EXPLORING CHILDREN'S EXPERIENCES AND PERSPECTIVES ON FLOOD-RELATED DISASTER RISK REDUCTION AND ADAPTATION IN MAMELODI EAST

By

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I, Simphiwe Clamentine Mazibuko, declare that this mini dissertation is my own original work. Where secondary information is used, this has been carefully acknowledged and referenced in accordance with university requirements.

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

13 May 2025

_____ _____

Signature Date

ETHICS STATEMENT

The author, Simphiwe Clamentine Mazibuko, has obtained, for the research described in this work, the applicable research ethics approval. The author declares that she has observed the ethical standards required in terms of the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.

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ABSTRACT

TITLE: **Exploring children's experiences and perspectives on flood-related disaster risk reduction and adaptation in Mamelodi East**

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In South Africa, floods have become a more prominent natural disaster in recent years primarily due to extreme weather events linked to climate change. These extreme weather events and natural disasters disproportionately impact and affect children. The goal of the study was to explore children's experiences and perspectives on flood-related disaster risk reduction (DRR) and adaptation in Mamelodi East.

A qualitative study was conducted using an exploratory case study design. The sample of four participants aged 8 to 12 years from Viva Foundation School in Mamelodi East was selected using purposive sampling. Data were collected using photovoice and semi-structured one-on-one interviews and analysed utilising the six phases of the reflexive thematic analysis method. The participant's parents/guardians provided informed consent, and the participants gave their assent, while the researcher adhered to the confidentially of information as outlined in the ethical considerations of the study.

The findings indicate that illegal waste dumping, and lack of necessary infrastructure contribute to environmental risks of flooding in Mamelodi East. Additionally, the findings reveal that floods negatively impact the daily functioning of the community, including people's health and the environment.

The study concluded that children are well informed about the interrelated nature of environmental flood risks and the severity of flooding impacts in their community. They recognise how floods affect their own lives as well as the lives of community members. Based on the identified environmental flood risks, participants proposed strategies to mitigate these risks and the impacts of floods, including the construction of flood-

resistant infrastructure, improved waste removal services, and the initiation and implementation of clean-up campaigns.

The study recommends that the community launch educational awareness campaigns about the impact of illegal waste dumping. Secondly, it advocates for the creation of resilient and improved infrastructure. Additionally, the study suggests that local and provincial governments enhance the provision of basic services. Lastly, it encourages promoting children's involvement in disaster risk reduction efforts.

Keywords

- Children
- Children's perspective
- Child participation
- Climate change adaptation
- Disaster risk reduction
- Environmental flood risks
- Social work
- Viva Foundation of South Africa

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CHAPTER ONE:

GENERAL INTRODUCTION AND ORIENTATION TO THE STUDY

1.1. Introduction[1]

There is a notable increase in the number of natural disasters occurring which are attributed to the ever-changing climate conditions (International Save the Children Alliance [ISCA], 2008:5). In South Africa, floods have become a prominent natural disaster. In 2022, Kwa-Zulu Natal and Eastern Cape experienced extremely devastating floods which led to thousands of people being displaced, loss of life and damage to properties (Ngcamu, 2022:53). Families located on the riverbanks of the Pienaar's River in Mamelodi have been subjected to flooding since 2019 (Mabona, 2022; Mahlokwane, 2023; Mothiba, 2022). The City of Tshwane has made progress in relocating some families to safer locations whilst some families remain in the dangerous riverbanks (Mabona, 2022; Mahlokwane, 2023; Mothiba, 2022). Developing countries, such as South Africa, lack the necessary capabilities and are thus susceptible to the impacts of climate change and natural disasters (Hattingh, 2019:28; Alston, 2015:356; Shokane, 2019:1).

There is an undeniable link between the severe implications of climate change and poverty (Save the Children, 2015:5). People who live in poverty and marginalised communities are more vulnerable 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 amongst the vulnerable groups who are most severely affected by the impact of natural disasters (ISCA, 2008:5). Natural disasters expose children to a wide range of health, psychosocial and psychological risks (UNICEF, 2016:5), which poses as a threat to children's human rights and their future. Butcher, Seballos and Whitehead (2010: vii) state that "The impact of climate change lays a heavy

[1] The study formed part of a broader study which was investigated by the 2022 MSW Social Development & Policy course work programme. There is overarching similarity in the rationale of the study, the goal and objectives, the research questions and data collection methods. Each student conducted an independent study.

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 participate in matters that affect them such as climate change, disaster risk reduction (DRR) and climate change adaptation (Save the Children, 2015:7; International Save the Children Alliance, 2008:5). Children's participation in climate change and DRR is aligned with one of the four principles of the United Nations Convention of the Rights of the Child (UNCRC), article 12 states that the "the child who is capable of forming his or her views has the right to express those views freely in all matters affecting the child and the views of the child should be given due weight following the age and maturity of the child" (UNCRC, 1989).

Children's participation means that their vulnerability is recognised, and promotes the development of their capacity which is realised when the children are engaged in decision-making platforms where they feel safe (Save the Children, 2015:7). Inequity has a significant role in "shaping vulnerability and resilience" which is evident in how those children could use early warning information to assess a situation and their capacity to be influential in decision making and actions that shape their lives (UNICEF, 2016:2).

Children can meaningfully participate by contributing in planning and implementing interventions at all levels to influence decisions and change (Save the Children, 2015:7). Children's awareness, involvement and empowerment are equally important for them to be successful agents of change and adopt appropriate approaches to address DRR (ISCA, 2008:5). Children should have access to knowledge, have a voice, and engage in action. For this purpose, DRR approaches should be a child-centred approach. Child-centred DRR interventions refer to the consideration of children's needs in the development and implementation of all interventions. Child-centred DRR extends a child-focus approach of benefiting children to being directly involved in the development and implementation of DRR activities (Back, Cameron & Tanner, 2009:6). The shift of involving child-centered DRR takes place on a continuum of *Knowledge, Voice, Action*, to *Action* that influences and *Action* that transforms (Back et al., 2009:37). A study by Back et al. (2009:7) found that emphasis was more on the first part of the continuum highlighting the expansion and transfer of *Knowledge* and

enhancing *Voice* to taking *Action* on a *Protect* level. Another significant finding was the growing emphasis on engaging more youth in DRR interventions at the expense of children under 18 years who have specific needs “as well as a right to determine the world in which they will live as adults” (Back et al., 2009:7).

The current 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, n.d.)

The research participants were children who attend the Viva Independent School which is situated in Mamelodi East (see Mamelodi East below) where they live and have experienced floods. Viva Foundation aligns with the stipulated requirements of an organisation by Butcher et al. (2010:vii) to promote social justice, to protect mostly vulnerable children and to advocate for them to participate at all levels, from community, national and international levels. Child participation includes focusing on children in climate change adaptation as they are affected and their future is more exposed to increased poverty, hunger, diseases and reduced access to education (Save the Children, 2009:1). While children have experienced natural disasters, their perspectives are hardly ever taken into consideration on DRR and adaptation (Save the Children, 2009:1).

It is the premise of the research study that children are “powerful agents of change” who should be active at all levels (Save the Children, 2015:7). Furthermore, children can make contributions to risk reduction and adaptation and building the resilience of their communities provided they have access to knowledge and skills development (Save the Children, 2015:7) that will extend *Action* to influence and transformation (Back et al., 2009:33). All actions towards improving child well-being, must consider the implications of climate change to ensure sustainable outcomes (Save the Children, 2015:3). Risk reduction and resilience go hand in hand and although the government should integrate risk reduction and resilience into development programmes which is referred to as “mainstreaming of child-centred adaptation into development processes” (Save the Children, 2015:3), this is not happening. The Viva Foundation South Africa is well situated to fill this gap. According to Butcher et al. (2010:vii),

leaders have failed in their responsibility towards “our children and our environment” and that the voluntary sector’s response to mitigate the impact of climate change, “will reflect how much we value children and young people”. The views of children on DRR and adaptation are important in developing their resilience and ensuring sustainable futures (Butcher et al., 2010:vii).

The key concepts relevant to the study are as follows:

- Children

Section 28 of the South African Constitution (1996) defines a ‘child’ as a person below the age of eighteen years. The children who participated in the study was eight to twelve years old. This is the middle childhood stage of development with further development in cognitive, physical and social skills (Schonert-Reich, Guhn, Gadermann, Hymel, Sweiss, Hertzman & Hymel, 2013).

- Children’s perspectives

Article 12 of the United Nations Convention on the Rights of the Child (1989) highlights the importance of child perceptions and participation in matters that affect their lives. In this study, children’s perspectives referred to how they experienced and understood the DRR situation and climate change adaptation in the community. Furthermore, it means supporting children to participate and formulate their perspectives in a child-focused manner which are determined by their age and level of maturity to accommodate their unique needs.

- Child Participation

Children have the right to participate in various settings on matters that affect their lives (Save the Children, 2018:4). In this study, child participation refers to the right of children to express their views on floods and its impact on the community, in accordance with the child’s age and maturity, as stipulated in Article 12 of the United Nations Convention on the Rights of the Child (UNCRC, 1989). Meaningful participation of children is the pathway to the realisation of their other rights (Save the Children 2018:4).

- Disaster Risk Reduction

DRR is defined as procedures implemented to avert the occurrence of disasters as well as to minimise the extent of disaster damages (United Nations Educational, Scientific and Cultural Organization, 2023). DRR is concerned with minimising risks such as death, physical injuries and damage to properties (Twigg, 2015:6). In this study DRR refers to the strategies aimed at reducing the identified risks associated with floods in Mamelodi East.

- Climate change adaptation

Climate change adaptation is the process of adapting to the effects of climate change, to increase the resilience of communities and natural systems (Intergovernmental Panel on Climate Change [IPCC], 2014). This includes actions such as building and implementing new disaster-resilient infrastructure, changing agricultural practices, or developing early warning systems for extreme weather events (United Nations Climate Change Conference [UNFCCC], 2015). Adaptation is crucial for climate change response, as despite the enormous mitigation efforts implemented, the impact of climate change is inevitable because of past emissions (IPCC, 2014). In this study, climate change adaptation refers 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 school and floods the community when the riverbanks overflow. Informal settlements in Mamelodi East include Lusaka, Phumolong and Alaska[2]. 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). Since December

[2] See website: https://www.google.com/search?q=mamelodi+east+is+part+of+mamelodie+township&oq=Mamelodi+east+is+part+of+mamelodie+township&aqs=chrome.0.69i59.3595j1j7&sourceid=chrome&ie=UTF-8

2019, homes in these areas have been frequently badly damaged by flooding. During the 2019 floods, many residents experienced significant losses, including birth certificates, identification documents, furniture and entire homes (Mabona, 2022). In riverside areas, approximately 1,500 people were affected, 74 homes were destroyed, and 240 homes had been flooded (Rafapa, 2021). According to residents, they have been struggling for better service delivery since 2007, the year the Alaska's informal settlement was established (Selaluke, 2021). The living conditions are not suitable for habitation, with shacks erected on the mountain and riverbanks. Basic services such as clean water, sewerage systems and electricity are lacking. In response, the residents have resorted to illegal electricity connections, which pose serious safety risks, especially for children (Selaluke, 2021).

- Viva Foundation South Africa

Viva Foundation South Africa was founded in 2007 and operates mainly in Gauteng, with some of their initiatives reaching country-wide through advocacy and activism campaigns. It is a non-profit organisation based in South Africa that aims to empower vulnerable communities and individuals through various social development programmes.

Viva Foundation targets several key areas, including independent education, early childhood development, nutrition, security, development of the arts and music, enterprise development and sexual violence prevention and response. The organisation's programmes are developed to address poverty and social injustice. They collaborate with local communities, government agencies, and other non-profit organisations to ensure that their programmes are effective, sustainable, and responsive to the needs of those they serve. The Viva Foundation has positively impacted the lives of thousands of people, contributing to the development of stronger, more resilient communities for the future. The unique 'village' concept of Viva Foundation builds community resilience of their own culture and values (Viva Foundation, n.d.).

The Viva Foundation's Mamelodi Campus is located in Alaska, an informal settlement on the eastern outskirts of Mamelodi (Mamelodi Mappers, 2015). It is located at the base of the Magaliesburg mountain (Madubedube, Rautenbach & Coetzee, 2018).

While the Viva Independent School is located in Alaska, it serves learners from the broader Mamelodi community.

1.2. Theoretical framework

Resilience theory was employed in this study to explore children's experiences and perspectives on disaster risk reduction and adaptation concerning floods. Several authors suggest that gaining insight into the specific risks, vulnerabilities, and lack of protective factors within a community can help identify effective pathways to strengthen resilience which in turn will improve response and recovery efforts during disasters (Cannon, 2008; Cutter, Barnes, Berry, & Burton, 2008; Greene & Greene, 2009). Reducing risks for disasters and in this case, floods will increase children's and communities' resilience in being better prepared for future floods (Save the Children, 2015:3).

In this study, resilience refers to the community's ability to recover efficiently and adapt to natural disasters (Cutter et al., 2008:558). This is in agreement with the resilience definition of the UN Disaster Risk Reduction terminology (2021), as it states that resilience refers to the capability of a system to effectively withstand the implications of a hazard in a timeously manner whilst preserving its existing structures and functioning as a system. Resilience depends on the number of assets, access to resources, and the opportunities that individuals and communities have (Cannon, 2008:65), all of which have an impact on the recovery process after a disaster (Cutter et al., 2008:601). Inequality thus influences and determines the level of resilience to disaster. The resilience theory is discussed further in Chapter 2.

