findings further suggest that because poverty as a vulnerability indicator in the community, families often resort to using any available and accessible resources such as corrugated iron to ensure access to shelter and electricity, the quality of chosen resources is often not strong enough to withstand flood shocks. These bridging efforts aimed at improving their everyday lives convert into additional vulnerabilities during a

flood because poorly constructed houses and sticks as electricity poles reduce resilience, these vulnerabilities lead to consequences discussed in subtheme 2.1. The findings further reveal that the type of soil a house is built can also add to vulnerability levels. The following responses support these findings:

P1: *"It [house] is made of... what is that? Eeh is a mkhukhu [corrugated iron] mam."*

P3: *"I feel like it's the soil. ... Others, in other areas they, we have cement. Others, we have different kind of soil."*

P3: *"I feel like it's the people that are responsible for it, because like at Skirilek, we have, like, sticks, and they put on the electric wires."*

P3: *"But the one [electricity] we are talking about that comes into the water, it's the one that people connect for themselves."*

The intersection of gender and poverty is highlighted as having permanent effects on some community members, an example of a woman who was displaced permanently is defined as poor, unemployed, a single mother and with limited resources.

P3: *"...She was poor, she, she doesn't work, she has children, but the father has run away... and that's how they're no longer living there."*

The findings indicate neglect in responding to known vulnerabilities as another systemic issue that needs to be addressed. Children, as a vulnerable group, were referenced in support of this finding, because a known route (the Pienaars river) used by learners from at least three schools in the community to access education was reported as a common drowning area. The intersection of poverty, vulnerability, and age is highlighted in the findings. It is the view of P3 that households, especially those with children and residing along the floodplain should relocate if they have money because their children are vulnerable. She articulated her views as follows:

P3: *"So when there is floods water comes here and more kids pass here like Sidima Sathuto, Mpendulo, Viva Foundation also, so they come here and pass so the water becomes then after they come here, they trip over, and they drown by water." (See photo P3.3.)*

P3: *“...So I feel like, if they have the amount of money to move the houses that are close to the river, especially if you have kids because kids don’t know that much about.”* (See photo P3.3.)

The findings show that the community lives with various vulnerabilities that reduce resilience levels during a flood. These vulnerabilities are mostly in critical infrastructure and limited access to resources. The findings confirm the interdependent relationship between social and economic development, which is an argument made by various authors, including Patel (2015), UN (2015) as well as Lombard and Twikirize (2014). An aligning argument is made by Sanson and Burke (2020:351), stating that to redress climate injustice, which directly relates to floods, the improvement of essential services, including housing is necessary. The findings on limited finances and the community’s inability to move out of floodplains echo a similar conclusion made by Bohra-Mishra, Oppenheimer, and Hsiang (2014) on a Bangladesh study, stating that because of limited access to immediate funds, it is hard for people to move away from disaster areas.

According to the findings, the community’s socioeconomic circumstances weaken its resilience, keep them trapped in the cycle of poverty, and make it challenging for them to recover speedily. Dominelli (2012:3) made a similar conclusion on the effects of poverty in low-income communities and how it impacts resilience levels negatively. It also contributes to the inequality gap (Martin, 2010; UNICEF, 2015; Alston, 2015). Adding to the vulnerabilities of existing socio-economic conditions, Otto et al. (2017:1653) conclude that climate extremes can lead to a cycle of losses, contributing to poverty traps or very slow recovery from shocks. The UNDP (2017:12) outlines age and gender as identity factors that influence vulnerability levels, while economic factors such as unemployment and income disparity further contribute to vulnerabilities. In instances where vulnerability factors are multiplied, impact and recovery become harder and inequality is reinforced (Cardona et al., 2012:88). The mentioned vulnerabilities lead to compromised resilience levels by community members, with those who have intersecting factors bearing the worst of the brunt. This was observed in the findings of this study as shared by participant three, where vulnerability indicators such as age, gender and poverty intersected in one person or household and worsened their experience, one such example is that of a poor single

mother who was permanently displaced, poverty was mentioned as a contributing factor to their inability to recover.

Informal settlements are seldom recipients of decent service delivery from the government (Mujere, 2019:74), which is in line with the findings of the study. An alternative perspective is shared by William et al. (2019) on the matter, who argue that local government is presented with a dilemma when it comes to servicing informal settlements in urban areas. Informal settlements are built illegally and with little urban planning (Nyam et al., 2024:1) which sometimes leads to little consideration for safety (Ahmed, 2014:747). These factors pose a dilemma for local government, as servicing such high-risk areas will be costly (William et al., 2019:170) because of its likelihood to encourage people to continue occupying areas that are dangerous for their survival. There is an argument to be made about available options for most of the occupiers with limited resources and who will continue to be confronted by such structural inequalities. Resilience building must address the plight of poverty-stricken communities, their systematic neglect, and the human rights violations they face. Disaster resilience is still not achieved, even with non-structural measures used to compensate for systemic inequalities such as lack of access to housing and essential infrastructure. The community is less resilient to shocks of all kinds, including well-meaning but unjust government policies and investments, because of the interwoven environmental, economic, social, and political inequalities (Arnold & Resilience Justice Project Researchers, 2021:669). Resilience justice, defined as a critical and productive framework for understanding systematic injustice as well as the resilience of marginalised and oppressed populations (Arnold & Resilience Justice Project Researchers, 2021:686), is necessary. Several community conditions, including socioeconomic, environmental, and political issues, public policies, governance structures, and cross-system forces and effects on marginalised communities, like systemic racism and climate change, could be the focus of resilience justice, according to Arnold et al. (2015), cited in Arnold et al. (2021:686). The results show that the vulnerability of the community is influenced by the three issues mentioned as possible areas of focus for resilience justice.

Sub-theme 3.2.: Infrastructure dangers and safety during floods

The findings show that existing conditions in community infrastructure pose dangers that undermine safety during floods. Electrification and power outages were noted as issues imposed by infrastructural issues. Participants visually explained how sparks that resemble fireworks are released by illegally connected electricity that shocks people and sometimes leads to power outages. The participants' views were expressed in the following quotes:

P2: *"Because when it rains, the rain, when the water get in here.... This danger box, it burns, and it bombs, and our lines, we don't have lights, lights."* (See photo P2.2.)

P4: *"The electricity gets down and it's not safe for children that live in this house because when they get out of inside... they will get shocked by the electricity."* (See photo P4.3.)

