



**UNIVERSITY OF  
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**INYUVESI  
YAKWAZULU-NATALI**

**EFFECTIVENESS OF THE ETHEKWINI MUNICIPALITY  
DISASTER RISK REDUCTION STRATEGY PERTAINING TO  
FIRES AT INFORMAL SETTLEMENTS: A CASE OF CLARE  
ESTATE INFORMAL SETTLEMENTS, SOUTH AFRICA**

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## **CHAPTER 1**

### **INTRODUCTION AND BACKGROUND TO THE STUDY**

#### **1.1 Introduction**

South Africa, like several other developing nations, has unique challenges within its metropolitan areas and surroundings. In particular, the major challenge is ensuring safety and security of residences in case of natural or human-induced hazards. The country continues to experience rapid urbanisation [United Nations (UN), (2009:34)]; in the form of two ‘destructive’ populations factors namely, natural increase upon already marginalised urban communities and in-migration of the poor to the cities (United Nations Office for Disaster Risk Reduction (UNISDR) 2009:76). Roth and Becker (2011:47) reveal that in major cities in South Africa, marginalised informal communities are disproportionately susceptible to both successive and infrequent disasters as well as everyday emergencies (Wisner, Blaikie, Cannon, and Davis 2004:28). Birkinshaw (2008:46) however, made an early recognition that fires are increasingly becoming a dire problem for people living in extra-legal settlements, highlighting that municipal responses in dealing with the threat are largely inadequate.

This chapter outlines an overview of the study. This includes the background of the research problem, the specific research problem of this study and key terms and definitions as presented in Table 1.1. The discussion of the research problem includes a review of the literature. The research objectives and research questions are set forth. The chapter highlights the philosophical worldview and research design and methods. This chapter then highlights the significance of the study before concluding with an outline of the dissertation chapters.

#### **1.2 Background to the Research Problem**

According to the international context, disaster management (DM), disaster risk management (DRM) and disaster risk reduction (DRR) are largely a domain of local government through public policy, legislation and planning that facilitates implementation of law and policy. DM, DRM and DRR are distinguishable. DM revolves more around emergency management, response to disasters and recovery from such disasters (Henstra 2010:236). Both DRM and DRR

are concerned with disaster preparedness and other components. Various arrangements for disaster preparedness operating at local government level for Bangladesh, Kenya and Portugal are referred to in the literature, [Network for Information Response and Preparedness Activities (NIRAPAD, 2011:165; Petty, Thomson, and Stew 2012:23; Mendes and Tavares, 2009:34). Kovac (2011:11) indicates that the main problem weakening DRM in Canada is that interventions fostered by government are politicised which hampers genuine community humanitarian efforts (Kovac 2011:9). Ahrens and Rudolph (2006:60) suggest that institutional failure largely represents a major cause for under-development and exposure to disasters for informal communities.

To distinguish DRM from DRR; on the one hand DRM is more concerned with management of disaster, which involves the planning process. It also includes assessment approaches and policies that enlighten disaster risk knowledge and promote preparedness, recovery and response actions. On the other hand, DRR centres on strategies and policies of reducing risk exposure. Salim (2012:56) assessed DRR in Brazil and stressed the importance of institutional failure. Salim (2012:56) argues that there should be a platform where DRR stakeholders are able to come together and collaborate to find better solutions to DRR. In Brazil, the Centre of Excellence for DRR provides technical guidance and is a think-tank for DRR (Salim 2012:56). In a report on reducing vulnerability to natural disasters, the Global Facility for Disaster Reduction and Recovery (GFDRR) (2006:170) stressed that lack of institutionalisation is the main problem for DRR in Swaziland. The GFDRR provides that public and private partnerships are a key strategy for DRR. The report also states that the identification of constraints regarding the collaboration of stakeholders must be a primary area in DRR. In addition, the report notes that whilst strategies and plans in disaster preparation are only as effective as their implementation and enforcement, compatibility with an economic and social development path is integral in minimising disaster risks (GFDRR 2006:16). Signalling the need to shift the discourse from DM to DRM and DRR, some studies have found that disaster preparation policies are generally in a classic knowledge crisis (Wisner, Blaikie, Cannon and Davis 2004:39; Hewitt 2007: 87; Gaillard and Mercer, 2013:93). This is due in part to conflicting views regarding the incorporation of information drawn from either the local or scientific sphere (de Souza Briggs 2005:335; Tibby, Lane and Gell 2007:335). Challenges of 'powerlessness', 'exploitation', 'marginalisation', 'violence', 'cultural imperialism' and 'denial' are the outcome of inhibited indigenous (local) knowledge (Gaillard and Mercer 2013:103).

In South Africa, the integrated development plan (IDP) introduced in magisterial district municipalities sought to offer indigenous and scientific knowledge a platform for a collectively founded policy understanding. Whether this new dynamic meant real collaboration or not, a substantial proportion of the urban growth continues to occur unplanned and is most prevalent in informal urban settlements, where buildings are of low quality and on land often deemed unsuitable for habitation (UNISDR 2009:78). Although the South African local government endures responsibility for the reduction of risks in such urban environments, at any rate, the task is difficult and overwhelming (Roth and Becker 2011:46). Informal structures are in their nature irreconcilable with regulations on fire safety and protection against fires in South African buildings (i.e. National Building Regulations, SABS 0400-1990). Hence, these structures demand extraordinary consideration. Birkinshaw (2008:46) recognises that fires are becoming an increasingly dire problem for people living in extra-legal settlements and highlights that municipal responses in dealing with the threat are largely inadequate.

Similarly, the Council for Scientific & Industrial Research (CSIR) asserts that extra-legal establishments violate regulations on the space between both individual and groups of buildings; thereby occupying fire escape routes and making it impossible to access fire equipment (Green, 2012:8). Moreover, procedural community awareness campaigns concerning safety and use of fire for lighting and cooking is more cumbersome under unplanned land-use arrangements. Hence, in its broadest sense, the research problem stems from the fact that South Africa's socio-economic development is dependent on a heightened focus on DRR. Inadequate housing provisions to accommodate a steady flux of migration from rural to urban areas exacerbate the problem. Limited DRR planning for vulnerable populations in informal settlements is problematic given South Africa's constitutional mandates and deliverables under the National Development Plan (NDP) and other imperatives. The next section narrows the statement of the research problem for this study.

### **1.3 Statement of the Research Problem for the Study**

After 1994, ensuring the safety of citizens from hazardous and extreme environments, and the provision of adequate housing became a legally binding imperative for the South African government. This study is more concerned with DRM and DRR than DM. Values underpinning DRM and DRR reflect national aspirations to a fully-fledged constitutional democracy that delivers political and socio-economic rights to a vulnerable population characterised by the

elderly people and previously marginalised groups (Miller 2012:20). However, there are enduring backlogs in the provision of most of these essential deliverables. According to recent past estimates in the General Household survey administered by Statistics South Africa in 2011, about 1.1-million South African households lived in informal settlements described as “shacks not in a backyard” (StatsSA 2012). Tshikotshi (2010:3) identifies the absence of affordable housing, ‘lack’ of urban policy, the legacy of apartheid planning and lack of service delivery and poor avenues of communication with local communities as contributory to deficiencies in existing DRM/DRR plans in several municipalities countrywide.

A vast amount of literature has been generated on the policy implications for disaster preparedness since the beginning of the 21st century (Pine 2002:34, Mener 2007:56, Pollner 2010:18, and Brownson 2010: 210). Nevertheless, key information is largely missing such as the approaches in which policy alternatives translate into action through implementation. In addition, the role of local knowledge especially in informal settlements is under-documented. With the exception of a few studies, for instance Gaillard and Mercer (2013), the majority rarely explore political processes that integrate indigenous narratives and scientific knowledge in informal settlements. In another rare study by Monngakgotla (2008:iv) in Botswana, policymakers in education remain largely divided over the merits of indigenous knowledge systems (IKS) in accompanying formal public policy and are typically sceptical of its known worth. More relevant to this study, there is a longstanding debate over the credibility of local agency versus centralised national government involvement and scientific knowledge versus indigenous knowledge in management of risk and reduction of risk. Literature from global governance organisations such as the UN (and to a lesser extent the local context), stemming from the vulnerability paradigm, increasingly recognise the importance of grass-root establishments in DRR planning and policy-making.

Statistics South Africa (StatsSA, 2016) issued a press release indicating that “the number of households living in formal dwellings across the country has increased from 76% in 2002 to 80% in 2014”, those who still subsist in informal settlements continue to face raging fires. For example, between 2012 and 2014, 7 518 shacks in Guanteng informal settlements alone burnt to the ground across Ekurhuleni, Emfuleni and Johannesburg (van Zyl 2015:1). In July 2015 a social movement organization (SMO) and non-governmental organization (NGO) donated materials to help rebuild shacks that were destroyed five months earlier by fire in a eThekweni informal settlement that left 100 people homeless (Mbili 2015:1). A November 2015 fire at

Lamontville informal settlement in eThekweni claimed one life, injured other residents and destroyed numerous homes (Malingo 2016:1). Demolition of more than 200 shacks by fire in May 2016 displaced 180 people from the informal settlement of Mangolongolo, near Johannesburg (Modise 2016:1). In the Zandspruit informal settlement, also near Johannesburg, 30 shacks went aflame in July 2016, incinerating all belongings, including identity documents and irreplaceable memorabilia (Ndlovu 2016:1). In each situation, the disaster management unit of the respective municipalities provided requisite response and recovery. As to causes of the fires, except for the Lamontville community, were use of paraffin, stoves or unattended candles. These events raise questions about the level of municipal planning and implementation of fire prevention and other risk reduction strategies.

In light of the problem that is encountered by informal settlement dwellers, this study is mainly concerned with DRR plans for fire prevention in informal settlements, programmes and initiatives to carry out those programmes and community involvement in such programme implementation. The focus is not on the DRR policy-making and implementation processes specifically, but considers policy measures from time to time. The study site is the South African province of KwaZulu-Natal (KZN) in eThekweni Municipality, particularly the Disaster Management and Emergency Control Unit (DMECU). eThekweni is a Metropolitan Municipality or Category A. eThekweni Municipality and DMECU are in charge of all disasters that are taking place in eThekweni and surrounding areas. This study sought to ascertain municipal planning and strategies for fire hazard management in Clare Estate, an informal settlement in eThekweni.