1.3. Problem statement and rationale for study

Natural disasters have become prominent and are attributed to climate change (ICSA, 2008:5). Several devastating floods have occurred in South Africa over the recent years (Ngcamu, 2022:53). Natural disasters pose a threat to the daily functioning of vulnerable communities. Families and children that live in poverty are more vulnerable to natural disasters such as floods as they are more likely to be located in areas such as on riverbanks in informal settlements and hence, in the event of a flood, risk losing their personal belongings, being displaced and exposed to various psychosocial risks such as food insecurity (UNICEF, 2016). While children are severely affected, their

views are hardly ever considered on DRR and adaptation strategies to mitigate risks (Save the Children, 2009:1).

In the affected areas in Mamelodi East, children in the Viva Independent School are exposed to living in poverty and the consequences of flooding for their families, homes, and the broader community (Mabona, 2022; Mahlokwane, 2023; Mothiba, 2022). Additionally, they are in a school setting that recognises their need for protection, as well as the significance of access to knowledge, skills, and empowerment to capacitate their agency while co-building a sustainable future. Viva Foundation South Africa is a child-focused organisation, and the needs of children are central to their programmes (Viva Foundation, n.d.).

Children's participation is a right recognised by the United Nations Convention on the Rights of Children (UNCRC, 1989). In fulfilment of this right, children should be given the necessary support, resources, and opportunities to meaningfully participate in conversations regarding climate change and its associated risks. Children can make significant contributions to DRR and adaptation and build their own and communities' resilience to be better prepared for future natural disasters (Save the Children, 2015:7).

To foster children's resilience and acknowledge their role in shaping sustainable futures, it is important to include their perspectives at all levels of participation, including the *Knowledge, Voice,* and *Action*-Project levels (Butcher et al., 2010:vii). It is envisaged that the findings of this research, together with those from the broader study, will inform strategies for reducing flood risks and enhancing community resilience through improved preparedness and mitigation efforts. By incorporating children's perspectives on risks and adaptation strategies, the study further envisages that the broader findings on this research topic may contribute to advancing the *Action*-project level of child participation (Butcher et al., 2010:vii), both within the Viva Independent School and the broader community. This in turn, can help strengthen community resilience by supporting relevant flood risk reduction efforts and the adoption of adaptative strategies in Mamelodi East.

The research question for the study was as follows:

What are children's experiences and perspectives on flood-related disaster risk reduction and adaptation 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 these contributing factors 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 flood risks and develop adaptive strategies in the event of future floods?

1.4. Goal and objectives of the study

The goal of the study was to:
Explore children's experiences and perspectives on flood-related DRR and adaptation 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 these contributing factors can be reduced in Mamelodi East.
- Explore how communities in Mamelodi East can be better prepared for future floods.
- Recommend strategies for flood risk reduction and the development of adaptative strategies to build resilience in the event of future floods.

1.5. Research Methodology

The study employed a qualitative research approach as it aligned with the study's purpose. Qualitative research is an approach that uses words to gain an in-depth understanding of the phenomenon being studied (Nieuwenhuis, 2020:59). The study was exploratory; it explored the perspectives of children. The qualitative research approach provided the researcher with a platform to engage in an in-depth dialogue with the children on their perspective on DRR and adaptation strategies. Action research, an extension of applied research, was employed for the study due to its collaborative mode of enquiry in nature (Ebersöhn, Eloff & Ferreira, 2019:156). An

exploratory case study was adopted as the research design as the focus was on real-life experiences of the participants (Nieuwenhuis, 2020:89), the learners of Viva Independent School.

The population of the study were children aged eight to twelve years old of Viva Independent School. Purposive sampling was employed in the selection of the sample of four learners who met the sampling criteria (Orcher, 2016:62). The study utilised photovoice and semi-structured one-on-one interviews as data collection methods and the data was analysed using the six phases of the reflexive thematic analysis method (Terry, Hayfield, Clarke & Braun, 2017:31). The researcher adhered to the ethical considerations for the study which is discussed in Chapter 3 (see section 3.7).

1.6. Chapter outline and timeline

Chapter One presents the general introduction and orientation of the study. It includes the conceptualisation and background, the key concepts, a brief overview of the theoretical framework, 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 outline of the research report.

Chapter Two presents the literature review of the study. It 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 regarding disaster management, disaster risk reduction and adaptation strategies with an emphasis on floods. The role of developmental social work in disaster management about climate change adaptation in mitigating the risks and developing adaptation strategies is discussed. Furthermore, resilience theory is discussed as the relevant theoretical framework.

Chapter Three presents the research methodology. It compromises the research approach and paradigm; the type of research; the research design, and the research methodology, which include the population and sample method, data collection methods, data analyses, trustworthiness and the pilot study. It also includes the relevant ethics, and the limitations of the study.

Chapter Four presents and discusses the findings. It includes the biographic information of the participants, the presentation and discussion of the photo-voice, and the themes and sub-themes from the collected data.

Chapter Five presents the key findings, concludes and makes recommendations. It begins by discussing the accomplishment of the goals and objectives, followed by presenting the key findings and conclusions, and finally making recommendations based on the study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

The increasing occurrence of natural disasters is affecting both developed and developing countries (Shokane, 2019:1). The natural disasters are being attributed to the ever-changing climate. Developing countries such as South Africa, are more vulnerable to the impacts of natural disasters and climate change due to their increasing vulnerability, lack of capacity, and poor resilience (Hattingh, 2019:28; Alston, 2015:356; Shokane, 2019:1). The poor are proportionally more vulnerable to the impact of natural disasters (Hawkins, 2010:74), as they live in areas that are prone to disasters; they are unable to cope with the impact of disasters which prolong the recovery phase from the natural disasters (Ngcamu, 2022:57; Shokane, 2019:2).

Children are among the more vulnerable groups as they are often severely affected by natural disaster and their impacts (Back et al., 2009:7). The notion that children are passive and helpless individuals is detrimental to the development of children. According to Lombard and Viviers (2014:81), some studies indicate that children are knowledgeable about climate change and the environment, and its implications. The views and perspectives of children on disaster risk reduction (DRR) are important because children have a right to participate in matters that affect them such as disasters and climate change (UNCRC, 1989:4).

This chapter presents a literature overview on the topic. It starts by conceptualising the interlink between climate change, inequality, and poverty. The discussion then shifts to relevant international and national policies and legislation on DRR and adaptation. In the next section, the importance of children participating in DRR, and adaptation is discussed followed by a discourse on developmental social work and DRR. Resilience theory is then discussed as the relevant theoretical framework. The chapter concludes with a summary.

2.2. Climate change, inequality, and poverty

South Africa is recording severe weather events which are attributed to climate change (Republic of South Africa National Climate Change Response White Paper, 2011:8). In 2022, Kwa-Zulu Natal and Eastern Cape, two provinces in South Africa recorded severe floods and landslides that resulted in death, people being displaced and damage to infrastructure (Ngcamu, 2022:53). Climate change has become one of the

most challenging phenomena that contemporary society is faced with as it affects every aspect of human life (Dominelli, 2011:430; Spies-Butcher & Stebbing, 2016:741; van Niekerk, Tempelhoff, Faling, Thompson, Jordaan, Coetsee, & Maartens, 2009:1; Hattingh, 2019:28).

Climate change is defined as “an ongoing trend of changes in the earth’s general weather conditions because of an average rise in temperature of the earth’s surface often referred to as global warming” (Department of Environmental Affairs, 2011:8). Global warming indicates that the global climate is changing faster, and the earth’s bio-physical system is failing to adapt to the climatic conditions, causing the extreme weather events (Department of Environmental Affairs, 2011:8). It is projected that the average temperature in South Africa would rise by 2° Celsius by 2050 (van Niekerk et al., 2009:2; Dube, Khulu, Mokoena, Molepo, Moswane, & Kau, 2025:2).

Human development and advancement in technology has an impact on the natural environment (van Niekerk et al., 2009:1). Evidence indicates that human activities causing the emission of greenhouse gases have attributed to climate change (Dominelli, 2011:430; Spies-Butcher & Stebbing, 2016:742; Department of Environmental Affairs, 2011:8). Human activities such as clearing the forests have also contributed to reducing the earth’s natural ability to absorb the greenhouse gases (Department of Environmental Affairs, 2011:8). The increased greenhouse gases have contributed immensely to the changes in “air temperature, precipitation patterns, ocean acidity, sea levels and melting glaciers” (Dominelli, 2011:430).

The functioning of all types of ecosystems that humans and animals are dependent on for survival is affected by climate change (Department of Environmental Affairs, 2011:8). Climate change has various impacts on societies, including adverse weather conditions currently being experienced, such as floods, cyclones, and droughts (Save the Children, 2015:4; Dominelli, 2011:430).

Climate change impacts the overall function of humans and their development. Climate change has catastrophic effects on people’s livelihoods, food security and general health of people (Bali Principles of Climate Justice, 2002:1). Food security is under threat as agricultural land is impacted by climate change, resulting in the decline of crop production and the loss of livestock (Chersich, Wright, Venter, Rees, Scorgie, & Erasmus, 2018:2; Masipa, 2017:1). Food insecurity leads to malnutrition and

poverty, which poses a threat to the human development progress that have been made thus far and the achievement of the 2030 Agenda for Sustainable Development and Sustainable Development Goals (SDGs) (Hattingh, 2019:29). Climate change also exposes human health to risk. It is reported that climate change exacerbates the existing health risks such as vector bone diseases, communicable diseases, and non-communicable diseases (Department of Environmental Affairs, 2013:11).

It is widely acknowledged that Africa has the least contributions to climate change, however, despite this, Africa is far more vulnerable to its impacts (Department of Environmental Affairs, 2011:8) and is challenged to adjust to climate change (Hattingh, 2019:28). Southern Africa is reported to be more vulnerable to climate change because the predictions indicate severe and prolonged impacts in its communities and on the livelihoods of people (Masipa, 2017:2).

The implications of climate change are far more severe in the most vulnerable communities such as informal settlements. Informal settlements are attributed to the rapid and unplanned urbanisation which is due to the migration of people in an attempt to be closer to cities and towns, seeking employment and better opportunities (Fatti & Patel, 2013:13). These areas are characterised by “poverty, unemployment, informality and environmental risks, and service backlogs” (Williams, Costa, Sutherland, Celliers & Scheffran, 2019:157). Informal settlements are often found in areas where there is poor and inadequate waste and drainage infrastructure which makes the impact of flooding extremely severe and endured for a longer period (Williams, et al., 2019:158; Ngcamu, 2022:57; Fatti & Patel, 2013:13). These areas are homes of the poorest people (Fatti & Patel, 2013:13). Sustainable urban development is important in addressing the vulnerability of informal settlements to climate change.

Hattingh (2019:29) argues that the fight against climate change should consider the needs of the poor and vulnerable groups, meaning that the measures developed to address climate change should not be detrimental to human development. However, it should contribute positively to human development and poverty alleviation. This argument is supported by Jayaraman (2019:18) who argues that the climate change fight should be conducted simultaneously with the fight for social justice. Failure to do so puts the poor and vulnerable groups at risk of being left behind in the fight.

As earlier indicated, children are amongst the most vulnerable groups that are immensely affected by climate change (Back et al., 2009:7), posing a risk to the rights of children as stipulated in the Convention on the Rights of the Child (Polack, 2010:11). Polack (2010:11) states that the rights stipulated under articles 6, 24 and 27 are particularly under threat. Children are considered to have much lower adaptive capacity than adults, which makes them more vulnerable as they lack resilience and resources (Save the Children, 2015:5; Polack, 2010:10).

Children subjected to poverty are even more vulnerable (Back et al., 2009:8). It is anticipated that climate change will intensively contribute to the death of children under the age of five (Save the Children, 2015:5) and have future implications on the lives of children (Back et al., 2009:8). Thus, including children in the process of making decisions is important.

Climate change and its social and economic impacts are a reality that contributes to increasing flooding, which severely affects vulnerable communities and children. In the quest to address climate change, Van Niekerk et al. (2009:4) propose that the government collaborate with civil society in addressing climate change adaptation and mitigation. Ngcamu (2022:54) agrees that engaging community members in person on disaster preparedness could yield better results. Collaboration with civil society and community members, particularly including children on disaster risk reduction is essential and will be discussed next.

2.3. Child participation and DRR

Save the Children (2018:9) defines child participation as the “active involvement of children in the decisions, processes, programmes, and policies that affect their lives”. Children’s participation is a right recognised in the United Nations Convention on the Rights of Children under article 12 (UNCRC, 1989:4). Regionally, the African Charter on the Rights and Welfare of the Child under articles 4, and 7, also recognises the importance of child participation (African Union, 1999). Articles 4 and 7 state that the child should be allowed to express him or herself in all matters that affect them and the child’s perspective should be considered (African Union, 1999:9-10).

Studies on children’s perspectives recognise children as active role players who are participating in their lives which is a paradigm shift (Peters & Kelly, 2011:14) of seeing children as empty vessels (Redmond, 2008:1) and mere objects of socialisation

(Lange, 2007:268; Save the Children, 2009:2). The paradigm shift is linked to several agendas and research initiatives, such as the United Nations Convention on the Rights of Children (1989) and the African Charter on the Rights and Welfare of the Child (1999) which emphasise the importance of children's participation in matters that affect them. Children's participation acknowledges that children have valuable knowledge and experience which is of equal importance as those of adults.

Children's perspective is different from adults and professionals (Lange, 2007:272). They are better position to identify their risks, needs and capacities (Save the Children, 2015:6) which makes their contributions valuable. Lange (2007:274) explains that "children are not a homogenous group". Children's backgrounds are different and thus they interpret their experiences differently. The cultural background, socioeconomic, and geographical circumstances have an implication on how children experience climate change (Save the Children, 2009:3).