P3: *"Yah, others they become like fireworks, others bezinyokanyoka [unauthorised electricity connection]is not there much of izinyokanyoka."*

According to the findings, floods frequently cause power outages and increased risks for electrification in the community. "Izinyokanyoka" is a term used to describe unauthorised electricity connections, in which subpar material and processes are used by households (Kayaga, Amankwaa, Gough, Wilby, Abarike, Codjoe, Kasei, Nabilse, Yankson, Mensah & Abdullah, 2021:144), which presents as a vulnerability during a flood. In their study, focusing on assessing the resilience of different electricity poles, (Gkika et al., 2022:73) recommend pole hardening among other things as a crucial step for preventing and mitigating power outages and other climate-related consequences such as floods. In the study, the safety of community members is further compromised because of dangerous infrastructure such as izinyokanyoka. Njogu (2021:4) confirms the relationship between poor infrastructure such as weak installation and poorly maintained electric poles and safety concerns during floods.

Sub-theme 3.3.: Lack of early warning systems

The findings showed that due to the lack of early warning systems, the community is often caught off guard by floods which lead to limited preparedness and response strategies. Consequently, those affected adopt an approach of discretionary action as

there are no clear guidelines on how to deal with floods. Participants shared that they were at school when the previous floods started, and children who walked to school were sent home, the decision to send children home does not discriminate between learners who cross the river to get home and those who do not. The school acts in good faith and within their discretion through early action of sending children home while there is minimal to minor flooding. The concern over crossing the river is valid, however, it is in the learners' best interests to cross the river while it is still safe to do so, as they normally do to get to and from school. Moreover, the findings indicate that for the duration of the floods, parents were told to decide whether their children came to school or not. Additional vulnerabilities that limit the community's preparedness for floods are the perceptions and attitudes of children on climate change consequences, as well as the school's location near the flood-prone river, which raises concerns over the school's resilience. The following quotes of P2 capture her experiences of the lack of early warnings and reactions to it:

P2: *"When it was raining, we were at school."*

P2: *"When the school sees floods, they send us home. Only those who use transport stay behind."*

P2: *"Yes, it doesn't matter if you stay on either side of the river, as long as you walk home, they allow us to leave early."*

Participants shared that parents were encouraged to use their discretion on when their children should return to school; the general instruction was that they can let children come back to school if they felt it is safe to do so, with no clear understanding of what constitutes safety. The instruction is an indication of efforts to minimise negative consequences; however, it revealed that despite surviving at least three flooding events, the community is yet to successfully form key collaborations for better DRR. Each parent was expected to use their discretion to decide if their child should return to school; the word "safety" could be interpreted in various ways unless it is understood from the same lens. This is only possible when everyone who is impacted has access to necessary education that is informed by context-specific hazards. The lack of key and meaningful collaborations renders the instruction on "safety" risky, thus affirming the premise of DRR being everyone's responsibility (Imperiale & Vanclay, 2021:900).

Moreover, the school is close to the river which is prone to flooding, and the findings point out that this increases vulnerabilities.

P3: *“Then the school say that if your child is walking, if you feel like it's safe that your child can come to school, you can bring them, but just if you feel that it's not safe, they must not come to school...”*

The findings further reveal that children's perceptions and attitudes on climate change limit preparedness, as they have a dismissive attitude towards the topic as they believe it is a joke and unreal. The following quotes were shared to support the distorted attitudes on the matter:

P3: *“Maybe I can say like a 7-year-old they don't take this seriously; they think like it's a game or what.”*

P1: *“I tell them (children in her community) mam, but they don't trust me that they are going to be killed, they just saying I am lying so I just leave them.”*⁴

The participants were of the view that the presence of systematic vulnerabilities in communities leads to floods that are more severe as the community is usually unprepared for repeated and increasingly devastating floods. Lacking capabilities as the study's findings point out, links to the argument of Bahadur et al. (2015:12) that a community requires absorptive, anticipatory, and adaptive capacities to effectively deal with disaster shocks. The IFRC (2012:58) proposes six characteristics of a safe and resilient community in its community-based disaster risk reduction study. The first characteristic proposes that a community should understand risk management and it must be able to learn from previous experiences. Secondly, a community must be able to identify problems, establish priorities and take necessary actions (IFRC,2012:58). The findings indicate that the community lacks the two mentioned characteristics because despite being repeatedly affected by floods, the community has not been able to build back better or to improve its preparedness through anticipatory action. The findings indicate that a trend is noted on how pre-disaster conditions lead to a

⁴ The participant associated land pollution with floods and other dangers such as children playing with the pollutants. She was complimented for her knowledge on the topic, and she was also asked if she shares her knowledge with children in her community. Her response indicated that attempts to educate her peers are met with a dismissive attitude towards the topic.

disproportionate impact during a flood, these include vulnerable bridges that lead to people and cars drowning. Moreover, children continue to have nonfactual information on what causes floods despite them being one of the most vulnerable groups.

These conditions result in a community that is not prepared to deal with and recover from floods. Amaratunga et al. (2018:1168) state that effective preparedness and early warning signs are critical for communities to act accordingly to minimise impacts felt during a disaster. Early warning systems are critical to sustainable development and DRR because they raise awareness of natural hazards and provide communities with warning information thus enabling them to take early action, to avoid unnecessary consequences (Šakić Trogrlić, van den Homberg, Budimir, McQuistan, Sneddon, & Golding, 2022:12). Moreover, they do not only serve to respond to hazards, but to (ideally) introduce a long-term risk reduction behaviour as well as instigate anticipatory action (Šakić Trogrlić et al., 2022:34).

Theme 4: Strategies to prepare for and respond to future floods

The findings conclude more could be done in the community to ensure that they are better prepared for future floods. Responses indicate that education on climate change is lacking. Furthermore, previous recovery processes did not incorporate building back better resulting in persistently compromised infrastructure, and lastly, coordinated collaboration between role players is limited. Three subthemes emerged, firstly, sustainable development and building back better is recommended as a strategy. Secondly, a need for community education on DRR to increase resilience. The need for partnerships for increased resilience emerged as a third subtheme.