#### **1.4 Significance of the Study**

The effectiveness of local government policies and strategies on DRR, particularly in the context of informal settlements is under-studied, despite the relationship between DRR and planning for human well-being. Thus, this study therefore intends to explore DRR planning in eThekweni Municipality as it pertains to fire hazards in an informal settlement setting. Fire disaster may result from the natural environment or be human induced. This study is significant for a number of reasons. The focal point of this work includes examining opportunities for public engagement in drafting DRR plans regarding fire, especially to establish strategies for aligning current municipal DRM and DRR frameworks to informal settlements. Local knowledge or indigenous knowledge has a role to play in DRM and DRR. Therefore, examining the application of IKS in

DRR in a formalised municipal planning and policy domain may locate IKS and clarify its current and future role not only fire DRR or DRM but also the abovementioned challenges pertaining to amenities. To this end, this study employs the Actor Network Theory (ANT). Application of this approach is very limited to developed nations. For example in the US it was applied on analyses of minor ‘actors’ involved in the Hurricane Katrina of 2005 in New Orleans (Kapucu, Arslan, and Demiroz 2010:222 and Lassa 2012:5). Thus, this study pioneers itself to understand management of risk and DRR (inclusive of pre-disaster and post-disaster governance) in South Africa by focusing on the policy of DRM and DRR. The ANT also helps to understand strategies of eThekweni Municipality in KwaZulu-Natal Province on fire risk management and examine the extent of local ‘actors’ knowledge assimilation at various disaster stages of the cycle. The current study could be very useful in producing missing knowledge within the greater body of literature on management of risk and reduction of disaster risk in South Africa.

### 1.5 Key Terms and Definitions

There are a number of key terms used in this study. It is worth clarifying these terms and the definitions assigned to them constructed on literature and for the purposes of the research. Table 1.1 shows the key terms and definitions of terms used in this study.

**Table 1.1 Key Terms and Definitions**

<b>Key Terms</b>	<b>Definition of the Terms</b>
<b>Disaster Risk Management</b>	Management of disaster risk is a procedure for planning, applying and assessing approaches, policies and actions to enlightening the knowledge of disaster risk and promote preparedness, recovery and response actions for growing security and quality of life and maintainable development. (Warner, Pflug, Martin, Linnerooth-Bayer, Freeman and Mechler 2003:27).
<b>Disaster Risk Planning</b>	Plans that prepare and respond to disaster risk (Vinh Hung, Shaw and Kobayashi 2007:54).
<b>Disaster Risk Reduction</b>	Reduction of disaster risk ‘is the application of strategies, policies, practices and also the systematic development to reduce exposure, threats and disaster influences all over the community in the wider setting of maintainable growth

	(UNISDR, 2004:3; Mercer, 2010:248).
<b>Indigenous Knowledge</b>	Indigenous knowledge refers to a body of knowledge that escalates through generations in a community and acquired through the build-up of experiences, relations within the surrounding society, and traditions (Kelman, Mercer and Gaillard, 2012:13).
<b>Informal Settlements</b>	A residential area does not comply with local authority requirements for conventional formal structure. They are located on land that is unclaimed for residential use and occupation is unauthorised. These informal settlements exist because government does not have capacity to provide land, infrastructure and homes yet urbanization is growing fast (Thinda, 2009: xiii).
<b>Public Policy</b>	Action by civil officers within government and by leeway of the population they represent, regarding what they prefer to act upon regarding public challenges (Kraft and Furlong 2013:3).
<b>Public Policy-making</b>	Developing courses of action to assist resolve public challenges (Kraft and Furlong 2013:94).
<b>Vulnerable Populations</b>	The characteristics of a group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a hazard, an extreme event or process (Wisner, Blaikie, Cannon, and Davis, 2014: 11).

In light of the literature review that led to the research problem, certain objectives of the study and research questions were set as indicated next.

### 1.6 Research Objectives

This study primarily aims to understand planning in eThekweni Municipality regarding DRR plans on fire. The study also examines the extent of local knowledge assimilation at various disaster stages of the cycle. As such, the study seeks to:

- Explore the DRR plan of eThekweni Municipality to address fire prevention at Clare Estate informal settlement community.
- Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.



- Determine involvement of Clare Estate informal settlement community members in the implementation of the eThekweni's fire disaster programmes.
- Examine community level initiatives in Clare Estate informal settlement to address fire prevention.
- Identify types of indigenous knowledge that enable Clare Estate informal settlement community members to protect themselves from fires.

For achieving the objectives of the study, the ensuing section poses an overarching research question and sub-questions.

## **1.7 Research Question**

### **1.7.1 Overarching Research Question**

To what extent does eThekweni Municipality's DRR plan address fire prevention at Clare Estate informal settlement community?

### **1.7.2 Research sub-questions**

- What factors facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality?
- How is the Clare Estate informal settlement community involved in the implementation of the eThekweni's fire disaster programmes?
- To what extent do community level initiatives in Clare Estate informal settlement address fire prevention?
- How does local or indigenous knowledge enable Clare Estate informal settlement community members to protect themselves from fires?

Against the backdrop of the problem statement of research and the research objectives and questions, the next element is to provide an overview of the study and identification of the philosophical worldview underlying the study as well as the research design and methods used to carry out the study.

## **1.8 Philosophical Worldview, Research Design and Methods**

The advocacy/participatory worldviews deal with the political economy of research. It also assumes that research inquiry should not be isolated from politics and a particular 'political agenda'. Implicit in this assumption is that, the ultimate end of any research undertaking is to bring about 'change' and 'reform'. Moreover, new emerging circumstances may affect partakers, the day-to-day operations of the organisations of employment, or where they reside, and the researcher's lifespan (Nissan-McMillan and Niles 2010:165).

In this study, one proposes to use participatory worldviews as it allow one to depict the political power struggle in the policy arena between the institutional and public domain. This study is interested in examining how the formal process of designing plans for fire DRR incorporates local value systems. Above all, this paradigm matches the intention of this study namely to understand the involvement of residents in DRR planning, specifically residents of informal settlements who regard themselves as marginalised and alienated from citizens living in proper housing.

A qualitative research design permits researchers to understand challenges of participants and to determine the meanings through their culture. It is the design that followed by the researcher to collect and analyse data to explore the opinions and feelings of informal settlement residents as well as municipal managers throughout the study. This research design helps discover themes rather than testing variables (Strauss, 2008:12). This study employs a qualitative approach in collecting data through interviews, focus groups as well as an examination of documentary evidence pertaining to reduction of fire risk in the eThekweni Municipality Clare Estate informal settlement.

In support of a qualitative approach for a study such as the proposed one, Creswell (2003:30) notes that the former largely depends on non-numerical and often exploratory information shared by interviewees. The strength for a qualitative research design is that it explores the phenomenon deeply and complex situations; thus, it gathers information that is not available from other sources. It is ideal for research to obtain new empirical data (see chapter 3). Thus, the proposed study will take advantage of the mix of the participatory worldview, qualitative approaches along with a case study strategy and narrative strategy in analysing the design of municipal strategies on disaster risk reduction concerning fires in Clare Estate as well as

community involvement in such DRR programmes. The researcher followed ethical protocols. There were certain limitations to the study such as the non-occurrence of a focus group of Kennedy Road residents due to unavailability of such residents. In addition, the head of DMECU was unavailable for the interview despite several attempts.

## **1.9 Outline of Chapters**

This dissertation is organised as follows:

### **Chapter One**

The chapter presents the introduction of the study, background of the study, research problem and significance of the study. The research objectives, research questions, philosophical worldview, research design and methods are also set in this chapter.

### **Chapter Two**

The chapter examines literature review of fire DRR and management of disaster in other countries along with DRR in South African informal settlements. The chapter also presents the theoretical framework that drives the study.

### **Chapter Three**

The chapter covers research design and methods, philosophical worldview, research strategy and units of analysis. It clarifies the case, site and participant selections. The chapter further discusses the sampling population and size, data collection tools, data analysis, ethical considerations, data analysis and limitations of the study.

### **Chapter Four**

This chapter deals with data presentation, analysis and findings. It gives background information on eThekweni DMECU as well as the Clare Estate area. The chapter further illustrates how the researcher used the combination of content, thematic and matrix analysis in analysing data. In accordance with narrative research strategy, the matrices demonstrate how data achieves the research objectives and answers the research questions. The results of cross-stakeholder analysis of data from municipal officials and civil society are summarised before presenting the triangulation of data.

## **Chapter Five**

This chapter highlights a summary of findings, conclusions, recommendations and questions for future research.

### **1.10 Chapter Summary**

A summary of the study is in this chapter, as well as an introduction to the research problem. Literature laid the foundation for the broad research problem and specific research problem for this study. This included literature on DRR in other countries in addition to South Africa. The chapter presented key terms and definitions used in the study. Research objectives of the study were set as well as research questions to which the study responds. Lastly, the chapter presented an outline of the dissertation chapters before this chapter summary.

## **CHAPTER 2**

### **THE RISE OF DISASTER RISK REDUCTION AND STAKEHOLDER ENGAGEMENT**

#### **2.1 Introduction**

This chapter analyses the literature in terms of the shift from DM to DRM and DRR. Different global North and global South countries are considered. It discusses DRR generally but also with particular reference to risk reduction strategies for fire hazards and disaster management plans. Literature suggests a connection between the need for DRR and socio-economic development of global South countries such as Asia and Africa. The chapter highlights the role of stakeholder engagement in DRR before identifying the theoretical framework driving this study. Lastly, the chapter concludes with a summary of contents.

#### **2.2 The Shift from Disaster Management to Disaster Risk Reduction**

Natural disasters have increased globally over the last fifty years (Djalante, Thomalla, Sinapoy and Carnegie (2012:1). Therefore, systematic efforts are required to reduce risk disaster. From a global perspective, the United Nations International Strategy for Reduction of Disaster (UNISDR) has, since the late 20<sup>th</sup> century overseen a number of global governance frameworks. These include the International Framework for Action for the International Decade for Natural Disaster Reduction of 1989 (UN, 1989), the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action (UN, 1994) as well as the UN International Strategy for Disaster Reduction (UN 1999). With the rise of climate change and the onset of countless natural disasters across the globe that resulted in loss of lives and property thereby thwarting sustainable development, regional governance organisations, national governments, non-governmental organisations (NGOs) and private sector followed suit. Midway through the first decade of the 21<sup>st</sup> century the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters, broadens the agenda. However, the focus began to shift from DM to DRM and DRR. The HFA prioritises resiliency through planning systems, evaluation and implementation of DRR initiatives. To reduce disaster risk vulnerability in an effort to build communities resilient to natural disasters, transformation of legislative and policy frameworks are required (Ibem,

2011:4). Recently, the successive instrument to the HFA has crystallised the global discourse and clarified worldwide aims for handling natural disasters. Adopted in 2015, the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) (UN 2015), is about, *inter alia*, strengthening disaster risk governance and investing in DRR. The DRR discourse recognises rapid urbanisation in African cities that has led to proliferation of informal settlements. The UN Plan of Action on DRR for Resilience (UN 2016) is a strategy to carry out the SFDRR. This plan includes an integrated approach to sustainable development through coordination and strategy, monitoring and reporting progress and communication, advocacy and partnerships (UN 2016).