Children's participation can provide valuable insights into their lives, which can further inform legislation, policies, budget allocations, and services as needed (Save the Children, 2018:10). It encourages children to acquire essential information, skills, and capabilities for their development, fostering awareness and knowledge that enhances their self-confidence.

The participation of children in matters of climate change is important as their experiences of natural disasters are different from those of adults (Save the Children, 2009:3). Children should be educated on climate change, disaster hazards, risks, mitigation, and adaptation (Pfefferbaum, Pfefferbaum & Van Horn, 2018:3; Save the Children, 2009:6). This will enable the children to harness their potential to be informed and skilled on climate and disasters. Children who are informed about disasters are in a better position to protect themselves and others (Pfefferbaum et al., 2018:3).

Learning about climate change and disasters should not only be in a school setting; learning can also take place in an informal setting such as playgroups, art projects, and reading clubs. The education should be relevant to the context for it to be meaningful to children and have an impact (Save the Children, 2009:9). This will further cultivate meaningful participation from children as they can relate to the education provided.

Disaster risk reduction is characterised by a top-down approach where the experiences and perspectives of children are overlooked despite being amongst the vulnerable groups (Save the Children, 2009:6; Save the Children, 2015:5). A child-centred approach to climate change must be adopted (Save the Children, 2015:2), one that involves children as key participants (Back et al., 2009:7) who can "identify their risks, needs, and capacities" (Save the Children, 2015:6). It further requires that these risks, needs, and capacities identified be incorporated in the vulnerabilities assessment which would be used to formulate development programmes that address climate change (Save the Children, 2015:8).

DRR is recognised as a cost-effective intervention that can be implemented to save people's lives and their livelihoods (Back et al., 2009:9). In the development of DRR interventions, it should be child-led where the needs of the children are considered which requires children to be consulted (Back et al., 2009:9). Children can provide valuable insights about their communities and what assistance is required by their families and communities concerning disasters (Pfefferbaum et al., 2019:3).

Back et al. (2009:7) conceptualised a child-led DRR model that is on a continuum which starts with *Knowledge*, and then shifts to promoting *Voice*, *Action* to protect, action to influence, and *Action* to transform. This model emphasises the importance of acquiring knowledge that children can utilise to have a voice that can influence actions. This current study focuses on the first three phases of the continuum, knowledge, promoting voice and taking action.

Acquiring knowledge is the first phase of the continuum. Children must acquire knowledge about climate change and DRR. Schools are considered a focal point for gaining new knowledge and skills that can be utilised in DRR. This knowledge and skills can be incorporated into the school curriculum, teachers' training, and mass education on social media and media broadcasting. It is emphasised that acquiring knowledge should extend beyond the school environment to include community-based learning and social media (Back et al., 2009:18).

Promoting children's voices is the second phase of the continuum. Children should be viewed as stakeholders in disaster risk reduction (DRR), and their input regarding their needs should be valued. Providing children with a platform from which they can

express themselves offers them an opportunity to engage meaningfully with policy developers and, in turn, influence policy development (Back et al., 2009:23).

The third phase of the continuum is the action. Child-led DRR empowers children by providing them with an opportunity to actively participate in initiatives that intend to protect the communities from disasters. The platform provided to children should be equipped with all the necessary resources and support required for the children's actions (Back et al., 2009:35). This phase includes involving children in making decisions, and influencing decisions being taken at the local and national levels. The implementation of this child-led DRR model requires all relevant stakeholders and role players to engage with children for the model to be effective. This requires that the policies and legislation be in place to support child-led DRR.

2.4. Policies and legislation for DRR and management

There are several international, regional and national policies and legislation developed to address climate change and provide guidelines for disaster risk reduction and management. The policies and legislation for DRR and management highlight the importance of reducing gas emission (UN, 2015a; UN, 2015b; UN, 2015c) managing the effects of climate change (Disaster Management Act 57 of 2002), and developing of disaster management interventions (Sim, He & Dominelli, 2021; UNDRR, 2017). These policies and legislation provide guidelines to government, private sector and communities on disaster risk reduction and management. Furthermore, these policies and legislation have an impact on children's lives.

The Paris Agreement is a legally binding international agreement which was adopted in 2015 to address climate change in developed and developing countries (UN, 2015a). Different countries are committed to reducing their carbon emissions. According to the Paris Agreement, countries will be held accountable for their commitments and must report on their greenhouse gases and the progress made towards the reduction of carbon emissions every two years (UN, 2015a:3). The reduction of carbon emissions is imperative for the lives of children.

The Sendai Framework for Disaster Risk Reduction was also adopted in 2015; it serves as a recommended guideline for reducing disaster risk (UNDRR, 2015:9). Its aim is to prevent the emergence of new disaster risks and to significantly diminish existing disaster risks and losses while enhancing societal resilience to disasters over

a 15-year period from 2015 to 2030 (UNDRR, 2015:12; Wahlstrom, 2017:334). Achieving this requires support for developing countries to bolster their capabilities and capacities for disaster management by investing in addressing the root causes of disaster risks rather than solely concentrating on post-disaster response and recovery (UNDRR, 2015:12). The Sendai Framework recognises the importance of understanding disaster risk in terms of its various aspects, including exposure, vulnerability, and hazards (UNDRR, 2015:5). Additionally, it acknowledges that effective disaster risk reduction necessitates collaborative partnerships among all stakeholders, including government entities, the private sector, and non-governmental organisations (Wahlstrom, 2017:334). In implementing the Sendai Framework, particular emphasis should be placed on vulnerable groups, such as children (UNICEF, 2016:3).

The 2030 Agenda was approved and adopted in September 2015 by the 193 member states of the UN and is a continuation of the Millennium Development Goals (UN, 2015b). It is a “plan of action for people, planet and prosperity” (UN, 2015b:3). There are five critical pillars of the 2030 Agenda which are people, prosperity, planet, partnerships and peace, also known as the 5Ps. Furthermore, the 2030 Agenda seeks to integrate and balance the three dimensions of sustainable development: the economic, social and environmental (UN, 2015b:3). The 2030 Agenda’s commitment to “leaving no one behind” emphasizes prioritising the vulnerable groups (UN, 2015b) such as children. According to Bhardwaj, Sambu and Jamieson (2017:22), “children are at the heart of the 2030 Agenda” and fulfilment of children’s rights is fundamental to sustainable development.

The Constitution of the Republic of South Africa (1996) mandate the South African government to promote environmental sustainability as its citizens have a right to live in “an environment that is not harmful for their health and well-being”. The South African government developed the Disaster Management Act 57 of 2002 and the National Disaster Management Policy Framework of 2005 (Department of Cooperative Governance and Traditional Affairs, 2005). The purpose of the Disaster Management Act 57 of 2002 and National Disaster Policy is to provide guidelines for addressing and reducing disaster risks and mitigating the disaster impact by providing emergency services to the affected communities (Van Niekerk, 2014:858). The Disaster Management Act 57 of 2002 recognises the importance of stakeholders as it

promulgates that the minister must establish an advisory forum consisting of various stakeholders such as social workers.

Social workers are to transform social work practice to align with the goals of both the Sendai Framework and 2030 Agenda (Wahlstrom, 2017:336), and the Constitution of the Republic of South Africa (1996). Furthermore, as a human rights profession, social work practice needs to build resilient individuals and communities through advocating for the rights of vulnerable groups. Social workers should advocate for child-centred approaches in implementing and monitoring the Sendai Framework to ensure meaningful participation of children (UNICEF, 2016:2).

2.5. DRR, developmental social work and child participation

The implications of climate change exacerbate the already existing inequalities in society, leaving the poorest more vulnerable to disasters (Lombard, 2022:51). This reinforces the need for social workers to be involved in conversations related to climate change. Disasters are "increasingly important in social work theory and practice as they grow in both frequency and the number of people affected" (Dominelli & Loakimidis, 2015:1). Therefore, social work intervention is often required in the wake of natural disasters (Mhlanga, Muzingili & Mpambela, 2019:47).

Social workers have an ethical duty to ensure the well-being of communities and individuals (Machimbidza, Nyahunda, & Makhubele, 2022:717). The challenges that arise from natural disasters threaten the achievement of social justice (Mhlanga et al., 2019:47) which is the core value of social work (Dominelli, 2018:11). Developmental social work mandates social workers to actively promote social, economic and environmental justice in their practice (Lombard, 2019:54).

Krings, Victor, Mathias and Perron (2020:275) state that social work has expanded the person-in-environment framework to include the physical environment. According to Lombard (2022:48), the social work profession needs to incorporate the natural environment in social and economic development to attain justice for communities. Social workers are ethically compelled to confront environmental issues that contribute to an unequal society and affect the livelihood of communities (Miller, Hayward & Shaw, 2012:272; Matlakala, Nyahunda & Makhubele, 2021:190) such as natural disasters.

Dominelli (2011:430) argues that social workers are better positioned to be advocates for climate justice as the profession's focus is enhancing the well-being of people and communities. Dominelli (2011:431) further states that social work practice must evolve beyond advocacy to also include community mobilisation. According to Lombard (2022:52), social workers need a "human-nature nexus" approach to mobilise communities into actions that foster healthy and sustainable communities. Social workers can contribution in a positive and sustained manner to reducing disaster risk and loss.

The role of social workers in disaster risk management is not well documented despite the profession's involvement and commitment (Nikku, 2015:601; Sim, Ki, Quen, & Dong, 2013:546; Nikku, 2015:601; Harms, Boddy, Hickey, Hay, Alexander, Briggs, Cooper, Alston, Fronek, Howard, & Adamson, 2022:2). The roles of social workers in disaster risk management must be well documented, taking into account the increase in the number of natural disaster incidents that are currently occurring (Machimbidza et al., 2022:718). Additionally, the social worker's role is an essential part of disaster risk management. DRR aims to reduce social and economic vulnerabilities in communities through the development of resilience to the impacts of disasters (Wahlstrom, 2017:334).

The social development approach informs developmental social work practice (Patel, 2015:127), it guides and promotes social and economic inclusion of people. Lombard (2019:51) indicates that developmental social work "reaffirms social work's commitment to social justice and poverty eradication to promoting social change and human development for sustainable development outcomes". Patel (2015:127) states that developmental social work aims to "promote social change through a dual focus on the person and environment and the interaction between the two". This requires broadening of the scope of social work practice to include environmental justice (Lombard, 2019:54). Patel (2015:127) describes the five themes of developmental social work as a right-based approach, economic and social development, democracy and participation, partnerships, and bridging the macro and micro divide. These themes should direct developmental social work interventions in DRR and management to achieve sustainable outcomes. These themes are discussed next.

2.5.1. A rights-based approach

Developmental social work practice is informed by the three-generation typology of human rights (Lombard, 2019:56). This impacts how social workers in practice implement interventions as it should reflect that they are based on a rights-based approach. Chapter two of the Constitution of the Republic of South Africa (RSA, 1996) stipulates the human rights which should be upheld by all social workers.

Children are among the most vulnerable groups (Back et al., 2009:7). Their participation in DRR interventions is paramount in ensuring that child-led DRR efforts are effective and relevant to their needs. Child-led DRR recognises the significance of protecting the rights of children (Back et al., 2009:38) which are threatened by climate change and natural disasters (Polack, 2010:11). Social workers should facilitate and advocate for the participation of children in DRR interventions (Schmid, Wilson & Taback, 2010:284). Educating children about their rights and empowering them to advocate for themselves is also a key role of social workers.

2.5.2. Economic and social development

Marginalised communities are the most vulnerable to the effects of climate change and natural disasters (Hawkins, 2010:74; Lombard, 2022:51). The effect of natural disasters endangers the livelihoods of the marginalised and puts at risk the economic assets of these communities (Matlakala, Makhubele & Nyahunda, 2022:2) who are already vulnerable to the effects of climate change and natural disasters (Hawkins, 2010:74; Lombard, 2022:51).

Economic and social development are key aspects of human well-being and development (Lombard, 2019:57; Patel, 2015:88). They also play a critical role in redistributing government resources through interventions that contribute towards the well-being of individuals (Patel, 2015:61). Furthermore, Patel (2015:88) states that economic and social development interventions and policies should be integrated as both play a significant role in promoting social wellbeing. She further explains how they can be integrated through social investment strategies (Patel, 2015:89). Intervention methods intended to address poverty should also actively promote the participation of vulnerable groups in the economy. In this context, child-led DRR focuses on providing opportunities for children to meaningfully participate in DRR interventions. Such

participation enhances their resilience by building knowledgeable and developing transferable skills that can benefit their families and communities.

2.5.3. Partnerships

Partnerships with stakeholders and role players are essential in achieving sustainable development (Lombard, 2019:59). South African government is mandated to develop policies and legislation that promotes "social development in a collaborative partnership model in service delivery" (Patel, 2015:93). The importance of partnerships is also highlighted in the 2030 Agenda (UN, 2015b), emphasising that its implementation will occur through the Global Partnership for Sustainable Development—promoting the participation of all countries, stakeholders and people.

DRR requires multi-disciplinary and stakeholder collaboration (UN, 2015b:13), and children should be included in this process, as they are able to identify risks, vulnerabilities, and resources in their specific communities (Dominelli, 2018:14). Green and Green (2009:1017) concur that the success and sustainability of DRR interventions and strategies rely on the collaborative efforts with the community. The Sendai Framework (UNDRR, 2015:13) emphasises that special attention should be given to vulnerable groups such as children. A child-led DRR aligns with the Sendai Framework guiding principles which promote partnerships and collaborations with the private sector, stakeholders, and affected communities (UNDRR, 2015:13).

