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EVALUATING THE STATE'S RESPONSE TO FLOODING DISASTERS: THE CASE OF DEELPAN VILLAGE EMERGENCY HOUSING

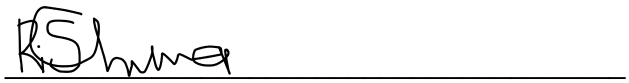
MASTER OF URBAN STUDIES (HOUSING AND HUMAN SETTLEMENTS)

Chuma Rirhandzu NO.368922 **June 2024**

PLAGIARISM DECLARATION

I hereby declare that this research report is my own work and that all the sources that I have used or quoted have been indicated and duly acknowledged by means of complete references.

It is submitted in fulfilment of the requirements for the degree of Masters of Urban Studies (Housing and Human Settlements) at the University of the Witwatersrand, Johannesburg. The work has not been submitted before for any degree or examination at any other University.



Signature

On 18 Day of June 2024

ABSTRACT

Over the past few years, South Africa has been struggling with managing flooding episodes. From a housing point of view, one then worries about the living conditions of the poor people who do not have the necessary resources to recover from the effects of the disaster, like the people of Deelpan Village in the North West province. To obtain data for this research, I analysed secondary data in relation to disaster management, housing, and planning accessed from government websites. I also conducted a total of 18 semi-structured interviews with the officials and community representatives who were actively involved in the Deelpan Village emergency housing project. This study revealed that the people of Deelpan preferred permanent housing structures over temporary solutions; hence, the Temporary Residential Units have not been provided. The study concluded that the Deelpan residents rejected TRUs for permanent structures due to fear of state failure. Three years after the 2021 flooding, no housing support has been provided by the state, indicating a lack of resources to handle disasters.

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LIST OF ACRONYMS

EIA ……...……...Environmental Impact Assessment

GIS ……..…Geographic Information Systems

HDA …….. Housing Development Agency

HREC…….Human Research Ethics Committee

IDP ……Integrated Development Plan

LUMS …….. Land Use Management Scheme

NEMA ……..….. National Emergency Management Agency

NHBRC ……..…….. National Home Builders Registration Council

NGO ……..……..Non-Governmental Organisation

RDP ……..…..Reconstruction Development Programme

SDF ……Spatial Development Framework

SPLUMA ……Spatial Planning and Land Use Management Act of 2013

SCM …… Supply Chain Management

TRUs ……..…….. Temporary Residential Units

USA ……..……..… United States of America

WULA ……Water Use Licence Application

1. CHAPTER ONE: INTRODUCTION

1.1 Introduction

This research evaluates the state's response to provide housing support, in particular the Temporary Residential Units (TRUs), after the 2021 flooding episode in the Village of Deelpan (per figure 1 reflected below). This village is found in the town of Delareyville, within the jurisdiction of Tswaing Local Municipality, in the North West Province.



Figure 1.1: Locality map indicating the Deelpan Village. Source: Google Map

Deelpan Village is predominantly surrounded by river streams and wetlands. Over the years, the village has experienced seasonal heavy rainfalls (mostly in the summer season), which did not result into floods and did not significantly impact the community. However, this has changed since December 2021, as the village has been experiencing continuous rainfall, which is torrential in the summer season. During this time, the heavy rains fill the river streams and wetlands then overflow into the households, which results in flooding events. The North

West Department of Human Settlements confirmed during the research interview that over the past 2 years, approximately 2000 households have been affected by the floods, with over 800 households significantly submerged , and whose houses were severely damaged and inaccessible.

The Tswaing Local Municipality relocated the community members whose households suffered severe damage into community buildings such as the Deelpan Church and the Tribal Hall (Parliamentary Monitoring Group, 2022) as a short-term response measure. This response is neither sustainable nor effective, as these spaces are not habitable for extended periods of time. According to Song, Mithraratne & Zhang (2016) temporary housing is essential to recovering from a disaster since there is a sudden demand for numerous units in a short amount of time. The immediate response (e.g., relocation to community halls) was provided in Deelpan Village, while it was anticipated that TRUs would be provided by the state in an incremental manner as part of an emergency housing relief programme. Meaning the support would be provided in a gradual manner from short, medium to long term.

Medium-term support refers to the provision of temporary structures, which are usually in the form of temporary tents and units typically constructed using interim materials such as steel and wood instead of bricks and cement. These structures would then provide a more habitable environment for the community. As per the National Department of Human Settlements (2009), the purpose of the temporary structures is to offer liveable housing for a period of five years, until such time as a long-term permanent housing structure is provided (either by the owners or the state).

The research study originates from the perspective that the provision of TRUs is a crucial element of disaster recovery for poor communities. Thus, this research interrogates the challenges that led to the non-provision of the TRUs to the Deelpan community following the 2021 floods. This first section seeks to introduce the research and is followed by the background, which provides the context of the study. The problem statement is provided in section 3 and the rationale is explained in section 4. The objectives of this research study are provided in section 5, while section 6 provides the key questions that the research seeks to query. These questions are followed by the expected research findings which is captured in section 7.

1.2 Background

Sustainability calls for development that take into consideration the needs of current and future generations. It entails maximising available resources by developing on land that is near amenities and accessible to bulk services. In many cases, such land is costly compared to land in the periphery with no access to bulk infrastructure and amenities. Thus, "poor people tend to build houses and live in flood-prone areas as those areas are considered affordable" (Mensah & Ahadzie, 2020: unpaginated). As a result, the less fortunate (such as the Deelpan community) are compelled to occupy land that is unsuitable for development and human habitation, such as land along the floodplain.

Some incidents, such as the 2022 KwaZulu-Natal flooding, had a huge impact on the community as many lives were lost, which resulted in many unclaimed remains at the mortuaries. The disaster damaged graves and exposed human remains at cemeteries. Meanwhile, there were other damages experienced by the KwaZulu-Natal province, such as infrastructure, personal property, business-related, insurance, etc., and some not so tangible, like trauma and community distress without support. (PMG, 2022). In the case of Deelpan Villages, many properties were damaged and submerged where they were not accessible; furthermore, road infrastructures such as roads and bridges were also impacted, which affected the community's mobility during the flooding days.

According to Adefisoye & Agagu (2020), the state generally delays providing residential support post-disaster. Post-hurricane Katrina in the United States of America (USA), for instance, the provision of temporary shelters was delayed due to the confusion of roles and responsibilities between the different states (Nigg, Barnshaw, & Torres, 2006). Studies have found that delays in providing TRUs are associated with various challenges, such as delayed purchasing of the required materials, as discovered by Davis (1977). Bolin & Stanford (1991) and Quarantelli (1995), found challenges in relation to a lack of coordination, whereas Johnson (2007), discovered that the delays were associated with challenges of land unsuitability. Due to these reasons, the provision of TRUs was delayed in the cities of Kalamata, Greece, Turkey, and Japan after the earthquakes and flooding disasters (Johnson, 2007). Considering that some of these numerous studies were undertaken more than four decades ago, focusing on different locations, the provision of TRUs continues to be delayed. One is interested in understanding the reasons for the continued delayed provision of TRUs. This study evaluates the readiness in terms of the pace to respond after a 2021 flood and the challenges faced by the state that led to the TRUs not being provided to the Deelpan community.

1.3 Problem Statement

The state's response to the Deelpan Village floods is inadequate and has led to the non-provision of TRUs to the community. It has been almost three years since the Deelpan community was impacted by the flooding episode in December 2021. This is a problem since the community members who were severely affected by the floods still reside in the inhabitable immediate relocation shelters as they wait for the TRUs to be provided by the state. Poor communities like Deelpan Village frequently lack the means necessary to recover from the effects of a disaster. As a result, the community relies on the government to provide access to habitable residential support, such as temporary residential structures, to rehabilitate their living conditions. The challenge, therefore, lies in the time it takes for the state to provide the support needed by the community.

The state delays responding after a disaster while the lives of the affected communities remain in catastrophic conditions. After flooding episodes, community infrastructure, such as houses are destroyed, leaving vulnerable people without habitable shelter. The Deelpan emergency housing project was declared one of the disaster projects in April 2022 by the Minister of Cooperative Governance and Traditional Affairs. It has been almost three years since the flooding episodes, and no housing support has been provided by the state to the people of Deelpan.

1.4 Rationale of the Study

The rationale of the study is to examine whether processes and procedures may have been done differently to achieve an efficient outcome for the Deelpan emergency housing project.

As a Housing Development Agency official who has been involved in the Deelpan emergency housing project, I played a role in identifying suitable land for the relocation of the affected community members. I am interested in undertaking a closer introspection into the preparedness of the state to provide the required support. The justification of the study is to establish the reasons behind the non-provision of TRUs by the state to the Deelpan community.

1.5 Research Objectives

The objectives of the study include the following:

- The key objective of the study was to evaluate the measures put in place in response to flooding and further evaluate whether the state had the necessary resources to respond to a flood disaster.
- Loopholes that led to the non-provision of TRUs to the Deelpan community were established.
- Lessons learned from the Deelpan emergency housing project were drawn and provided recommendations for improvements on similar projects in terms of disaster-related emergency housing support.

1.6 Research question and sub-questions

The main question of the research study was:

What are the reasons for the lack of provision of TRUs to the Deelpan Village after the 2021 flooding episode which occurred almost three years ago?

Whilst the sub-questions of the research study included the following:

- What policies and implementation frameworks are in place for the state to respond to disasters, in particular flooding?
- What is the expected turnaround time for the state to provide TRUs after such a disaster has occurred?
- What caused delays in the provision of TRUs to the Deelpan community?
- What type of support was required by the Deelpan community and ultimately provided by the state after the 2021 flooding occurred?

1.7 Outline of the research report

The introduction chapter serves as the first of five chapters that make up this report. The aim of the first chapter was to familiarise the reader with the study at large. The most significant work done regarding the research theme was reviewed in Chapter 2, along with a review of essential and relevant scholarly literature. Furthermore, the report's key terms and concepts were defined in this chapter. A brief review of the motives for residing along floodplains and

wetlands, as well as their implications is provided. This is followed by an in-depth review of relevant legislations and policies related to the research theme. To conclude this chapter, the research conceptual framework is presented.

The research methodology chapter (Chapter 3) presents the essential steps, methods and techniques employed and undertaken to conduct the study. Meanwhile, the fourth chapter provides the research findings and discussions. Lastly, chapter 5 draws conclusions from the findings and makes appropriate recommendations.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The objective of this literature review chapter is to provide insight into the key variables that have been studied in relation to the subject of evaluating the state's response to flooding. To accomplish this, major topics are identified and summarized.

To present this literature chapter, the following sections are discussed: the key concepts are defined, and the motives for residing along floodplains and wetlands are discussed. An insight into the implications of residing along wetlands is provided. This is followed by discussions on the legislation and policy reviews on disasters and TRUs. The types of emergency housing support post-disaster as well as the effects of the non-provision of TRUs are also deliberated. A section of the best and worst-case examples of how to respond to flooding is provided. This is followed by a discussion on the challenges faced by states post-disaster, and a section on moving towards innovative disaster risk mitigation mechanisms is provided. The last section presents the conceptual framework.

2.2 Key concept definitions

2.2.1 Defining disasters

A disaster has been defined by several authors as an unexpected accident or natural calamity that causes extensive damage (International Federation of Red Cross and Red Crescent Societies, 2003; Mvuyana, Mbambo & Ntshangase, 2020). This definition has been further expanded by Agha and Szpytko (2020) who define a disaster as a significant disruption to the normal functioning of a community or society that causes extensive losses and damages in terms of people, property, assets, or the environment, greater than what the affected community or society could reasonably repair with its own resources.

In terms of South African legislation, a disaster is defined as "a progressive or sudden, widespread or localised, natural or human-caused occurrence which causes or threatens to cause death, injury, or disease; damage to property, infrastructure, or the environment; or disruption of the life of a community" (Disaster Management Act, 2002:6). Furthermore, according to Agha and Szpytko (2020), there are different types of disasters, ranging from tropical cyclones, intense heat or cold, flooding, earthquakes, and also man-made disasters such as accidents and war.

It should be noted that the primary emphasis of this research is the flooding disaster. Tasantab (2019) defines flooding disaster as the overflow of water onto normally dry areas, which is usually caused by heavy rainfalls of longer durations and ultimately results in catastrophic losses and disruptions to lives. In this research, I define a flooding disaster as a disruptive, unexpected overflow of water into settlements that are situated along wetlands and flood lines as a result of continued heavy rainfall.

2.2.2 Causes of flooding and its impacts

Flooding is caused by a variety of factors. The main factor is heavy rainfall, as mentioned above. However, human activities are also blamed for the flooding. Firstly, floods can be caused by human actions and as a result of climate change, which causes unpredictable weather changes leading to heavy rains, some of which communities cannot cope with due to inadequate stormwater drainage infrastructure and other matters. Secondly, vegetation cover leads to soil erosion and increased flooding in the long run (Liu, Huang, Xie, Wang, Leng, Huang, Wei & Wang, 2019). Thirdly, Şen (2020) states that land siltation decreases lake sizes, resulting in a reduction in flood storage capacity; and the construction of levees (dams, canals, etc.) causes flood levels to rise due to limited flood discharge capacity. Lastly, floodings are caused by insufficient drainage infrastructure and poor maintenance of drainage infrastructure, which limits water flow and increases flooding capacity (Mensah & Ahadzie, 2020). Similar to the case of Deelpan Village, where the key causing element was heavy rainfall, which has been exacerbated by the fact that Village is surrounded by wetlands that expands into the built-up area during prolonged rainy seasons.

Flooding episodes affect numerous places in different ways. A disaster impacts the community's livelihoods by claiming human lives, destroying food stocks and infrastructures (Dube, Mtapuri & Matunhu, 2018). According to Douglas (2017:34) “poor people are usually far more vulnerable to floods and their impacts than those who have more financial resources”, this is due to their inability to cope with the effects of disasters. Similar flooding impacts have been recorded in Ghana, where 3.9 million people were impacted by flooding during the year 2015. These people were directly impacted by the floods in different ways, ranging from numerous causalities to an estimated death toll of 550 and $780 worth of economic damage (Tasantab, 2019). In China after the 2008 earthquake, the disaster impacted an area extent of 440,400 km², resulted in a death toll of 69 227 people and an economic damage worth of 845 billion yuan (Du, Zhang, Xu, He, Lai, Li, Kimura, Hayashi, Hosokawa, and Sakurada, 2015). Aside from these measurable variables, the distress, trauma, and health risks caused by catastrophic disasters are rarely discussed (Tasantab, 2019). When flooding episodes

strike, the affected communities predominately require Temporary Residential Units to serve as accommodation for a particular period; this is further defined in the next sub-section.

2.2.3 Defining Temporary Residential Units

From a global viewpoint, there is no uniform definition for temporary or emergency housing, but different authors have offered definitions from the perspective of time, where it is described as housing intended for a limited duration (Gibberd, 2020; Atmaca, 2017 & Peacock, Dash, Zhang and Van Zandt, 2018). According to Wagemann (2017:1) "the term ‘temporary’ refers to a building that will be used for a defined and short lapse of time".