Sub-theme 4.1.: Sustainable development and building back better

The findings suggest that participants have learnt lessons from previous floods on how to minimise vulnerabilities. Recommendations to reduce the risks include better infrastructure, resilient houses, relocation, and monetising resources. The recommended factors that build resilience are ensuring that water does not get inside the house during a flood, the use of alternative building materials for housing, in instances where economic resources prevent community members from rebuilding better, and relocation is recommended especially for those in high-risk areas. The participants also recommend drainage systems, quality roads and bridges that have clear demarcations for cars and pedestrians. The following quotes capture the

recommendations for the use of alternative materials for houses and roads, relocation, as well as monetising of bridges:

P1: *“They must go (relocate) at their home or Limpopo, or they must fix their houses so when it rains the water cannot come into the house...”*

P1: *“...Make this street and put rocks and cement and we cover, when we are done, we must thank you to each other and any car if its pass we ask for money that we help each other.”* (See road in P1.3.)

P3: *“I feel like, uh, they could try to, like, fix the roads, you know.”*

The findings further emphasise resilient and bigger bridges designed to ensure safety. Additionally, the need for drainage systems to prevent flooding was emphasised through the following quotes:

P1: *“Yes mam we must do a big one (bridge), we must do a line this side for car and the other side for people. But for cars it must be big because other cars they are too big they can kill us or damage kids.”*

P1: *“...Build down there and we must do something like a bridge so that the water when it rains, the water not getting in the houses it must just pass.”* (See road on P1.3.)

P3: *“And to also make the bridge bigger maybe.”* (See bridge in P3.3.)

The findings identified that infrastructure is critical in the community during a disaster, and it therefore makes sense that it is built to withstand disasters. This view aligns with the conclusion by Malalgoda et al. (2014:736) who argue that the built environment needs to be functional during a disaster because it acts as a protective factor to people and communities. The community has been impacted several times by floods, yet critical infrastructure remains vulnerable, a situation which authors associate with the lack of building back better (Dube, 2020:1). The findings recommend sustainable solutions such as the use of durable building materials to build homes and roads, the building of houses in flood safe locations, and relocation in instances where the use of durable building material is not feasible. The need for preventive infrastructures is reported to help avoid or reduce the impacts of disasters and it is recommended for resilience building (Amaratunga et al., 2018:1165). Concerning the findings that the

community is increasingly vulnerable because of poor recovery initiatives which do not factor in building back better, Dube (2020:2) states that existing evidence points out that communities affected by disaster often find it hard to recover because used strategies do not factor in building back better to address future vulnerabilities. An argument for policy reform on the matter is made by Amaratunga et al. (2018:1167), stating that risk-sensitive building codes and regulations lead to resilient communities. The findings of the study alert that the community could benefit from the implementation of such policies because the current infrastructure is not designed to withstand disaster risks. The incorporation of building back better leads to long-lasting outcomes for communities affected by disasters, and it aids sustainable development (Dube, 2020:3).

Sub-theme 4.2.: Community education on DRR to increase resilience

The results indicate that limited access to accurate information on DRR further contributes to the severe impact of floods on the community. Unethical waste management, the use of disaster susceptible building materials for houses, and drivers who use non-aquatic cars to cross flooded areas were mentioned as indicators of limited knowledge on the topic. The following opinions were shared by participants on the matter:

- P3: *“A shack is not that strong. And a, a brick-built house is sometimes stronger, but it depends on the foundation.”*
- P3: *“...I feel like we have to not throw rubbish on the floor, we have to do it on the bin so that when the collectors come, we must throw it in there.”*
(meaning in garbage bins)
- P1: *“.... Last time here it was full of water another transport jumped the river and children died all of them because the water it was too much, but the driver didn't die. All the children died...”*

About the findings that the community is sometimes affected due to limited and inaccurate information on DRR, which undermines preparedness efforts, prior studies highlight the relationship between community knowledge and disaster preparedness. Amaratunga et al. (2018:1167) agree that it is vital that communities are aware of hazards and risks making them vulnerable to disasters as this will enable them to

prepare to cope when a disaster strikes. The findings demonstrate that community members sometimes act in a manner that increases their vulnerability to floods, such as driving across flooded areas, and polluting areas with no proper drainage, which is due to limited information on disaster risk management. Community education on DRR does not only aid response efforts, but it is also beneficial in preparedness strategies which shifts the approach from reactive to preventative (Vaughter, 2016:1). Education plays a critical role in DRR as it aids in building necessary knowledge, skills, and attitudes (Vaughter, 2016:2). The relevant education will minimise some consequences discussed in theme two.

Sub-theme 4.3.: Partnerships for increased resilience

The findings indicate that the community has various stakeholders whose collaborated efforts could increase resilience. The findings highlight what worked in the past through collaboration, and how some community structures worked independently to rebuild post-disaster. The findings further include suggestions on who should be involved more in DRR strategies where the municipality, parliament, the local community, and school learners are mentioned as role players. The following quotes were used to highlight past partnerships:

P1: *“We cleaned and picked papers, things like pampers after we picked, we put in the plastic and went to throw them, so we help each other.”*

P3: *“Then after that we tried to fix where it got like ruined or where the water could get in.”*

The views of participants also include the identification of potential partners within the community who should be involved in preventing floods through waste management, building resilient houses, and clearing the polluted river.

P3: *“Mmm I feel like its maybe the community and also stronger people that know that we can pass here, people who are used of that place.”*

P3: *“I feel like the schools that are around it, also the people who live around the river.”*

P1: *“Even us (learners) mam we can.”*

P3: *“I feel like the municipality, or the parliament must also help us...”*

P1: *“The Municipality had to come here and help us.”*

The findings indicate that disaster management requires collaboration by various stakeholders which includes local government, schools, and local people. According to Imperiale and Vanclay (2021:900), the role of the local community as a partner is significant to disaster resilience as they can use lessons from previous mistakes in DRR. The findings support this observation as local people are mentioned as potential partners, and the participants who are part of the local community shared insights gained from previous experiences such as ensuring that water does not get into the house and the value of drainage systems. Echendu (2022:11) supports the value of partnerships in DRR and further argues that it can contribute to helping the world achieve the 2030 Agenda more easily. The role of partnerships in increasing resilience is encouraged by various authors such as Amaratunga et al. (2018:1164) who argue that multi-stakeholder engagement is key to resilient cities. Additionally, Koliou, Van De Lindt, McAlister, Ellingwood, Dillard and Cutler (2020:134) indicate that resilience can be achieved across various levels of society on condition that relevant partners are involved to provide funding, make decisions, and implement decisions taken.

4.5 Summary

The chapter presented and discussed the findings of the study. The profiles of the four participants were outlined followed by the selected photos that were discussed during the one-on-one interviews.