Prior to the shift to DRM and DRR, DM revolved more around emergency management, response to disasters and recovery from such disasters. Henstra (2010:236-246) found that local government plays an important role in emergency management by developing an Incident Management System (IMS) and procedures that allow to respond effectively to community emergencies and their aftermath. The IMS is a tool for identifying the disaster and responding to it (Kohn 2010:47). However, municipalities tend to misunderstand the IMS and fail to comply with its guidelines in dealing with disasters that affect informal settlement residents. The norm is that disaster responses organizations often speak of but rarely use IMS (Kim, Tachikawa and Takara 2007:250). In contrast, the aim of the IMS is to justify and arrange responders while integrating pre-planned resources into response. What appears to be the challenge is the implementation of the IMS to effectively deal with disasters such that the impact is minimised. Despite these shortcomings, the mere existence of this plan is itself a promising indication.

Kusumasari and Alam (2012:356) note the importance of disaster policy and strategy in response and recovery stages. Processes of response begin immediately as the disaster strikes, and it is clear that appropriate action should be quick instead of mitigating for lack of preparedness. Responses to disaster include diverse categories such assessment of damage to property, determination of loss of life, identification of less injured people, coordination and supporting means. In response to disasters, the Mayor of Bantul district seems to care for its people whose lives are involved in disasters. Best medical services rendered in order to attend to injured people (Kusumasari and Alam 2012:356). The recovery stage is the important action of reinstating structures and systems to pre- disaster conditions (Kusumasari and Alam 2012:356). The recovery phase involves a number of actions that need to be taken such as assessment of damage in the area, and social rehabilitation programmes. This phase in Bantul is both in short-term and long-term goals (Kusumasari and Alam 2012:356). Since year 2000, Bantul local

government has made tremendous efforts in involving the community to participate in municipality development and to give input in local government programmes (Kusumasari and Alam 2012). According to Kusumasari and Alam, (2012:351) Bantul district in Yogyakarta, Indonesia used the local wisdom based recovery model. Any type of local government in developing countries might use the model. It is a recovery process from the disaster based on local community wisdom. The local government discovered that education, escape structures from disasters, socialization and risk identification and warning tools are important factors for safety from disasters.

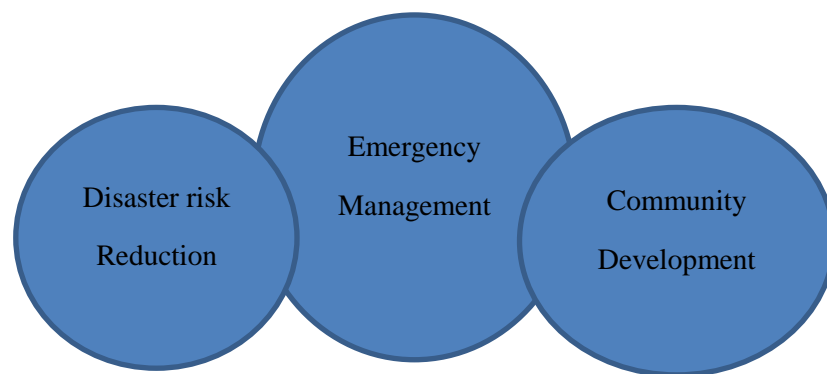
According to Djalante *et al.*, (2012: 1-9), the major reaction to disaster should take the form of preparation in advance, this includes the creation of emergency reaction before disasters occur. In Canada, provincial legislation in Ontario and Quebec requires that all municipal and regional governments adopt emergency management planning. Notably, there is commonality of approach between Canada and Australia in the sense that there must be legislation in place to compel municipalities to carve a disaster prevention strategy. In Australia, a significant number of cities already have systematic disaster management plans in place. According to Gabriel (2003:74), the local government throughout Australian cities plays an important role in emergency management. They give support to the community for emergency services for both during and post-disasters. Australian local governments use risk analysis, prioritization, and treatment under this design of emergency risk management. Sylves (2014:11) highlights the comprehensive approach to emergency management in the United States that is incorporated into state legislation and management structures. The approach, called ‘preparedness, prevention, response and recovery’ (PPRR) is applied. Sylves (2014:11) further explains that these phases are not sequential, independent to one another but can overlap and run simultaneously. This approach embraces the view of a safer community (Sylves 2014:11).

This approach provides, *inter alia*, identification and treatment to risks, support for the emergency services in response operations, that the recovery from emergencies should not only provide resources to assist residents but also personnel to manage recovery processes and assist affected householders and communities. According to Rogers (2011:54), current research suggests more resilient ways of safeguarding Australia by enhancing the PPRR approach in that country, that is extending the approach to include the participation and assessment of threats. National Strategy for Disaster Resilience in Australia and current research shows that the components of ‘reduction of risk’ and ‘development of community’ have to combine with



‘emergency management’ to create a disaster resilience trio. In applying the strategic alliance it shows the importance of learning as the essential element of creating disaster resilience using ‘practice of communities’ and exploring how communities learn before, during and after disasters (Dufty 2012:1). Cutter, Burton and Emrich (2010:1547) note that there is interest in disaster resilience as a tool for mitigating the effects to local communities, but the recognition of metrics and standards for assessing resilience remain a challenge.

Figure 2-1 presents the relationship between the three components to create community disaster resilience based on latest research. This shows an effort to combine DM, DRM and DRR.



**Figure 2-1 – Dufty’s components of community disaster resilience**

Source: Researcher content adapted from Dufty (2012:41)

Dufty (2012:6) notes that the importance of each field can be smaller or bigger, it is not necessarily equal as shown in Figure 2.1. It depends on the resilience that is ‘profile of community’. The value of ‘reduction of disaster risk and management of emergency’ section as depicted in Figure 2.1 is questionable because PPRR in emergency management can serve both. The difference between the two is that it differentiates hazard risk mitigation (prevention) activities from preparedness activities. The boundaries are sometimes confusing (Dufty 2012:6). Dufty (2012:7) distinguishes mitigation from preparedness by putting emphasis on long-term resilience, by applying permanent modification of visible and other circumstances that make risk and vulnerability the important consideration. News media and the public mostly misunderstood the meaning of mitigation. It is always confused with preparedness (Dufty 2012).

Turning from global North to global South countries, according to Courbage and Mahul (2013:401), developing countries have regulatory systems that cannot manage the fast asset growth of risk and do not have resources for minimising vulnerability and reducing risk

exposure. Courbage and Mahul (2013:401) further notes that governments urgently need to manage and reduce the financial impacts due to disasters. A number of governments are realising the need to have strategies for the comprehensive disaster risk management which include finances that are reserved for disaster risk strategies in order to have sustainable development and move from disaster response to disaster prevention (Courbage and Mahul 2013:401). Long-term approaches developed by the World Bank seek to support proactive risk reduction in developing countries. GFDRR and World Bank established a government consortium in 2006 to facilitate mainstreaming global support towards integrating DRM into national development planning (Courbage and Mahul. 2013:401).

Loh (2005:231) argues that in Southeast Asia, post-disaster activities dominate response and action on managing disaster particularly on emergency response. Loh (2005:231) argues further that there is an overreliance on multinational development banks and donor agencies for post-disaster funding and provision of emergency assistance on an obligatory basis. For example, the International Bank for Reconstruction and Development (IBRD) is widely known for lending money to developing countries affected by natural disasters. According to Loh (2005:231), the World Bank has loaned more than U\$38 billion for projects that are of emergency to countries that have experienced natural disasters. This makes the World Bank the largest reinsurer in the world. However, Loh (2005:231) also notes that there are numerous serious drawbacks with the current format of post-emergency reconstruction. The post-emergency reconstruction provides little incentives for countries to prepare themselves for risks before they occur. Furthermore, Loh (2005:231) argues that despite the fact that multinational banks and donor agencies finance a certain portion of government reconstruction work after disasters, delayed release of funds inhibits expeditious reconstruction of infrastructure and economic development at large.

The shift from a focal point of emergency management and response and recovery to prevention, preparedness, risk mitigation and involvement of multiple stakeholders including communities, signals the rise of DRR, which is the next discussion.

### **2.3 Disaster Risk Reduction in a Global Context**

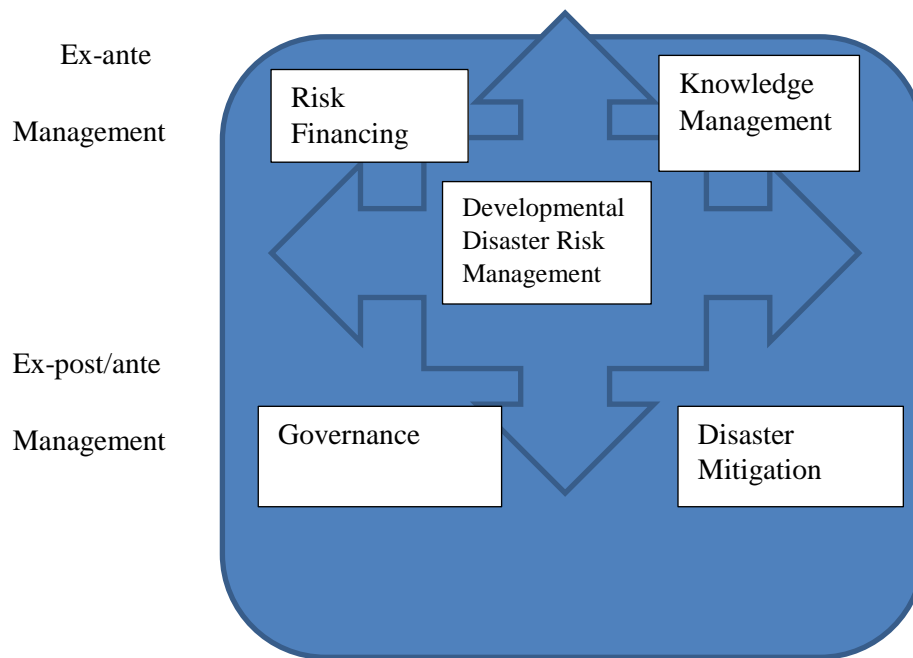
According to Ruffin and Reddy (2015:220), DRR is a global phenomenon with local manifestation, indicating the global/local nexus of DRR. Literature on the state of disasters globally maps out disaster risk, examines how the burden thereof relates to development and

reviews DRR strategies adopted in different contexts. It is important to note that there are high probabilities for the occurrence of hazards and extreme climatic conditions with more frequency and severity thereby increasing the vulnerability and risk, particularly for the poor in urban informal areas of developing countries (van Niekerk 2014:24). Vulnerable populations are of important concern in DRR.