In alignment with developmental social work, which advocates for partnerships, Lombard (2019:60) asserts that service users should be included as partners and given opportunities to develop their capabilities, thereby strengthening their agency to participate. This principle is also applicable to children. Social workers should advocate for children to be recognised as partners and collaborate with them in decision-making processes.

2.5.4. Democracy and participation

Developmental social work emphasises the importance of giving people an opportunity to meaningfully participate in matters that affect them (Lombard, 2019:59). This is supported by Patel (2015:91), stating that all relevant role players must be consulted, and citizens should participate meaningfully. It is important in a democracy such as South Africa that the voices of the people are included as this respects their human rights (Lombard, 2019:59). As earlier mentioned, children's right to actively and

meaningfully participate is also captured in the UNCRC (1989), the African Charter on the Rights and Welfare of the Child (1990), and the National Child Participation Framework (2018:10). Their meaningful participation is also reflected in the development of the 2030 Agenda, as there was thorough consultations and engagements with role players and stakeholders, including children, in developing the agenda (UN, 2015b:5).

Citizen's participation in DRR in their communities, can contribute to the development of resilience as evident in the disaster framework indicators for the City of Tshwane (Terblanche, de Sousa & van Niekerk, 2022:8). To be effective, all DRR interventions should be developed in consultation with the affected people (Save the Children, 2015:2). Furthermore, it must reflect the needs of the affected individuals and communities. In the context of this study, children should be actively involved in the child-led DRR.

2.5.5. Bridging macro-micro divide

Micro and macro practice are both important spheres of developmental social work (Lombard, 2019:58). Micro practice focusses on individuals and families, while macro practice addresses broader systems, institutions, and structures (Patel, 2015:98). Developmental social work emphasises the importance of both macro and micro practice to achieve a just society. However, in practice, micro-level interventions remain the dominant mode of social work (van Breda, 2018b:67), with macro practice often being overlooked (Reisch, 2016:258). Sheedy (2013, as cited in Lombard, 2015:494) explains that social workers' practice should not neglect the social institutional structures whilst focusing on individuals' needs. There should be a smooth integration of macro and micro-interventions which will enable service users to receive the appropriate service from social workers (van Breda, 2018b:68). Resilience theory is discussed next as the relevant theoretical framework for this study.

2.6. Resilience Theoretical Framework

In the quest to achieve sustainable development, resilience has become an integral part of DRR legislation, the Sendai Framework (UN, 2017), the 2030 Agenda (UN, 2015) and the Paris Agreement. The Sendai Framework emphasises the importance of strengthening the resilience of individuals and communities as part of disaster risk

reduction (UN, 2017). This is also reiterated in the 2030 Agenda, as it aims to promote the resilience of vulnerable groups to reduce their vulnerability to disasters (UN, 2015).

Therefore, resilience theory was relevant to explore children's perspectives on disaster risk reduction and adaptation to floods. There are different definitions of resilience (van Breda, 2018a:2). As articulated in Chapter One, resilience in this study means the community's capacity to cope with natural disasters and the social system's ability to recover efficiently and adapt from recent disasters (Cutter et al., 2008:558).

Community resilience is context-specific as the socioeconomic circumstances of communities are different (Cannon, 2008:10). Resilient communities have fewer vulnerabilities than less resilient communities (Cutter et al., 2008:601). Cannon (2008:10) explains that to increase the community's resilience, its vulnerability needs to be decreased. Cutter et al. (2008:599) further explain that vulnerabilities are pre-existing conditions in society, while Cannon (2008:6) emphasises the importance of addressing the issues that perpetuate the existence of vulnerable communities.

Communities with unsustainable environmental practices such as illegal waste dumping and deforestation tend to be more vulnerable to extreme hazards, as the practices decrease their ability to be a disaster-resistant community (Cutter et al., 2008:601). Cannon (2008:2) presents five components of vulnerability, namely livelihood strength and resilience, well-being and baseline status, self-protection, social protection, and governance. These components are interdependent and are important in assessing the vulnerability of a community. The crucial component of vulnerability is the strength of community members' livelihoods (Cannon, 2008:16). Whilst it is important to recognise the vulnerabilities of a community, recognising the community's capacity to overcome adversities is equally important as it is known that communities greatly participate in emergency response (Cannon, 2008:1). This demonstrates resilience and capacity in communities. Community resilience is about increasing capacity, social support, and resources that will equip them to respond better to disaster risks and hazards (Mavhura, Manyangadze & Aryal, 2021:1).

In the face of a disaster, communities can become more resilient if they receive the necessary and appropriate planned intervention (Greene & Greene, 2009, 1013). The government have a responsibility to develop strategies for prevention and mitigation of the impacts of natural disasters (Greene & Greene, 2009:1020). Disaster resilience

aims to reduce the impact of disasters on the livelihoods of individuals and communities (Fernando, Ranadewa, Kulatunga, & Keraminiyage, 2023:433).

Children are dependent on others as they do not have their own means to support themselves (Cannon, 2008:4). Research studies tend to focus more on children's vulnerabilities in disasters and not on children's capacities in disasters (Mohammadinia, Ardalan, Khorasani-Zavareh, Ebadi, Malekafzali, & Fazel, 2018:1). As children can engage in disaster risk reduction interventions (Save Children 2015:2), educational programmes on disasters play a crucial role in building their resilience (Mohammadinia, et al., 2018:1). By participation in these programmes and learning about natural disasters like floods, children's resilience can be strengthened.

In summary, resilience theory is relevant to the South African context, as it helps to understand how people in adverse socioeconomic circumstances and resourced constrained environments like Mamelodi East, survive and how they can be empowered for their development (van Breda, 2018a:13). Building community resilience is a long-term strategy that requires programmes and activities aimed specifically at "mitigation, risk reduction and risk management" (Aksha & Emrich, 2020:22).

2.7. Summary

The literature indicates that poverty exacerbates the vulnerabilities of vulnerable groups such as children. Climate change and natural disasters, including floods, have severe effects on vulnerable communities, as they often cannot adjust to climate change and are already exposed to adversities that are worsened by floods. This poses a significant risk to their well-being and sustainable development. Children, being among the most vulnerable, are particularly impacted but excluded from participating in DRR initiatives. This chapter emphasised the importance of children's participation in DRR, a right recognised by the UNCRC (1989) and the African Charter on the Rights and Welfare of the Child (1990).

The chapter further discussed relevant policies and legislation and policies developed in response to climate change and natural disasters. These policies and legislation aim to provide guidelines for disaster risk reduction and management, targeting the government, private sector, and broader communities. They also emphasise the importance of partnerships with stakeholders and affected parties, including children.

Social workers should advocate for the implementation of these policies and legislation. Additionally, the chapter discussed developmental social work as a practice framework for guiding social work interventions in DRR-related matters, informed by the five themes of developmental social work. Finally, resilience theory was discussed as a relevant theoretical framework for the study, providing insight into how communities in dire circumstances, such as natural disasters, can thrive amidst adversity.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research methodology of the study. The chapter begins with a presentation of the research approach, type of research, research design and research methods. The discussion follows with the relevant ethical aspects and finally, the limitations of the study, ending with a summary.

3.2. Research Approach

This study utilised a qualitative research approach, which is utilised to explore a phenomenon in its natural setting (Nieuwenhuis, 2019:59). A qualitative research approach embraces the subjectiveness of reality (Cropley, 2022:9). According to Nieuwenhuis (2019:59), qualitative researchers are interested in studying the interaction between individuals and their environments, the meaning attached to the interaction.

The study was exploratory, exploring the experiences and perspectives of children on flood-related DRR and adaptation in Mamelodi East. Research studies tend to be exploratory in nature when there is limited to no knowledge about a certain phenomenon and when the researcher requires to gain in-depth understanding about a phenomenon being studied (Nieuwenhuis, 2020:61). The qualitative research approach allowed the researcher an opportunity to observe the participants at the research site whilst collecting data.

The research paradigm for the study was constructivism, which is aligned with the qualitative approach (Nieuwenhuis, 2020:66). It provided the researcher an opportunity to explore the subjective meanings developed by participants of their experiences of floods in their community through exploring the meanings from a varied and multiple complex approach (Creswell, 2014:8).

3.3. Type of Research Approach

The study was applied research, and particular action research, which was chosen for its collaborative nature as a mode of enquiry (Ebersöhn et al., 2019:156). Action research is suitable in an educational environment and community settings (Ebersöhn et al., 2019:156). According to Ebersöhn et al. (2019:156), the key characteristics of action research include contributing to creation of new knowledge; promoting

collaboration and participation. These characteristics align with the principles of the 2030 Agenda, specifically promoting of partnerships (Maree, 2019; UN, 2015b).

There are four types of action research namely technical action research, practical action research, participatory action research and emancipatory action research (Ebersöhn et al., 2019:158). The aim of technical action research is to enhance the impact of practice, while the aim of practical action is to contribute to the professional development of practitioners. Emancipatory action research focuses on transforming existing system and contributing knowledge. Participatory action research (herein PAR) focuses on exploring current challenges and emphasises collaborating with participants to find implement changes (Ebersöhn et al., 2019:159).

For this study, the researcher utilised PAR. She collaborated with Viva Independent School learners, allowed them to share their perspectives on flood-related risks and how floods impacted their lives, families, and the broader community (Alaca, Rocca & Maggi, 2017; Save the Children, 2015). The children shared their perspectives on environmental flood risks, and adaptation strategies to mitigate these risks, which will in turn develop their lives, and enable them to prepare for and mitigate the impact of future floods (Save the Children, 2009:1).

3.4. Research Design

Research designs are strategies and practices implemented to study a phenomenon (Creswell, 2009:1). The selection of a research design is informed by the type of research problem or topic being studied and the experiences of both the researcher and the participants of the study (Creswell, 2009:1). In this study the participants' experiences and perspectives on flood-related DRR and adaptation were explored to reduce the impact of future floods.

This research study employed a case study as a research design. According to Nieuwenhuis (2020:89), case study research occurs in the setting where the phenomenon being explored. In this study, that setting is Mamelodi East. The case study design allowed the researcher to gain in-depth understanding of the phenomenon (Edwards, 2019:151; Nieuwenhuis, 2020:89). An exploratory case study design was utilised in this research study. Lucas, Fleming and Bhosale (2018:216) describes exploratory case study design as a design to explore "situations in which the case being evaluated has no clear or single set of outcomes".

The case study design provided the researcher with an opportunity to explore a phenomenon through multiple and different perspectives (Lucas et al., 2018:216). In the case of this research, the researcher explored the experiences and perspectives of the participants on flood-related DRR and adaptation through their selected photos and one-on-one interviews.

3.5. Research Methods

This section discusses the research population and sampling, data collection methods, data analysis, trustworthiness of the data, and the pilot study.

3.5.1. Study Population and Sampling

According to Makofane and Shirindi (2018:34), a population refers to all the possible participants that have certain characteristics that the researcher is interested in. In this study, the children of Viva Independent School were the broad population of interest to the study. The study employed purposive sampling. Etikan, Musa and Alkassim (2016:2) define purposive sampling as an intentional selection of participants based on specific characteristics that they have. Purposive sampling was employed in the selection of the four participants from the Viva Independent School based in Mamelodi East who met the following criteria:

- Agree to voluntary participation.
- Aged 8-12 years.
- Male and female learners.
- Be affected by at least one flood in the past.
- Ability to take pictures with a smartphone.
- Willing to walk in the community to take photos of risks for flooding.

In alignment with purposive sampling, the researcher used her judgement to apply an exclusion criterion to children who indicated that they were suffering from post-traumatic stress after experiencing a flood(s). This criterion aligned with the ethical consideration of causing no harm to the participants which the researcher adhered to when conducting this study (Maree, 2019:48).

At the initial stage of the sampling process, the researchers (fellow students) collectively had an information session with all learners of the school to introduce them

to the study, and explore their interest in participating in the study. The study was explained to the learners through a role play.

The sampling group was selected from grade four, five and six learners. All the learners who met the criteria were given assent forms and informed consent forms to obtain permission from their caregivers to participate in the study. Twenty-eight learners in total participate in the study. A random draw was used to select research participants from different grades. An independent person was appointed by the school to draw the participants' names for inclusion in the study and the draw was conducted in the presence of learners. The school created three boxes per grade (grades four, five and six) with the names of the learners who met the criteria and had received consent to participate from their parents The independent person then drew the names of the participants by drawing a name from each box, so that each researcher's group consisted of at least a grade four, five and six learner. The researcher had four learners as participants, two in grade four, one in grade five and one in grade six.

3.5.2. Data Collection

The researcher utilised photovoice and semi-structured one-on-one interviews for the collection of data. Photovoice is a PAR data collection method whereby photos are used to represent the experiences of the participants (Delgado & Wester, 2020:193) and community members are involved in a process that is facilitated to create stories of change concerning their communities (Kessi, Kaminer, Boonzaier & Learmonth, 2022:354). Photo voicing is a child-friendly tool that enhances the participation of children in research as "peer researchers and change-makers" (Cai, 2017:1174). It further promotes including children in research with different "living realities" (Alaca et al., 2017:1111), enabling the researcher to collect detailed and rich information (Wang & Burris,1997 in Ebrahimpour, Esmaeili, & Varaei, 2018:216). According to Alaca et al. (2017:1112), utilising photovoice as a data collection method has financial implications, more especially when working with a large group of participants. However, the number of research participants for this study was small which mitigated the costs associated with photovoice as the researcher could use one device to collect data.