Four themes emerged from the data. The first theme highlighted the factors contributing to floods in the community, specifically land and water pollution, inadequate infrastructure, including vulnerable bridges and roads, and poor housing structures. In theme two, the consequences of floods were discussed, including the destruction of assets and infrastructure, impacts on livelihoods and forced migration, as well as mortality and injuries. The third theme focused on systemic issues such as poverty, access to resources, infrastructure hazards, safety concerns, and the lack of early warning systems. The final theme proposed strategies to enhance community resilience and preparedness for future floods, combining successful past approaches with improvements. These key strategies included community education on DRR, building back better for sustainable development, and the role of partnerships.

CHAPTER FIVE: KEY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study and is divided into three main parts. It starts by outlining the extent to which the goal and objectives of the study were realised. The study's key findings and conclusions regarding primary school children's perspectives on DRR and adaptation to floods follow. Finally, the chapter will conclude with recommendations.

5.2 Goal and objectives

The goal of the study was to determine primary school children's perspectives on DRR and adaptation concerning flood experiences in Mamelodi East. This goal was achieved through the following objectives:

Objective 1: To explore how communities in Mamelodi East are affected by floods.

The objective was addressed in Chapters Two and Four, where the literature review and study findings were discussed, respectively. It was discussed in Chapter Two (see sub-sections 2.3.1 and 2.6.1) that floods are associated with losses that amount to human rights violations. Scholars such as Wisner (2004) and Martin (2010) mention death, injury, hunger, and loss of property as effects of floods. In Chapter Four, the findings indicate that loss of life and injuries, destruction of assets and infrastructure, effects on livelihoods, and forced migration are consequences of floods in the community (see subthemes 2.1 to 2.3). These findings are supported by literature. Augustine and Akinlolu (2015:54) emphasise that death and property destruction are significant effects of floods (see subtheme 2.1). Ahmed (2014:749) confirms that floods lead to forced migration and affect livelihoods (see subtheme 2.2) while Foudi et al. (2017:5831) concur that injuries and potential fatalities are also consequences of floods. In conclusion, the findings indicate that floods contribute to and are exacerbated by economic, social, and environmental injustices, supporting the argument made by the UN (2015a) regarding the impact of disasters on human beings.

Objective 2: To determine the factors that contribute to floods in communities in Mamelodi East.

This objective was covered from a literature perspective in Chapter Two (sub-sections 2.3.2 and 2.6.2) where the intersection of socioeconomic factors was associated with vulnerabilities that contribute to floods. The relationship between poverty, inequality, and flood risks was discussed, particularly in the context of Mamelodi East. Moloisane (2017:26) links the community's limited development—evidenced by informal settlements, unemployment, and compromised education—to the legacy of apartheid. These systemic vulnerabilities are associated with widening the inequality gap globally (Hawkins, 2010; Alston, 2015; Hattingh, 2019). It was proposed in Chapter Two (see sub-section 2.6.2) that social and economic development are two sides of one coin, as economic factors influence levels of social security, including access to quality healthcare, housing, and education. This sub-section also highlights that social and economic justice are fundamental to achieving environmental justice (Hawkins, 2010:74). Additionally, the lack of access to basic human rights is highlighted in the sub-section as a component undermining resilience, making the community more vulnerable to floods.

The objective was further achieved in Chapter Four (see subthemes 1.1 to 1.2.2), where the findings indicated that pollution, inadequate housing, and flood-susceptible infrastructure are vulnerabilities contributing to flooding. These subthemes also confirm that factors such as the material used, a limited drainage system on the roads, low-quality materials for makeshift bridges, and insufficient maintenance play significant roles in vulnerabilities. Nyam et al. (2024), SERI (2018), and Malalgoda et al. (2013) support the findings that these vulnerabilities are linked to poor urban planning, low income, and high unemployment levels.

Objective 3: To determine how risk factors for floods can be reduced in Mamelodi East.

This objective was discussed in Chapter Two through the integration of the study's theoretical framework which proposes converting vulnerabilities into protective factors. While the discussion on reducing flood risks in Mamelodi East was brief in some sub-sections of Chapter Two, a comprehensive argument was presented in subsections 2.4 and 2.6.1 to 2.6.5 through layered legislative mandates and the developmental

approach, respectively. The policies and legislation discussed in Chapter Two (see sub-section 2.4) propose strategies to minimise risk factors and enhance preparedness for disasters such as floods by increasing resilience. The common threads identified in these policies include a call for partnership, the empowerment and inclusion of vulnerable groups, an understanding of context-specific risks, the provision of finances, and familiarity with disaster management phases—all aimed at increasing resilience and contributing to the 2030 Agenda. At a local level, CoT (2015:5,23) acknowledges that Mamelodi East is a flood-prone area, moreover, a commitment to make the community more resilient through various strategies such as prioritising interventions with at-risk groups to formulate adaptation plans. Further evidence of the objective's achievement emerged through the discussion of the developmental approach as a pathway to resilience (see sub-sections 2.6.1 to 2.6.5). Five themes related to the development approach (Patel, 2015) were proposed to enhance resilience at all levels of society: the relationship between micro and macro interventions, the protection of human rights and how its impact on resilience is evident, the value of partnerships, and the inclusion of vulnerable groups through active participation in decision-making processes that leverage economic, social, and political influence.

This holistic approach is supported by scholarly voices including Lombard (2019) and Patel (2015) who assert that access to basic needs increases capabilities and resilience. Gray et al. (2013:11) complement the developmental approach for its consideration of how humans and their environment are interdependent, therefore resilience-building interventions should be cognisant of the interconnection between humans and their environment. Chapter Four candidly contextualised the objective through the study's findings on how systemic issues make the community vulnerable to floods. It further suggested that addressing these chronic risks can enhance resilience (see subthemes 3.1 to 3.3). The findings of this study show that poverty, limited access to resources, and critical infrastructure risks undermine preparedness and recovery processes in Mamelodi East. As Dominelli (2012:3) states, poverty in marginalised communities negatively affects resilience levels. This emphasises the need to identify and address risk factors to better prepare the community for floods, in collaboration with those affected.

Objective 4: To explore how communities in Mamelodi East can be better prepared for future floods.