According to Pineda (2012:1), poor urban communities like those in the Philippines are at risk because of extreme disaster events such as earthquakes, storms, flooding, landslides and fire. Local development planning can assist at-risk communities to minimise risk and alleviate poverty. Pineda (2012:708) states that Community Based Disaster Risk Management (CBDRM), which consists of disaster and vulnerability training programmes, is useful for developing countries. This programme helps the poor communities in bringing together the resilience in disasters and building disaster risk planning and self-management. Communities at-risk are deeply involved in identifying, analysing, treating, monitoring and evaluating disaster risk to reduce vulnerability and enhance capacities with the help of CBDRM programmes.

DRR strategies should address long-term situations. Studies based on Southeast Asian countries mostly detail how regions that are exposed to disaster can succeed in DM and DRM/DRR. Loh (2005:232) suggests that the agenda for these countries is managing disaster risk instead of loss financing post-disaster. Loh (2005:232) states, “This will enhance development to optimize post-loss funding capacity and strengthen budgetary discipline to protect and sustain current and future development projects”. The *modus operandi* for DRM here is ensuring that investment adds value and social beneficence that exceeds the social costs. The emphasis is therefore on enhancing development of managing disaster risk by ensuring that scarce post-loss funds create value (Loh 2005:232).

Against the background given above, lessons drawn from the past decade of Asian tsunami disasters, Loh (2005:229), suggests that risk financing, knowledge management, mitigation of disaster and governance accountability frameworks should be made in current management of disaster risk plans to safeguard and maintain current and future projects in Southeast Asian countries. According to Loh (2005:231), it is important for the country’s long-term development project to serve as a sustainable DRM model to restore the environment post-disaster. Figure 2-2 shows Loh’s developmental model.



**Figure 2-2 The Developmental Model of Disaster Risk Management.**  
 Source: Loh (2005:231)

The projected model argues that both the pre (ex-ante) and post (ex-post) management initiatives need to be implemented for protecting and sustaining current and future development projects (Loh 2005:231). Ex-ante management component of the nation’s disaster risk ruminates both financing instruments and risk transfer resolutions that are for maximizing a country’s financial preparations for disasters. The aim for finance in disaster risk is mobilising resources of finance to donate towards countries disaster risk, after implementation of all risk-reduction strategies. Another element in ex-ante management includes the management information of disaster to be able to identify risks facing the country (Loh 2005:232). The sharing of knowledge involves network interactions between actors that are involved in risk management undertakings. According to Loh (2005:232), ex-post category determines governance accountability and ensures that the use of post disaster funds wisely assist the victims. Moreover, stricter government visibility will be a protective factor from corrupt officials. The last component of the mitigation model is about tools that can be used pre or post disasters to reduce its ultimate effect, especially upon vulnerable populations.

Ruffin and Reddy (2015: 219-220) contend that “the root causes of human vulnerability are the same socio-political and economic factors that forestall development” and local government has

a significant role to play in DRR. Similarly, Kusumasari, Alam and Siddiqui, (2010:439) point out that those poor communities are the most vulnerable to disasters because of political, economic, cultural and social factors which leave them with no choice but to live in risk areas. Local government can reduce vulnerability of communities and disaster impacts, as this is their responsibility to identify and protect the community (Kusumasari, *et al.*, (2010:438). Reduction of vulnerability realises danger. Therefore, it is important to take prior measures to prevent it from transforming to disasters (Ibem, 2011:30). Quarantelli (2009) argues that the disaster vulnerability reduction and risk management is a function of the location, development, nature of settlement as well as nature of disasters prevalent in a particular context. Ibem (2011:27) states that vulnerability to disasters is a universal hazard yet there are indications that the poorest people living in less developed continents are in Africa. Asia and South America are at an increased risk to disasters such as floods, fires and droughts. In line with the findings of Ibem (2011:28), this exposure to disasters constitutes a critical challenge for development of global South countries. It appears that the much focus on management of disaster risks in the African sub-region is on response, recovery and rehabilitation, with few attempts in reducing vulnerability to disasters.

Ibem (2011) conducted a study in Lagos, Nigeria with an aim of establishing factors that influence vulnerability of disaster reduction in the area. Respondents recognised a number of challenges that are holding up adoption of a DRR strategy. Table 2.1 illustrates some of the key challenges identified by respondents.

**Table 2-1 Challenges of Disaster vulnerability reduction in Lagos Megacity Area.**

Factors	Built environment professionals		Disaster managers		Total	
	n	(%)	n	(%)	n	(%)
Institutional failures	14	29.12	12	19.35	26	23.64
Inadequate housing and infrastructure	16	33.3	18	29.03	34	30.91
Socio-economic challenges	4	8.33	9	14.5	13	11.82
Disaster education	12	25.0	20	32.26	32	29.09
Political issues	2	4.12	3	4.84		4.55
<b>Total</b>	<b>48</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>110</b>	<b>100</b>

Source: Field survey in 2008 (Ibem 2011)

Table 2-1 indicates that 30.91% identify inadequate housing and infrastructure, 23.64% recognised institutional failures and 11.82% spotted socio-economic challenges. Only 4.55% were of the view that political issues inhibit the integration of an effective program for disaster risk vulnerability in the city of Lagos. This suggests that the critical challenge to adopting the strategies of vulnerability reduction in the area is inadequate housing and infrastructure.

## **2.4 Fire Disaster Risk Reduction Strategies**

This section covers fire DRR strategies in relation to countries such as Australia, the United States and China. Williams (2013:270) points out that mega fires contribute to property loss. There is high impact in mega-fires. These include unprecedented cost, property losses, natural resource damages and loss of life. As it would happen in informal settlement fires, when there is fire, often times loss of life occurs. Williams (2013:270) further notes that fires have an impact in countries around the world, even those with massive firefighting capabilities suggests that fire management programmes are essential in reducing fire risks.

In terms of fire risk reduction, the Greater Shepparton City Council in Victoria, Australia has a Municipal Fire Prevention Strategy in place; subject to update every three years. The aim of the strategy is to prepare and protect the community, their assets and the municipality from the threat of uncontrolled fire (Shepparton, 2012:28). The strategy seeks to point out major fire risks, within the Municipality, and to outline a process for minimizing those risks. This strategy aims to protect life and lessen property loss (Shepparton, 2012:28). Providing safer communities is the goal/vision of the strategy. The strategy, amongst other things, provides for different structures that involve members of the community. One of the components of the strategy is the Fire Access Road. This strategy makes it possible for Greater Shepparton City Council to establish a road network within an area occupied by a community to enable the Fire Brigade and the fire trucks to manoeuvre close to the affected area and extinguish fire.

In addition, another municipal council in Victoria, Australia also has a fire prevention plan like the Greater Shepparton City Council. This is the Yarra Ranges Council based on the Country Fire Protection Act 1958 (Greater Shepparton City Council; 2012:65). This council's plan has similar participating structures as in Greater Shepparton City Council but it does not have a clear strategy to prevent an accidental fire from ravaging the whole community through an access road network. It seemingly provides little evidence with regard to the structure and elements of fire

disaster risk reduction plans. Different plans appear to be more beneficial for comparative purposes and exchange of ideas rather than a single framework universally implemented in different locations (Mercer 2010: 215).

The Yarra Ranges Council (YRC) in Australia conforms to the requirements of Country Fire Authority Act 1958, stipulating that each municipality should have the Municipal Fire Prevention Plan (MFPP) in place. The purpose of this plan is to identify fire related risks within the municipality and to specify how the council will respond to those risks within their capacity. This includes the contribution they will provide for the benefit of community safety (Yarra Ranges Council 2009-2012:5).

The organogram in Figure 2-4 illustrates the main thrust of the MFPP, which is to enhance the safety of people living, working, visiting the area, also planning, and implementing measures necessary to minimise the occurrence of unplanned and extensive fire, which cause unnecessary damage (Yarra Ranges Council *MFPP 2009 – 2012*:6). The YRC plan responds to its 2020 vision theme of ‘A safe and shire’.



**Figure: 2-3: Yarra Ranges Council Municipal Fire Prevention Plan**

Source: Yarra Ranges Council (2009-2012)

The YRC municipality has deliberate resolutions to care for its community, particularly for people living in informal settlements; measures are in place to minimise its extent of damage in the area (Yarra Ranges Council MFPP 2009 – 2012:6).

In a study on endeavours to prevent forest and wild fires in European countries, Moreira and Pausas (2012: 29) found that authorities elect to spend money in constructing firebreaks and fuel breaks rather than spend money in rehabilitation of the devastated forests and the wild. Several cities in the United States provide fire prevention examples. Portland implements a strategy of appointing schoolchildren as assistant marshals in fire prevention. This initiative stems from the influence that the average child has in his/her home. This initiative directed schoolchildren to



make careful inspection around their homes if there are no careless candle light ups or stoves left unattended. Children took this initiative seriously and became an educational force towards fire prevention in informal settlements (Riley, Grenfell, Boatwright, Hopkins and Woodward nd: 5).

In the United States, Parker-Gibson (2012:12) contends that the best method of preventing fire is through public education initiatives. In fire prevention, fire investigation and code enforcement do not play a major role when compared to the ongoing success of public fire safety education programmes. This is in line with Portland, Oregon initiative. Community fire-safety education serves as an intervention to life safety and fire prevention by providing educational initiatives in schools, civic and businesses associations. Fire codes and ordinances reduce fire incidents through fire investigative techniques. In Houston, Texas, the law enforces fire and life safety inspection as a requirement and an integral part of fire code enforcement in their business communities. Communities expect a safe environment to live in with the enforcement of the fire codes. Hence, the Houston Fire Department (HFD) reduces fire death incidents through education and public awareness. The method of the HFD is congruent with the earlier noted local wisdom based recovery model of Bantul district in Indonesia where they endorse the educational method to minimise disasters particularly fire. The Public Affairs Office of Houston installs smoke detectors and provides fire safety literature in fire fatality areas within 48 hours of the incident. The city conducts the smoke detector campaigns targeting informal settlements and high-risk areas. HFD also collaborates with industry to facilitate the education and public awareness to communities with household loss through fire.

The HFD believes that their ability to protect communities from fire depends on the health and safety of their fire fighters as well as their ability to provide services. This department ensures that their main goal is to provide health and safety environments for their personnel. The 2009 National Fire Protection Association (NFPA) firefighter incidence statistics in the U.S. revealed that 54% of firefighter fatalities emanate from stress and that a number of incidents occurred in the line of duty (Houston Fire Department Strategic Plan 2011-2015:13). It is clear that fire departments should ensure safety environments at all times so that the firefighters could produce adequate services when fighting fires that destroy people at informal settlements.