Emergency housing is a disaster response which is aimed at accommodating displaced households and allowing them to resume their lives as quickly as possible following an event (Gibberd, 2020). After a disaster, most affected communities need to seek alternative accommodation while permanent housing solutions can be established; thus, according to Peacock et al. (2018), temporary residential housing is a phase in the procedure of rehousing post-disaster. In order to adequately define temporary housing, Quarantelli (1995) has made a distinction between ‘sheltering' and ‘housing’. Temporary ‘housing’ may take the shape of shacks or a prefabricated structure, depending on the circumstances, which is the medium-term support. In this instance, temporary housing is defined as the resumption of regular life routines, even though the affected families will be residing in temporary dwellings, hopefully anticipating a more permanent solution (Quarantelli, 1995). This definition is in line with Atmaca (2017), who alludes to the fact that temporary residential housing (housing units that are typically built from interim material) is the location where victims may temporarily reside, typically for a period of six months to five years. This is the definition of TRUs that this study adopts.

Meanwhile, sheltering is referred to as the process of residing in a place during the immediate aftershock of a disaster, in which regular everyday routines and activities are suspended. In support of this, Gibberd (2020) writes that an urgent response, emergency shelter is provided, which may include temporary housing in a school, a hall, or under plastic sheeting. In this research, ‘sheltering' is referred to as an urgent, immediate, and short-term response, whereas ‘temporary housing’ is referred to as the Temporary Residential Units (TRUs), which is the medium-term support provided in an incremental manner with expectation of a longer-term support to be provided in the future. The community of Deelpan has been waiting for the ‘temporary’ support to be provided by the state. While the causes of flooding and its impacts are discussed above, the motives for residing along floodplains and wetlands are often not understood. The following sub-sections provide further discussions on this.

2.3 Motives for residing along floodplains and wetlands

Despite the notable challenges of floodings, people continue to reside in wetlands that are prone to seasonal flooding (Zweig, 2017). This may be because people are afraid to relocate from settlements where they have lived for many years, wherein memories and investments (social and financial) have been linked to the area. According to the Housing Development Agency (2012), relocation should be the last resort for recovery due to its challenges and the unintended consequences of livelihood disruption. These disruptions could be related to the availability of public transportation, opportunities for employment, access to schools, and health facilities.

According to Dube et al. (2018), cultural beliefs also have a huge impact on people's preference to reside in areas prone to continued flooding. For instance, people may refuse to relocate from such areas due to the point that families would not easily access their graves and continue building bonds with them. To add to this, Osuret, Atuyambe, Mayega, Ssentongo, Tumuhamye, Bua, Tuhebwe and Bazeyo (2016) state that relocation after flood disasters is deemed unsustainable since people frequently return to high-risk locations due to cultural beliefs. Noting the rationale for residing along waterbodies, the next sub-section discusses the implications of residing along floodplains and wetlands.

2.4 The implications of residing along floodplains and wetlands

The need for wetlands is not questionable as they are vital for biodiversity production since they provide a variety of ecosystem services, including the purification of water, runoff and river discharge buffering, and ecotourism. (Reis, Hermoso, Hamilton, Ward, Fluet-Chouinard, Lehner, and Linke, 2017). To add, Xu, Weng, Yan, Wang, Li, Bi, Li, Cheng, and Liu (2019) mention that wetlands are significant in regulating the global climate, protecting ecosystem diversity, and managing the global hydrological cycle. Moreover, wetlands provide economic benefits through food production, as the wetlands outskirts can be utilised for agricultural purposes in terms of cultivation due to the crucial groundwater available (Ignar, and Grygoruk, 2015). Taking note of the importance of wetlands, locating residential areas on and around wetlands disrupts their natural state; nonetheless, residential areas are also at risk of being affected by wetlands. For instance, flooding is becoming more severe and frequent as a result of climate change and the expansion of settlements; thus, this is due to the development of households on floodplains and wetlands, which reduces the available space for conveying and storing floodwaters (Douglas, 2018). It must be emphasised that the impacts of development on increased floods go beyond families residing on floodplains; sometimes compact development increases the land’s water tables to a point where water pools and is not

channelled properly. Thus, where the infrastructure is inadequate, surrounding areas are prone to flooding.

In Europe, the Water Framework Directive has been used as the primary legislation protecting water systems since the year 2000, which aims to maintain and restore the health of Europe's freshwater ecosystems (Voulvoulis, Arpon, Kand & Giakoumis, 2017). Through this legislation, each country is expected to develop its own National Water Environment Plan which provides specific regulations on the management of water systems. In Poland, for instance, systems such as fish-path construction, illegal waste disposal liquidation, construction of sewage treatment plans, etc. have been implemented to ensure effective aquatic and wetland ecosystems (Ignar & Grygoruk, 2015).

Meanwhile, the federal government of the United States has become increasingly active in restricting development in wetlands since the 1970s; this was through the promulgation of the Clean Water Act of 1970, which protects wetlands and rivers (Tiner, 2017). The first permits are granted for discharge from a wastewater treatment plant or factory, which assists with minimizing contaminants released into lakes and river streams, while the second permit is granted for construction activities in and around wetlands (Theodore Roosevelt Conservation Partnership, undated).

In South Africa, wetlands are protected by various pieces of legislation that aim to ensure that development does not disrupt wetlands and that they remain in their natural state. Such legislation ranges from the National Water Act of 1998, the National Environmental Management Act (NEMA) of 1998, and the Mineral and Petroleum Resources Development Act of 2002. In terms of Section 24(2)(a) of NEMA, the minister is required to "identify activities that may not be commenced without prior authorisation from the Minister or MEC" (National Environmental Management Act, 1998:34). Subsequently, such listed activities have been identified through the Department of Water and Environmental Affairs, listing notice 3 in terms of government gazette number 33306 of 2010. Through this notice, wetlands have been defined as a type of watercourse wherein any type of development is required to be provided within a 100-meter buffer from the wetland (Department of Water and Environmental Affairs, 2010). The next section of this report reviews the legislations and policies in relation to disasters and TRUs.

2.5 Legislation and policy review on disasters and TRUs

Looking at a global context, in terms of Australia's human rights law, the state has legally binding obligations to fulfil a fundamental set of human rights for everyone on its territory, including meeting their basic needs for suitable, secure, and safe housing (International

Covenant on Economic, Social, and Cultural Rights, 1966), while the Homelessness Bill 2013 compels the state to support people who are homeless for various reasons, including causes of disasters (Australia Homelessness Bill, 2013). Meanwhile, in the USA, responses to disasters are coordinated by the Federal Emergency Management Agency (FEMA), which is established in terms of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. According to Section 315 of this Act, "the president is authorized, at the request of the Governor of an affected State, to provide for a survey of construction materials needed in the area affected by a major disaster on an emergency basis for housing repairs, replacement housing … including, where possible, the allocation of such materials for a period of not more than one hundred and eighty days after such major disaster" (Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988:30). However, after Hurricane Katrina in 2005, the state recognized the gaps in roles and responsibilities amongst them, and as a result, they developed a coherent federal housing policy that responds to the community's catastrophic demands and recovery as well as confirms the state's obligation to provide emergency housing support post-disaster (Greer & Brokopp Binder, 2017)

In Nigeria, the state has been obliged to provide emergency support after disasters in terms of the National Emergency Management Agency (NEMA) since 1999 (Adefisoye & Agagu, 2020). The NEMA was established through Act 50 of 1999 to address natural and man-made disasters in Nigeria. Essentially, it develops strategies for all disaster-related operations and coordinates national-level plans and programmes for efficient and effective disaster response (United Nations Office for Disaster Risk Reduction, 2009). According to Mbaeze and Eneasato (2019), NEMA response systems are mostly implemented on an ad hoc basis without being structured. For example, post-disaster in Nigeria, NEMA response was limited to post-event actions such as assisting victims with evacuation and providing palliatives like temporary shelters. In my view, this case is similar to the situations in South Africa, where there are various chief/national legislations that do not get to be localised within provinces and specific municipalities. The lack of localisation of legislation results in implementation that is not structured.

The aftermath of disasters reveals issues of inequality within communities, as most people in poor rural settlements lack the necessary means to recover from the disaster's effects, whereas the minority does (Kammerbauer & Wamsler, 2017). Whose role is it, then, to bridge the gap between the two in order to try and assist the poor who lack the necessary means? The constitution, in terms of Section 26, obligates the state to provide access to adequate housing within its available resources in a timely manner (Constitution of the Republic of South Africa, 1996). However, it is critical to note that this does not compel the state to provide housing to everyone immediately. Nonetheless, the Emergency Housing Programme, as part

of the National Housing Code, compels that the state should provide emergency assistance to communities that have become homeless as a result of situations caused by extraordinary incidences such as floods (National Department of Human Settlements, 2009). In my opinion, predominately the community is aware that the state should provide support after a disaster strike; however, there is lack of awareness on the available different types of supports which the state can provide. There are different categories of emergency response options in South Africa which the state can provide post a disaster, these are further discussed in the next section.

Poor disaster management in South African laws was exposed by the 2000 flooding episode that impacted much of the Limpopo province, resulting in the formulation of the Disaster Management Bill 2000, which was ultimately passed into law two years later in 2002 (Khandlhela & May, 2006). The Disaster Management Act of 2002 is one of the crucial pieces of legislation on disaster for South Africa, which "provides an integrated and coordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disasters, and post-disaster recovery " further the act provides for "the establishment of national, provincial and municipal disaster management centers" (Disaster Management Act, 2002:2). These management centers are established to serve as intergovernmental structures with different roles, responsibilities, and communication channels. For instance, in terms of sections 41 (2) d and h of the Disaster Management Act of 2002, the Premier of the province is responsible for "the evacuation to temporary shelters of all or part of the population from the disaster-stricken or threatened area if such action is necessary for the preservation of life" and "the provision, control, or use of temporary emergency accommodation" (Disaster Management Act, 2002:42). In my observation, it is important to note that these centers do not exist in terms of physical structures where one can access them, but they are established committees that are constituted by a group of interested and affected parties in the field of disaster management. These committees or centres are the recognised and are governed by specific norms and standards as per the Disaster Management Act of 2002.

2.6 Types of emergency housing support post-disaster and the effects of the non-provision of TRUs

Félix, Branco, and Feio (2013) indicate that the concept of ‘temporary’ denotes that the units are expected to be utilised for a specific duration before they must be replaced with a long-term permanent alternative. The permanent structures would either be provided by the state, or the affected individuals might have gathered the resources to build the house over time. In Turkey, after the 1999 earthquake, the government provided access to various options for the

affected community, such as subsidies for rental allowance, tents, and prefabricated temporary accommodations (Johnson, 2007). Meanwhile, after the 2008 earthquake in China, in the province of Wenchuan, Sichuan Province, a stadium was used as a site to build temporary shelter to resettle the affected people (Du et al., 2015).

In terms of the South African Emergency Housing Programme, there are three main categories of emergency response options in South Africa, namely the on-site assistance, relocation or resettlement, and formal housing repair (HDA, 2012). According to the National Department of Human Settlements (2009), each category contains specific preferences depending on the conditions of the affected community. The first preferred category entails that where disasters occur within suitable sites, the formal housing repair option can then be implemented. The second category is the on-site assistance options, where relocation is not necessary; site rehabilitation can be done, while formilisation and permanent housing can be provided in the same location over time. The relocation or resettlement response is the last option, and it is aimed at communities that would be relocated to a suitable permanent location with the initial provision of temporary housing assistance (National Department of Human Settlements, 2009). Moreover, the policy makes provision for the acquisition of the land by the state; however, the use of state-owned land in the vicinity of the affected community is the first preference. Some of these options are available in South Africa in terms of the Emergency Housing Programme policy; thus, in consultation with the affected community, the North West department could consider the most preferred options.

It must be emphasised that the South African Emergency Housing Programme provides that the relocation and resettlement be implemented in an incremental manner, from short-term to medium-term and then to long-term support (National Department of Human Settlements, 2009). TRUs are interim support, meaning the support would be provided in a gradual manner, from short (emergency shelters) to medium (TRUs), then to long-term (more permanent houses). The process of human settlement is crucial for livelihood recovery, as "for many households, the process can be characterized as multi-staged, from sheltering to temporary housing and finally permanent housing" (Peacock et al., 2018: 569). However, it is important to note that the resettlement support does not have to be implemented in a linear fashion because some communities may transition from sheltering to permanent housing or from minimally damaged houses to permanent houses (Gibberd, 2020). This is dependent on the specific circumstances of the affected communities, as some houses may not be severely damaged but are located along a wetland, for example.

The HDA (2012) states that once the validity (5 years) of the TRUs has lapsed or the permanent houses are ready to be implemented, the TRUs will then be dismantled to be

reused when the need arises (depending on the condition of the TRU after use). There are five possible uses of TRUs post-disaster, as discussed by Johnson (2007a), which include dismantling and storing, selling off, demolishing, reusing, etc. These options have since been previously implemented in Turkey and have yielded various challenges ranging from the unit's dysfunctionality, as some units may not be in the best condition to be reused, to little value added versus the costs of transportation and reassembling. Because the durability of temporary shelters deteriorates over time, once an individual has used the temporary structure for 5 years (for example), the cost of transferring such structures to another distant site does not generate value creation (Johnson, 2007a). The reuse of temporary housing was also successfully implemented in the city of Gaza Strip, Palestine, while taking into consideration the criteria elements of portability, longevity, adaptation to varied family sizes, and social appropriateness (Asfour, 2019).

In terms of the effects of the non-provision of TRUs, it should be noted that suitable land for human settlement development is expensive; as a result, "poor people tend to build houses and live in flood-prone areas as those areas are considered affordable" (Mensah & Ahadzie, 2020: unpaginated). In terms of the Disaster Management legislation, a disaster is a sudden, natural-caused "occurrence of a magnitude that exceeds the ability of those affected by the disaster to cope with its effects using only their own resources" (Disaster Management Act, 2002:6). It is crucial for such communities (like Deelpan) to be provided with TRUs support, as Félix et al. (2013) refer to, because temporary housing provides victims with a private and secure environment in which to resume their minimal regular life.

The non-provision of TRUs to the people has a positive impact and the potential to reveal community resilience as it strengthens community relationships. For instance, the delays in providing TRUs post-Hurricane Katrina in the USA revealed that under extreme pressure and devastating situations, communities unite; individuals with the means for evacuation supported the very large destitute community, which lacked the resources to recover or even survive until rescue arrived (Waugh, 2006).

2.7 Examples of International best and poor flooding responses case

When a flooding episode occurs, the impact differs per household. Some households require emergency attention if the houses have been significantly damaged by the disaster. As highlighted above, globally most countries are expected to provide temporary accommodation in the event of a disaster in order to prevent homelessness (Turok & Scheba, (2019). There are some international best and poor case which can be reflected as examples. Globally, improved flooding responses can be noted in Germany after the 2002 flooding. Germany

improved in terms of enhanced building structures for flooding protection and the development of systems for detecting flooding warnings. The results of these improved responses can be seen after the flooding episode of 2013, wherein the flooding damage was reduced by half (Kreibich, Di Baldassarre, Vorogushyn, Aerts, Apel, Aronica, Arnbjerg-Nielsen, Bouwer, Bubeck, Caloiero, and Chinh, 2017). Turkey is one of the countries that has successfully provided TRUs to cater for victims of earthquakes and civil wars. In 2013, 20 different TRU centers were established, which accommodated 250 000 people (Atmaca, 2017). I agree that Turkey serves as a good example since the country managed to establish numerous separate locations within a year, while many countries seem to struggle with spreading the TRU sites within the different locations and managing the aspects of relocation.