The participants received a smartphone from the researcher to take pictures of what they saw as risks for floods in the community. The participants walked in the

community observing and using the smartphone on a rotation basis. When one participant identified a picture, they wanted to take, he/she would request the phone, take the picture then return the phone to the researcher who kept the phone until another participant wanted to use it. The participants took turns in this manner until the picture-taking process was completed. Each participant selected three photos from all the photos that he/she had taken to discuss with the researcher in a one-on-one interview.

Semi-structured interviews were guided by a predetermined interview schedule (Welman, Kruger & Mitchell, 2010:167). Nieuwenhuis (2020:108) posits that this type of interview is commonly employed in research projects to corroborate data obtained from other sources. In the context of this study, semi-structured one-on-one interviews were utilised to corroborate data derived from participants', photographs and discussion thereof with the researcher (see Appendix A). Typically, these interviews are not prolonged (Nieuwenhuis, 2020:108) and are based on a predefined line of inquiry established by the researcher (Welman et al., 2010:167).

The interview schedule allowed for additional probing to address vague responses, thereby obtaining more detailed and elaborate information, and maximising the collection of data, while the semi-structure questions helped participants to express their views without restrictions (Mack, 2005 cited by Makofane & Shirindi, 2018:40). However, the researcher actively listened to the participant's responses, allowing for the identification of probing opportunities (Nieuwenhuis 2020:109).

Offering the participants a platform to voice their perspectives on the risks and adaptation strategies enabled them to be active in decision-making and take ownership of the research process, as Kessi et al. (2022:355) emphasise. In addition to the photovoice and semi-structured one-on-one interviews, the researcher made observations at the research site of participants' behaviour, their interactions, and activities while taking photos.

3.5.3. Data Analysis

The reflexive thematic analysis method was utilised to analyse the data obtained from the photovoice and semi-structured interviews. Norwell, Norris, White and Moules (2017:2) define reflexive thematic analysis as "a method for identifying, analysing, organizing, describing and reporting themes found within a data set". The reflexive

thematic analysis method has six phases which involves data arrangement, generating themes from the data, and reporting the findings (Terry et al., 2017:31). While these six phases are presented as linear, the process requires constant back-and-forth movement between them (Norwell et al., 2017:4). The six phases were implemented in this study as follows:

Phase 1: Getting familiar with data

In the first phase, the researcher immersed herself in the collected data (Braun & Clarke, 2006:87). This process included listening to the audio recordings of the one-on-one interviews, transcribing the audio, and reading the transcripts of the interviews and field notes. In this phase, the researcher also began to make notes (Braun & Clarke, 2006:87).

Phase 2: Generating initial codes

The researcher started the process of generating initial codes after becoming fully familiarised with the collected data (Braun & Clarke, 2006:88). The identified data was then colour coded and grouped according to its relevance to each other (Braun & Clarke, 2006:87; Norwell et al., 2017:6).

Phase 3: Searching for themes

In this phase, the colour coded and grouped data was utilised to develop themes (Braun & Clarke, 2006:89; Norwell et al., 2017:8). Themes often reflect recurring raw data that is relevant to the research question (Braun & Clarke, 2006:91). By the end of this phase, the potential main and subthemes were identified.

Phase 4: Reviewing themes

In the fourth phase, the proposed themes were reviewed against the collected data. The themes were fused, or deleted based on the coded data (Braun & Clarke, 2006:92). The final themes accurately reflected the collected data (Norwell et al., 2017:9).

Phase 5: Defining and naming themes

In the fifth phase, the relevance between themes and data was established. Each theme was phrased to give the reader an outline of what will be discussed (Norwell et

al., 2017:10). During this phase, the researcher explored each theme by utilising data from the transcripts and verified by literature.

Phase 6: Producing the report

The final phase of data analysis involved producing this research report, which encompasses the participants' experiences and perspectives on flood-related disaster risk reduction and adaptation. It includes the presentation of findings that are integrated with relevant literature and quotes from the participants. The integration of literature in findings strengthens the arguments presented (Norwell et al., 2017:11).

3.5.4. Data Quality

According to Nieuwenhuis (2019:143), the evaluation of trustworthiness is crucial in data analysis, findings and conclusions (Nieuwenhuis, 2019:143). Four criteria are used to achieve the trustworthiness of data, namely credibility, transferability, dependability, and confirmability.

For Greenwood and Levin (2007) as cited in Burns (2015:192), credibility is concerned about the credibility of the research findings. In this study, the sampling criteria utilised in selection of the participants such as age and location enhanced the credibility of research findings as the participants expressed their perspectives based on personal experiences on floods. Additionally, the research methods employed in this study were aligned with the research question (Nieuwenhuis, 2019:144).

The focus of transferability is to ensure that the findings are valid and that it will yield similar findings when the research study is conducted with different participants (Burns, 2015:192). In this study, the four participants each selected three photos to discuss in the one-on-one interviews about flood-related DRR adaption. The data collection method of photo voicing and one-on-one interviews can be repeated in similar contexts where participants have similar inclusion criteria and would yield similar findings as this study.

Dependability of findings is indicated through the implementation of the research design and data collection (Nieuwenhuis, 2019:145). The researcher provided a comprehensive description of the research methodology utilised to ensure adherence to the criteria of dependability (Morse, 2015; Stenfors, Kajamaa & Bennett, 2020).

According to Nieuwenhuis (2019:145), confirmability is achieved through the triangulation and audit trail process. Triangulation and audit trail assist the researcher to refrain from biasness and ensure that findings are aligned to the data (Nieuwenhuis, 2019:145). This study achieved confirmability by providing a detailed description of the data analysis process, conducted peer debriefing with fellow students and consultations with the research supervisor (Gunawan, 2015; Nowell et al., 2017).

3.6. Pilot Study

A pilot study assists in testing the questions in the interview schedule and other related aspects of the research process, including time and costs (Strydom, 2021:387). Due to safety reasons, all the research participants had to take the photos in a pre-scheduled slot. Furthermore, the interviews for all the participants took place the following day. A pilot study was conducted with the first participant as is acceptable in qualitative studies. However, participants had an opportunity the day before the photo-taking session to practice at the school how to use the mobile phone to take good photos for discussion. Furthermore, the researcher was mindful of the interviewing questions during the first interview in case it needed some rephrasing for the following participants. The researcher found that the learners were struggling to comprehend the questions which were phrased in English due to a language barrier. Consequently, during the interviews, the researcher rephrased the interview schedule questions in isiZulu or SeSotho based on the learner's home language to enhance the learners' understanding of the questions.

3.7. Ethical Considerations

The researcher adhered to the ethical considerations when conducting the study. Ethical considerations are viewed as guidelines that inform the behaviour of the researcher when conducting research (Hasan, Rana, Chowdhury, Dola & Karim, 2021:1). The researcher obtained ethical clearance from the Faculty of Humanities at the University of Pretoria. The protocol number is HUM027/0623 (see Appendix B). The following ethical considerations were applied.

3.7.1. Informed Consent

The researcher obtained signed informed consent and assent forms for all the participants prior to data collection (Babbie, 2017; Du Plooy-Cilliers, Davids & Bezuidenhout, 2014). The assent form was compiled in a child-friendly language to

ensure that the participants understood the research purpose (Maree, 2019:48). The researcher explained the assent form using isiZulu and Sesotho, as these were the languages better understood by the participants. Both the informed consent and assent forms outlined the goal of the study as well as the research process to be followed in the study (see Appendixes C and D).

3.7.2. Voluntary Participation

Participation in the study was voluntarily and the participants were not influenced to participate (Babbie, 2017:63). Furthermore, the participants knew that they would not be compensated for participating in the study. As already indicated, the parents gave consent for their children to participate in the study, who in turn, gave their assent. The researcher informed the participants that they could opt out at any time they wished without any consequences (Maree, 2019:48; Du Plooy-Cilliers et al., 2014; Strydom 2011:116).

3.7.3. Working with Gatekeepers

The researcher sought permission to access the participants from the gate keeper, Viva Foundation South Africa (McFayden & Rankin, 2016:82). Permission was granted by the Chief Executive Officer of Viva Foundation South Africa to conduct the study with learners from Viva Independent School (see Appendix E).

3.7.4. No Harm

The researcher did not foresee any psychological harm to the participants (Babbie, 2017; Hammett, Jackson & Bramley, 2022). However, there were safety risks involved with walking in the community with a smart phone to take photos. Therefore, to ensure the safety of the participants, the learners walked in a group in the community to take photos, accompanied by the researcher, the teacher, and the teacher's assistant. An additional safety measure was to walk near the main road and the school. A debriefing session was conducted after the photo-taking session and each participant was debriefed after their one-on-one interviews. No participant indicated the need for counselling.

3.7.5. Confidentiality

Due to the sampling method utilised in the study, drawing the names of participants from three hats, and walking in the community in a group, the research participants were known to one another. Additionally, the teacher and his assistant knew the

children as they walked with them in the community as a safety measure. Nonetheless, the researcher assured the participants that their responses will be kept confidential. Only the participants and researcher knew which photos they were selected to discuss during the interview. Furthermore, the research report does not contain identifying particulars of the participants, and pseudonyms were used by the researcher (Maree, 2019:48). The interviews were transcribed by the researcher and the transcriptions are safely stored and locked away in password-protected computer files to which only the researcher has access.

3.7.6. Actions of the researcher

The researcher adhered to all ethical considerations by ensuring her behaviour does not compromise the credibility of the study (Du Plooy-Cilliers et al., 2014:269). This was attained through maintaining a co-operative relationship with the participants during the process of data collection to ensure that findings are representative of participants' views (Dockett, Einarsdottir & Perry, 2009:283). The researcher was aware of the power imbalances (since the participants were children) and treated the participants with respect and dignity, and avoided behaviours that were possibly exploitative in nature (Pillay, 2014:197).

3.7.7. Dissemination of research findings

Thyer (2001), as cited by Rose and Flynn (2018:28), describe research dissemination as means to distribute research findings "to those who need and can use them". The distribution should include both academic and non-academic groups, and language used in the research findings should be tailored for each group (Bartlet, 2013 in Rose & Flynn 2018:28). The final research report will be uploaded to the UPSpace website. Additionally, the research findings will be submitted to a journal for possible publication and considered for a conference paper. The findings will also be disseminated to Viva Foundation South Africa and the Viva Independent School community.

3.8. Limitations of the Study

As stipulated under pilot study, the researcher could not fully pilot the study due to safety concerns that the school had with learners walking in the community with smartphones to collect data. The emphasis on safety, which the researcher fully supports as being in the best interest of children, also impacted the time allocated for data collection. Furthermore, the researcher only had one smartphone for pictures and

facilitated the process of participants taking turns to take pictures. The researcher created folders in the smartphone with the participants' pseudonyms and after each photo, the researcher would transfer the photo into each participant's folder. The information and photo-taking session conducted at the school before data collection in the community, counteracted some of the limitations as the participants had a clear view of the research process and what was expected of them.

Furthermore, the questions in the interview schedule were only compiled in English and the researcher had to rephrase them in the participants' home languages after realising that the participants' comprehension of English was limited. The translations resulted in participants misunderstanding some of the interview questions, which in turn influenced full engagement with the researcher. Inaccurate rephrasing and understanding of questions could have contaminated the data if the participants had not fully understood a question. However, the responses were appropriate to the questions which ensured trustworthy data. In hindsight, the research questions should have been translated before data collection into the predominately spoken languages at Mamelodi East in anticipation of the language barrier. If the first participant's photo session and the interview had been transcribed and analysed, the researcher could have been proactive in making the required adjustments by translating the questionnaires in isiZulu or Sesotho in time for the following participants' interviews.

3.9. Summary

This chapter discussed the research approach and paradigm, the type of research and the research design of the study. Furthermore, it presented an overview of the research methodology employed in the research which included the research population and sampling method, data collection methods and data analysis, the trustworthiness of the data, and the challenges in piloting the study. Furthermore, the chapter presented the ethical aspects relevant to the study, and lastly, the limitations of the study were discussed.

CHAPTER FOUR: EMPIRICAL STUDY AND DISCUSSION OF FINDINGS

4.1. Introduction

The chapter presents and discusses the research findings. The research question that guided the study was as follows:

> What are children's experiences and perspectives on flood-related disaster risk reduction and adaptation in Mamelodi East?

The following sub-questions informed the research question:

- How are communities in Mamelodi East affected by floods?
- What factors contribute to floods in communities in Mamelodi East?
- How can these contributing factors 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 flood risks and develop adaptive strategies in the event of future floods?

The chapter begins by presenting the biographical information of the participants. This is followed by three selected photographs per participant are next presented and discussed. Then the themes and sub-themes emerged from the collected data are presented and discussed. Lastly, the chapter ends with a summary.

4.2. Biographical Information of Participants

The four participants all reside in Mamelodi East and are learners at Viva School. The biographical information of the participants includes their age, gender, grade, and the number of floods that they have experienced. To maintain confidentiality, participants were given pseudonyms, namely P1, P2, P3, and P4. A summary of the biographical information is presented in Table 4.1.

Table 4.1: Biographical information of participants

Participants	P1	P2	P3	P4
Age	10	12	11	9
Gender	Female	Female	Male	Female
Grade	4	6	5	4
Number of floods experienced	Three	Two	Five	Two

Table 4.1 indicates that three participants identified their gender as female and one as male. The participants were aged from 9 to 12 years. The while the age of the male participant was 11 years. Two participants were in grade 4, one in grade 5 and one in grade 6. Two of the participants experienced floods twice, one participant experienced floods three times, and one participant experienced floods five times.