Turning to China in the global South, according to Liu, Zhang and Tong (2010:53), China has a challenge in fire disasters because of global warming and human activity. The Northwestern and Northeastern China confront mitigation problems of fire than any other regions. From 1991-

2006 statistical analyses, fire disasters in northern China have increased due to economic development and population growth. The main challenge for China is to create systems of fire disaster risk in order to facilitate the distribution of resources for DRR so that economic assistance becomes available. Liu *et al.*, (2010:54) point out that risk assessment is an imperative tool for managing natural disasters. There has been an increase in the number of research studies focusing on analysis of natural disaster risk and assessment of earthquakes, flooding and droughts. However, fire disasters receive less attention. Fire disasters erupt from both natural and human factors and their interactions. Liu *et al.*, (2010:54), further point out that it is important to obtain prospect causes and losses that suffered during fire in order to compensate losses effectively.

Lixin, Lingling, Dong, Junxue and Zhanwu (2012:298), explain that the Chinese government has a disaster management plan. China treats each disaster individually, for example they have a treatment for fire and treatment for floods, or prevention of earthquakes. The Ministry of Water Resources is responsible for flood prevention and mitigation. The China Earthquake Administration, established by central government is responsible for earthquake affairs including prediction and prevention of earthquakes. As active duty soldiers, the Brigades serve in the Ministry of Public Security and Forestry Armed Police. Both the State Forestry Administration and the People's Liberation Army of China co-lead the Fire Brigades. These two forces are isolated from each other (Lixin *et al.*, 2012:298). These authors state that Fire Brigades are in charge of fire disasters in the city, province and country levels under their own administration whilst forest forces are in charge of forest and grassland fires. Fire Brigades are not the only wing responsible for all types of fires in the city but rather Forestry Armed Police Force is responsible for fires caused by natural disasters. This arrangement decreases the workload of Fire Brigades and increases chances of being effective in their area of work. Lixin *et al.*, (2012:298) argued that before 2008 the Department of Fire in China had a "single style" job, which was the responsibility only for fire disasters. Fire Brigades began to be responsible for emergency rescue and other responsibilities such as lifesaving. This is in line with the new Fire Prevention Law of the People's Republic of China (PRC).

Lixin *et al.*, (2012:296) suggest that in emphasising the importance of disaster management the PRC formed the 'single-style' disaster management system, which consists of different categories. The categories are disaster prevention and disaster management. This prevention is by means of detecting the early warnings of risk and educational talks on disasters. All the

means of prevention are combined together in order to enhance disaster management. All government departments play a dominant leadership role in disaster prevention and reduction in conjunction with public communities. Lixin *et al.*, (2012:296) state that communities are the first priority such that people's protection and their property are ensured at all times.

## **2.5 Fire Disaster Risk in South African Informal Settlements**

A number of laws and policies govern South African DM/DRR. These include the 1998 Green Paper on Disaster Management, Disaster Management Act No. 57 of 2002, National Disaster Management Framework of 2005 and the National Development Plan: Vision 2030 (NDP). White Paper 1999 on Disaster Management, which the main focus of this policy document was on vulnerability reduction as a key strategy to minimize disaster risk, in particular to poor household and communities (Napier and Rubin 2002:9). The purpose of laws and policies is to ensure that the eThekweni Municipality uses the guidelines of the South African DRM/DRR policies as mentioned above in their strategy to eliminating fires at Clare Estate. This will ensure the effectiveness of the Municipality's DRR strategy.

Ruffin and Reddy (2015:221) affirm that socio-political and economic factors are the root cause of human vulnerability, including vulnerability of informal settlement residents to disasters. In spite of intergovernmental arrangements for DRR, communities turn to local government for both fulfilments of socio-economic needs and assistance in preventing and responding to disasters. Informal settlements are a common phenomenon in South Africa. With regard to fire in informal settlements, Pelling and Wisner (2009:112) note the nine-year review of the nature and scope of damage incurred through fire in South Africa during period of January 1995 to December 2004. Of the more than 18504 fire incidents reported, 8554 occurred within informal settlements. These fires ranged from small-medium sized events, affecting up to 40000 people whilst the number of people either sustaining injuries or losing their lives at informal settlements is largely undocumented. Significant damage to property and severe disruption of lives of victims occurs from fire disasters.

Ruffin and Reddy (2015:224) further state that socio-economic inequities and political power differentials at local community level shape vulnerable populations and create poverty, lack of adequate housing, rising urbanisation, high rates of illiteracy and unemployment leading to risky environments like informal settlements. This issue revolves around economic inequities that lead to vulnerable communities at risk. For example, Table 2.2 below demonstrates the losses

incurred in the provision of different post-disaster services by various actors with professional concern for fire DRR in the year 2000 at the informal settlement of Joe Slovo in Cape Town. As noted below the total cost of these services on this occasion was at least R500 000. This amount does not include social services invariably offered by the City of Cape Town such as blankets, shelter, food and other financial assistance for households to rebuild their dwellings - assuming that R500.00 was expended per family and the sub-total may have amounted to R148 000 bringing the aggregate losses to R702,989.

**Table 2-2 Fires in Joe Slovo: Recorded direct losses from small medium and large scale**

<i>Services</i>	<i>Type</i>	<i>Amount</i>
<i>Total loss %</i>		
Fire services	Response cost 20	110,989
Social services	Recovery cost	Data not available
Red Cross	Relief cost 4.5	25,000
Losses to households	Loss to property 75.5	419,000
Sub-total		554,989.00

Source: Pelling and Wisner (2009:112)

More focused understanding of past literature seems to suggest that socio-economic conditions increase the risk of fire disasters in informal settlements. This notion stems from residents' reliance on cheap but hazardous sources of energy and lighting such as paraffin stoves, lamps, candles and most of all illegal electricity connections (Pelling and Wisner 2009:112). Findings from other studies reveal that alcohol abuse and domestic violence including politically motivated unrest underlie causes of fires in informal settlements. An informal settlement known as *Imizamo Yethu* in Cape Town reported that fires are more likely to occur during fights in Shebeens (beer drinking clubs) at night. Another problem is residents falling asleep leaving candles or stoves burning to generate warmth. Such behaviour is common among young men living alone. Thus, this demographic sorting in informal settlements and the subsequent drinking behaviour explains the increased fire DRR. Apart from the detailed tendencies, there is reason to suggest that low-cost housing creates exposure to fire risks and hazardous environments. Materials used to construct informal structures cannot withstand extreme conditions. These materials include cheap cardboard, untreated wood, corrugated iron sheets, plastics and highly flammable and emissive material. Fire rapidly spreads between structures

frustrating efforts to extinguish fires. Inadequate resident-driven planning or lack of municipal-driven planning for the location of structures and inaccessibility of affected areas due to no proper roads (Harte, Childs and Hastings 2009) further exacerbate congestion and fire risks.

Informal settlements exist in a socio-political context. Social movement organisations attempt to raise the consciousness of political officials as well as informal settlement residents to work toward reduced vulnerability in these communities (Gibson 2012:61). For example, Abahlali baseMjondolo (AbM) SMO was formed in 2005 at the Kennedy Road informal settlement in Durban during the protest, which was caused by the contestations about the sale of land to this informal settlement community for housing purposes as promised by municipal councillor. The purpose of the organisation is to represent people who are living in informal settlements. Membership is open to residents in the shacks regardless of citizenship, language, ethnicity and background (Gibson 2012:61). AbM ventured into politics, which raised radical change such as providing services to shack dwellers (Gibson 2012:62). Ruffin and Reddy (2015:230) contend that DRR cornerstones are preventative culture that outspreads to CSOs and SMMEs while raising awareness and empowering citizens. This involves engaging stakeholders in DRM/DRR, A discussion on stakeholder engagement follows.

## **2.6 Legislation on Disaster Management and Disaster Risk Reduction**

Disaster Management Amendment Act No. 16 of 2015 amended Disaster Management Act No. 57 of 2002. The purpose of this act was to substitute and point out different definitions including clarifying the functioning of disaster management centres. Also to aligns the functions of the National Disaster Management Advisory Forum to accommodate the South African National Platform for Disaster, Disaster Management Amendment Act No. 16 of 2015. According to Pelling and Holloway (2006:3) In 2003 South Africa's Disaster Management Act, was commended in other countries as a path-breaking example of national legislation that encourages DRR. The large disaster in 1990s and international policy influenced the DRR legislation in South Africa as a process in the government institutions in the post-apartheid era. There are various stages in the history of South Africa's DRR **legislation, they are listed below:**

- A period of extensive stakeholder consultations and policy formation was created in 1994-1999.
- Discussion of legislation moved to formal status in year 1999 to 2003

- Crafting and funding of national implementing framework was developed from 2003-2005

The success of DRR legislation in South Africa have been shaped by requirements that enabling political and legal context that branded support and high levels of transformative energy and other requirements which includes a local professional context looking to align itself with international best practice.

As mentioned in 2.5 that there are various laws and policies that govern South African DM/DRR. Napier and Rubin (2002:8) state that in the policy context there are two sides. The one is the range of policies, which form the position and development of new settlements, and determine how the issue of illegal informal settlements should be addressed. The other set of policies apply to government's responses to disasters when they occur, but it also states on how to avoid them. The constitution of South Africa and the housing legislation bind government in ensuring that all South Africans have access to adequate housing. Policies and programmes are to fund local infrastructure, education recreational facilities and health to support the creation of fully serviced new settlements. Legislation aimed to ensure that government follows processes of planning and budgeting with an aim of achieving good location as an outcome.

Napier and Rubin (2002:8) further state that regardless of policies that are put in place for ensuring services and housing to people who need it the most informal settlements continue to grow . In 1997 the Interministerial Committee for Disaster Management was appointed by Cabinet to make a clear policy on disaster management.

## **2.7 Stakeholder Engagement in Disaster Risk Reduction**

Stakeholder engagement in DRR has become increasingly important with the rise of DRR. Stakeholders involve not only government but also the corporate sector and civil society. Inclusion of civil society is bringing to bear the value of indigenous or local knowledge in devising DRR programmes and strategies. Likewise, including civil society in participatory research in DRR is beginning to receive scholarly attention. Shaw (2012:3) suggests that CBDRR entails different stakeholders at different levels. Whilst CBDRR tends towards being government based, civil society organisations lobbied for it (Shaw 2012:3). Therefore, the new trend receiving recognition in the current governance context is that every country and community has its unique character. This requires considering unique characteristics of areas

when discussing the CBDRR (Shaw 2012:3). One of the distinctive characteristic in many countries is the availability of indigenous knowledge.