The objective intended to determine how the community's vulnerabilities could be transformed into protective factors to enable preparedness and facilitate improved recovery from future floods. This objective was contextualised in Chapter Two where Noris et al. in Mayer (2019:167) define resilience as being positioned for recovery after a disaster by being resistant and adaptive (see sub-section 2.3.2). Additionally, Cutter et al. (2008:8) emphasise that pre-disaster circumstances, including vulnerabilities, should be understood and improved if they make the community prone to disproportionate impact. The Addis Agenda states that sustainable development, economic growth, environment protection and social inclusion are key to resilience building, especially with vulnerable groups (UN, 2015C:3) (see sub-section 2.4). The objective was further contextualised in sub-section 2.6, where the protection of all three generations of human rights was linked to resilience building.

The objective was also achieved through the empirical study, as reflected in Chapter Four. In subthemes 4.1 to 4.3 participants also made recommendations, including sustainable development and "building back better", community education on DRR, and establishing key partnerships to enhance preparedness. Scholarly viewpoints that support the proposed strategies and verify the findings discussed in these sub-sections include Dube (2020:1), who recommends building back better to enhance preparedness for future disasters. Amaratunga (2018:1167) asserts that communities must be well-informed and understand the existing risks that make them vulnerable to floods to prepare effectively for disasters. Additionally, Echendu (2022:11) emphasises the value of collaboration in DRR and its contribution to the 2030 Agenda.

Objective 5: To make recommendations on how the school and learners can work together with families and communities to reduce flood risks and develop adaptive strategies in the case of future floods.

Objective Five is closely related to objectives three and four as they all emphasise the value of collaboration in resilience building to combat flood impact. The role of partnership is highlighted in subtheme 2.4., all policies and legislation on disaster management highlight the need for partnerships across all levels of society. The value of meaningful child participation and inclusion of all other vulnerable groups in all their

forms is encouraged (see subtheme 2.5.). Meaningful child participation incorporates knowledgeable adults from various systems who understand child-appropriate language and competencies, an argument that aligns to that of Viviers and Lombard (2013:11). The developmental approach highlights the value of democracy and participation, emphasising active citizen engagement (see subtheme 2.6.3.). Moreover, partnerships for development are discussed about social, economic, and environmental justice (UN, 2015a). Lastly, key partnerships for increased resilience are discussed and highlighted in Chapter Four (see subtheme 4.3.). The findings highlight both successful partnerships from the past and those that need strengthening. The same subtheme proposes that local communities, including children, various levels of government, and parents, all have a role to play in minimising vulnerabilities in Mamelodi East.

5.3 Key findings and conclusions

This section presents four key findings and conclusions drawn from the study.

- The findings indicate that human behaviour and poor infrastructure contribute to floods in the community. Pollution that results from unethical waste management by garbage collectors and community members was identified as one of the factors contributing to floods. A significant correlation between land and water pollution was reported in the findings as the main contributor to the Pienaar River's flooding. Additionally, the vulnerable state of critical infrastructure in the community was also noted as a contributing factor to floods. Vulnerable bridges and roads, as well as poorly constructed housing structures, were identified as the most susceptible infrastructure.
- It can be concluded that while little can be done to stop floods, a lot could be done at a local level to minimise flood effects and increase community resilience. Concerning current human actions contributing to floods in the community, alternative behaviour needs to be adopted by the community and government waste collectors. Additionally, good governance is critical to addressing poor infrastructure as a risk factor for floods. To help in flood preparedness and building back better, the local government has a role in regularly maintaining and developing resilient infrastructure.

- The findings further indicate that the consequences of floods do not discriminate between infrastructure, assets, and humans, as all are affected. The findings also suggest a relationship between the effects of floods and development levels (which is measured by the quality of critical infrastructure) and limited education on risk reduction. The destruction of assets and infrastructure, such as houses being washed away, windows and doors coming off their hinges, and electricity wires falling to the ground, was an indication of poorly constructed infrastructure. This destruction leads to forced displacement during the rebuilding process, which results in missed work and non-operational informal traders, and in some instances displacement remains permanent. Lastly, loss of human life through drowning, death by suicide, and electrification is a permanent consequence of flooding, while injuries tend to be temporary. The data highlights a relationship between limited information and drowning deaths, as non-aquatic cars (cars that cannot drive on water) were driven through flooded areas.
- The conclusion is that the community's lack of preparedness and inability to use lessons from previous floods contribute to the disproportionate effects felt during a flood. Moreover, the effects of floods could be lessened by the development of resilient and sustainable critical infrastructure and increased knowledge of DRR. It can be concluded that limited awareness and structural issues often lead to the community being unprepared for floods.
- The findings reveal that systemic issues always have and continue to weaken the community's resilience, which is associated with poor planning and preparedness for floods. Poverty, limited access to resources, infrastructure dangers, and safety during floods, and the lack of early warning systems were reported to increase the impact of floods in the community, consequently worsening social, economic, and environmental injustices. At an individual level, factors such as age, gender, and income levels were noted as vulnerability indicators that predispose locals to floods. At a community level, there is limited evidence of efforts made to improve critical infrastructure, access to accurate information on DRR by community members, and limited understanding of local risks despite the community repeatedly experiencing floods.

- It can be concluded that a comprehensive pathway such as the developmental approach is suitable for such deep-seated and intergenerational issues. Increased efforts towards planning and preparedness for floods are needed to minimise the impact of systemic issues on the community. In practice, this would include non-reactive strategies that advance DRR such as advocating for and ensuring access to basic human rights such as decent housing. This would also extend beyond micro practice as the developmental approach allows for collaboration with various stakeholders which may include the community and local government to challenge systemic barriers that increase vulnerabilities such as poor and often unmaintained communal infrastructure such as roads and bridges. Lastly, the participation of local communities in educational campaigns that empower them to understand not just the role of the government, but what they (community) can do to increase protective factors for themselves and generations to come.
- The findings point out a few strategies that could assist the community to prepare for and deal with future floods. The findings propose partnerships, education on DRR, and sustainable development for better preparedness for future floods. The findings on the consequences of floods in the community, factors that contribute to floods in the community, and the risk reduction strategies suggest that increased awareness and education on DRR could minimise the level of impact felt during a flood. Additionally, the need for resilient and better-built infrastructure was seen as a possible solution to some issues, and lastly, collaborations between various stakeholders could bridge gaps that leave the community more vulnerable. This includes the roles of the local community, the government, and learners.
- It can be concluded that meaningful participation from all affected groups is critical for better preparedness. It can also be concluded that improved service delivery and protection of human rights could assist the community in dealing with and recovering more effectively from future floods.

5.4 Recommendations

The researcher proposes the following recommendations based on the study's findings and conclusions to promote DRR and adaptation about floods in the community.