Afriyie, Ganle and Santos (2018) have reported positive responses to flooding in Ghana within communities that experience frequent flooding, such as Buipe and Yapei, and have undertaken various flooding adaptation strategies. These strategies include the relocation to areas with higher ground, utilising water-resistant traditional building materials such as clay, planting trees around the houses, digging drains around the houses to increase storage capabilities, and raising the plinths for the management of stormwater drainage. In this paper, these can be reflected as some of the best examples of dealing with flooding episodes as these strategies do not necessarily rely only on the state for implementation. With coherent awareness, even the communities can manage to implement them.

There are numerous poor-case examples of flood responses. For instance, in Nigeria, the effectiveness of disaster response and the ability of the agency in charge of disaster management are questionable, as many victims after the Ilorin 2009 disaster reported that assistance did not arrive on time and did not measure up to the degree of loss suffered as there was a lack of materials for repairing or replacing destroyed properties in the community, as promised by the agency (Olorunfemi, 2011). In Italy, poor reaction was recorded during the 1987 floods due to insufficient emergency management strategies by the authorities; this considerably improved after the 2013 floods, as better responses were noted (Kreibich et al., 2017). Meanwhile, in Syria after the 2019 floods, various risk factors in terms of post-disaster housing reconstruction were discovered, such as inadequate regulatory mechanisms for building implementation, poor supplier quality, unsuitable design, and insufficient quality assurance procedures (Agha & Szpytko, 2020).

In these cases, the South African state would implement the Emergency Housing Programme, which includes emergency relief projects such as the construction of elevated gravel platforms above the water table to enable rain runoff and mitigate the risk of flooding, similar to the case

of Green Park informal settlement in Cape Town (Jordhus-Lier, Saaghus, Scott & Ziervogel, 2019).

2.8 Challenges faced by the state post-flooding

Adefisoye and Agagu (2020) state that the beginning of a disaster necessitates immediate action to save people and assets, as well as to start stabilizing the situation. Hence, increasing the response rate to flooding events should be a matter of urgency. However, the state usually delays responding. Globally, there are several reasons for the delayed response from the state; such reasons are provided in the following sub-sections.

2.8.1 Poor coordination from the state

Generally, the state delays providing support to affected communities after a disaster has occurred from a global point of view (Kousky, 2017). Gibberd (2020) concurs that emergency housing is often criticised for being too late. Similarly, for the Deelpan Village, delays are experienced for residential support, in which the state delays implementing short-term housing relief measures for residential support. The poor performance due to delays from the stakeholders can be noted in the 2004 tsunami that occurred in the city of Tamil Nadu, India. This was experienced during the disaster recovery period, where there was poor coordination amongst the donors (Raju & Becker, 2013). In the Global North, various studies (Waugh, 2006; Moynihan, 2009) have investigated the lack of coordination amongst the states as well as time wasting during the search for suitable land, particularly post-Hurricane Katrina in the USA. Lack of communication amongst state officials resulted in poor emergency response after the 1994 earthquakes in California, which resulted in the failure to promptly deliver the resources required to unlock the approvals required for emergency response projects (Nigg, 1997).

According to Adefisoye and Agagu (2020) the state predominantly faces challenges in different types of disasters, from inadequate relief administration measures and ineffective disaster response and recovery plans. This has further been confirmed by Mvuyana et al. (2020) who state that it was discovered that there was a lack of coordination and poor accountability from the South African government's side during the implementation of emergency programmes after the COVID-19 pandemic. Meanwhile, delays were also experienced for the Green Park informal settlement in Cape Town, where it took 10 years for the state to implement tangible development in response to various recurring floodings (Jordhus-Lier et al., 2019).

2.8.2 Prolonged state bureaucracies and poor capacity to respond to flooding

The execution of emergency housing development requires thorough policies, clear implementation frameworks, and adequate capacity. However, poor intergovernmental relations, bureaucratic corruption, a lack of collaboration and political commitment on the part of government, and insufficient funding negatively impact the provision of effective support after a flooding episode (Adefisoye & Agagu, 2020). Moreover, Tasantab (2019) states that the delays in the provision of emergency housing support are usually due to the prolonged approvals and permits required prior to the construction phase, such as building permits and engineering designs.

The successful implementation of emergency housing programmes is reliant on the effectiveness of all interested and affected parties, including state officials. However, according to Mvuyana et al. (2020) the present approaches to human settlement disasters would not provide remedies in a fragmented government system where accountability is not adequately coordinated.

In line with the above, should the state have coherent plans in place to respond to disasters, the challenge remains the incapacity to execute these plans in terms of the nonavailability of qualified and professional personnel within the government (Mvuyana et al., 2020). In terms of the municipal organisational structure and workload, a municipality is required to have five planners, but in reality, due to tight financial resources, some can only afford one planner. This challenge of understaffing and limited trade resources results in delays in performing work (Tasantab, 2019). For instance, Sekondi-Takoradi Metropolitan municipality in Ghana was discovered to have only one planner rather than the five planners required to carry out municipal planning activities; meanwhile, there is only one vehicle for field work. Hence, according to Mvuyana et al. (2020:671) there is "weak coordination among the spheres of government in executing the emergency plans. The irregular expenditures and failure to deliver value for money illustrate further weaknesses in government's capacity to handle an emergency response".

2.8.3 Poor community consultations by the state

According to Jordhus-Lier et al. (2019) various communities usually resort to protests in order to obtain attention from the state. Green Park informal settlement in Cape Town is a case in point, which only received response from the state due to their elected community leader’s persistence. Zweig (2017) has confirmed that collaborative community development is possible when the state is ready to listen, open to finding solutions that would work for all parties, and when there is participation of state officials who have the authority to make

decisions. Additionally, there is need for a comprehensive governance system that encourages broad stakeholder interaction in order to improve accountability and better coordinate government functions across all sectors (Mvuyana et al., 2020).

2.8.4 Complex community dynamics

With the above being said, it should be noted that predominantly rural and informal settlements are situated on land that has ownership challenges that must be unlocked in order to cater for the community's permanent housing development. The process of unlocking the land's accessibility usually delays, resulting in community impatience (Jordhus-Lier et al., 2019). Dube et al. (2018) have established that post-disaster construction projects have proven to be more complex compared to pre-disaster projects as they take longer to execute, particularly for an emergency purpose. For instance, post-disaster projects are prone to expectations from emotionally vulnerable communities and their unwillingness to participate in the project (Geekiyanage, Keraminiyage, Fernando & Jayawickrama, 2021).

The successful implementation of any community project is subject to the community's acceptance of the project. Post-flooding, in South Africa, the community generally anticipate the state to provide emergency residential support, such as the provision of Temporary Relocation Units in terms of the Disaster Management Act of 2002. In support of this, Turok and Scheba (2019) allude to the fact that municipalities are obliged by law to provide emergency housing in order to prevent homelessness. However, it should be noted that on some occasions, the community is not willing to accept the temporary measure for various reasons, such as the preference for a more permanent measure.

For instance, in India after the 2004 Indian Ocean tsunami, the community refused the implementation of "environment-friendly, low-cost, and seismically resistant materials in flood-impacted areas as part of embracing new technology" (Dube et al., 2018a:10). The Indian community was not pleased with the new types of materials and construction methods; the public was not happy to be part of the pilot community or trail run of the new methods; in addition, the community was not happy that the state would not return for correctional measures should the new technology be unsuccessful (Dube et al., 2018). Thus, it is my view that such complex community trust dynamics have the potential to cause delays in the execution of any project.

2.9 Moving towards innovative disaster risk mitigation mechanisms

Considering the discussions above regarding the flooding disaster's causes, its impacts, and the challenges towards recovery post disaster, this sub-section seeks to provide a literature review in relation to mitigation measures for floodings.

2.9.1 The need for a proactive state

Prior to floods, the state must be proactive and prepared to implement policy frameworks to prevent from the disruptions caused by a disaster. This necessitates the state having a disaster preparedness plan, which entails anticipating and taking preventative steps to avoid an approaching disaster threat where early warnings are possible (International Council on Archives, 2016). To add to this, Adefisoye and Agagu (2020) state that government is supposed to take the lead on issues of disaster management in South Africa. This is provided in line with sections 9 and 15 of the Disaster Management Act of 2002, in which the state is expected to establish a center for disaster management that will provide support for the creation, evaluation, and execution of multi-sectoral disaster risk reduction strategies, as well as advance in relation to public awareness and training. Furthermore, Section 19 provides that the center is expected to be proactive by developing and being ready to implement disaster management policies (Disaster Management Act, 2002).

According to Mvuyana et al. (2020) disaster management entails the integration of various activities intended for the prevention and mitigation of a disaster within an emergency situation. Moreover, Iyer and Mastorakis (2006) state that disaster management transpires within a cycle of immediate risk reduction, readiness in relation to emergency planning, response in relation to the provision of emergency services, recovery, and rehabilitation to return to normality. Sukmaningsih et al. (2020) indicate that the disaster management cycle involves pre-disaster planning, emergency planning, as well as post-disaster planning. Thus, to be proactive, the government needs to be prepared to take specific actions in advance, such as budget allocation for emergency incidence and resource allocation in the form of the establishment of emergency units. Preparedness entails establishing institutions and obligations for emergency actions, as well as gathering the resources to support them. The success of pre-disaster planning can be noted in the city of Angra do Heroísmo in Portugal after the 1980 earthquake, in which the estimate temporary accommodation unit needs technique was used to forecast the resources required to develop temporary housing before an earthquake occurs. This technique makes use of available earthquake vulnerability data to forecast the number of households that may become uninhabitable following the disaster and the number of temporary dwellings required to cope with it (Félix, Monteiro & Feio, 2020).

Meanwhile, in the city of Koben, Japan, through Japan's strategy of transitional shelter, about 6000 temporary units per month were built successfully and quickly after the 1995 earthquake (Walker & Crawford, 2017).

2.9.2 The need for a resilient state

It is a state's responsibility to ensure the affected community has capacity to respond efficiently in order to bounce back and recover from disruptions created by a disaster. When coherent strategic measures are in place, the state is likely to be able to recover and be prepared to rebuild communities after a disaster. Such mitigation measures for floodings relate to the understanding of suitable locations to reside and a comprehensive manner on how to build, which involves planning prescriptions, building regulations, and floodplain investigations (Adefisoye & Agagu, 2020). This can be realised through the implementation of disaster risk reduction, which employs the use of land use management as described by Tasantab (2019). Through this, planning can be utilised to reduce flood risk by evaluating different types of flood discharge and managing land cover changes to eliminate and/or avoid flood risk.

2.9.3 Land use management enforcement in rural areas

Dube et al. (2018) concur that land use management planning can be used to reduce flood risks by restricting development in wetlands and flood-prone areas through zoning regulations. In line with this, municipal planning records, such as environmental and geological attributes, would be kept for the provision of sustainable development on well-located land. For instance, accurate wetland records are critical for developing policies on wetland protection and sustainable land use, as well as for studying global climate change and the conservation of biodiversity (Hu, Niu, and Chen, 2017).

It should be highlighted that the previous planning regime of the Development Facilitation Act No. 67 of 1995, differentiated the execution of land use management depending on the type of location (urban or rural). Rural areas were not subjected to land use management regulations, as much concentration was placed on urban areas (Sambo, 2018). The Spatial Planning and Land Use Management Act (SPLUMA) 16 of 2013 has since been introduced to fill the gaps between urban and rural development and to correct the challenges of rural development neglect through Section 8 of the Act, which aims to promote rural development revitalisation. The application of this SPLUMA section is questionable since rural development still proceeds without taking this legislation into consideration. Liu, Huang, Tan, and Kong (2020) concur that the application of land use management tools in terms of rural land development is often neglected.

2.9.4 Community collaboration on issues of flooding management

Prevention is better than cure, and there is a need to move towards a better flood disaster-informed generation. There are numerous human-environmental interaction factors that contribute to floodings (Liu et al., 2019). Not withholding the accountability and measures provided by the state for flooding management, it is crucial to note that the state alone is not effective in minimizing the effects and occurrence of disasters without collaboration of the community.

According to Osuret et al. (2016) in most cases, inadequate disaster preparedness and awareness are to blame for the failure to mitigate the effects of floods. Thus, community awareness on matters of flooding is crucial, including awareness of the causes, the impact, and the mitigations to disasters. Furthermore, in order to be prepared to respond to emergencies in the best way possible, the community should constantly be trained in preventive and response measures for floodings (Najeri, Mahyuni, Apriansyah, Sompa, Jamaluddin, Asmu'i, Budhi, Rachman, & Alunaza, 2020). Therefore, other proactive mitigation measures, over and above the state's accountability measures, include educating the public on pre- and post-disaster measures that can minimize loss and damage in the event of a disaster. Steinfort (2017) states that residing further from water bodies such as rivers and wetlands is a pre-disaster measure, while the ability to urgently identify places of refuge and the importance of working together to assist one another to cope with and recover from the disaster is a post-disaster measure.

According to Adefisoye and Agagu (2020) awareness of the dangers of developing wetlands should be employed as an ongoing measure. The success of such mitigation was noted in the 2014 city of Sekondi-Takoradi in Ghana, where the state implemented a public education programme on flood-prone areas (Tasantab, 2019). This was after the realization that communities continued building in flood-prone areas. In line with community empowerment, Dube et al. (2018) employ the 'build-back-better principle', in which the state is encouraged to provide flood awareness and integrate with the community to provide simple community-driven development. Such proactive measures have the potential to reduce the risk of flooding occurring during heavy rain seasons.

Other community-driven measures to mitigate flooding may include community awareness on the importance of minimal human-environmental interactions. These measures, as discussed by Liu et al. (2019) include, firstly, that the community needs to keep rivers clean and free from pollution in order to increase flood storage capacity. Secondly, the community should avoid the construction of levees (dams, canals, etc.) and allow the natural water flow of the river to avoid rising flood levels due to limited flood discharge capacity. Lastly, the community needs

to avoid the destruction of vegetation, as it leads to flooding risks and increased soil erosion in the long run. Okorafor, Akinbile and Adeyemo (2017) indicate that sufficient vegetation traps and protects the soil from moving, which results in fewer flooding events as the vegetation reduces the speed and capacity of flowing water. As a result of this, Mensah and Ahadzie (2020) add that improved green infrastructure has the potential to reduce the negative consequences of urban flooding by increasing vegetation cover, which ultimately increases the storage of floods.

2.10 Conceptual Framework

The conceptual framework is an analytical tool that shows relationships between key concepts in the study. It illustrates the connections between the main research variables. In studying flooding, it is crucial to understand what they entail and their impacts; thus, such information is provided. Post disaster, the emergency housing Programme denotes that the state should provide the required residential support to the affected communities. Figure 2.1 presents that state support is provided in an incremental manner, commencing with short-term, medium-term, and long-term support.