4.3. Photovoice

This section presents the photographs selected by the participants from the set of pictures that they took on environmental risks for floods while walking in the community. Each participant took approximately 15 photos and then selected three of them to discuss in one-on-one interviews with the researcher. Since participants shared a phone camera and took photos at the same time in the community, some of the photos were similar. However, participants were unaware of each other's photo selections for the one-on-one discussions, and each interpreted their chosen images independently. The photos selected by the four participants are next presented and discussed individually.

4.3.1. Participant One (P1)

Participant one's (P1) photos focus on waste and its implications for pollution, soil, trees and water flow.

Photo 1 (P1.1)

Photo P1.1 shows the waste that influences the flow of water.

The participant explained her view in the following words:

P1: “I see rubbish and bushes (weeds) blocking the river, the water…cause, papers, this rubbish is blocking water, so water cannot pass to the other bridge and when it is raining, the water will stay in there”.

Photo 2 (P1.2)

Photo 2 (P1.2) shows illegal dumping under a dry bridge which could obstruct water flow during a rainfall event and harm the environment. The participant expressed her experiences and views as follows:

P1: “There is dirt everywhere and where the dirt and water mix, it makes a bad smell… This picture is keeping people, it is telling people to get dirty, “hore batlale dichila ho feta” [to continue dumping rubbish even more], it makes the trees die.

Photo 3 (P1.3)

Photo 3 (P1.3) shows a self-made pedestrian pathway made from recycled material.

The participant explained how the dirty soil hardens, affecting the flow of water:

> P1: "It is a road. This road is blocking the river and the dirt, the soil is blocking the water to pass…This dirt, there are things inside, the green things they make the water dirty, and the soil makes the water dirty and this stops the water to pass and the papers stops the water to pass."

4.3.2. Participant two (P2)

Participant two's (P2) photos focus on both the deteriorating and the lack of important infrastructure.

Photo 1 (P2.1)

Photo 1 (P2.1) depicts neglected municipal infrastructure.

The neglect is linked to a failure to clean the pipes, resulting in soil and debris blocking them, preventing water from under the bridge. The participant expressed this concern as follows:

> P2: "Because this, there is soil and the water can't get through the bridge. There is papers around, they should have closed this thing so that the papers do not go in"

Photo 2 (P2.2)

Photo 2 (P2.2) shows a self-made pedestrian pathway built by community members to help them cross the river.

The participant explained that the sacks obstruct the water flow, a problem further compounded by the trees and debris nearby, which disrupt the natural flow of water.

> P2: "Because there is "masaka" [sacks] in there and the water can't flow properly… There is trees and rubbish next to this, "masaka" and there is a little bit of holes and water can't go just once, the water is squeezing so that it can go to the other side."

Photo 3 (P2.3)

Photo 3 (P2:3) shows a pothole with dirty water, symbolising insufficient road maintenance.

There are papers and rock lodged in the pothole, causing the water to accumulate. The following quote reflects the participant's view:

P2: "Because there is[are] holes in here and the water is stuck… there are papers and the hole is full of water and there is a rock."

4.3.3. Participant three (P3)

Participant three's (P3) photos focus on illegal dumping and lack of infrastructure in the community.

Photo 1 (P3.1)

Photo 1 (P3:1) shows an illegal dumping site in a dry riverbed.

The participant explained that the illegal dumping shown in the picture occurs because people continue to dump waste, even after the area has been cleaned by the participant and others. This ongoing illegal dumping harms the growth of the plants. The participant explained this in his own words:

P3: "Mam, you can see there is rubbish. Some people when we clean like mam people don't give up to throw rubbish and they are destroying the plants that they are growing…"

Photo 2 (P3.2)

Photo 8 (P3:2) shows the self-made pedestrian pathway.

The participant explained how transportation is affected by heavy rains, and then the community adapted by making a path using sacks. However, when the rains are particularly heavy, the sacks and surrounding debris obstruct the water flow. The participant explained this in his own words:

P3: "Mam, because some kids stay at RDP so the transport when there is a lot of rain they cannot pass… ahh mam you can see, water and some there's rubbish there and trees. People even throw rubbish into the water."

Photo 3 (P3.3)

Photo 3 (P3:3) shows some rubbish.

From the participant's perspective, he associated this space with land pollution also with waste burning which harms the environment. The participant expressed the burning of rubbish as follows:

> P3: "As you can see mam, there is rubbish all over and some they burn… It's rubbish and grass. All the rubbish will fall in the river, the river is long, you don't know where it ends. It just goes with the river. They make water pollution."

4.3.4. Participant four (P4)

Participant four's (P4) pictures highlighted illegal dumping and undeveloped land.

Photo 1 (P4.1)

Photo 1 (P4:1) shows an illegal dumping site in the community.

The participant emphasised the risks of waste dumping in the river which blocks the river flow as follows:

> P4: "Because this picture—it has rubbish on the street—and others are throwing rubbish on the street and sometimes, they're throwing on the river… Others they are taking a rubbish and they are throwing in the [ground], when people they are taking the rubbish and they are throwing the rubbish down and doing the rubbish when us are passing on."

Photo 2 (P4.2)

Photo 2 (P4:2) shows unmaintained grass and overgrown trees.

Although the participant did not explicitly state that this poses a risk to water flow, overgrown grass—like waste—affects the movement of water. The participant emphasised the dumped rubbish among the overgrown grass.

> P4: "Because there [is] rubbish…And rubbish when the paper they throw them down because they will be dirty down there will rubbish every time, sometime yes sometimes no. The people they're throwing the rubbish down, when you buy "zimbas" sometimes you buy chips sometimes not buy chips the papers down."

Photo 3 (P4:3)

Photo 3 (P4:3): This photo shows an empty veld with illegal dumping.

Participant Four (P4) was the youngest in this study. The impact of pollution on the community was a major concern for the participants. In this image, she links the harm caused by waste to land pollution, which affects children's play and poses risks to river flow. The participant stated that people play soccer in an empty veld with illegal dumping. The interconnection between humans and the environment is reflected in the participant's words:

P4: "Because it has the trees, the river… Because the people that play the ball [soccer] on the rubbish. Sometimes not."

4.4. Themes and Subthemes

Table 4.2: Themes and subthemes

Themes	Subthemes
1. Contributing factors to flooding	1.1. Illegal dumping of waste 1.2. Poor infrastructure
2. Consequences of flooding	2.1. Damage to property 2.2. Missing school and work 2.3. Environmental degradation 2.4. Health implications
3. Mitigating strategies for reducing flood risks	3.1. Building flood resistant infrastructure 3.2. Clean-up campaigns 3.3. Improved waste removal

Theme 1: Contributing factors to flooding

The findings show that participants are knowledgeable of environmental risks that contribute to flooding in the community. They identified illegal waste dumping and poor infrastructure as key risk factors for flooding in their community. The risk factors are discussed as subthemes.

Sub-theme 1.1. Illegal dumping of waste

The findings indicate that illegal dumping is a contributing factor to flooding. The participants identified the extent of illegal dumping as a risk factor that contributes to flooding, as it blocks the flow of water during rainfall. Illegal dumping occurs both on land (P1.1, P3.1, P4.1) and in the river (P1.2), resulting in pollution of both land and water.

The participants expressed continuous illegal dumping in their community in the following words:

> P1: *"…This rubbish is blocking water, so water cannot pass to the other bridge and when it is raining, the water will stay there. The water is going to be blocked by the dirt here."*

P2: *"…Some people throw rubbish into the water [river] and its stuck next the masaka [sacks]."*

P3: *"You can see there is rubbish. The rubbish is going to move, fall into the river. They make water pollution. Water pollution is like when you throw rubbish into the water [river]."*

P4: *"….the people they're throwing the rubbish down."*

The findings on waste dumping align with the observations of Polasi (2018), and Jakeni, Maphanga, Madonsela and Malakane (2024:1), who state that Illegal dumping is an improper way of disposing of garbage that continues to challenge South African municipalities. Additionally, the findings corroborate those of Echendu (2023), which indicate that illegal dumping contributes to flooding. Several factors contribute to illegal dumping, including urbanisation, socioeconomic status, infrastructure issues, and community perceptions (Grangxabe, Maphanga, Madonsela, Gqomfa, Phungela, Malakane, Thamaga & Angwenyi, 2023:2), as well as poor solid waste management (Wantim, Zisuh, Tendong, Mbua, Findi, & Ayonghe, 2023:2). The finding is echoed by Cutter et al. (2008:601) who mention that the state of the environment such as illegal dumping exacerbates the vulnerability of the community to severe floods.

Subtheme 1.2 Poor infrastructure

The findings reveal that the infrastructure in Mamelodi East is in poor condition. The participants pointed to the lack of a proper municipal bridge, which led to the construction of an alternative pathway by community members (see photos P1.3, P2.2, P3.2). According to the participants, this pathway obstructs the natural flow of water during rainfall, exacerbating flooding in the community and disrupting the daily lives of both children and the broader community. Furthermore, the pathway contributes to water pollution which also contributes to flooding as noted in subtheme 1.1.

P1: *"This road is blocking the river and the dirt, the soil is blocking the water to pass…This dirt, there are things inside, the green things they make the water dirty, and the soil makes the water dirty and this stops the water to pass and the papers stops the water to pass."*

P2: *"Because there is masaka [sacks] in there and water can't flow properly. There is trees and rubbish next to this masaka [sacks] and there is a little bit of holes and water cant go just once, the water is squeezing so that it can go to the other side. [community built this] because there were no bridges and people couldn't cross."*

The findings further indicate that it is not only the walking pathway that becomes obstructed during heavy rainfall and flooding but also vehicle access, as the road becomes impassable which also influences school attendance (see theme 2.2 below). Participant P3 expressed this view as follows:

P3: *"Some kids stay at RDP [houses] so the transport when there is a lot of rain they cannot pass."*

The finding on impassable roads during floods aligns with the findings of Conteh (2015:114), who notes that slippery roads cause vehicles to slip off when attempts are made to pass, as highlighted by Participant P1.

P1: "*At the news other taxis slip because of the water."*

The impassable roads have adverse impacts the daily functioning of the community, as will be discussed in subtheme 2.2 below.

Mamelodi East consists of both formal and informal settlements. Participant P1 pointed out that inadequate housing is another contributing factor to flooding in the community. The houses are clustered closely together, obstructing the flow of water and causing it to accumulate, which leads to flooding in the area.

P1: *"Houses, the houses are too close to each other, the water cannot pass."*

The findings also reveal that the existing municipal infrastructure of Mamelodi East is neglected. Participant P2 captured an image (see picture P2.1) of an open pipe, which appears to be part of the drainage or sewerage system. The waste in the opened pipe indicates that it is clogged, which could contribute to localised flooding in the community.

The findings on poor infrastructure in informal settlements and urban townships are consistent with the findings of Ngcamu (2022) and Williams et al. (2019), who note that residents of informal settlements face inadequate basic services compared to

those in suburban areas. Informal settlements are defined as “unplanned residential areas” (Williams et al., 2019:158), resulting in houses being closely clustered and poorly constructed. They are characterised by overcrowding and a lack of basic infrastructure, such as drainage, sanitation, sewage systems, proper roads, and bridges, which makes these settlements more susceptible to the impact of disasters as they lack the necessary resources fundamental to disaster resilience (Socio-Economic Rights Institute of South Africa [SERI], 2018:12; Ajodhia & Makhanya, 2024:605; Sakijege, Lupala, & Sheuya, 2012:2; Ngcamu, 2022:60; Willimas, et al., 2019:158). The informal settlement of Mamelodi East is located along the banks of the Pienaars River (Nyam, Modiba, Ojo, Ogundeji, Okolie & Selelo, 2024:2), which makes the area particularly susceptible to flooding during heavy rainfall.

In summary, the findings highlight that Mamelodi East is characterised by a lack of essential infrastructure, and the neglect of the existing infrastructure further exacerbates the community’s vulnerability to flooding. The self-made pathway symbolises the dire state of infrastructure in Mamelodi East. Similar to the findings of the study by Ngcamu (2022:62), poor infrastructure exacerbated the severity of the 2022 floods in KwaZulu-Natal and Eastern Cape. This aligns with resilience theory, which recognises that pre-existing conditions such as poor infrastructure pose a flood risk in the community (Cutter et al., 2008:604).

Theme 2: Consequences of flooding

The participants in this study have experienced flooding firsthand and were able to identify its various consequences. They identified factors such as damage to property, missing school or work, environmental degradation, and health implications as significant consequences of flooding in their community. These factors are further discussed as subthemes.

Subtheme 2.1. Damage to property

The findings indicate that flooding often causes significant damage to various types of properties (Munyai, Nethengwe, & Musyoki, 2019:1; Madzivhandila & Maserumele, 2022:193). The findings reveal the impact of previous floods on the participants’ houses, highlighting the poor condition of the existing housing infrastructure. The participants indicated that their houses were damaged during floods, leading to the destruction of household furniture and the loss of personal property.

As reflected in the following quote, flooding causes water to enter homes, resulting in damaging household items such as furniture.

> P2: *"…there was a lot of water and it came inside the house and then it made our furniture wet."*

Findings further reveal that heavy rainfall causes damage to poorly constructed houses, with some being so unstable that their roofs are blown off during storms.

> P1: *"Other houses got damage because the rain was too much, other houses are not too stable and the roof flies with the rain."*

Furthermore, the findings indicate that the floods also damaged the road infrastructure, which in turn led to further damage to people's properties. As discussed in subtheme 1.2, the current state of the road infrastructure is poor due to inadequate maintenance by the City of Tshwane, resulting in significant damage to community members' vehicles.