There is limited literature entirely focusing on indigenous community initiatives for mitigation of fire disasters. One rare study is by Stiger *et al.*, (2005:255). However, there is an abundance of studies emphasising concurrent use of indigenous practices and western knowledge (Cadag and Gaillard 2012:100; Mercer *et al.*, 2009:157; Becker 2008; Wisner 2003; Kasperson *et al.*, 2001). For instance, Kasperson *et al.*, (2001) and Becker (2008) note that vulnerability to disaster is likely to be effectively addressed by a composite approach integrating science, technology, political control and application of indigenous knowledge. In terms of the abovementioned paradigm of vulnerability reduction, there is increased focus on adopting strategies of managing disaster risk with the potential of dealing with poverty, social inequality, infrastructure provision and reduction in environmental degradation in line with MDGs.

Mercer, Kelman, Lloyd and Suchet-Pearson (2008:212) contend that top-down DRM/DRR strategies have been dominating over the years. There is a noticeable shift in research of reduction in disaster risk from “top-down” approaches to “bottom-up” approaches. This includes a shift from research of a traditional form led by foreigners, not conducive for the community and their level of understanding to local people playing an instrumental role in research. It is important that local people/community be included with mechanisms for participatory research agendas. Participatory techniques should address challenges of excluding local people. Instead, the focus should be on ways of interacting with people and engaging them to make decisions for their future. Many communities exposed to risk of any form are isolated; it is difficult to access informal settlements due to limited research and interaction with stakeholders (Mecer *et al.*, 2008). The importance of involving communities in research on DRR can never be overstated. Just as civil society should be included in DRR research, so should the private sector.

As to the corporate sector, Miyaguchi and Shaw (2007:210) took an exploratory survey to study the attitude and behaviours of corporate sector companies in Mumbai, India towards community and disaster management. The study focused on their corporate social responsibility and community involvement initiatives in order to identify the level of emphasis placed on risk and disaster management. There has been a frequency of disasters, which has increased in Asia Pacific regions. The corporate sector has intervened trying to minimise damages and impact after

disasters as well as risk mitigation practices. Successful disaster management projects often consist of different actors which contribute to achieving common goals in lessening disasters, with managing partners from diverse sectors including community, national, provincial, local agencies, NGO's, scientists and researchers (Miyaguchi and Shaw 2007:210). It is for that reason that this study applied actor network theory by engaging actors' from different sectors. Miyaguchi and Shaw (2007:210) note that it is widely acknowledged within the international community that the corporate sector plays an important role in the development of nations in terms of community-based disaster management approach. A number of global initiatives and non-NGO's affirm the central role of the corporate sector in alleviating the suffering of the poor (UNDP, 2004). However, the corporate sector has not been as active as expected in terms of disaster management either because of lack of attention or because of limited resources. Miyaguchi and Shaw (2007) conducted a study in order to identify which part the corporate sector contributes towards disaster management within the community, taking into account that the corporate sector and community play a vital role in influencing disaster recovery.

There is an interdependent relationship of risk sharing emanating from the 'host-guest' relationship. The corporate sector shares with communities as to which premises and other physical property of the former are situated. Accordingly, vulnerability to disaster risk (i.e. floods, landslides, earthquakes, storms, droughts) has implications for human and economic losses. World Bank (2002) notes that 85% of the total accumulated insurance cost worldwide accrued from natural disasters. Miyaguchi and Shaw (2007:211) account for this estimate by noting that all over the world 80% of natural disasters happen in Asia and millions of people are affected. They further note that the corporate sector is accordingly concerned with safety in their operations and fortifying the environment in case a hazard hits the area. It is important that the corporate sector have necessary measures for disaster risk, be it multinational or domestic. In developing countries, the role of corporate sector is critical to the lives of inhabitants with regard to national development and post-disaster activities. According to Issar and Mathur (2005:60), the corporate sector has capacity and strength to promote their own safety and that of surrounding communities against natural catastrophes through their disaster management activities. The corporate sector plays an important role in assisting vulnerable people owing to disasters. Miyaguchi and Shaw (2007:211) express it better in their study conducted in Mumbai, India that the corporate sector has contributed in disaster reduction and prevention by forging long-term partnerships, addressing prevention and increasing business activities and engagement of employees and local communities, thereby playing a philanthropic role.



By providing jobs, benefits and tax revenues, the corporate sector bonds with the community whilst companies in return depend on the well-being of the community. The interface between the two entities is essential for the promotion of disaster management in a long run. According to Miyaguchi and Shaw (2007:213) corporate social responsibility (CSR) activities obtained immense recognition in disaster management hence overshadowing as the importance of intermittent special activities. More than this, most CSR activities overly focus on post-disaster measures, therefore, such relief efforts only last for a few weeks or months. In Miyaguchi and Shaw (2007:215), the study required the participants to evaluate the importance of community involvement on a scale of five where “highly important” was on the one extreme and “not important” on the other extreme. The majority of respondents evaluated the involvement as highly important. The minority that did not evaluate community involvement as highly important were from sectors that employ highly skilled workers.

In order to realize participatory and sustainable disaster management involvement of the community, including civil society and the corporate sector, it is important to have active involvement of the community. It is the responsibility of government to manage disasters as long as their approach is not top-down (Shaw and Okazaki, 2004:102). The top-down approach always fails because it lacks community participation and involvement in decision-making and implementation of activities whilst they are the ones affected during and after disasters. Therefore, the informal settlement community of Clare Estate should be involved in constructing and implementing disaster management strategy of eThekweni Municipality because they are the people who directly affected when fires occur at informal settlements. They can apply indigenous knowledge to combat fires. Chapter 4 further discusses this point, based on empirical evidence. The next section highlights the theoretical framework driving this study.

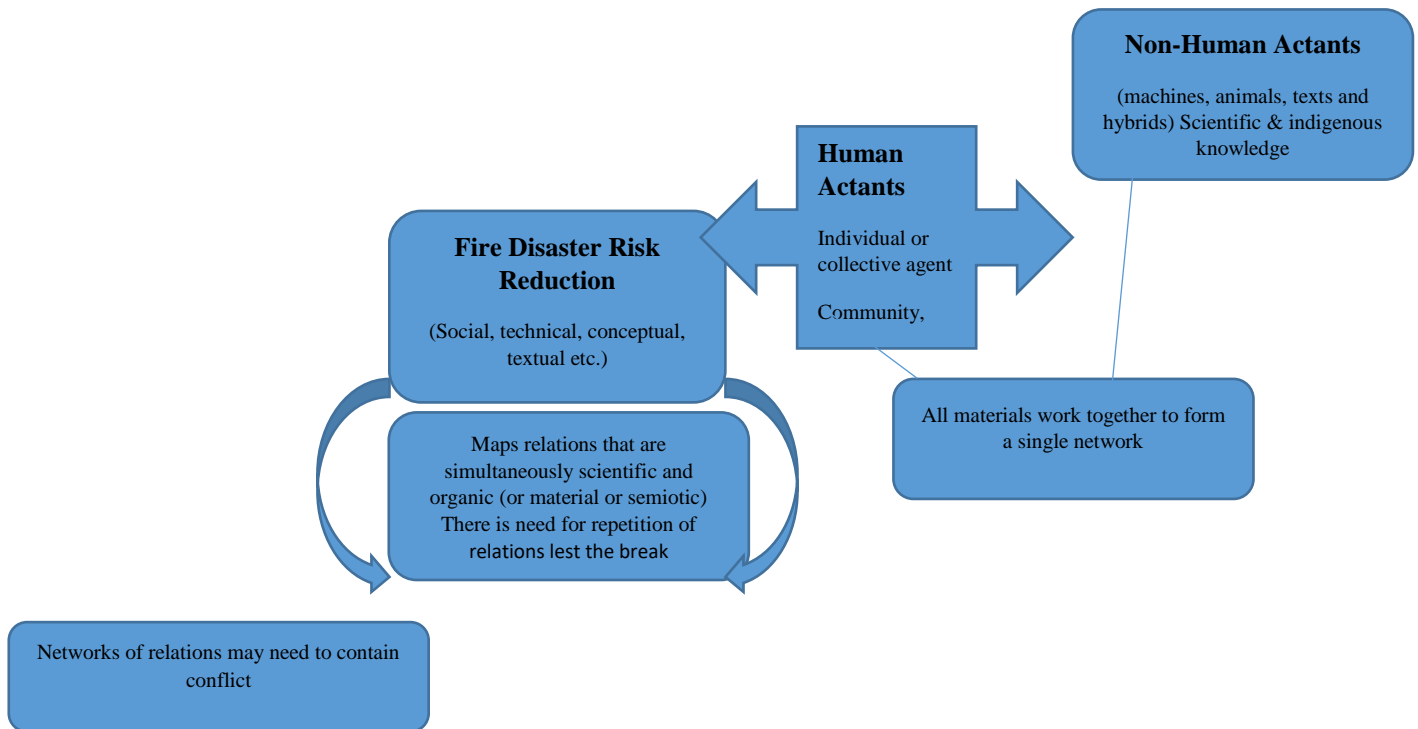
## **2.8 Theoretical Framework**

Having explored some key dimensions of DM and DRM/DRR in literature locally, nationally and globally, attention now is on discussing notions associated with the Actor-Network Theory (ANT) in order to discover subsequently whether this approach can contribute towards a ‘critical’ analysis of risk reduction and management. Therefore, this sub-section examines the theoretical and conceptual literature relevant to reduction of disaster risk and managing disaster

risk in particular and to the broader areas of knowledge relating to DRR and DRM stakeholder integration and networking, in light of ANT.

Creswell (2008:45) recognises that a tool influencing the direction of an analysis is the theoretical framework. The theoretical framework comprises of concepts along with their definitions and linkages to relevant scholarly literature. Notably, through a theoretical framework, scientific concepts and approaches influence research studies. This study draws upon frameworks provided within the ANT in the attempt to make sense of the interview material and understand whether and how indigenous could facilitate community well-being and recovery appropriated within the fire disaster risk context. Chatterjee (2010:1) suggests that informal settlement dwellers have to employ both structural means and complex network of assistance to recover from disasters. Figure 2-6 depicts the ANT.

#### Actor Network Theory (ANT)



**Figure 2-4: Actor-network theory diagram**

Source: Adapted by researcher from Lassa (2012:7), Kenney and Phibbs (2014:3), Stones (2010:1287) and Latour (2011:799).