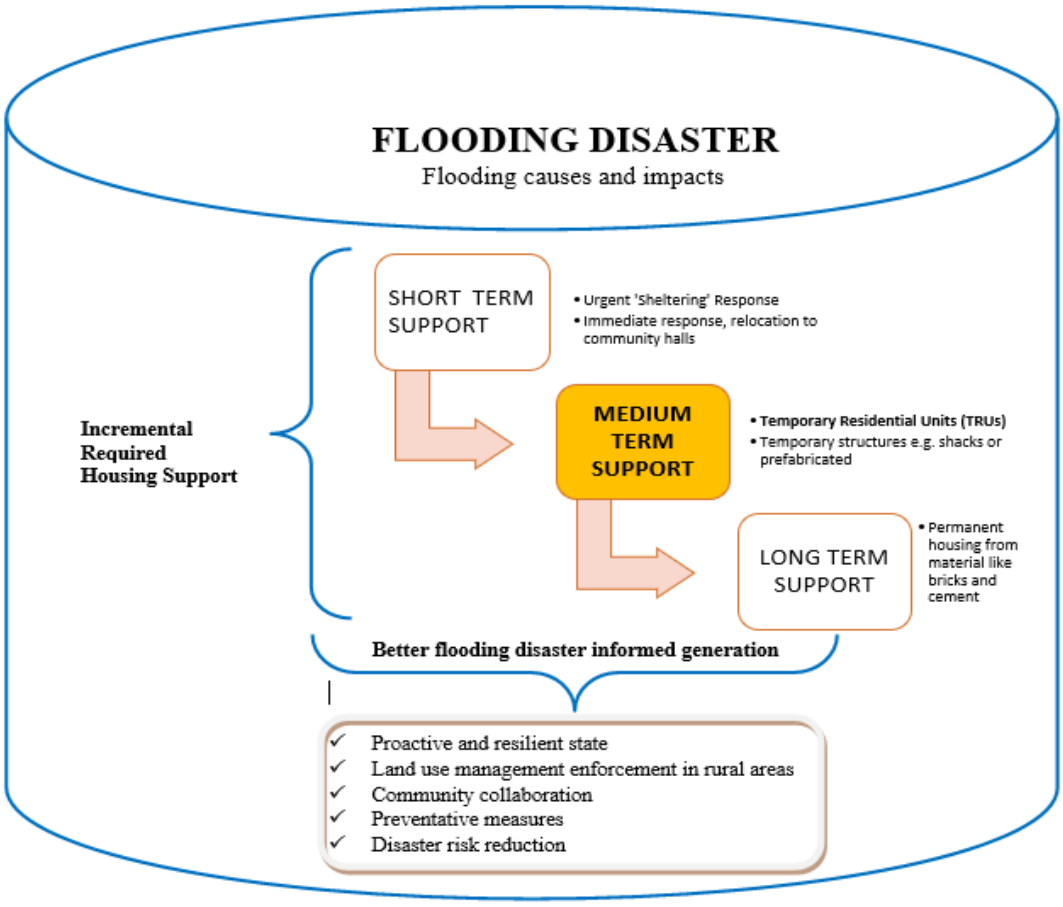


Figure 2.1: Conceptual Framework, TRU as a medium-term support post-disaster
Source: author's own material

The study originates from the perspective that flooding episodes occurs, and as such, flooding causes and impacts are defined. The conceptual framework places more emphasis on the provision of TRUs as a crucial element required for housing support. Moreover, this conceptual framework shifts its focus to key concepts of moving towards a better flood disaster-informed generation, which entails discussions on preventative measures, disaster risk reduction, community vulnerability to disasters due to location on wetlands and flood lines, and the continued risk in rural areas due to the lack of land use management systems.

2.11 Conclusion

The literature on the subject of flooding and the requirement for temporary residential units has been presented in this chapter. The chapter begun by defining the key concepts, this was succeeded by demonstrations of the motives for residing along floodplain and wetlands as well as its implications. An in-depth review of legislations and policies review on disasters and TRUs, from a local and global point of view is provided. An appraisal of flooding case responses is provided, with various good-case examples as well as poor-case examples of flood responses. It can be concluded that Ghana is one of the countries that sets a good example of how to respond to flooding. Wherein the Ghana implemented practical strategies such as utilising water-resistant traditional building materials such as clay, planting trees around the houses, digging drains around the houses to increase storage capabilities, and raising the plinths for the management of stormwater drainage.

The literature revealed that, whilst the state is aware of its responsibility to provide housing support post-disaster in South Africa, the state is faced with numerous challenges which affects the turnaround time to provide such support. These challenges range from poor coordination from the state, prolonged state bureaucracies and poor capacity, poor community consultations by the state and complex community dynamics. This then led to discussion to improve the situation by presenting ways for moving towards a better flooding informed generation. To do this, various proposals such as land use management enforcement in rural areas and community collaboration on issues of flooding management were presented.

Some of the key conclusions drawn from the literature reviewed is the fact that many countries (globally) are expected to provide temporary emergency accommodation to disaster-stricken communities. In South Africa, this is governed in terms of the Disaster Management Act of 2002. However, it is imperative to note that the resettlement support does not have to be implemented in a linear fashion; from short, medium to long-term solution. Since some communities may transition from sheltering to permanent housing or from minimally damaged

houses to permanent houses (Gibberd, 2020). The type of support required is dependent specific circumstances of the affected communities and their preferences.

It can also be concluded that there is a need for the state (referring to the local municipality in this instance) to develop coherent strategic measures and implement mitigation mechanisms to avoid the recurrence of flooding episodes. Such measures include the development of systems to enhance the understanding of suitable locations within the municipal jurisdiction (floodplains investigations) and the enforcement of planning prescriptions such as building regulations and land use management in rural settlements (Adefisoye & Agagu, 2020).

3. CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This methodology chapter presents the essential steps, methods and techniques undertaken to conduct the study, with specific attention to the case of the Deelpan Village emergency housing project in the North West Province. It includes the following sub-sections: research approach and methods, sampling methods, information gathering methods, information analysis tools, ethical considerations and limitations of the study.

3.2 Research approach and methods

The research was qualitative in nature and adopted a case study approach. The Deelpan village was chosen as case study due to the Village being predominantly surrounded by river streams and wetlands. The Village has had seasonal strong rainfalls without floods. This changed in 2021 when the Village began receiving continuous summer rainfalls. Heavy rains filled river streams and wetlands, which overflowed into households and caused flooding. Thus, the study employed the Deelpan emergency housing project as a case study to gain insight of how the Village was affected by heavy rains.

As a government agency official who has been involved in the Deelpan emergency housing project, I noticed that, over a period of nearly three years, the affected households received no housing units support from the state after the 2021 flooding episode. Thus, inductive methods were utilised to observe how the state responded to the flooding. I took a closer look at the circumstances that led to the non-provision of Temporary Residential Units (TRUs) to the Deelpan community.

3.3 Sampling techniques

The non-probability sampling technique of Quota was utilised to sample the population. Through this technique, predetermined officials (government and non-government) and community representatives who were actively involved in the Deelpan Village emergency housing project were selected as key respondents of the research study. This technique allowed for the selection of mutually exclusive subgroups that are of great interest and impact to the Deelpan Village emergency housing project. These quota participants ranged from officials who are responsible for the planning and construction of TRUs and the identification of suitable land, for relocation and individuals who were directly affected by the disaster.

3.4 Research data collection

To obtain a comprehensive understanding of the research subject, the case study method was used. The following research instruments were employed for data collection:

3.4.1 Semi-structured interviews

Semi-structured interviews were performed to gather secondary data from the relevant government departments, housing agency, the municipality, community representatives, as well as relevant Non-Government Organisation. Open-ended questions from semi-structured interviews prompted further discussions and allowed for additional exploration of themes and replies. Questions such as “What were the living arrangements post the flooding disaster?”.

The rationale for the selected institutions to participate in the study varied as per their involvement and contributions towards the Deelpan emergency housing project. Further details about the specific institutions, the number of interviews undertaken, and the interview venue is provided on the table below:

Table 3.1: Details of the semi-structured interviews conducted.

Deelpan Village emergency housing project semi-structured interviews held between 28th August to 6th October 2023			
Institution	**Participation Rationale**	**NO. of interviews**	**Interview Venue**
North West Department of Human Settlements	The only state institution that is accredited to provide housing in the North West province. Four officials were interviewed: -2 for planning and technical services -2 for housing construction	4	Physical, at the offices in Mmabatho, Mafikeng
Tswaing Local Municipality	-3 Officials responsible for the planning, and other relevant approvals for the housing structures -1 Officials from the office of the speaker	4	Physical, at the municipal offices in Delareyville
Housing Development Agency	Responsible for the identification of suitable land	1	Physical, at the agency’s offices in Riviera Park, Mafikeng
Tshegetsang Old Age Day Centre (NGO) (Official)	Provision of Emergency response shelters	1	Deelpan Village

Community representative	Directly impacted by the disaster and is aware of how the broader community and its needs were affected	8	Deelpan Village
TOTAL		**18 interviews**	
➢ 2 site inspections (observations & photography) on the 28th of August 2023 and the 23rd of September 2023 were conducted at the Deelpan Village.			
➢ Spatial mapping of the Deelpan Village was undertaken to assess spatial effects of the Village, such as the community layout, the wetlands and their proximity to the houses etc.			
➢ Various secondary data was collected and reviewed.			

In order to preserve the identity and anonymity of the participants, their names have not been reflected in the report; instead, labels have been created to replace their identities. For example, officials from the various organisations have been identified as: Official 1, Official 2, etc., while community representatives have been identified as: Community representatives 1, Community representatives 2, etc.

A total of 18 interviews were held during the months of August to October 2023. The research interview schedules were utilised to guide the interview processes and capture the information. One interview session for a duration of approximately 30 minutes was undertaken per respondent. The interview sessions for officials were held physically at their place of work as per respondent preference. Meanwhile, physical interviews with the community representatives and the Non-Governmental Organisation (NGO) were held at a tribal office in Deelpan Village.

3.4.2 Observations and photography

Further primary data was collected through observations and photography, in which two site inspections on the 28th of August 2023 and the 23rd of September 2023 were conducted at the Deelpan Village without disrupting the community. The purpose of the site inspections varied in the following manner: firstly, the site inspection was undertaken to review if there were any houses that were still submerged. Secondly, the purpose of the inspection was to gather further information relating to the current living conditions post-disaster. Thirdly, the inspection was undertaken to verify whether the TRUs were provided. Lastly, the purpose of these inspections was to assess the damage caused by the floods.

During the inspections, site photos were taken, and more insight regarding the Village was obtained. The photos were analysed in the following two manners: firstly, the photos were analysed on the basis of whether or not the houses were still submerged. Secondly, the photos of the damages to the houses were analysed based on the structural damages and the extent

of the impact in terms of visible effects such as loose floors, foundation and wall cracks, wood distortion and water dampness on the wall.

3.4.3 Spatial data

Spatial mapping of the Deelpan Village was undertaken, wherein online Geographic Information Systems (GIS) tools such as Planet GIS and Google Earth were utilised. These systems were employed to gather and analyse information regarding the spatial effects of the Deelpan Village, such as the community layout, the wetlands that seasonally flood, their proximity to the houses, and also confirmed the permitted standards in terms of National Environmental Management Act of 1998. In accordance to the 2020 Tswaing Local Municipality Spatial Development Framework, these maps were utelised to examined the Deelpan settlement and the spatial distribution of current and desired land uses. Furthermore, wetlands and floodlines have been analysed in relation to floods and settlement patterns.

3.4.4 Document review

Various secondary data was collected and reviewed. Such information was collected from the government institutions websites. These secondary documents entail policy frameworks and legislation and thus include (but are not limited to) the following:

- Tswaing Local Municipality Spatial Development Framework and Integrated Development Plan
- National Housing code, Emergency Housing Programme of the Department of Human Settlements
- Disaster Management Act 2002
- National Environmental Management Act 107 of 1998
- Housing Act 107 of 1997
- Housing Development Agency Act of 2008

3.5 Research data analysis

Thematic data analysis was employed to analyse the collected information. Firstly, the data analysis process commenced with data familiarisation and reading through a data set of interview transcripts obtained from the various interviews. Secondly, the process of data set coding to identify meaningful patterns in the data and establish themes was undertaken. The themes were generated on the basis of the research questions and also identified in relation to the dominant responses obtained from the semi-structured questions. For instance,

responses related to issues of land identification for relocation, ‘temporary’ versus ‘permanent’ community acceptance, etc.

Thirdly, the established themes were reviewed to make sure each had sufficient evidence to support it and that the theme was distinct. For instance, themes related to the living conditions of the Deelpan people who were impacted by floods and the type of housing support required by the people of Deelpan. Lastly, a coherent narrative about the data was written, which included carefully selected vivid quotes from the data as well as interpretive analysis of my own to support the statements presented.

3.6 Ethical considerations

Ethical clearance from the Human Research Ethics Committee (HREC) Non-Medical at the University of the Witwatersrand, Johannesburg, was obtained on the 23rd of August 2023. Permission letters from various state institutions were sourced to allow data collection through interviews with officials. Along with the permission letters, the respondents were asked to sign consent forms related to the research study interviews. Other respondents, such as the NGO and community representatives, were also required to complete and sign the research consent form. Furthermore, participation information sheets were developed for further elaboration of the research study and how the interviews would be conducted. The interviews were treated as confidential and anonymous to keep the identities of the respondents private. For instance, some households that have returned to their houses have requested that the pictures of their houses not be taken, out of fear that the government would not provide them with a permanent structure.

3.7 Study limitations

The research was aimed at evaluating the state’s response to flooding, with particular focus on the provision of dignified temporary housing support. The following study limitations can be noted: firstly, permission to conduct research at the North West Department of Cooperate Governance was not obtained. As such, information in relation to the implementation of the policy frameworks associated with disaster management could not be accessed. Secondly, delayed ethical considerations and authorisation had an impact on the commencement of primary data collection, as interviews could not be scheduled without ethical clearance. Lastly, the delayed availability of some institutions to conduct the interviews prolonged the primary data collection.

3.8 Conclusions

This chapter presented the steps undertook in order to carry out the research. The overall method of the study was qualitative; the reasons behind the selection of this methodology technique were explained. The chapter also outlined that a case study research method was used while the non-probability sampling technique of Quota was utilised to sample the population. Semi-structured interviews were used to gather primary data, and various government documents were used to gather secondary data. The data was analysed using thematic data analysis. The study findings and discussions are covered in Chapter 4 of the report (research results and discussion).

4. CHAPTER FOUR: FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents findings and discussions of the research looking particularly at the reasons for the delay in providing or no provision of the Temporary Residential Units (TRUs) to the Deelpan Village after the 2021 flooding episode occurred almost three years ago. The study also provides findings and discussions in relation to the measures put in place in response to the Deelpan disaster in terms of the state's resources to respond to a flood disaster.

The findings are derived from the primary information which was gathered via semi-structured interviews with various stakeholders such as the community, municipality, government sector departments which revealed the loopholes that led to the non-provision of TRUs to the Deelpan community. The chapter is presented thematically, with themes on policy frameworks, the housing turnaround times, and the support required by the Deelpan community and future flooding prevention plans.

4.2 Policies and frameworks in place for the state to respond to flooding

There are various existing legislation frameworks applicable to respond to disasters, such as the Housing Act of 1997 and the Disaster Management Act of 2002. Policy review revealed that states are obliged to provide TRUs after the declaration of a disaster in terms of sections 41 (2) d and h of the Disaster Management Act of 2002. This is the same in Nigeria in terms of the National Emergency Management Agency, similarly to Australia's Homelessness Bill of 2013.

The North West Department of Human Settlements stated that the Department relies on the Emergency Housing Programme, which is famously known as the 'Housing Code', as a guiding policy document in responding to disasters and providing TRUs post-disaster. While the literature review also revealed that in terms of the South African Emergency Housing Programme, there are three main categories of emergency response options: on-site assistance, relocation or resettlement, and formal housing repair (HDA, 2012). The Deelpan community was initially earmarked for the provision of option 2 (relocation with the provision of TRUs). Similar emergency options were provided globally in Turkey after the 1999 earthquake, as well as in China after the 2008 earthquake.