> P2: *"There is a hole [pothole] in here [street] and water is stuck. There is going to be a lot of water and when it's going to get dry, here it is going to take long because there is a lot of water and it is a hole…Because even cars when they pass through, they can get a puncture."*

Similarly to the findings of Pharoah (2014), informal settlements and state-subsidised housing areas—also known as RDP houses—are highly susceptible to significant flood damage. This is largely due to the poor design and construction of the dwelling, which uses cheap materials that further exacerbate the community's vulnerability to natural hazards such as floods. According to SERI (2018:14), the South African government continues to struggle with addressing the apartheid-era government spatial planning, which contributes to the expansion of informal settlements.

Additionally, the location of these informal settlements exacerbates their vulnerability to flooding in the area (Williams et al., 2019:158) often leading to significant damage to houses. The damage results in the loss of bedding, personal belongings, furniture, food, and clothing (SERI, 2018:12; Drivdal, 2011:9; Mwape, 2009:57). Furthermore, such destruction often leads to displacements of people (Sakijege, et al., 2012:4) compelling them to relocate to alternative shelters provided (Mwape, 2009:57).

Marginalised communities such as in informal settlements have increased floods risk based on their location and lack of resources (UNICEF, 2016:3).

Subtheme 2.2. Missing school and work

The findings indicate that flooding disrupts the functionality of communities. Community members, including children, are unable to cross the river during floods, leading to missing work and school. As discussed earlier in subtheme 1.2, participants mentioned missing school during floods because they could not cross the river, either on foot or by transportation. With no formal bridge, the community relies on a self-made pathway to cross the river. However, this makeshift pathway is low-lying and can easily become submerged, even with normal rainfall. The challenges faced by learners in attending school are clearly articulated in the following statements from the participants:

P3: *"…. because some kids stay at RDP [houses] so the transport when there is a lot of rain they cannot pass."*

P4: *"The river will be full sometimes I am not coming to school."*

These findings correlate with those of Conteh (2015), Mwape (2009:54) and Mudavanhu (2014), who also found that children miss school during floods. The resulting high absenteeism led to poor academic performance, as the loss of learning hours significantly impacts children's education (Mudavanhu, 2014:5). This, in turn, compromises children's right to access basic education as enriched in Section 29 of the Constitution of the Republic of South Africa (1996).

Additionally, the inaccessibility of roads during floods prevents community members from commuting to their workplaces, which can impact their livelihoods negatively resulting in increased poverty (Mudavanhu, 2014:5). According to Cannon (2008:4) people's livelihood is a protective factor against disasters such as floods.

P1: *"My father couldn't go to work…I couldn't go to school…The water is going to go above the masaka and people will not pass and it is going to be difficult for people who are going to cross."*

As discussed in subtheme 1.2, the lack of adequate infrastructure in the community contributes to flooding. The impact of this poor infrastructure is evident in both children

missing school and adults missing work, further increasing the community's vulnerability.

Subtheme 2.3 Environmental degradation

The findings indicate that floods caused significant damage to plants, with participants reporting that plants were destroyed and failed to regrow after the floods. Participant P1 mentioned the soil erosion that affected her family, as soil washed down to their house. This highlights the environmental damage caused by flooding in the community. The following quotes from participants further confirm these findings:

P1: *"Our plants got ruined. We put bricks so it can hold the soil and those bricks moved and soil came down to our house."*

P3: *"Ditlotheba di plants hore de gole coz babeile di chila mo. Ka mokgoa dilo tse dingwe di kase grow up* [It will make the plants to stop growing because of the rubbish here]. *The rubbish is going to move, fall into the river. They make water pollution."*

The findings align with research by Mwape (2009:51) and Musyoki, Thifhufhelweni and Murungweni (2016), who studied the impact of floods on the physical environment. Similarly, Mwape's (2009) study on the impact of floods in Kazunguka District, Zambia, found that 94% of the sampled population reported having their plants destroyed during floods, reinforcing the findings of this study.

Literature also confirms the extensive environmental impact of floods, including water pollution, soil erosion, and flood deposits (Zhang, Li, Xu, Ge, Qian, Li, Sun, Zhang, and Jiao; 2024:1; William, et al., 2019:158). Zhang et al. (2019:158) further note that the survival rate of plants is negatively impacted by flooding, as they are often uprooted or buried by soil erosion and flood deposits. Stagnant water also weakens plants, eventually leading to their death (Aldardasawi & Eren, 2021:44). According to Aldardasawi and Eren (2021) For residents who rely on crop cultivation for their livelihoods, such damage can result in the loss of food resources, increasing vulnerability to poverty (Mwape, 2009: 54).

Subtheme 2.4. Health implications

The findings indicate that floods present significant health risks to children, broader community members, and animals. Participants reported that the floods led to illness, with some community members requiring medical intervention due to being exposed to floodwaters. Additionally, the findings further indicate the tragic loss of life as some people drowned as a result of flooding.

P1: *"It is not good for our health…. Children can drink the water and the water is not good for animals."*

P2: *"People started feeling sick because of the water. Some people went to the hospital because the water went inside their noses and they couldn't breathe. Some people went into the bridges, and there was lot of water and it flew with them."*

Consistent with the findings, several studies have reported that community members are at risk of developing health conditions because of exposure to floodwaters and that disease outbreaks are common in areas affected by floods (Drivdal, 2011; Memon, 2015; Sakijege et al., 2012). Drivdal's (2011) study on the Graveyard Pond informal settlement found that residents contracted illnesses such as influenza, diarrhoea, rashes, and tuberculosis after floods. Additionally, children are particularly vulnerable to contracting diseases during floods such as malaria and cholera as they are more likely to play in stagnant, contaminated water (Sakijege et al., 2012:6; Mudavanhu; 2014:7). The World Health Organisation (2008), as cited by Sakijege et al. (2012:1), states that people living in informal settlements are more vulnerable to ill health, and natural disasters further exacerbate only exacerbate this vulnerability.

Theme 3: Mitigating strategies for reducing flood risks

The participants in this study shared their perspectives on strategies that could be implemented in the community to mitigate the impact of floods. They identified the importance of building flood resistant infrastructure, initiating and participating in clean-up campaigns, and improving waste removal as key measures to help mitigate floods. These strategies are further discussed as subthemes.

Subtheme: 3.1. Building flood-resistant infrastructure

The findings indicate that the participants recognise various types of infrastructure that could be improved in the community. They suggested that houses be built with better

materials to allow water to flow more easily and that roofs should be seal-proofed to prevent water inclusion. Additionally, the participants highlighted the need to repair and improve road infrastructure, including the bridge, drainage systems, and roads, to reduce flooding in the community.

P1: *"Separate the houses….and keep the soil still. I would like that they do a new road, a smaller road and they must do holes under the road and remove the papers. Because this road is also dirty, maybe they can put cement on the road, open holes or put a pipe on a road."*

P2: *"We can put bridges and move away the masaka [sacks]. We can put bridges so water can flow away properly, because when we put masaka it can't…and we can make pipes so that the water can get into the pipes and then we can build so that the water can't get into our houses. We can make the roof to be properly, without holes in it so that the rain must not get in the house."*

The findings align with research by Nyam et al., (2024:8), which emphasises the importance of housing infrastructure in mitigating the impact of flooding. The DROP model proposed by Cutter et al. (2008:604), also recognised the importance of infrastructure being resilient to natural disasters The recommendations provided by participants are aligned with those found in a study by Ebhuoma, Nene and Leonard (2024:6), where residents of Amanzimtoti, KwaZulu-Natal, used sealants on their properties to reduce flood damage. The study also highlighted the need for municipalities to build proper drainage systems to mitigate flood impacts (Ebhuoma et al., 2024:6). Additionally, the work of Adelekan (2016:262) emphasises that both existing and new infrastructure should be climate-proofed to withstand extreme weather events such as floods. This recommendation is echoed by the participants in this study, who noted existing infrastructure needs to be better constructed to address flooding. The findings are supported by Terblanche et al., (2022:8) in their resilience framework indicators for the City of Tshwane, indicating that the municipalities need to sustain their infrastructure to be able to be resilient in the face of disasters such as floods.

Subtheme 3.2. Clean-up campaigns

The participants recommended waste removal as a key strategy to mitigate the impacts of floods. The findings indicate that the participants want to actively participate in cleaning up the community. Additionally, they recognised the shared responsibility of the entire community in ensuring proper waste removal. The participants shared their perspectives:

P1: *"Clean this place, take all the rubbish out."*

P2: *"I would like to clean the mess here and move the masaka and I cut a little bit of trees… They [community] can clean here."*

P3: *"Clean and put in dustbins so that the municipal truck can collect, once a week on Wednesday."*

Similarly to the findings of this study, Adelekan (2016:261) found that community members removed debris from drainage systems to ensure the free flow of water and mitigate flood impacts in the community. Similarly, a study conducted by Wantim et al. (2023:7) found that a clean-up campaign was organised by the local municipality to clear debris along riverbeds to ease water flow. According to Wantim et al. (2023:7), this measure is implemented to reduce the likelihood of flooding in the area. Furthermore, the municipality has implemented an ongoing clean-up campaign, occurring twice a month, where the entire community is encouraged to participate in cleaning their surroundings to ensure the continued flow of water (Wantim et al., 2023:7).

The findings suggest a contradiction in the effectiveness of cleaning campaigns, as Participant P3 indicated that while cleaning campaigns are held in the community, they have not yielded the intended outcomes. Despite the community's efforts to clean, illegal dumping continues because those responsible for dumping the waste are not involved in the clean-up campaigns.

P3: *"When we clean, like people don't give up to throw rubbish… Because it is not them cleaning."*

The findings align with those of Niyobuhungiro and Schenck (2021:4), who found that cleaning campaigns are often unsuccessful as they do not provide a sustainable solution. They further note that new and existing dumping sites tend to reemerge soon after these cleaning campaigns. Similarly, Ngalo and Thondhlana (2023:3) emphasise

that interventions for combatting illegal dumping must be informed by research findings. This view is supported by Malinowski, as cited by Niyobuhungiro and Schenck (2021:4), who argue that illegal dumping will continue unless the underlying causes are addressed.

Subtheme 3.3. Improved waste removal

Based on the findings, the participants are aware of the impact of illegal dumping on the community and how it exacerbates the severity of floods. Furthermore, the participants highlighted the need for improved waste removal services as a means to mitigate flood risks. They suggested that the community should make better use of dustbins by disposing of waste properly. It was also recommended that dustbins be provided to households who do not currently have them. Furthermore, the participants indicated that the City of Tshwane provides a waste removal service that collects the rubbish once a week on a Wednesday. Their perceptions of improved waste removal are as follows:

P1: *"Buy them* [RDP houses section] *bins, they will help people to stop throwing their papers here and throw in bins. The boys who take rubbish…bade kalisa* [they recycle the rubbish] *and bring back your bin."*

P2: *"The community, we can remove the rubbish and put it in dustbins."*

P4: *"Others they will pick them* [rubbish] *up when they are taking the dustbin[s] and throwing in the moving car* [garbage truck]*."*

The findings are supported by a study conducted by Wantim et al. (2023:11), which suggests that solid waste management by the municipality is the most sustainable practice for mitigating the effects of floods. The findings indicate that waste removal services are delivered by local government once a week. However, the study by Ngalo and Thondhlana (2023:9) found that, while waste collection services exist in informal settlements, they are often dysfunctional. This corroborates the findings of Terblanche et al. (2022:3), which highlighted a 14.4% service backlog in refuse removal by the City of Tshwane, leaving the community with no choice to resort to illegal dumping. Waste management plays a key role in preventing illegal dumping as outlined in Schedule 5B of the Constitution of the Republic of South Africa (RSA, 1996), which designates waste management as a local government responsibility. Additionally,

providing basic services to communities such as waste removal strengthens the community's resilience (Terblanche et al., 2022:8).

4.5. Summary

The study presented and discussed the findings of the study. The biographical information of the participants was presented in a tabular according to age, gender, grade and number of floods experienced. This was followed by the photographs that the participants took of the environmental risks of floods whilst walking in the community. Three themes, contributing factors to flooding, consequences of flooding and mitigating strategies for reducing flood risks were presented and discussed. Theme one discussed the factors which the participants attributed as contributing factors to flooding in the community, theme two discussed the consequences of flooding in the community based on the perspectives of the participants and the third theme discussed the participants proposed mitigating strategies for reducing flood risks in the community.

CHAPTER 5: KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter concludes the research study. The chapter begins with the presentation of how the goals and objectives were achieved, the key findings and conclusions are subsequently discussed, followed by the recommendations made by the researcher based on the study's findings.

5.2. Goal and Objectives of the Study

The goal of the study was to explore children's experiences and perspectives on flood-related DRR and adaptation in Mamelodi East. The goal was achieved through the following objectives:

Objective 1

- To explore how communities in Mamelodi East are affected by floods.

This objective was achieved in Chapter 4, under theme 2, consequences of flooding, the participants shared their experiences and perspectives on how their community was affected. Four subthemes emerged from theme 2: damage to property, missing school or work, environmental degradation and health implications. The participants described their own experiences of how they were affected by floods and how the community was affected based on their observations. The findings indicate that floods are disruptive, causing damage to properties, including homes and road infrastructure. This damage led to the destruction of furniture and the loss of personal belongings. Furthermore, the floods disrupted the daily functioning of the broader community. Commuting to school or work was impossible as the absence of a formal bridge meant the river could not be crossed, either on foot or by transportation. Environmental degradation such as soil erosion and damage to plants, was observed by participants following the floods. Additionally, there were health complications, including loss of life, and some community members that required medical intervention.