Adapted by researcher from Lassa (2012:7), Kenney and Phibbs (2014:3), Stones (2010:1287) and Latour (2011: 799) ANT largely symbolizes the products and processes of ‘interaction’ between actors. It presumes that, if actors and their connections are lumped together, they make a ‘network’. The constituent parts of networks tend to be more pronounced if matters in a system do not go according to plans, conversely, these inter-connections lie inactive when things are normal (Kenny and Phibbs, 2014:757). An actor is described as the origin of an action regardless whether it is a human or non-human entity; notably, this is a radical notion given that it suggests that non-human entities e.g. such as technology or fires can also have impact (Creswell, Worth & Sheik 2010). ‘Actors’ are largely regarded as equal except in their ability or throughput and impact or interaction with other actors. For instance, Lassa (2012:7) notes that communities invite global agencies to transact their humanitarian imperatives because they are more likely to have stronger connections than local relief groups in terms of post disaster organizations’ networking. Either actor can be in any form, in a form of humans or non-humans, even objects. Persuasion and the negotiation of same interests safeguard translations, the main function of interaction among actors (Miles *et al.*, 2012:370). ‘Merging’ in a network describes the extent between translations’ and ‘circulation’ result in the bond between the two. ‘Actant’ is a term applied by Bruno Latour to denote artefacts, concepts or practices that influence human behaviour (Kenny and Phibbs, 2014:2). Actors that are united share same interest in each other’s activities hence ‘alignment’ occurs. Poor correlation amongst actors needs frequent correlation of their interactions. Prolonged correlations between actors result in the ‘durability’ of an actor network. This describes one of the most endorsed features of ANT as it relates to social spaces. Under the ANT perspective, there is no social, predetermined material to study: rather, every situation is the result of continuous associations among actors (Arnaboldi and Spiller, 2011:641). Accordingly, actors both human and non-human form participate in networks; hence it is only by observing these actors and their associations that social and scientific phenomena can be understood. ANT will thus frame data analysis through shaping interpretations of Clare Estate community’s knowledge, value-set and cultural practices pertaining to disaster risk reduction and management as inter-related and co-constitutive actants that influence Clare Estate residents’ behaviours at the collective and individual levels.

Largely, the ANT and methodology is a robust tool for exploring the ways in which technologies (actants) mutually shape interaction and the interplay between local and scientific knowledge in disaster management. Although in the early years of its inception, during the mid-1980s it was

mainly adapted in studies on the information technology, recently several other researchers increasingly use ANT in widely diverse disciplines, such as health care, accounting, information technology, sociology (Cresswell *et al.*, 2010; Justesen and Mouritsen, 2011; Greenhalgh and Stones, 2010, Elbanna, 2010). Furthermore, only a minority of researchers have employed components of ANT in disaster research and vulnerability valuations. These include among others, Yamane (2009), Miles (2012), and, Kenny and Phibbs (2014). Nevertheless, the challenge with disaster management has been drawing a frame of reference or lens through which one is able to examine DRR and DRM with the view to design appropriate fire disaster prevention strategies and measures for evaluating them for communities at risk. Drawing upon and extending ANT, Kenney and Phibbs (2014:3) explore the way in which indigenous knowledge, values and beliefs culminate as abstract actants that guide action. Within ANT, hazards such as wild fires are non-sentient actants that unintentionally influence human behaviour and modify social networks (Miles, 2012:34). Physical as well as abstract cultural technologies, such as oral practices for fire prevention and mitigation of effects, land, and solidarity may conceptualise the heterogeneous relational and material entities that have capacity to achieve durability brought about by the collective actions of the Clare Estate informal settlement community.

ANT postulates that the emergence of scientific knowledge is synthesised through a network of widely diverse materials constituting social, technical and natural elements. Therefore, networks occur when actors of different backgrounds interact with one another in a relevant network arena. Ultimately, mutually founded efforts of different actors are vital in the generation of solutions for a known problem. While the theory supposes that the nature of interaction is among actors of equal status, it concedes that relations may need to contain conflict and all actors are unable to play the same roles in a network. Lassa (2012:6) finds empirical evidence for the latter by noting that in developing countries, specific stages of disaster governance are affected by inadequate human resources and high information asymmetry owing to dysfunctional communication infrastructure after a catastrophe; and lack of transparency and information sharing.

As a concept, the ANT approach is important in assisting researchers to obtain a real sense of the complexity and fluidity of reality, an aspect often neglected by research approaches assuming a more linear and causal approach to studying disaster risk management (Latour, 2011:799). Difficulties in collaboration are a persisting problem in multi-agency response to disasters.

Notably, problems arise around the number of agencies and actors involved in DRR and DRM and the kinds of connections needed between them. Key decision-makers in complex and uncertain settings may rely on foresight processes to plan and identify goals for uncertain futures, yet actors in ad hoc situations lack time to develop multiple scenarios of collaboration and its projected outcomes (ISCRAM, 2015). Thus, ANT will assist in theorising how different realities caused by different actors are experienced, resulting in a more balanced picture of the dynamic relationships between different actors without disregarding their inter-relatedness. This is important, given the dynamic area of disaster risk reduction and management and more so, as it relates to government-led initiatives and resultant changes in power shifts (Hiltz, Kushma and Plotnick 2014).

Effective disaster intervention emerges from bottom up and local groups, in particular those in marginalised communities. They are likely to be more responsive (and rapidly so) to disasters (Kapucu *et al.*, All authors are mentioned above p.5 2010: 452). In the United Kingdom, risk management and emergency response practices have since changed in response to the movement towards a polycentric response (Miles, 2011:14). Currently, new legal and professional best-practice policies emphasise the need for stakeholder integration. In his seminal work on the Risk Society, Beck (2009) cautions against overreliance on the efficacy of risk management and crisis response measures. The main objection advanced in this was whether formal systems can deal effectively with the unexpected that is risks. This study suggests that ANT both as a method and theory to explicate eThekweni Municipality DRR strategy pertaining to fires and can help establish whether the scope of enquiry involves actors that are typically excluded, i.e. the informal settlement community of Clare Estate. An important caveat to this task is that rather than a singular and clear-cut approach, ANT is well suited to examine whether indigenous knowledge is or could amount to embedded resilience and shape responses to fire disasters in the Clare Estate informal settlement community.

The South African national civil protection is grappling with various large and novel programmes of crisis management in particular, fire disaster risk reduction and management. This study seeks to design a more fine-tuned lens with which to exhaust the question, ‘To what extent does eThekweni Municipality disaster risk reduction plan and the Clare Estates informal settlement community level initiatives address fire prevention?’ Using examples from the information and data yielded by the empirical research in Clare Estate informal settlement in KwaZulu-Natal in Durban, this study considers how ANT application can be a tool of empirical

investigation. As highlighted above, ANT studies the relationships that link people and technologies, sentient and non-sentient, in dynamic networks. ANT considers how to translate technologies into practices for fire DRR and DRM.

## **2.9 Chapter Summary**

The aim of this chapter was to first distinguish DM, DRM and DRR including the unique focusses of DRM and DRR. The chapter then compared and contrasted DRM and DRR strategies across multiple continents in global North and global South countries. There was specific reference to fire disasters in informal settlements and to determine prevention plans. The chapter also considered local indigenous management systems for informal settlement dwellers including stakeholder engagement in DRR. After presenting the theoretical framework guiding this study, this summary concludes this chapter.

## **CHAPTER 3**

### **RESEARCH DESIGN AND METHODS**

#### **3.1 Introduction**

This chapter presents the research methodology employed in the study. It highlights the qualitative research design with a case study and narrative research strategy. It also presents the location of the study demarcated to the geographical space, namely Forman and Kennedy Road in Clare Estate, an informal settlement of Durban in the KwaZulu-Natal Province of South Africa. The data collection methods included collection of primary and secondary data. These research methods facilitated a comprehensive understanding of the role-players affected by informal settlement fires in Clare Estate and understanding of the dynamics involved in addressing DRR. This chapter discusses in-depth interviews and a focus group as primary data collection tools. Relevant documents provided secondary data. The role-players include local government officials, a social movement organisation, and the informal settlement dwellers affected by informal settlement fires. This chapter also provides a discussion of data analysis through a combination of content, thematic and matrix analysis as well as Excel software. Ethical considerations and limitations of the study follow before the chapter concludes.

#### **3.2 Research Design**

Qualitative, quantitative and mixed methods are research designs. In order to obtain the relevant information and data sought, this study adopted a qualitative research design. The research problem, questions and objectives informed the selection of a qualitative research design. Bluhm, Harman, Lee and Mitchell (2011:1867) point out that the research questions determine whether qualitative or quantitative approach is best suited for a study. This study employed an exploratory qualitative approach because it is an appropriate method for in-depth understanding of the formation and implementation of the fire DRR plan of the eThekweni Municipality.

According to Schurink, (2009:803) a research design is the researcher's road map of how to implement research from finding a topic right up to interpreting the results. Creswell (2013:4) defines qualitative research as an approach for discovering and understanding the significance of

individuals or groups assigned to a social or human challenge. Turner III (2010:754) points out those in-depth interviews provide in-depth information regarding experiences of participants and their perspectives of the research under study. Qualitative research design allowed the researcher to gather information from participants in a social setting at Clare Estate informal settlement in a real life context. A qualitative research design is not like the quantitative paradigm. A qualitative research design is bigger than a plan or source of data gathering tools. A properly constructed and implemented qualitative research design is a method to assist the researcher to unlock the empirical world.

In support of a qualitative approach for the study, Schurink (2009:805) states that qualitative researchers endeavour to make sense of the social world and generate new knowledge or revisit what they know. A qualitative research design creates new spaces, new possibilities and new formations. There are various reasons that prompted the researcher to conduct a qualitative study. Among others is that the topic requires in-depth study to explore the nature of the research questions. The research questions for this study required in-depth study in order to explore the extent the eThekweni Municipality Disaster Risk Reduction Plan (DRRP) for preventing fires in Clare Estate and also to explore the involvement of role players (informal settlement dwellers) in DRRP of the eThekweni Municipality and their indigenous knowledge (IK) in fighting and preventing fire in informal settlements. A quantitative research design would be inappropriate because the study is not aiming to acquire data by collecting numerical data that would need to be analysed using a statistical method.

Denzin and Lincoln (2011:102) note that the word qualitative implies qualities that are pronounced entities and processes, not quantitative measures in terms of frequency and amounts. Qualitative researchers stress the social nature of reality and intimate relationship between the researcher and what is studied. Qualitative researchers seek to answer questions that stress creation of social experience such as how implementation plans for fire prevention in eThekweni Municipality are actioned to prevent extensive fire in Clare Estate. In contrast, quantitative studies emphasize the casual relationship between variables and measurement (Denzin Lincoln: 2011:102). In qualitative research, it is important to note that the researcher's role in a study that is under investigation plays a significant role as a researcher is directly involved in data collection and analysis of the study. Thomas and Magilvy (2011:152) point out that the aim of qualitative research is to offer a deeper understanding within a specific area, unachievable in quantitative research. Qualitative researchers bring all the knowledge they have but still learn to



put their perceptions aside and listen to participants about their stories and experiences (Thomas and Magilvy, 2011).