From a global context an environmental point of view, in the United States of America, responses to disasters are coordinated by the Federal Emergency Management Agency (FEMA). Meanwhile, South Africa relies on the National Environmental Management Act (NEMA) of 1998 as one of the key pieces of legislation and policy that guides the safe location of settlements. This legislation is established to ensure that all development is provided within suitable and well-located land parcels. From an environmental point of view, the Acts state that any development that is located close to any water bodies or environmentally sensitive areas is required to be provided within the prescribed distance of 32 meters.

Meanwhile, from a provincial point of view, the North West province developed a provincial Biodiversity Sector Plan in the year 2015.According to this policy document, Deelpan Village is located within Aquatic Critical Biodiversity Areas and Ecological Support Areas. As such, no development should commence within this area prior to the Environmental Authorisation being granted by the relevant department. The municipality does not have any localised specific policy frameworks in relation to environmental conversation. The research established that these legislations and policies were not enforced and complied within Deelpan Village.

Secondary data was collected in terms of legislation reviews, and it was established that the Deelpan emergency project was declared a disaster in line with Section 2 of the Disaster Management Act of 2002. The Deelpan Village was declared a disaster area due to the continued flooding incidents. The sole purpose of declaring a project a disaster is to enable the fast-tracking of any processes related to the provision of recovery support. Furthermore, a disaster declaration allows for exemptions from certain processes, such as public participation in Environmental Impact Assessment (EIA) processes, and another approval required for the implementation of disaster-related projects. However, all these exemptions and privileges would only be applicable if TRUs were implemented instead of permanent housing. Gathering from the various interviews held with state officials, both from the Department of Human Settlements and the municipality, it could be noted that other delays were attributed to prolonged approval bureaucracies, which could be bypassed by implementing TRUs. An HDA official made the following statement in light of this:

> “The North West Department of Environment had initially given an exemption to allow the construction of TRUs to proceed without obtaining an environmental authorization; however, that decision was later retracted when the scope of the project changed from TRUs to permanent housing. As a result, the entire Environmental Impact Assessment process needed to be undertaken, which took about 5 months to complete” (Personal Communication: HDA Official, September 2023).

In terms of existing policy frameworks available for the Tswaing Local Municipality to respond to disasters and also related to the provision of shelter, the municipality indicated that there is no document or any standard operating procedure that outlines how the municipality deals with flooding. The official from the municipality added that:

> "The matters of the Deelpan emergency operation were attended to by separate Departments within the municipality without the need to follow a particular disaster policy. The disaster function in municipalities is that of the district municipality; that is the reason Ngaka Modiri Molema District Municipality was seen to be leading the processes" (Personal Communication: Tswaing Local Municipality Official 3, September 2023).

Many scholars have emphasised the importance of the state being proactive and prepared to develop and implement policy frameworks to recover from and prevent disruptions caused by a disaster (Iyer & Mastorakis, 2006; Mvuyana et al., 2020; Sukmaningsih et al., 2020). In this case, the Tswaing Local Municipality was expected to have existing localised disaster management plans that would entail pre-disaster plans, emergency plans, as well as post-disaster plans. The absence of these plans led to delays in verifying the community's preferred option for emergency housing support.

From a planning perspective, the Spatial Planning Land Use Management Act of 2013 (SPLUMA), in line with the Tswaing Local Municipality bylaws, allows for exemptions to speed up the process. Section 121(a)(ii) says that "the municipality may exempt a development from compliance with the provisions of this by-law to reduce the financial or administrative burden of the provision of housing with the assistance of a state subsidy. In an emergency, it is authorized that a development may depart from any of the provisions of this by-law" (Tswaing Spatial Planning and Land Use Management By-law, 2017:68). Through this research, it was established that there is a gap in terms of the implementation and utilisation of this tool. During the interview with the official from the Tswaing Local Municipality, it was confirmed that the SPLUMA planning prescripts were not applied to the identified site for relocation since Deelpan is a rural settlement under the custodianship of a tribal authority. Nevertheless, no application was submitted to the municipality for approval, so there was no need to apply for the exemption of the application.

The Tswaing Local Municipality further confirmed that there are other planning prescripts in place to guide the municipality, such as the Spatial Development Framework (SDF) and Land

Use Management Scheme (LUMS). The municipality has an existing SDF that indicates and provides for the determination of wetlands (refer to figure 4.1. below, wetlands shaded blue).

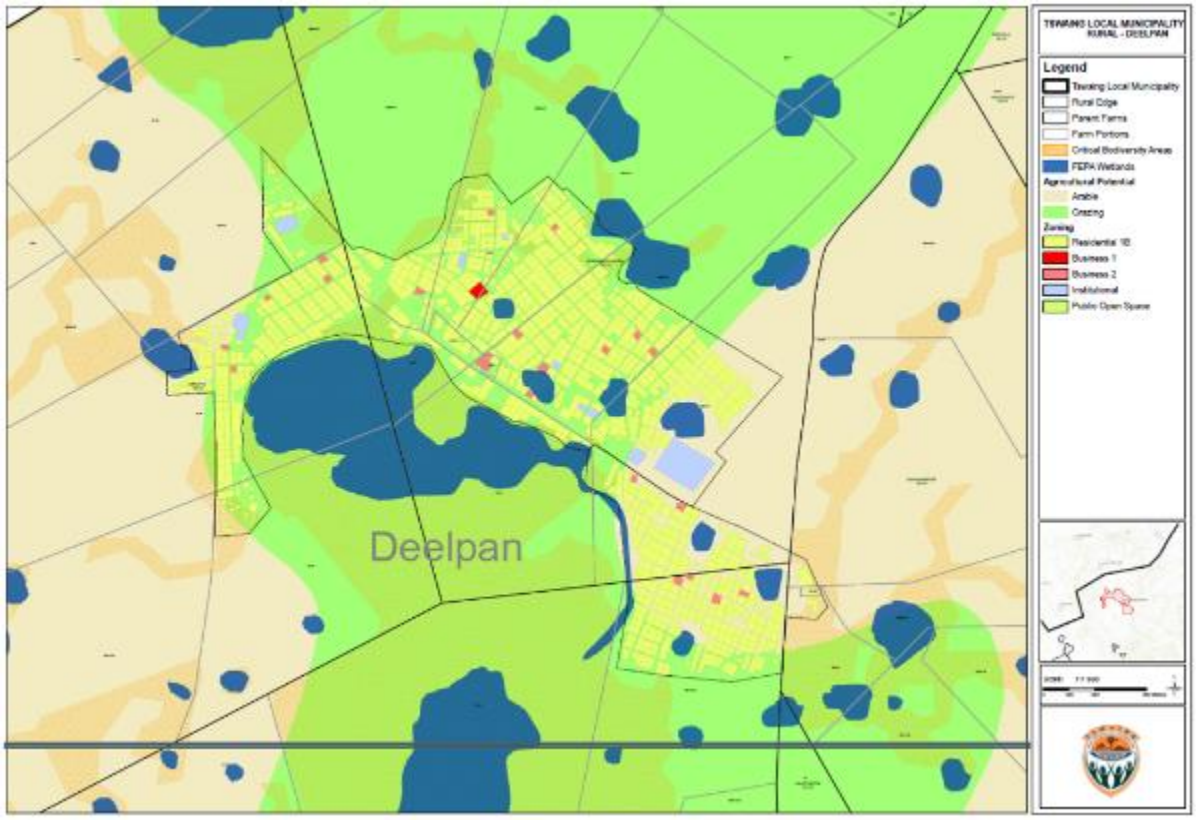


Figure 4.1: Tswaing Local Municipality Spatial Development Framework 2020. Source: Tswaing Local Municipality

In the year 2011, the municipality established its land use scheme, which also incorporates rural settlements such as Deelpan. The land use scheme provides for the demarcation of rural boundaries or village fringes in order to guide and streamline the expansion of the settlement (refer to figure 4.2. below).

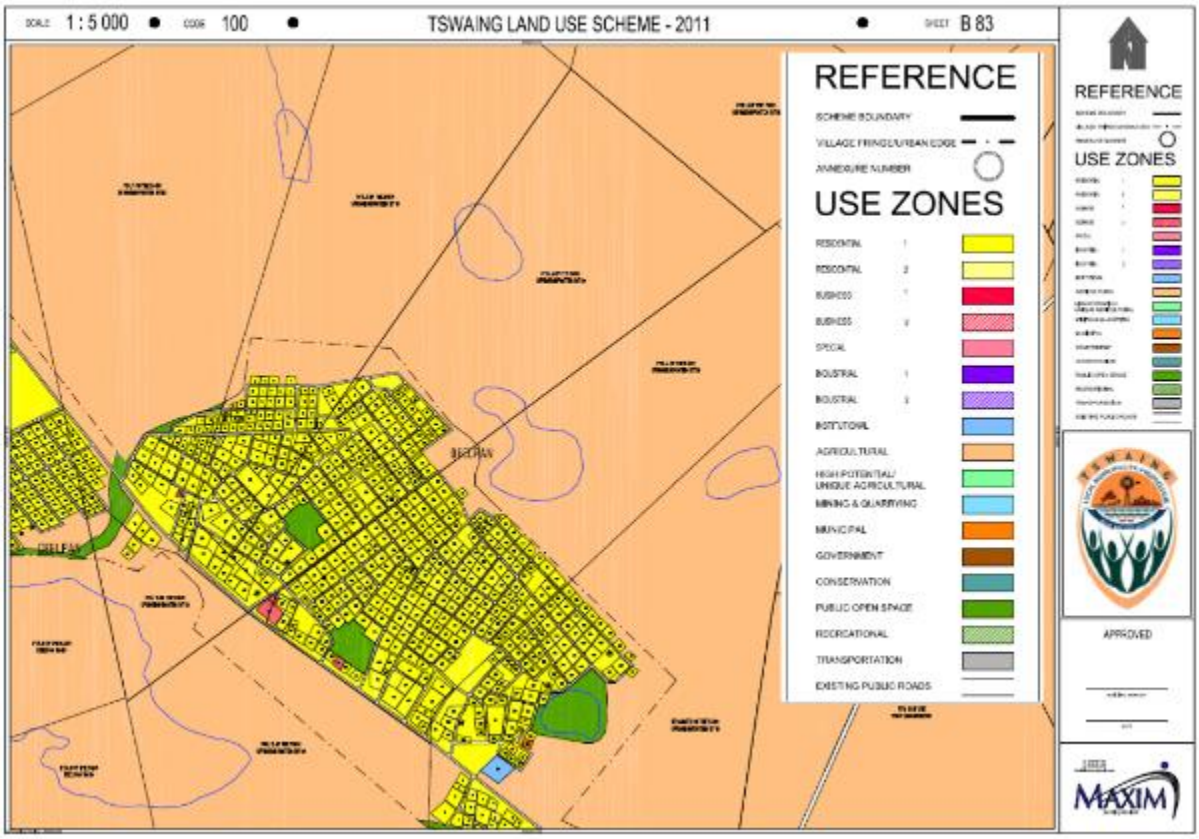


Figure 4.2: Tswaing Local Municipality 2011 Land Use Management Scheme. Source: Tswaing Local Municipality

SDF and LUMS are key planning tools, processes and governance structures crucial for the development of settlements in appropriately zoned areas; however, it appears that the municipality seems to have neglected the application of these tools within the rural settlements. The municipality indicated that predominantly rural settlement residents do not submit the relevant land use management application for approval to the municipality prior to the implementation of most developments. Furthermore, the municipality elaborated that there is no sufficient capacity for the enforcement of the planning prescripts. To expand further, the official from the municipality added that:

> "There are planning frameworks that exist in the municipality and rural areas are covered; however, the municipality does not have sufficient capacity to make sure that people in rural areas apply for approval before they start building" (Personal Communication: Tswaing Local Municipality Official 2, September 2023).

The Tswaing Local Municipality has existing essential planning tools such as IDP, SDF and municipal by-laws. While the IDP is well implemented and monitored, there is a lack of enforcement and monitoring of the implementation of the SDF within rural areas. The Deelpan

area is located within a village setup where land use management prescripts are not enforced; hence, development regulations to control development on flood lines and wetlands are not considered. Resulting in the community's continued vulnerability. The municipality does not enforce the application of these planning prescripts within rural areas for all types of development (residential, institutional, educational, etc.) and for all institutions including the development brought by the state. This has also been reflected by Liu, Huang, Tan, and Kong (2020), who state that the application of land use management tools in terms of rural land development is often neglected. This is despite the awareness on dangers of developing along wetlands and river streams. As reflected in the conceptual framework of this report, there is a need for the municipality to shift its focus towards a better flood disaster-informed generation. This can be done through the implementation of land use management systems in rural areas, with similar vigour as it is applied for urban settlements.

Najeri et al. (2020) discuss the need for community disaster awareness in relation to the risks of residing next to water bodies. The results of interviews with all the institutions (departments, municipalities, communities, Non-Governmental Organisation (NGO)) revealed that the dangers of residing along wetlands and floodplain are well known. The community confirmed that they are aware that residing along the wetlands subjects them to flooding vulnerabilities, and given that it seems even the state is doing the same, the community representative stated that:

> “We know about the dangers of staying close to a river; we are just not sure of the distance at which we must stay further away from the river and the pan. But it seems even the government doesn’t know since the RDP house they built were also affected by the flood” (refer to figure 4.3 below) (Personal Communication: Community representative 8, August 2023).



Figure 4.3: Over flooded RDP houses in the Deelpan Village. Images captured in April 2022 of RDP structures affected by the floods Source: Community representative member.

Secondary data was also collected from the Tswaing Local Municipality's website, and it was noted that in the 2023 municipal Integrated Development Plan (IDP), various projects have been earmarked to be implemented within the Deelpan Village, such as internal roads, water, electricity, libraries, high mast lights, and the proposed 3000 fully subsidized housing units (famously known as the RDP housing). The IDP is silent in terms of the TRUs required to temporarily ease the housing pressures while the permanent housing projects are underway.

The issues of climate change are not thoroughly discussed in all the Tswaing Local Municipality policy documents. The local municipality relies on the Ngaka Modiri Molema District Municipality, which has carried out a vulnerability assessment to identify key climate change indicators where the district may be vulnerable to the effects of climate change. As reflected in the conceptual framework, in order to shift towards innovative disaster risk mitigation mechanisms, the local municipality requires to be proactive. As discussed by the International Council on Archives (2016), this necessitates the municipality having relevant disaster awareness information which entails anticipating and taking preventative steps to avoid an approaching disaster threat where early warnings are possible. As such, initial steps for the Tswaing Local Municipality would be the strengthening of policy documents in relation to issues of climate change.

In line with strengthening climate change policies, there is also a need for the municipality to establish weather systems for improving and developing early weather warning signs. The success of this can be noted in Germany after the 2002 flooding, where the country developed systems for detecting flooding warnings, which reduced flooding impacts after the 2013 floods (Kreibich et al., 2017).

When looking at legislation review, the constitution, in terms of Section 25(5), obligates the state to provide land access to citizens within its available resources and in an equitable manner (Constitution of the Republic of South Africa, 1996). Other crucial pieces of legislation that played a significant role in the identification of suitable land are the Housing Act of 1997 and the Housing Development Agency Act of 2008. Through these Acts, agencies such as the Housing Development Agency (HDA) identified well-located areas for the relocation of people with houses that were severely damaged.