Objective 2

- To determine the factors that contribute to floods in communities in Mamelodi East.

The objective was accomplished in Chapter Four, under theme 1: contributing factors to flooding, as reflected through photovoice. Participants selected and discussed photographs they took of environmental flood risks whilst walking in their community. The photos were analysed, and participants shared their views on how they depicted potential flood risks in their community. The key factors included limited, and poorly maintained infrastructure, and illegal waste dumping that contributed to land and water pollution. Waste obstructs water flow which contributes to flooding. Participants emphasised the lack of infrastructure in the community, noting the absence of a formal bridge to cross the river, the clustering of houses, and inadequate maintenance of existing municipal infrastructure, such as roads, sewage, and drainage infrastructure.

Objective 3

- To determine how risk factors for floods can be reduced in Mamelodi East.

The objective was accomplished in Chapter Four, under theme 3, mitigating strategies for reducing flood risks. Participants shared strategies to mitigate the flood risks identified in their community. The findings suggest that improving waste removal services would help reduce illegal dumping. Furthermore, community members without dustbins should be provided with them to prevent illegal waste dumping. Clean-up campaigns to address illegal dumping sites in the community were also recommended. Additionally, the findings highlight the need for flood-resistant infrastructure in the community.

Objective 4

- To explore how communities in Mamelodi East can be better prepared for future floods.

This objective was also achieved in theme 3, mitigating strategies for reducing flood risks. Three subthemes emerged: building flood-resistant infrastructure, clean-up campaigns, and improved waste removal in the community. The findings suggest that the current infrastructure should be upgraded to be flood-resistant. Additionally, the waste removal services should be improved to help mitigate illegal dumping in the community.

Objective 5

- To make recommendations on procedures for children, their families, the school, and the community to work together on reducing flood risks and developing adaptative strategies in the case of future floods.

This objective is addressed in Chapter Five, the researcher presents recommendations based on the findings from Chapter Four.

5.3. Key Findings of the Study and Conclusion

This section presents and discusses the key findings of the study. The three key findings are: contributing factors to flooding in the community, the consequences of flooding, and strategies for mitigating flood risks.

5.3.1. Contributing factors to flooding

The findings indicate that illegal dumping of waste, which leads to water and land pollution, and poor infrastructure are key contributing factors to flooding in Mamelodi East. The severity of illegal dumping was evident in the photographs taken by participants, showing waste in vacant land, the river, and its bed. The continuous dumping constructs water flow, contributing to floods. Additionally, the community lacks adequate infrastructure, including a formal bridge for crossing the river. Residents rely on a self-made pathway, which also restricts water flow. Furthermore, the clustering of houses in the community limits space for water to flow exacerbating flooding.

In conclusion, participants are informed of the implications of the environmental flood risks in their community. The photographs reveal multiple illegal waste dumping sites, neglected municipal infrastructure and a lack of necessary infrastructure, all of which suggest poor service delivery in the community. Children's perspectives on environmental flood risks align with the literature and resilience theory, which indicates that inadequate basic service delivery and poorly constructed houses in informal settlements exacerbate vulnerabilities.

5.3.2. Consequences of flooding

Based on the findings, the floods disrupted the lives of both children and the broader community. Participants indicated that children living across the river were unable to cross and attend school, disrupting their education. Furthermore, community members could not commute to work, affecting their livelihoods. The floods also damaged infrastructure. Including homes and roads, leading to the destruction and loss of

personal belongings. Health implications were also noted, including loss of life and health complications that require medical intervention. Additionally, the environment suffered, with plant damage and soil erosion caused by the floods.

In conclusion, the participants have personally experienced floods, enabling them to identify their impact on the community. Their lived experiences have provided them with a deep understanding of how floods affect personal lives, families, livelihoods, infrastructure, education, health, and society at large, making the community vulnerable to further floods. This insight also means that they are aware of the necessary actions to reduce flood risks and have shared views on how to mitigate these risks in their community.

5.3.3. Mitigating strategies for reducing flood risks

The participants identified several strategies for reducing flood risks based on the contributing factors and impacts of floods. The findings indicate that the improvement of infrastructure to be flood-resistant is a critical strategy. Additionally, improving waste removal services, a responsibility of the local government is necessary to mitigate the prevalent illegal waste dumping, which poses a flood risk. Furthermore, the findings suggest that initiating and implementing clean-up campaigns targeting illegal dumping sites would help address this issue in the community.

In conclusion, the participants recognise that to mitigate flood risks, factors such as poor infrastructure and illegal waste dumping must be addressed. The strategies they proposed demonstrate their agency in providing solutions to reduce vulnerabilities in their community, thereby enhancing its resilience. Furthermore, these proposed strategies align with the literature, which indicates that children's meaningful participation in processes can yield in desired outcomes.

5.4. Recommendations

The following recommendations are based on the findings and are presented in this section. They include ways in which children, their families, the school, and the broader community can collaborate to reduce flood risks and develop adaptive strategies for future floods. Additionally, the role of social work will be integrated into these recommendations to support and strengthen community efforts in addressing these challenges.

5.4.1. Educational awareness on the impact of illegal dumping of waste

The community faces a challenge with illegal waste dumping, which contributes to environmental and health issues. Waste dumping blocks water flow and blocks water flow and clogs drainage systems, exacerbating flood risks and increasing vulnerability to natural disasters like floods. It also results in land and water pollution, which has adverse effects on the health of community members and leads to environmental degradation.

Social workers have a crucial role in raising awareness and providing education to community members about the harmful effects of illegal waste dumping. By initiating and implementing educational campaigns, social workers can help the community, including children, comprehend the environmental and health impacts of waste dumping in their community. These educational awareness campaigns should highlight the significance of proper waste management and the interrelatedness of illegal waste dumping and the community's flood risk. The school can mobilise families and the broader community to participate in educational awareness campaigns aimed at mitigating environmental risks, such as illegal waste dumping. These campaigns would help reduce illegal dumping and, as a result, have positive outcomes for the community, fostering meaningful participation from all members, including children.

5.4.2. Advocate for resilient and improved infrastructure

The findings indicate that Mamelodi East is characterised by poor, unmaintained and inadequate infrastructure, which significantly exacerbates the community's vulnerability to flooding. as the lack of a proper drainage system and poorly designed houses, which often collapse during floods due to their lack of resilience, are key contributors to the impact of floods. Building resilient infrastructure requires careful consideration of land use and town planning, to ensure that housing development allows for the free flow of water during rainfall (Wantim et al., 2023:239).

Furthermore, roads within the community should be equipped with stormwater drains to prevent stagnant water and flooding. Effective land use and town planning would direct water to retention ponds or nearby rivers, reducing the risk and severity of flooding. Social workers should advocate for community members, and in particular children, to live in a safe environment. The development of resilient infrastructure

might help reduce vulnerabilities, ultimately reducing the impact of flooding on the community.

5.4.3. Local and provincial government to improve the provision of basic services

The findings indicate a significant lack of basic service provision, as evidenced by the widespread illegal waste dumping and the neglect of municipal infrastructure prevalent in the community. The community resorted to building its own crossing pathway over the river. Furthermore, there is a lack of proper town and spatial planning in Mamelodi East.

Based on these findings, it is recommended that local and provincial governments, in collaboration with the broader community, including the school and social work, improve and upgrade the existing infrastructure. This would reduce the community's vulnerability to flooding and the potential loss of life, homes and personal belongings. Upgrading the stormwater drainage system, addressing illegal waste dumping, ensuring efficient waste collection, and constructing a bridge to provide safe access across the river are key actions. Social workers could actively advocate for the improvements, supporting community mobilisation efforts, and ensuring that community members, including children, are included in making decisions. Schools can also partner, and raise awareness about proper waste management and infrastructure development, further supporting the call for change.

5.4.4. Promote children's participation

It is recommended that children's participation be promoted, as literature (see National Child Participation Framework, 2018:10; UNCRC, 1989, African Union, 1999:9) indicates that their views are valuable and should be considered in matters that affect their lives. Social workers and community members should encourage children to participate in addressing environmental flood risks. The findings show that children are well informed of these risks and their implications for the community. Involving children in disaster risk reduction and management discussions would be beneficial both now and, in the future, as it will capacitate them with the necessary knowledge and skills. Children can participate in various ways, such as voicing their opinions, engaging in clean-up campaigns, and advocating for their right to live in an environment that is clean and safe.

5.5. Future Research

It is recommended that future research focus on improving waste removal services in informal settlements and townships, as it was identified as a key strategy for mitigating flood risks. Given that waste management is a basic service and a significant issue in the community but also across South Africa, it highlights a critical area for improvement. Social workers have an essential role in such research by advocating for the inclusion of vulnerable groups—particularly children—and ensuring their voices are taken into consideration in the development of waste management strategies. Through this involvement, social workers can ensure that the strategies address the needs of children and other vulnerable groups, helping them to protect themselves from the adverse impacts of poor waste management and flooding.

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Appendix A

Interview Schedule

SECTION A: BIOGRAPHICAL INFORMATION

1. How old are you?

8	9	10	11	12

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

1

- 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

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100
Since 1919

20 July 2023

Dear Miss SC Mazibuko

Project Title:	Children's perspectives on disaster risk reduction and adaptation: The case of floods in Mamelodi East
Researcher:	Miss SC Mazibuko
Supervisor(s):	Prof A Lombard
Department:	Social Work and Criminology
Reference number:	22846825 (HUM027/0623)
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

Room 7-27, Humanities Building, University of Pretoria, Private Bag X20, Hatfield 0028, South Africa
Tel +27 (0)12 420 4853 | Fax +27 (0)12 420 4501 | Email pghumanities@up.ac.za | www.up.ac.za/faculty-of-humanities

Appendix C

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho
Department of Social Work & Criminology

08 June 2023

Researcher: Simphiwe Clamentine Mazibuko
E-mail: phiwemm@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

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Appendix C

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 076 787 1945 or email her at: phiwemm@gmail.com

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Appendix C

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

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Appendix D

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho
Department of Social Work & Criminology

10 June 2023

Researcher: Simphiwe Clamentine Mazibuko
Tel: 076 787 1945
Email: phiwemm@gmail.com

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

CHILD ASSENT

Hello 

My name is Simphiwe Mazibuko, I am a postgraduate student in the Department of Social Work & Criminology at the University of Pretoria. I am doing research on the topic, "Children's perspectives on disaster risk reduction and adaptation: The case of floods in Mamelodi East". I invite you to participate in the study. I am interested to hear what you suggest can be done to reduce risks for floods in Mamelodi-East and how to adapt to the environment before and after a disaster has occurred. 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 should be done to reduce the risks and adapt in times of flooding. I would also like to hear how you think children, their families and communities can work together to help reduce the risks for floods and develop adaptation strategies to cope with such a disaster.

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What to expect?

If you agree to participate in the study, you will be asked to take pictures with a smartphone on what you see as factors contributing to floods in your community and how these contributing factors can be reduced. You will join two other learners who also took photos in their communities in a group to discuss their photos and perspectives thereof. You will decide which picture you want to select which will be printed for discussion in the group. You will share your views on what the selected picture means in relation to risks for flooding in Mamelodi East and how you see these risks being reduced in your communities. 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 photos that you have selected in my research report. We will have group discussions of more or less an hour at a time so that it does not become too tiring for you to participate. We will continue having group discussions until you have no more views to share in the group on the photos and related questions.

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 that make you feel uncomfortable. If you are asked any questions during the interview that you do not want to answer, you can freely say so. After we have discussed the photos, I will give you an opportunity to say how you have experienced the discussion and your participation. In the case where you feel upset and saddened by discussing floods and challenges, 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

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them are heard and considered to influencing policy changes for disaster risk management. 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 in the community.

What rights do I have? 

Participation is voluntary. This means that even though your parents agreed 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. Furthermore, if you withdraw from the study, you do not have to give any reason for your decision.

Who will know that I joined the study? 

Your parent(s) or guardian(s) gave permission for you to participate in the study and they will know that you are part of the study. Various people at your school, including your teacher, teaching assistant and other learners will know that you participate in the study. Other children from your school will also participate in the study and hence some will see you in the focus group discussions. You will work with me and other learners in the group to analyse and interpret the research findings which I will use to write a research report 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 076 787 1945 or send me an email at phiwemm@gmail.com

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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

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Appendix E

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.

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 study and will participate in data analyses, the drawing of findings and conclusions and making recommendations from the study. We avail ourselves to assist and accommodate the participants for the duration of the study and possible follow-up visits and activities thereafter.

It is a privilege for the Viva Foundation to be granted the opportunity to be involved in this valuable study and I am confident that the outcome will be of ultimate benefit to our school, its learners and the community of the Alaska Informal Settlement, Mamelodi East and other similar communities.

Best regards

Meleney Bough Kriel
CEO Viva Foundation SA, UK, DE
Tel. +27 (0)79 954 4426

Appendix F

KUKU COMMUNICATION & CONSULTANCY
For all your language editing needs

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

03 April 2025

To whom it may concern

LANGUAGE EDITING – SIMPHIWE CLAMENTINE MAZIBUKO

This letter confirms that the mini-dissertation, *Exploring children's experiences and perspectives on flood-related disaster risk reduction and adaptation in Mamelodi East* for Simphiwe Clamentine Mazibuko, student number 22846825, was submitted to me for language editing.

The thesis was professionally edited. Track changes and suggestions were made in the document, which, if Simphiwe Clamentine Mazibuko followed, would result in a thesis with high-standard English.

Yours faithfully

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

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