5.4.1 Introducing alternative waste management strategies across various systems in the community

The study recommends introducing measures aimed at minimising land and water pollution. These strategies should incorporate education on behaviour modification, targeting local drivers of pollution, including learners, community members, informal traders, educators, and garbage collectors. Additionally, the provision of key resources, such as sufficient garbage cans, is recommended. To foster interest in these recommended strategies, different parts of the community could compete against one another, with an objective party, such as the Viva Foundation, serving on a quarterly panel to announce the winning section.

5.4.2 Formal and informal education on DRR

It is recommended that formal and informal education initiatives on DRR, focusing on local risks and adaptation strategies, be implemented by the school in collaboration with the community. At a formal level, DRR should be integrated into the curriculum in an age-appropriate manner by the school. Informally, community members, churches, and parents should be educated on disaster management in a language they understand. Considering literacy levels, this can be achieved through workshops, campaigns, and information-sharing sessions. Lastly, the reduce, reuse, recycle, and recover initiative should be taught to the local community, with an emphasis on its economic benefits. This could be achieved through recycling or repurposing waste for monetary benefit.

5.4.3 Sustainable development through affordable and resilient infrastructure

The findings indicate that existing infrastructure presents vulnerabilities for the community during floods. Despite experiencing at least three flooding incidents, strategies for building back better strategies are not yet evident. Sustainable development is recommended to include informal settlers by providing critical infrastructure that facilitates easier mobility during disasters, along with implementing

evacuation plans and early warning systems. Moreover, issues related to responsible and safer building guidelines for houses should be prioritised and aligned with the community's socioeconomic capacities.

5.4.4 Develop partnerships for DRR and meaningful participation

The findings reveal that key partnerships could improve the community's resilience against floods. It is recommended that clear and appropriate roles and responsibilities be outlined and communicated among the school, its learners, transport drivers, and parents to ensure better preparedness for future floods. The findings further reveal that impacts on human lives were due to actions stemming from a limited understanding of risks. These actions include transport drivers crossing flooded areas with children on board and rebuilding strategies that continue to expose the community to further risks during future floods. Partnerships and participation should occur proactively and meaningfully include marginalised groups.

5.4.5 Mainstreaming the developmental approach in disaster management

The environmental injustices experienced by the community constitute a violation of human rights (UNDP, 2015; Save the Children, 2015). Therefore, it is recommended that social work organisations implement systemic interventions to protect and promote human rights, with specific attention to the role of local government. The findings indicate that systemic and infrastructural issues intertwined with the community's vulnerability to floods require advocacy work for improved service delivery and maintenance of critical infrastructure. Additionally, the relocation of informal settlers living on floodplains should be prioritised by the local government, with stricter measures enforced to prevent re-occupancy of these high-risk areas. The study reveals that children are not only affected by the consequences of floods, but they also have valuable opinions, suggestions, and concerns that require professional and capable adults who can hear the voice of the child. The recommendation will require partnerships with the local community and children, who demonstrated through the study that they do have a voice, opinions, and lessons to share on the topic.

5.4.6 Recommendations for further research

Recommendations for further research are as follows:

- A research study on the role of social workers as stakeholders in the pre-disaster phase with vulnerable groups. The research could focus on what strategies and interventions have worked to aid DRR with various vulnerable groups.
- In collaboration with the social worker(s) involved at Viva Foundation and Viva Independent School, learners should be engaged in further research activities. The research could focus on the exploration of experiences of learners in Mamelodi Township regarding the implementation of formal and informal education on DRR in the community.

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Appendix A: Interview Schedule

SECTION A: BIOGRAPHICAL INFORMATION

1. How old are you?

8	9	10	11	12
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2. How do you describe your sex?

Male	Female	Other	Prefer not to say
------	--------	-------	-------------------

3. In what school grade are you?

3	4	5	6	7
---	---	---	---	---

In what community do you live?

How many floods have you and your family experienced in Mamelodi East?

SECTION B: QUESTIONS ON TOPIC

Photos on environmental risks in the community

1. Why did you choose the specific photo to discuss?

2. What is happening in the photo?

- What story does the photo tell you about floods and possible risks for floods?
- Who is contributing to what you see in the photo?
- What would you like to change in the community when you look at the photo? Why do you say so?
- How does what you see in the photo influence you and your family's wellbeing?
- Who should do something about what you see in the photo?

- What can you / your school / family / community do to change what you see in the photo?
- How do you feel when you look at the photo?
- What in the photo make you feel scared or worried?
- What does the photo say about your community and living conditions?

3. How is your family and community affected by floods?

- Homeless / stranded
- Injuries
- Drowning – loved ones; pet(s); livestock
- Health challenges – waterborne infections
- Power breaks
- Sewage spill
- Polluted water
- Destruction of crops / food gardens
- Financial burdens
- Infrastructure collapse – no roads to access school; transport; shops

4. What factors contribute to floods in your community?

- Overflowed riverbanks
- Dumping of rubbish in river
- Climate change
- Poor roads and draining systems
- Poor rebuilding of houses, infrastructure post floods.

5. How can risk factors for floods be reduced in your community?

- Develop proper infrastructure – roads; draining systems
- Secure land for safe housing construction
- Evacuate / move to higher ground / shelter
- Turning of gas and electricity power to avoid electrocution
- Support neighbours to evacuate
- Collaborate with role players in the community / government / NGO
- Address poverty and inequalities
- Access to clean tap water
- Adequate sewerage systems / toilets
- No hanging power lines

- Removal of dangerous waste / rubbish
- No crossing of rivers / walking across flooded roads

6. What strategies do your family and community use or could use to recover from floods and to be better prepared for future floods?

- Have a flood and evacuation plan.
- Develop pathways for water run-offs.
- Built back better for sustainability.
- Engage local expertise and strengths.
- Stay informed and share information.
- Reduce poverty and unemployment.
- Develop social networks / relationships in strengthening the community.
- Plan access to emergency water supply.

7. How can your school and learners work together with families and communities in reducing risks and developing adaptation strategies to cope and recover?