Permission to conduct research at the North West Department of Cooperate Governance was not obtained, as mentioned in chapter three, sub-section seven (study limitations) of this report. As such, information related to the implementation of disaster management policies could not be accessed. However, as mentioned in chapter two, section 2.5 of this report, it can be noted in terms of sections 41 (2) d and h of the Disaster Management Act of 2002 that the state is obliged to provide TRUs to the people who were highly affected by disasters similar to the Deelpan Village.

4.3 Support required by the Deelpan community and support provided by the state after the disaster occurred

The Deelpan Village was affected by the flooding tragedy in December 2021. According to Dube et al. (2018), a disaster impacts the community's livelihoods by claiming human lives. In the case of Deelpan, no fatalities were reported. Though houses and other community infrastructure, such as roads, were destroyed during a flood disaster, which left people without a place to live. The flooded roads prevented the community from accessing social amenities like schools (see figure 4.4 below).

> “It rained from December to April nonstop, people were unable to go work and school, the Department of Public Works and Roads came only after a year to grade the roads” (Personal Communication: Tswaing Local Municipality Official 2, September 2023).



Figure 4.4: Over flooded roads in the Deelpan Village. Images captured in April 2022 during the flooding days. Source: Community representative member.

As mentioned by Douglas (2017), poor people lack the financial resources to cope with the effects of disasters. Similarly, in the case of Deelpan, the people did not have the means necessary to recover from the effects of a disaster. Through the interviews, the community confirmed that accommodation was one of the most urgent and crucial resources they required since their homes were inaccessible due to the flood. One community member confirmed this reality and continued by saying that:

> "It was raining every day; in the beginning, we could control the water, but the water kept coming into our houses, and we couldn't manage it anymore (refer to figure 4.5 below). We lost everything, including clothes, furniture, and the food we had stored" (Personal Communication: Community representative 4, August 2023).



Figure 4.5: Submerged house in the Deelpan Village. An image captured in December 2021 during the flooding days Source: Community representative member.

The interview with the municipality also confirmed that the living conditions of the people of Deelpan were severely impacted by the floods. The Municipal Official went on to add that:

> "The community was badly affected. More especially the people who built their houses close to the pan. Houses didn't fall or collapsed but they were covered with water and people couldn't live in that environment. The municipality does not have Tractor – Loader – Backhoe that could be used to channels the water to move away from the houses to reduce the impact" (Personal Communication: Tswaing Local Municipality Official 4, September 2023).

The state (municipality and government departments), together with the tribal authority and the community, worked together to relocate severely affected community members (within a month after severely damaged houses started to submerge). The required mobility resources to evacuate people were sourced from other municipalities within the district, while others were provided by the North West Department Roads and Public Works. The community members whose households suffered severe damage were relocated into community buildings such as the Deelpan Zion Christian Church, Gereformeerde Church, the Tribal Hall, Badibana Primary School, etc. The municipality echoed these sentiments and added that:

> "Firstly, there was a need to secure alternative accommodation for the affected people, as they needed shelter more than anything. The municipality managed to get the church, a tribal hall, and an old age home to accommodate people who were displaced from their homes. The community needed to be relocated to temporary shelters while

> alternative solutions were sought. The Department of Social Development also provided food parcels and blankets to the affected families" (Personal Communication: Tswaing Local Municipality Official 1, September 2023).

The Deelpan community predominantly relies on domestic farming and livestock for sustenance; unfortunately, the majority of this was affected by the floods. The extent of this impact could not be quantified through this research. Hence, in addition to housing support, assistance with basic needs assistance was required. As indicated by the municipality, such support was also provided by some private sectors, such as the Gift of the Givers and Coca-Cola.

4.4 Turnaround time for the state to provide TRUs after a disaster has occurred

When an unfortunate incident such as a flooding episode occurs, such news gets delivered to the state through the ward councillor, who is the point of contact between the community, the municipality, and the various departments. This was the case with Deelpan; the turnaround time to notify the relevant interested and affected parties was prompt, but the actions thereafter are questionable. This was supported by a Municipal Official, as he mentioned that:

> "The municipality responded immediately because the ward councillor managed to alert all the relevant stakeholders in the municipality about the situation, and there was a quick and immediate response" (Personal Communication: Tswaing Local Municipality Official 2, September 2023).

As reflected in the conceptual framework of this report, in South Africa, housing support after a disaster is provided in an incremental manner, from short-term to medium-term and then to long-term support. The official from the North West Department of Human Settlements indicated that after a disaster has been declared, the expected turnaround timelines in terms of the Emergency Housing programme for the provision of TRUs are estimated at 6 months (which is the medium-term support), while the duration for the construction and provision of permanent housing is not specified. The Department indicated that roughly a duration of a year is required to construct a house (inclusive of all the processes from procurement, design approvals, construction and the handover of the house). The Department engaged the people of Deelpan Village 3 months after the disaster occurred. This was stated by the official from the North West Department of Human Settlements, and he alluded further added that:

> “The Department did not take time to engage the people of Deelpan after they were notified about the disaster by the Tswaing Local Municipality. We made sure that we engaged the community through the available stakeholder engagement channels, such as the councillors and the tribal authorities (Personal Communication: North West Department of Human Settlements Official 2, September 2023).

Immediately upon receiving notification of the disaster, the municipality identified the severely affected community members and promptly sought out alternative shelters like schools and churches. Other people even chose to reside with relatives.

During the site visit, it was observed that neither the TRUs nor the permanent houses have been provided to the people of Deelpan. The community has since returned to their old, damaged structures and made means to undertake minor refurbishments to be able to reside within the houses. In line with this, the NGO and community members (respectively) stated that:

> “The municipality asked us to use our premises for a short period of time; we were expecting the houses to be built sooner. Now that it has been two years, there are no houses. It is really sad because all the people whom we had catered for are not employed and only rely on government grant funding” (Personal Communication: NGO Official, August 2023).

> “We all had to find means to fix our damaged properties so we could go back because the living arrangements at the church were also not conducive. I mean, we were all staying together in one shared space, and it was not nice. You can imagine the daily living arrangements, which are not suitable for extended periods of time” (refer to figure 4.6 below) (Personal Communication: Community representative 5, August 2023).



Figure 4.6: People relocated to a church in the Deelpan Village. An image captured in January 2022 at one of the available emergency shelters during and post the flooding days. Source: Community representative member.

It was clear during the interviews with the various community representatives that the prolonged turnaround time in terms of response rate from the state had a substantial influence on the lives of people in Deelpan. One community member affirmed that:

> “I know at some point I have to move because my house is close to the river, but for now, it's better than living in those shared shelters. My biggest fear is that we are now nearing the rainy season again. I am worried about my kids. The heavy floods usually happen from December until April. And I know my house will be swimming in water again” (Personal Communication: Community representative 2, August 2023).

During the site inspection, it was established that some of the houses that were submerged have since dried up (after the flooding that occurred almost three years ago). While other houses, particularly those near the wetland, remain flooded and inaccessible (see figure 4.7 below).



Figure 4.7: Over flooded house in the Deelpan Village. An image captured on the 23rd of September 2023 after the flooding. Source: Author.

When asked about the support provided to the people of Deelpan, the Tswaing Local Municipality indicated that they promptly responded by going to the village, observing the situation, and assisting the houses that were submerged and inaccessible by moving some of their belongings to friends and family. The municipality mentioned that their contribution was limited due to the challenges of capacity that the municipality is encountering in terms of financial resources. When asked to elaborate further, an official from the municipality indicated that:

> “We are a small, rural, and poor municipality with a very limited budget. Most of the time, we rely on Ngaka Modiri Molema District Municipality for support, as well as the various sector Departments. The municipality is not accredited to provide housing services; thus, we do not have a budget to do so. We rely on the Department of Human Settlements to implement that function” (Personal Communication: Tswaing Local Municipality Official 4, September 2023).

Communities like Deelpan Village frequently lack the means necessary to recover from the effects of flooding, in which the municipality is expected to provide emergency housing (but usually fails to do so in practice) in order to prevent homelessness, as discussed by (Turok & Scheba, (2019). It must be emphasised that the non-accreditation of Tswaing Local Municipality, coupled with the insufficient budget, means that the municipality is also dependent on the Department of Human Settlements and, as such, will not be able to manage the turnaround time for the provision of housing support (TRUs or permanent housing) after a disaster has occurred.

4.5 Reasons behind the non-provision of TRUs to the Deelpan community

As indicated above, the Disaster Management Act of 2002 and the Emergency Housing Programme required the state to provide TRUs after a declaration of a disaster. The Deelpan community experienced a flooding episode almost three years ago, and to date, no housing support has been provided by the state. The results of the interviews conducted provided the reasons behind the non-provision of TRUs to the Deelpan community, as reflected below:

4.5.1 Land identification dynamics

One of the crucial factors contributing to the delays in providing permanent housing support to the Deelpan community is the identification of suitable land for relocation. As indicated in Chapter 2 of this report, Deelpan Village is predominantly surrounded by rivers, streams, and wetlands. As a result, researching a suitable site for relocation proved to be a difficult exercise as most sites were affected by the wetland and floodplain buffer. This was further affirmed by the HDA:

> “The process of getting a suitable site for relocation took long as most locations within Deelpan are next to a wetland or a river stream. Most land parcels appeared suitable from a desktop view but were later ruled out after extensive site inspections” (Personal Communication: HDA Official, September 2023).

The literature review established that community relocations are filled with complex community dynamics. For instance, according to Jordhus-Lier et al. (2019), the process of unlocking the land's accessibility usually delays, resulting in community impatience. In the instance of Deelpan Village, in addition to the task of finding a suitable relocation site, the municipality acknowledged that the community members expressed a desire to relocate within the village, which is under the Bakolobeng tribal authority. This was confirmed during the interview with one of the community representatives:

> “I understand that I need to move from where I am currently residing since I’m too close to the river, which is not a problem; however, I would prefer to still move within the Deelpan Village under the leadership of Bakolobeng council. This is where my life is; my roots and relatives are within this Village” (Personal Communication: Community representative 1, August 2023).

The process of identifying suitable land within the Deelpan Village took a duration of approximately 6 months, as confirmed by the HDA. The agency undertook land ownership investigations in and around Deelpan Village and it was established that the majority of the land is owned by the state (Department of Rural Development and Reform). The intention was to obtain state-owned land within the vicinity of Deelpan Village, a piece of land that preferably would be situated within an elevated slope so it would not be subjected to flooding or be within the wetland’s buffers. The official from the HDA further elaborated that the buy-in from the tribal authority was essential, as all state-owned land within a village is under the custodianship of the tribal council. Ultimately, only 5 hectares of land were made available for the relocation by the tribal authority. Obtaining approval from the tribal authority proved to be a challenging exercise, as the Agency further mentioned that:

> “The agency identified several other land parcels within the Deelpan Village prior to obtaining the greenlight from the tribal council. Ultimately, after various consultations with the traditional authority, another alternative land measuring 5 hectares next to the Badibana Primary School was made available for the relocation of the Deelpan community” (Personal Communication: HDA Official, September 2023).

Deelpan is a village set up within a rural settlement where the stands are significantly large to cater for cattle and domestic farming. The community expressed a desire to continue domestic farming, which necessitates a larger stand, and rejected the idea of densifying the land to accommodate more people. In line with this, the official from HDA further mentioned that:

> “The initial proposed layout would have catered for 108 households, but we could not get community buy-in because of the small stand sizes. The tribal authority indicated that we should not take advantage of the opportunity for the people to continue their lifestyle of domestic farming. As a result, we then reduce the stand sizes (refer to figure 4.8 below) of the current layout for the relocation of people. This is phase 1, for which we have Environmental Impact Assessment (EIA) approval; we are still busy with phase 2” (Personal Communication: HDA Official, September 2023).

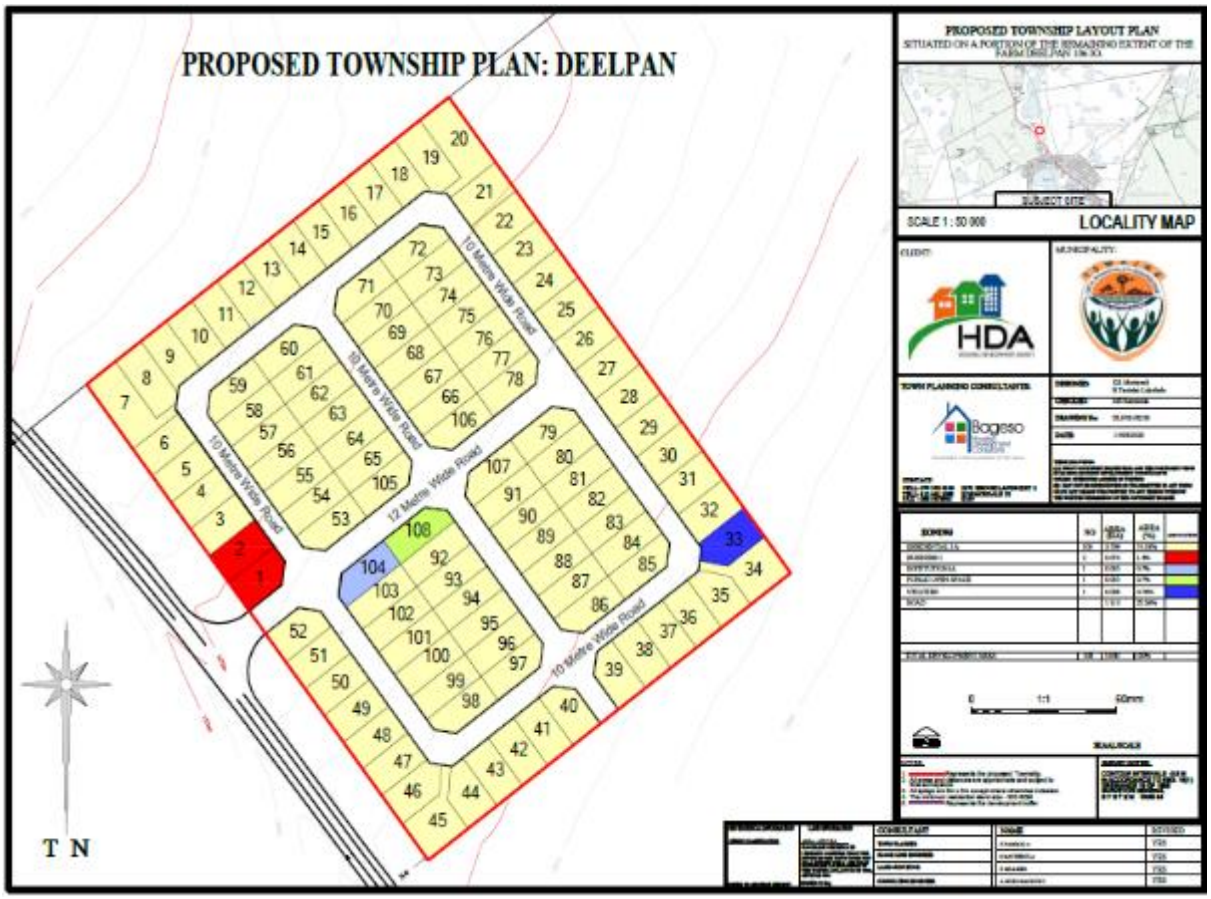


Figure 4.8: Layout plan of the Deelpan Village relocation site. Source: HDA

4.5.2 'Temporary' versus 'permanent' community acceptance

As discussed in the literature review chapter, in South Africa, there are different types of emergency housing support post-disaster. The Deelpan Village fits into the relocation and resettlement response in terms of the Emergency Housing Programme policy. The residents of Deelpan were notified during state-community engagements and consultations that those whose homes suffered significant damage would receive TRUs from the state as a quick response under the Emergency Housing Programme. When looking at the cost implications between TRUs and permanent housing, according to the Housing Code, the cost to construct a TRU is R97 684, while the cost for permanent housing (RDP) is R181 172. The representative from the North West Department of Human Settlements revealed in the interview that the municipality did not agree with the TRU approach due to the cost versus the cost of building a permanent structure. This was also seen from the interviews with the municipality and the community representative (respectively), which argued that:

> “There were proposals for temporary structures but looking at the costs of temporary structures and those of permanent ones, it was clear that the difference was not that much, so a decision was made that permanent structures be built instead of temporary ones. All affected parties agreed to the proposal” (Personal Communication: Tswaing Local Municipality Official 3, September 2023).