- School-based initiatives
- Inter-sectoral collaboration
- Support and capacity building
- Child participant and development of agency

Appendix B: Ethical Approval Letter



Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bontata



20 July 2023

Dear Miss PN Thabede

Project Title: Children's perspectives on disaster risk reduction and adaptation: The case of floods in Mamelodi East
Researcher: Miss PN Thabede
Supervisor(s): Prof A Lombard
Department: Social Work and Criminology
Reference number: 17397538 (HUM020/0623)
Degree: Masters

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 6 July 2023. Please note that before research can commence all other approvals must have been received.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,



Prof Karen Harris
Chair: Research Ethics Committee
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

Research Ethics Committee Members: Prof KJ Harris (Chair); Mr A Looze; Dr A M de Beer; Dr A de Santos; Dr H Gubbins; Ms KJ Govender; Andrew D.L. Johnson; Dr D Krige; Prof D Makoni; Mr A Ndlovu; Dr D Nkomo; Dr C P. Rensburg; Prof M Sene; Prof P Tsaloni; Ms B M Mkhaleke

Room 7-27, Humanities Building, University of Pretoria, Private Bag X20, Hatfield 0026, South Africa
Tel: +27 (0)12 420 4859 | Fax: +27 (0)12 420 4503 | Email: p.humanities@up.ac.za | www.up.ac.za/faculty-of-humanities

Appendix C: Informed Consent

08 June 2023

Researcher: Patience Ntombifuthi Thabede

Tel: 078 678 7932

E-mail: nzimande20@gmail.com

Research supervisor: Prof A Lombard

Tel: 012 420 2325 / 2030

Email: antoINETte.lombard@up.ac.za

INFORMED CONSENT: PARENTS

1. Title of the study

Children's perspectives on disaster risk reduction and adaptation: The case of floods in Mamelodi East

2. Goal of the study

To determine the perspectives of children on Disaster Risk Reduction and adaptation in relation to floods in Mamelodi East.

3. Procedures

Your child has been invited to participate in the abovementioned study. He/she will be asked to walk around in his/her community with the researcher and the teaching assistant and/or teacher to take photos around the community that depict his/her perspectives regarding risks for floods and possible adaptation strategies. Your child will be well prepared for the study and be provided with a smartphone to take the photos. This will take approximately one hour. Photos taken will be printed and discussed in focus groups of three children per group. The children will share their views on what the photos indicate and the researcher will ask questions related to the

study. The focus group discussions will take approximately one hour at a time and will continue until the children agree that they have shared all their views on the photos and study topic.

To ensure that all the participant views are heard, the interviews will be tape recorded with the permission of the children. The recordings will be transcribed as part of data analysis. Only the researcher and the study supervisor will have access to the tapes and transcripts which will ultimately be stored in a secure place by the University of Pretoria for a period of 10 years. If data is used again, it will only be for research purposes.

The children will be engaged in analysing the collected data. Findings of the study will be shared with non-participating learners and teachers in the school to explore how the school and learners can become further engaged in reducing risks for floods in the community.

4. Risks and discomforts

The researcher does not foresee any risks or psychological harm to children participating in the study. However, in order to ensure the children's physical safety, they will be accompanied by the researcher as well as a teacher and / or teaching assistant during the photo-taking stage. The researcher will have a debriefing session with the children after the photos have been taken as well as after the focus-group discussions. In cases where children feel upset to talk about the floods and need counselling, they will be referred to a social worker for consultation without any costs involved.

5. Benefits

The children will not receive any compensation for participating in the study. The study will, however, benefit them indirectly as they will get an opportunity to have their voices heard on an issue that affects them, their families, the community, and the larger country. Their views will contribute to knowledge on risks for floods and how to adapt and manage these risks. The research findings could possibly influence policy development on disaster risk reduction management such as floods and adopting and implementing adaptation strategies.

6. Participants' rights

Participation in the study is voluntary and your child has the right to indicate whether he/she wants to participate in the study or not. Furthermore, he/she may also withdraw from the study at any time without any consequences to him/her. The child also has the right to refuse to answer any question that the researcher asks if he/she does not want to.

7. Confidentiality and anonymity

Information collected in the study will be treated with confidentiality and the names of the children who participated in the study will not appear in the research report or the scientific journal in which the results will be published. Findings will be presented in such a way that readers will not be able to identify the children.

8. Person to contact

If parents have questions or concerns relating to the study, they may contact the researcher on **078 678 7932** or email her at: nzimande20@gmail.com

Declaration

I, ..., the parent / guardian of
(child's name and surname) understand the above and voluntarily consent to my child's participation in this study. I understand what the study is about as well as why and how it is being conducted.

-----	-----	-----
Date	Place	Parent's signature
-----	-----	-----
Date	Place	Researcher's signature

Appendix D: Child Assent



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomotheo



10 June 2023

Researcher: Patience Ntombifuthi Thabede
Tel: 078 678 7932
Email: nzimande20@gmail.com

Supervisor: Prof A Lombard
Tel: 012 420 2325 / 2030
Email: antoINETte.lombard@up.ac.za

CHILD ASSENT



Hello

My name is Patience Thabede I am a postgraduate student in the Department of Social Work & Criminology at the University of Pretoria. I am doing research on what children see as environmental risks for floods in their community and how these risks can be reduced. I invite you to participate in the study. I am interested to hear what you think can be done to reduce environmental risks for floods in the community and how these risks can be reduced to prevent floods or if it occurs, to cause less harm to people and their belongings. I work with other students in my class who, like me, believe that children are important to listen to and that they have many ideas to share to make the world and the communities where they live a better place. I invite you to participate in the study because I believe you have ideas to share on how you see disaster risks for floods in your community and what you think could be done to reduce the risks and cause less harm if a flood happens. I would also like to hear how you think children,

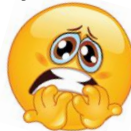
their families and communities can work together to help reduce the environmental risks for floods and develop ways to cope with floods when they happen.



What to expect?

If you agree to participate in the study, you will be prepared on how to take good pictures with a mobile phone on the study topic. You will be expected to join two other learners and take pictures around the school on what you see as contributing factors to floods and how these factors can be reduced. This will take about one hour. You will take more or less 20 pictures and then you will choose three (3) of those pictures to discuss with the researcher and tell her what the picture means. The discussion will take place at the school and will be about 30 minutes. You will also join two other learners in a small group to discuss the findings of the photos with the researcher. The session will be about one hour and will take place at the school. With your permission, I will be recording our discussion so that I can make sure that I captured all the information that you have shared with me. I will type the recorded discussion and if you want to you can see what I have written down; you can read it to let me know if you are happy with what we have discussed and if you wanted to add or change anything. I will include the pictures that you have selected in my research report.

Is there anything to be afraid of?