> “We did not buy into the idea of temporary housing, even though the Department indicated that it would be faster to build them compared to an RDP house. Our biggest worry with the temporary housing is that it is a short-term measure, as the word "temporary" says, and we know that our government will take time to come back and build proper houses. So, we want to utilize this opportunity to get proper houses from the government instead of a temporary situation” (Personal Communication: Community representative 6, August 2023).

Félix, Branco, and Feio (2013) indicate that the concept of ‘temporary’ denotes that the units are expected to be utilised for a specific duration before they must be replaced with a long-term permanent alternative. An important point is that the community’s preference for permanent housing over TRUs was guided by a lack of trust and fear that the government would not return to their village to provide permanent structures.

The change in the type of housing required by the people of Deelpan had a significant impact on the turnaround time allocated to provide support post-disaster. The approval procedure for a TRU differs from that for a permanent housing structure. For instance, the Department of Human Settlements stated that:

> “The 6 months to respond after a disaster are for TRUs, which do not require any planning approval, only municipal and NHBRC consent on the structural design. Then we start with the construction. The change from temporary to permanent housing necessitated the Department going back to the drawing board, where detailed planning processes had to be undertaken” (Personal Communication: North West Department of Human Settlements Official 3, September 2023).

Some of the key findings drawn from the literature reviewed is the fact that it is imperative to note that the resettlement support programme does not have to be implemented in a linear fashion, from short, medium to long-term solution. Since some communities may transition from sheltering to permanent housing or from minimally damaged houses to permanent houses (Gibberd, 2020). The type of support required is dependent on the specific

circumstances of the affected communities and their preferences. In the case of Deelpan, the community preferred to move from short-term (urgent assistance) to long-term (permanent structure).

4.5.3 Prolonged approval processes

Another crucial activity that has resulted in delays in providing housing support is the prolonged procurement processes of the state for obtaining a suitable company for the construction of the permanent houses. Government procurement is governed by the Public Finance Management Act of 1999 as well as the approved regulations with respect to the Framework for Supply Chain Management (SCM). These policy frameworks allow the state to shorten the procurement process to implement an emergency project that responds to disaster recovery. The NW Department of Human Settlements demonstrated that the application of this Act was also disrupted by the change in model from TRUs to permanent housing. One official from the department further expanded that:

> "We urgently managed to appoint four contractors for the construction of the TRUs, but all that needed to stop after it was rejected by the community. Then we had to wait for the EIA approval before starting the SCM processes again to source a contractor for the construction of permanent houses. The houses to be built will also be provided with access to basic services such as waterborne sewers and water reticulation to individual stands. But now we are still busy with the WULA" (Personal Communication: North West Department of Human Settlements Official 1, September 2023).

It has been almost three years since the 2021 Deelpan floods, and to date, no housing support has been provided by the state. It was confirmed by the North West Department of Human Settlements that the state is still waiting for the approval of the Water Use Licence Application (WULA) related to the construction of the permanent houses and the finalisation of procurement processes for the constructor. Tasantab (2019) states that the delays in the provision of emergency housing support are usually due to the prolonged approvals and permits required prior to the construction phase, such as building permits and engineering designs. The results of interviews with all the institutions revealed that the challenges of prolonged government processes are known to all. The element that in government every development aspect must go through a number of procedures and approvals. However, other institutions question whether the fact that the Deelpan area was declared a state of disaster by the minister of the Department of Corporate Governance and Traditional Affairs made any

significant impact on shortening the processes. It is from this that an official from the NGO argued that:

> “From my observation, the response rate has been quite slow in terms of providing all the necessary measures by all the government Departments. The Department of Human Settlements did not make use of the emergency procurement route for the appointment of service providers for undertaking the technical studies and contractors for construction and upgrading of roads. In addition, the community got angry due to the prolonged government response” (Personal Communication: NGO Official, August 2023).

It can be reflected that this means that the declaration of disaster by the minister was not utilised to the advantage of the situation. The failure to take advantage of the opportunity to expedite the approval and procedural processes highlights the shortcomings in the state's implementation frameworks and ability to respond quickly in the event of a disaster. There is a lack of a process flow strategy that guides the state on what to do once a disaster is declared and the process exemptions.

4.6 Future flooding prevention plans

Previously, land suitability investigations and planning prescripts were not implemented in rural areas, moreover, no approvals were required for all the types of development (not only housing) within a rural settlement. During the interviews, the municipality reflected its intentions to change this narrative.

The HDA was tasked with a job to find land for relocation and also ensuring that the land was suitable for human settlement development. Hence, land suitability studies such as geotechnical investigations, geohydrology, traffic impact studies, service investigations, wetland, and floodline delineation were conducted as per the requirements of the National Environmental Management Act of 1998 in order to obtain the environmental authorization. It is important to take into account issues of environmental impact assessment in order to ensure that we provide sustainable human settlements. The official from HDA indicated that:

> “No application for township development was submitted to the municipality, but we did all the investigations and processes required for an urban development. We needed to make sure that the relocation site was suitable and sustainable for human settlement development. We needed to make sure that we were not moving people

from one wetland to another; hence, we needed the confirmations for wetland buffer and floodline determination" (Personal Communication: HDA Official, September 2023).

Spatial mapping of the Deelpan Village was undertaken to assess the spatial effects of the village, such as the community layout, the wetlands and their proximity to the houses. Refer to figures 4.9 and 4.10 below, which indicate that the proposed relocation site is suitable within the allowable 1:50 and 1:100 floodlines as well as the 32 meters buffer in terms of the National Environmental Management Act of 1998 (respectively).

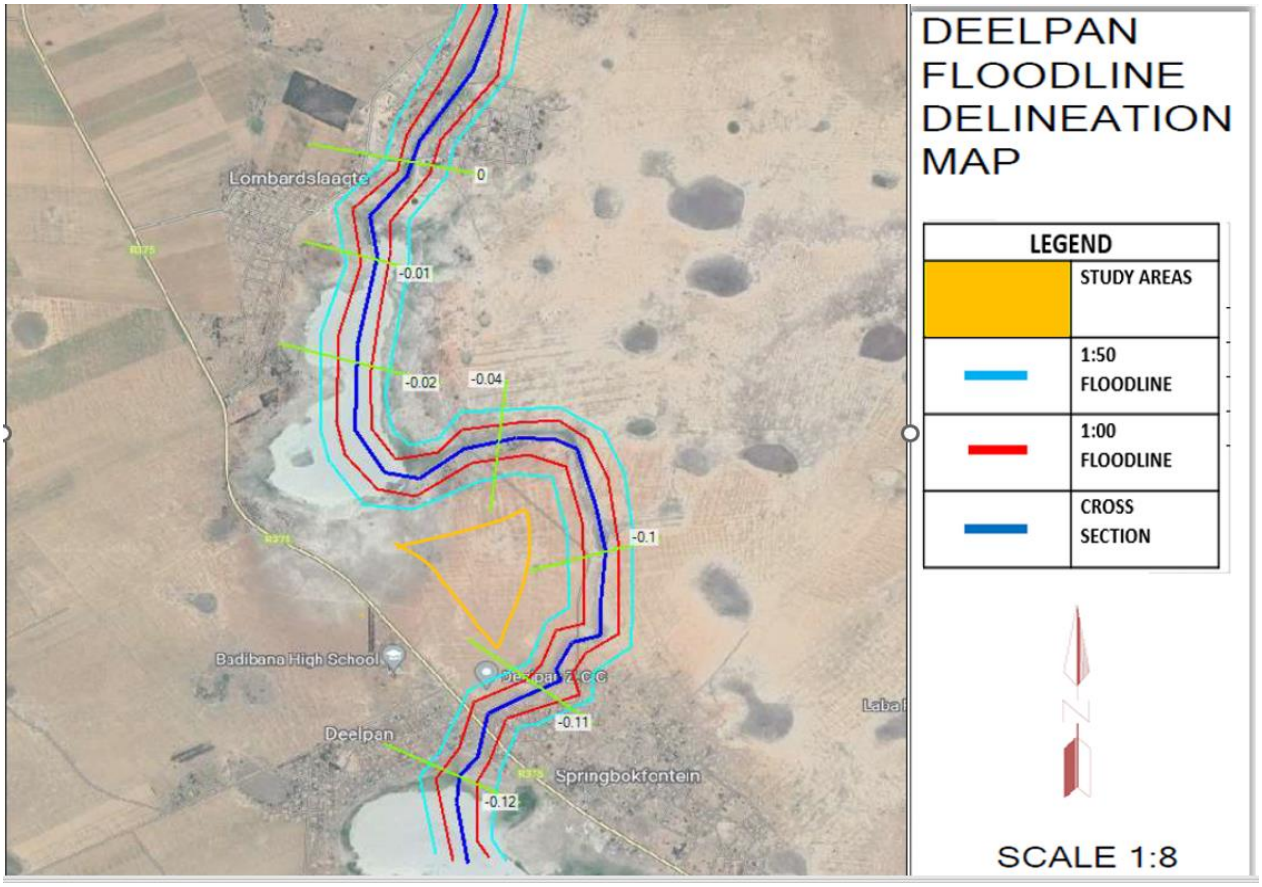


Figure 4.9: Floodline delineations of the Deelpan Village relocation site, 1D- Geometries used to model the 1:50 and 1:100 Floodplain. Source: Author

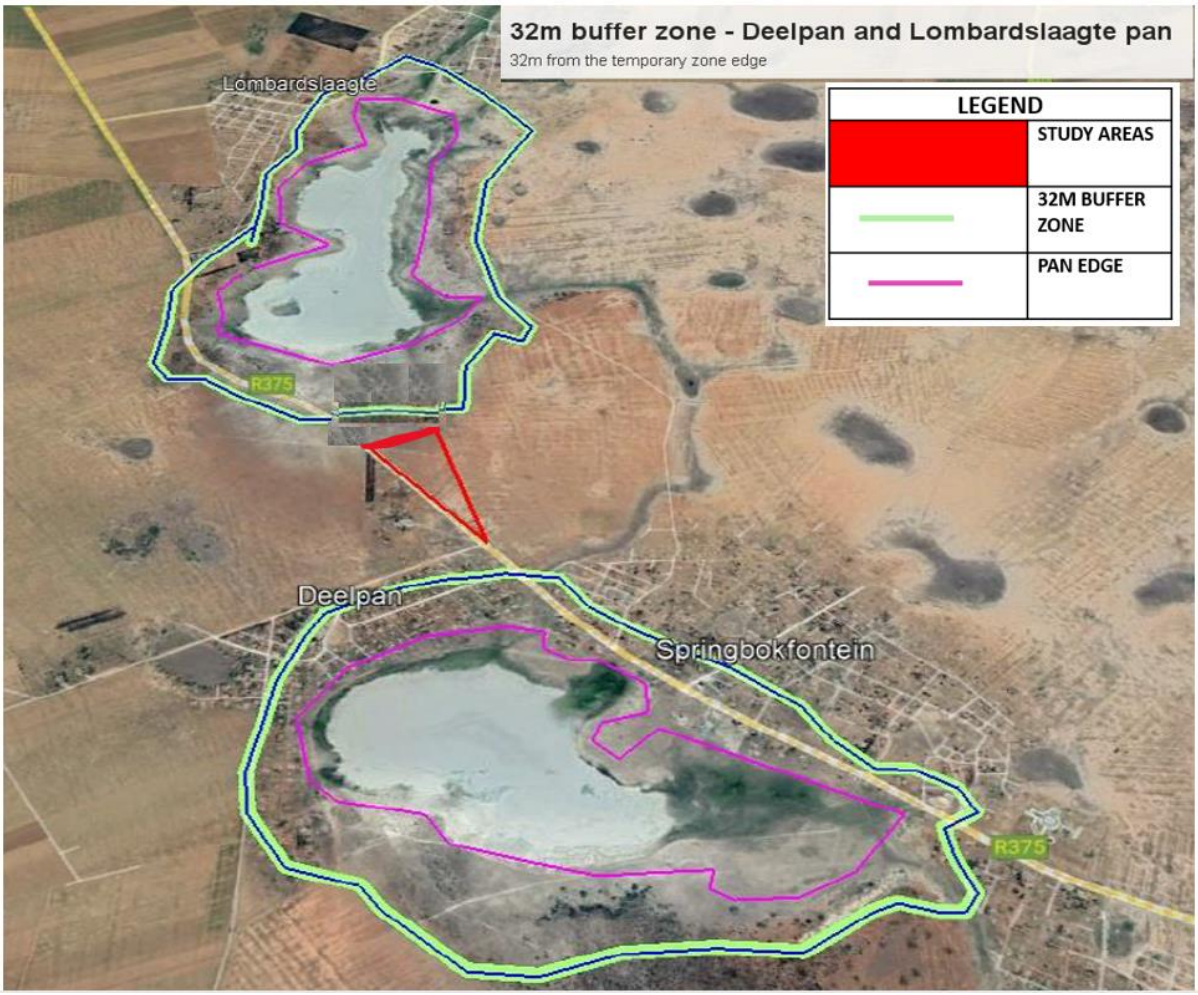


Figure 4.10: Wetland delineations of the Deelpan Village relocation site, 32m buffer zones for Deelpan and Lombardslaagte Pan. Source: Author

When questioned about the resources in place to maintain housing infrastructure and ensure the reduction of flood occurrences, the municipality acknowledges that the lack of application of planning prescripts in rural areas has resulted in the current impacts of flooding since no approvals were required for the establishment of new developments and the construction of houses. Going forward, this is a matter that the municipality is going to review for the creation of sustainable development (housing, schools, etc.) It is for that reason that the municipality requested that the HDA undertake thorough investigations on the identified land. Furthermore, the municipality welcomes the proposed provision of storm water channels and drainage systems along with the permanent housing projects. The municipality is geared to remedy this disaster situation to ensure that it does not occur again; thus, they stated that:

> “The municipality had recently formed a Disaster Unit to focus on possible threats and formulate intervention strategies to avoid occurrences or to respond swiftly to assist

affected people" (Personal Communication: Tswaing Local Municipality Official 1, September 2023).

As much as the community may have some knowledge about the dangers of living within floodlines and wetlands, the municipality indicated that there is a need for continued community awareness programmes to lessen the impact of flood occurrences. There is a need to establish policy frameworks that will regulate and guide the establishment of new developments and the construction of new infrastructure, whether in an urban or rural settlement.