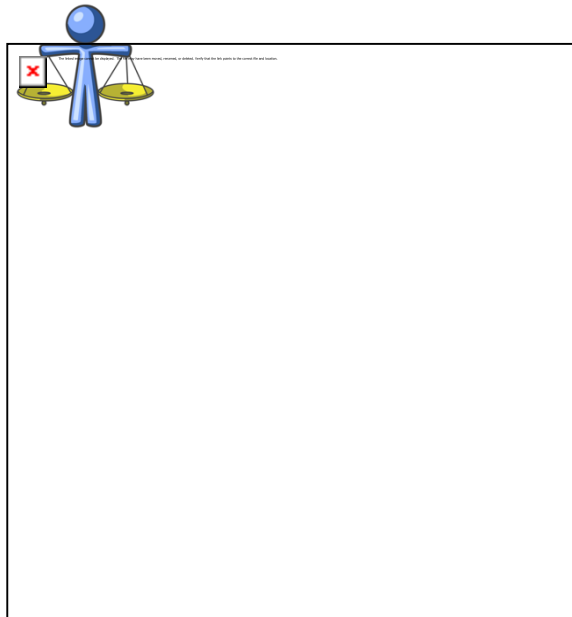
There is no reason to be afraid to join the study because there will be no intended harm done to you. I understand that it may be hard for you to discuss your pictures and experiences of floods in your community as it may trigger unpleasant memories of floods that make you feel uncomfortable. After we have discussed the pictures, I will give you an opportunity to say how you have experienced the discussion and your participation. If you feel upset or saddened by discussing floods and environmental risks for floods and you would like to talk more about it, I will refer you to a social worker with whom you can discuss your feelings and experiences.



Are there any benefits for joining the study?

You will not receive any gifts for your participation but if you agree to participate in this study, you will help to make sure that children's views on floods and how to reduce them are heard and considered when decisions on policy changes to manage risks for floods are made. Your views will assist me to learn how children, their families, and

the community can work together in reducing risks for floods and finding ways to cope with floods when they happen.



What rights do I have?

Participation is voluntary. This means that even though your parents will have to agree for you to participate in the study, you have a choice to say whether you want to be part of the study or not. If you join the study, you are allowed to stop participating at any point if you are not comfortable to continue as participant and it will not affect you in any way, not at the school or personally. Furthermore, if you withdraw from the study, you do not have to give any reason for your decision. If the researcher asks you any questions during the interview that you do not want to answer, you do not have to do so.



Who will know that I joined the study?

Your parent(s) or guardian(s) will have to give permission for you to participate in the study and they will thus know that you are part of the study. Various people at your school, including your teacher and other learners will know that you participate in the study. Only you and the researcher will know what photos you have selected and discussed with her. I will write a report on the research findings of the study for the university. Your personal details and those of the other children will not be included in the report. You can choose a nickname that I can use in the research report. The findings will be presented in a way that you will not be identified or linked to any of the information that I have written up in the research report. All the information regarding the study will be stored in secured files for 10 years in the Department of Social Work

& Criminology at the University of Pretoria. If the information that you shared is used again, it will only be for purposes of research.

Do you have any questions to ask about the study?



You can contact me on my mobile number at 078 678 7932 or send me an email at nzimande20@gmail.com.

Would you like to join the study?



Yes ☐ I would like to participate in the study.

No ☐ I would not like to participate in the study.



If you would like to join the study, you can write your name and today's date below.
You will get a copy of this letter.

Child's name

Date

Name of researcher

Date

Appendix E: Permission Letter from Viva Foundation



Viva Foundation of South Africa

Postnet Suite 8, Private Bag X 1
The Willows. 0041 RSA

Mamelodi Campus:
371 Moshumi Street
Alaska Informal Settlement Ext. 22
Mamelodi East 0122

Refilwe Campus:
Portion 8 Louwsbaken, Cullinan 1000

Tel.: +27 (0)79 635 2964
Email: info@vivafoundation.life
SCHOOL EMIS: 700401010

Our Ref: Meleney B. Kriel
Tel. +27 79 954 4426
E-mail: meleney@vivafoundation.life

13 June 2023

To:

Professor A Lombard
Dept. of Social Work and Criminology
University of Pretoria
Tel: (012) 420-2325
E-mail: antoINETTE.lombard@up.ac.za

Dear Professor Lombard

Re. Permission to conduct research with learners from Viva Foundation School

On behalf of the stakeholders, faculty, and beneficiaries of the Viva Foundation's independent school in the Alaska Informal Settlement, Mamelodi East, I express our willingness to accommodate the MSW Social Development & Policy students with a research site at our school and assist the research team with facilitation of activities in the community for their research on *"Children's perspectives on disaster risk reduction and adaptation: The case of floods in Mamelodi East."*

We understand the scope of the research and activities namely that the research students from your department, will each conduct an independent study with three learners from our school, each in the age category of 8-12/13 years. We will be able and willing to assist and collaborate, with the researchers, in the data collection method and other related activities in any way possible.

The Viva Foundation of South Africa
Registration Nr. PBO 930024128 & NPO Nr. 094-301

We acknowledge that participation in the study will be voluntary, and parents will be asked to give informed consent that their child may participate in the study.

In the light of the participatory Action Research approach of the study, we further acknowledge that the researchers, their supervisor and the learners of our school, will be co-researchers in the

Appendix F: Language editing

KUKU COMMUNICATION & CONSULTANCY

For all your language editing needs

P. O. Box 21537
Windhoek
Namibia
Cell +264 810 336 206
Email: colettakandemiri173@gmail.com

.....kcc..... 

PHD IN ENGLISH (UNAM), M.A. IN ENGLISH STUDIES (UNAM), BA HONOURS IN ENGLISH (UZ)

24 November 2024

To whom it may concern

LANGUAGE EDITING – PATIENCE N. THABEDE

This letter confirms that the thesis, *Exploring the Perspectives of Primary School Children on Disaster Risk Reduction and Adaptation: A Case Study of Flood Experiences in Mamelodi East* for Patience N. Thabede, student number 17397538, was submitted to me for language editing.

The thesis was professionally edited, track changes and suggestions were made in the document which if followed by Patience N. Thabede, would result in a thesis with high-standard English.

Yours faithfully



.....
B.A. HONS. IN ENGLISH (UZ)

Dr. Coletta Kandemiri
PHD IN ENGLISH (UNAM)
M.A. IN ENGLISH STUDIES (UNAM)

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