When asked about resources for the implementation and maintenance of housing infrastructure in order to reduce flood occurrences, the Department indicated that they would be developing a risk management plan in line with the Council of Geoscience standards. This will assist in tracking and monitoring the construction of houses within land parcels that are suitable for human settlement development.

The above-mentioned remedy mechanisms have been noted as good examples of how to respond to flooding as implemented in Ghana. Ghana implemented practical strategies such as utilising water-resistant traditional building materials such as clay, planting trees around the houses, digging drains around the houses to increase storage capabilities, and raising the plinths for the management of stormwater drainage (Afriyie et al., 2018). These are some of the future flooding prevention plans that the municipality could consider as they establish the local disaster management unit.

4.7 Summary of findings

In summary, the research findings in relation to policies and frameworks in place for the state to respond to disasters reveal that various legislation and frameworks, such as the Disaster Management Act of 2002 and the Emergency Housing Programme are in place to serve as guidance to deal with matters post-disaster. However, there is a lack of a clear implementation plan that guides the state on the processes to follow post-disaster, which has an impact on the state's support for the people of Deelpan. In terms of planning prescripts, the municipality has tools such as SDF and LUMS in place; however, over the years, these have not been implemented in the rural areas. According to Zweig (2017), people continue to reside on wetlands and floodplains despite being informed of the dangers of residing there. It is the same for the case of Deelpan; the community is aware of the risks; however, there is a lack of community guidance on the distance to buffer away from the wetlands and floodplain. As such,

it can be noted that the unregulated old development practices of not implementing planning prescripts within rural areas played a significant role in the flood's events.

The Deelpan community experienced torrential rain falls for a duration of over 4 months; as such, urgent shelters were sourced by the state along with the provision of basic living resources such as food parcels and blankets. The roads were also flooded, which affected the community's mobility to travel to places such as work and school as well as mobility to assist with evacuation. The Deelpan residents experienced flooding almost three years ago, and to date, no housing support has been provided by the state. The study found that the turnaround time to provide a TRU is 6 months; however, it takes approximately a year to provide a permanent house. Various reasons were established as a source of the non-provision of the TRUs. It is crucial to discuss that the community did not support the provision of TRUs; instead, they preferred permanent housing structures. This was due to the lack of trust from the community that the state would not return to provide permanent housing; moreover, the municipality has a view that the costs related to the construction of TRUs are relatively high, and as such, the state would rather provide a longer-term solution.

The change of housing model from TRUs to permanent housing had a significant impact on state operation procedures. Firstly, the need to search for suitable land needed to be sourced, which was delayed due to community dynamics such as the fear of relocating due to cultural beliefs and investments, as discussed by Dube et al. (2018). Secondly, prescriptive approvals such as EIA, NHBRC, etc. are required to ensure the implementation of land use management prevention for disasters. Lastly, there are the prolonged procurement processes to source a contractor to build the houses. Based on the research findings, it can be discussed that there is weak coordination, incapacity, and poor resources within the state (Mvuyana et al., 2020); thus, there is a need to improve turnaround time for providing housing support.

4.8 Conclusion

It is clear from the results that the disaster had a huge impact on the livelihood of the people of Deelpan. This chapter demonstrated that the various existing policy frameworks aimed to provide directions in terms of timelines, processes, and operations to unfold in the event of a disaster. In an effort to provide Deelpan residents with housing following the flooding tragedy, the state is shown in this chapter as having undertaken a number of activities. The effects of the disaster in Deelpan seem to have made the state more concerned about sustainable human settlement development; this has been seen from the identified relocation sites where intensive land suitability investigations have been undertaken. From this, it is evident that the state will consider various forms of mechanisms to reduce flooding occurrences.

The discussion sub-section above presented insights from the study on the lack of provision of TRUs to the Deelpan Village after the 2021 flooding episode occurred almost three years ago. This chapter presented the research results and discussions of the data, which was collected from numerous semi-structured interviews, observations, site spatial analysis, and secondary data. The findings of the research were interpreted and analysed through other scholars' works and the conceptual framework. The next chapter of this report will provide the overall study's conclusions.

5. CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study employed the Deelpan emergency housing project as a case study to gain insight into how the village was affected by heavy rains, which commenced in December 2021 and ended after 5 months. The study took a closer look at the circumstances that led to the non-provision of Temporary Residential Units (TRUs). The measures put in place to respond to flooding were evaluated. The research study's final conclusions is presented in this last chapter of the report. Wherein the study's limitations, recommendations, and areas for future investigation are discussed, and finally, a research summary is given.

5.2 Conclusions drawn from the findings

Three main conclusions are drawn from the findings, which includes: firstly, there is a lack of community guidance on the distance to buffer away from the wetlands and floodplain. As such, it is concluded that the unregulated old development practices of not implementing planning prescripts within rural areas played a significant role in the flood's events. The people of Deelpan rejected TRUs and preferred permanent structures due to the fear that the state would not return to provide permanent structures. Hence, it is concluded that the community does not trust the state. Finally, the Deelpan community experienced flooding almost three years ago, and to date, no housing support has been provided by the state. The state is still waiting for the relevant approvals and the appointment of a constructor; thus, it can be concluded that the state does not have the necessary resources to deal with disasters.

5.3 Recommendations

In terms of legislative reviews, it is essential to note that there is legislation, such as the Disaster Management Act, put in place in response to flooding from a national perspective. The challenges lie in the lack of localised detailed and accurate plans for executing the legislation by the provincial departments and the municipalities. It is therefore recommended that the development and the establishment of a disaster management unit within the municipality be prioritised. This unit would have the responsibility of formulating municipal disaster management policies and corresponding implementation strategies.

It was established that the state does not have sufficient resources to respond to flooding. To the extent that housing support is still not provided to the people of Deelpan, while other services such as flood road grading were only done over a year after the disaster occurred. It is recommended that the establishment of a localised disaster management plans and unit

should also provide a resource management plan to address this challenge. Once the municipal disaster management units is established and accurate disaster management plans are developed, these plans will then be incorporated into the municipal Integrated Development Plan and be included in the municipal priorities, thus be allocated with the necessary budgets for execution.

Various challenges that led to the non-provision of TRUs to the Deelpan community were established, such as the delayed land identification, the change of housing model from temporary to permanent, the appointment of the constructor, etc. Two of the key lessons learned from the Deelpan flooding are, firstly, that people prefer permanent housing structures over temporary housing for various reasons. The state is expected to provide temporary housing structures within a duration of 6 months, while the turnaround time for permanent housing is not specified. Since neither of the two housing structures have been provided in almost three years after the 2021 flooding occurrence in Deelpan Village, it is recommended for the state to review the implementation turnaround strategies in accordance with the dynamics on the ground. Additionally, it is recommended that measures of enforcement for achieving turnaround deadlines should be developed.

The second lesson learned is in relation to the practice of unregulated development within rural areas, which results in the flooding of some houses situated close to the wetland and river streams. From a planning perspective, it is recommended that all planning prescriptions be enforced in all settlements, be they rural or urban. The municipal Spatial Development Framework provides guidelines for floodlines and wetland buffers; the loophole lies in a lack of awareness among community members, as confirmed by the study. Therefore, it is recommended that the municipality implement an awareness programme to inform the community about the required distance from waterbodies. It is further recommended that the municipality implement this awareness programme in conjunction with strengthening the enforcement of land use management tools. Ultimately, this will lessen the vulnerability of communities to flooding incidents.

To improve similar projects, it is recommended to strengthen community consultation at the start of the disaster to ensure awareness of the Emergency Housing Programme and the various types of available support. This will provide a platform for the affected communities to have a better understanding of the programme and allow the community to select the preferred and required type of support to fit their needs within the confines of the state's available resources.

5.4 Study Implications

From the literature review, the study revealed that there are prolonged state bureaucracies, insufficient resources, and poor capacity to deal with issues of disaster management (Tasantab, 2019). This has been further affirmed through the case of the Deelpan Village emergency housing project in the North West Province. For instance, the Department of Public Works and Roads delayed providing support for clearing and grading of flooded roads, while the Department of Human Settlements is yet to commence with the construction of houses.

From a housing point of view, this study revealed that the community does not prefer to be provided with TRUs post-disaster due to the lack of trust and fear that the government would not go back to the area to provide permanent structures after providing temporary measures. TRUs were also not supported by the local municipality due to the high costs of constructing a TRU compared to a permanent house. It is then crucial for the state to consider the review of the Emergency Housing Programme in order to assess the needs and demands of that programme and respond to the community needs on the ground.

From a planning perspective, the study revealed that although the community is aware of the consequences of living close to wetlands and river streams, there is a lack of guidance by the relevant development regulatory authorities (such as the municipality) to provide advice on wetland delineations and floodplain buffers in order to prevent vulnerabilities to floods.

Additionally, with regard to planning legislation, the study found that there is a practice of not enforcing planning prescripts within rural areas by the municipality, wherein all types of developments (whether housing, educational structures, road infrastructure, etc.) within rural settlements do not require any type of approval from the municipality. This was also revealed through the literature review, where Liu, Huang, Tan, and Kong (2020) concur that the application of land use management tools in terms of rural land development is often neglected. Hence, in order to guarantee the execution of land use management to prevent flooding, prescripts for development approvals such as the Spatial Planning and Land Use Management Act, Environmental Impact Assessment, National Home Builders Registration Council, etc. should be enforced, as these are mandatory legislations. Moreover, all development should be implemented in accordance with planning prescripts such as the Spatial Development Framework.

5.5 Areas for Future Research

This research study was undertaken with limits to the housing support required post-disaster, focusing on Deelpan Village within the North West province. It is then recommended that

further research be conducted for other affected communities within the province, such as Kraaipan, Mooipan, or Vatpan, which were also affected by the flooding. The expansion of the study area will provide a platform to undertake a comparative study to review the impact of the floods on the different villages. The study concluded that one of the reasons for the floods is the practice of unregulated development within rural areas. One is intrigued by the reasons behind that, and as such, further research can be conducted to gain insight into the application of regulatory and planning prescripts within a rural settlement under the custodianship of tribal authorities.

5.6 Conclusion

The overall research study took a period of about seven (7) months, from March 2023 to November 2023. The main objective was to evaluate the measures put in place in response to flooding and further evaluate whether the state has the necessary resources to respond to a flood disaster. A literature review was undertaken as an ongoing process throughout the study period. This study adopted a definition of TRUs by Atmaca (2017), who defines temporary residential housing (housing units that are typically built from interim material) as the location where victims may temporarily reside, typically for a period of six months to five years. This is the definition of TRUs that this study adopts. For this study, it was significant to unpack the rationale for TRUs, in which Félix et al. (2013) indicate TRUs provide victims with a private and secure environment in which to resume their minimal regular life.

In conclusion, the study established that, almost three years after the disaster, neither TRUs nor permanent housing were provided in Deelpan. As a result, the severely affected individuals are no longer residing in urgent shelters such as community halls, as they have either returned to their homes where the floods have subsided, or have taken up residence with relatives. It can be concluded that the people of Deelpan preferred permanent housing structures over TRUs. There are various reasons that lead to the non-provision of housing structures (either temporary or permanent). The research found that, to date, the state is still in the planning and procurement processes for providing permanent housing structures.

The study found that the lack of regulatory support and guidance on wetland buffers and wetlands in rural areas may have contributed to the flooding. Planning prescriptions were previously not enforced in rural areas, which municipalities have confirmed that they will rectify moving forward. Having said that, the study concludes that the state lacks the resources required to address disasters. Furthermore, the municipality anticipates establishing a disaster management unit to focus on possible threats and formulate intervention strategies to avoid

flooding occurrences or to respond swiftly to assist affected people. This unit will contribute to the municipality's preparedness and response to all disaster management issues.

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APPENDIX A

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | SCHOOL OF ARCHITECTURE PLANNING

23 August 2023

Dear Rirhandzu Chuma (368922)

This letter confirms that your clearance/waiver application has been approved. Your protocol/clearance number is: SOAP073/07/2023

Yours sincerely

Lerato Nkosi

Faculty of Engineering and the Built Environment

Private Bag 3, Wits 2050, South Africa * Telephone (011) 717 – 7007 * Fax: (011) 717 7009

WITS UNIVERSITY

SUBMISSION OF THESIS/DISSERATIO/RESEARCH REPORT FOR EXAMINATION

1. Name: RIRHANDZU
2. Surname: CHUMA
3. Student No: 368922
4. Current Residential Address: 1 BLACKREEF ROAD, GERMISTON, 1401

   Home Telephone Number:

   Work Telephone Number: 011 544 1000

   Mobile Number: 073 187 0069
   E-mail Address: rirhandzu.chuma@gmail.com

5. I hereby submit my Research Report
6. I have checked all copies of my Research Report and declare that no pages are missing or poorly reproduced.
7. Number of copies: _____ (bound) _____ (pdf)
8. I confirm that my signed declaration in terms of Rule G27 is included in each copy of the Research Report
9. Title of submitted Dissertation / Research Report / Thesis

EVALUATING THE STATE'S RESPONSE TO FLOODING DISASTERS: THE CASE OF DEELPAN VILLAGE EMERGENCY HOUSING

10. Did your research involve animal experimentation or human participants as defined in A.4 of the Senate Standing Orders on Higher degrees?

YES	NO
X	

    If **YES**, please certify that clearance was obtained from the relevant Ethics committee

    Clearance Number: SOAP073/07/2023
11. I understand that I may not graduate unless my University fees have been paid in full and I have no Library holds.
12. Name of Supervisor(s)

    Dr. TSEPANG LEUTA School: SCHOOL OF ARCHITECTURE AND PLANNING

    _____ School: _____

13. Has the work been published in any peer reviewed journals. If yes how many papers?

YES	NO
	X

Signature of Candidate: R.S Chuma.

Date: 15/12/2023

FACULTY STAMP

Faculty of Engineering and the Built Environment

Private Bag 3, Wits 2050, South Africa * Telephone (011) 717 – 7007 * Fax: (011) 717 7009

WITS UNIVERSITY

ACQUIESCENCE FORM

Name: RIRHANDZU CHUMA Student Number: 368922

Candidate for the degree of: MASTER OF URBAN STUDIES (HOUSING AND HUMAN SETTLEMENTS)

has today submitted her research report for examination.

Please answer **ALL** questions below by ticking the appropriate box:

Is this research submitted with your acquiescence? (if no attach/submit a separate report to the Faculty Office)

YES	NO

To the best of your knowledge are you able to verify that the candidate has acknowledged wherever any information used in the thesis or other work have been obtained by him or her while employed by, or working under the aegis of any person or organization other than the University or its associated institutions?

YES	NO

Did the students research involve any animal experimentation of human participants as defined in A.4 of the Senate Standing Order on Higher Degrees:

YES	NO

If yes, has clearance been obtained rom the relevant Ethics Committee? Provide ethics clearance form.

YES	NO

Name of Supervisor: Dr Tsepang Leuta

Signature: _____

Date: 16/12/2023

Name of Co-Supervisor: N/A

Signature: _____

Date: _____

Name of Head of School: Professor Nnamdi Elleh

Signature: _____

Date: _____

FACULTY STAMP

Faculty of Engineering and the Built Environment

Private Bag 3, Wits 2050, South Africa * Telephone (011) 717 – 7007 * Fax: (011) 717 7009 * Email: febe.co@wits.ac.za

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Rirhandzu Chuma (Student number: 368922) am a student registered for the degree of Master of Urban studies:Housing & Human Settlements in the academic year 2023.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this in not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature: R.Chuma. Date: 15/12/2023