Dwyer and Buckle (2009:55) affirm this by stating that the matter of the researcher's membership in an area that is under investigation is applicable to all approaches of qualitative methodology since the researcher is directly involved in data collection and data analysis. Being an insider or outsider regarding experience or commonalities shared by participants in a study is irrelevant. However, the individual character of a researcher should be maintained at all times including researcher's membership status in relation to participants in the research is an important aspect of the research (Dwyer and Buckle 2009:55). Qualitative research design has its own challenges, for instance in Chapter 4 it produced excessive data that requires the researcher to consolidate. In contrast, according to Thomas and Magilvy (2011:152) the researchers should gather more data for the study or experience to deepen their preferred understanding. The purpose of qualitative research is to go deep on specific phenomena for developing insights on an issue that is sensitive to participants in the study and not to generalise. According to Bluhm *et al.*, (2011:1870), qualitative researchers confront more challenges compared to quantitative researchers. For instance, there is no outline regarding conducting and writing qualitative studies yet qualitative work standards are attached much higher value than quantitative work.

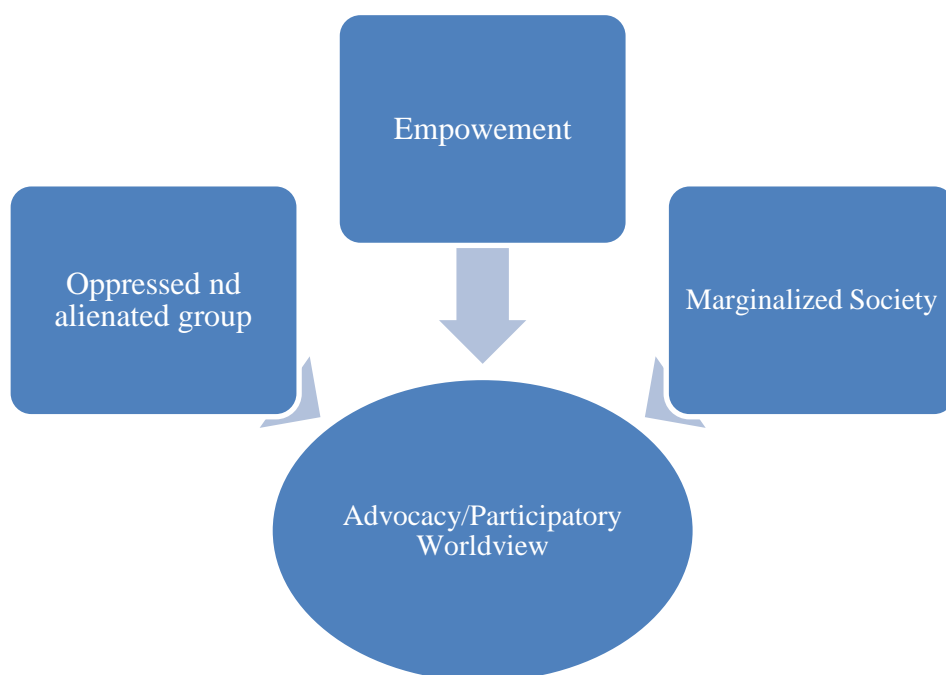
This study requires learning more about how fire incidents affect the lives and experiences of people living in Clare Estate informal settlement. Therefore, a qualitative approach is appropriate for this study since it explores the experiences of individuals in a social setting, and the way they interpret their experiences. Bluhm *et al.*, (2011:1870) state that qualitative research is vital for uncovering deeper processes in people, groups, and organizations, and understanding how the processes unfold over time. Schurink (2009:806) contends that the function of the theoretical framework is to inform the research design. A theoretical framework directs researchers in evaluating and purifying their goals; to develop realistic and applicable research questions, and to guide their methodological approach. As mentioned in Chapter 2, the ANT drives this study. ANT is a process of interaction among actors as their interaction are lumped together to form a network. This framework is consistent with a qualitative research purpose to understand actors' subjective meanings and interpretations to explain their individual behaviour and interaction or the lack of interaction with others. Not only do the research questions and

research objectives influence this qualitative research design but the underpinning philosophical worldview. The discussion now turns to the philosophical worldview.

### **3.3 Philosophical Worldview**

Creswell (2009:5) notes that the philosophical worldview influences the practise of research. Therefore, it is important not to hide or minimise a philosophical worldview but to identify it. The researcher should have an idea or belief system embedded in the study even though it remains hidden. The worldview assists the researcher in that regard. Hart (2010:2) describes worldviews as ways of observing the world. Hiding a philosophical worldview does not minimise its value in the research. The philosophical worldview is the foundation for the study. It informs questions that lead to sought after answers and directs data collection methods. Creswell (2009:6) outlines four worldviews, upheld by custom in a study. These worldviews are constructivism, advocacy/participatory, post-positivism and pragmatism. This study used advocacy/participatory worldview, which agrees with both quantitative and qualitative research. However, this study applied it within the context of qualitative approach. The advocacy/participatory worldview addressed the needs of marginalised groups. This ascends from the fact that other participatory worldviews may not address challenges of marginalised societies that are in contact with fire incidents at informal settlements. The advocacy/participatory worldview aligns itself with empowerment, inequality, oppression, domination, suppression and alienation that need to be attended to in society (Creswell 2009:9). Advocacy/participatory worldview holds that the research investigation must be intertwined with politics and political agenda, which enclose the reform agenda that may change the lives for participants in the institution. This worldview according to Creswell (2009:9) gives a programme for change and improvement through the voice of participants. Creswell (2009:10) points out that one of the key features of this worldview is participatory action that aims at bringing change. By engaging with indigenous knowledge that allows the informal settlement community of Clare Estate to protect themselves from fire, it allows change in the society rather than waiting for the Municipality to extinguish the fire they apply safety measures so they can protect themselves from fire. Advocacy/participatory worldview is appropriate for the study as it addresses the marginalised and alienated informal settlement society of Clare Estate. The study has engaged different actors from political domains and other participants in the study that have the same goal towards the network of bringing different forms of contribution towards the effective strategies of DRR at eThekweni Municipality. Consequently, the study took advantage

of the mix of the advocacy/participatory worldview, qualitative approach and narrative strategy. This study remained fundamentally qualitative, for measuring textual information. The strength of a qualitative research design is that it explores the phenomenon deeply and engages complex situations; thus, it gathers information that is not available from other sources. Figure 3.1 represents the advocacy/participatory worldview underpinning the study.



**Figure: 3-1 Advocacy/participatory Worldview underpins the study**

Source: Modified by researcher from Creswell (2009:09)

These components of the advocacy/participatory worldview in Figure 3.1 are analysed in detailed in Chapter 4 by the use of matrices aligned with the theoretical framework. After the establishment of research design and philosophical worldview, the applicable research strategy for the study was determined. A discussion of the strategies follows.

### **3.4 Case Study and Narrative Research Strategy**

The study used case study and narrative research strategies. According to Yin (2013:4), the choice of a research strategy depends on research questions. The higher the questions pursue to clarify the current situation like “how”, the higher the case study research is appropriate. This strategy’s chances are also higher the more questions require broad and in-depth narrative

phenomenon. Simons (2014:456) is congruent with Yin (2013) when he reported that for the study to amount to research, it requires exploration of evidence that leads to fresh knowledge that is publicised and available for investigation. Simons (2014:457) also states that case study research is an in-depth investigation and it is unique in its real life settings. Swanborn (2010:13) defines a case study as a social portent within borders of case or more like, individuals, groups, organisations, local communities in which portents to be investigated are registered. According to Thomas (2011:3), a case study is a technique of research that deals with an individual detailed object that is not generalised. Remenyi (2013:2) maintains that case study research helps inquire into difficult research questions using multiple sources of data evidence. Yin (2012:3) reports that the case study technique holds a full set of approaches. These errands comprise designing case study, collecting data for the study, data analysing, giving, and presenting the results.

A case study is relevant in investigating the real life proceedings where the investigator has no control. Case study research allows the researcher to have a better understanding of the case at hand. Yin (2012:xix) affirms that previous case study research has sheltered a wide variety of subjects such as education studies, community, health, businesses, public policy and public administration and societal challenges. As scholars have identified that case study requires in-depth investigation in order to achieve new knowledge and better understanding of subjects under investigation, it is for this reason that case study permits views from participants.

In this study, Clare Estate is a sub-case of eThekweni Metro Municipality's DMEUC as the broader case context. Yin (2009:59) affirms that every individual case may be either holistic or embedded. This is a single case study attached to a subcase. It is an embedded case study with multiple units of analysis including fire managers, fire fighters, AbM as an organisation and Clare Estate informal settlement dwellers as community stakeholders. As mentioned earlier, a case study requires an in-depth investigation; hence, the informal settlement community of Clare Estate meant to give opinions of situations they are facing regarding fire DRR strategies. As stated in chapter 2, the ANT drives the study. Disaster managers, fire managers, fire fighters, AbM and Clare Estate residents are seen as network actors for fire prevention plans and implementation strategies. These network actors or stakeholder segments are units of analysis.

Piekkari and Welch (2011:173) state that the description of the unit of analysis is the key component of case study research, as a case study is not a procedural selection but a selection of what is to be investigated. Piekkari and Welch (2011:173) further contend that research decisions include the choice of a suitable unit of analysis. A key concern is to establish what

unit a researcher needs to voice out. A unit of analysis is the main object analysed in the study and it is what or who is investigated (Piekkari and Welch 2011:174). According to De Vaus (2013:28), a unit of analysis is the unit from which one gets information and descriptions. It is imperative to identify the unit of analysis in the study because it gives clear results. Barrat, Choi and Li (2011) confirm fewer case studies specify the unit of analysis than those that do so. This situation needs improvement because the unit of analysis makes a difference in the results of research outcome.

According to Yin (2009:50), a single case study may be characterised by more than one unit of analysis. This occurs when attention is on other sub-units. In this study, the case context and one unit of analysis is eThekweni Municipality DMECU. EThekweni Municipality Disaster Management and Emergency Control Unit is responsible for governance and management of DRR in the municipality. Several sub-units of analysis are included because of the relationship between the DMECU and their respective stakeholders when it comes to fire disasters in Clare Estate. Therefore, Municipal Fire Managers and Fire Fighters are sub-units of analysis, as well as members of the Clare Estate community and the SMO, AbM whose members live in the Clare Estate informal settlement. A subsequent section on site, case and informant selection further discusses this matter.

Turning to narrative strategy, Larsson and Sjöblom (2009:273) argue that narrative strategy in research may reflect as a type of case-centred strategy. This study also embarked on the use of narrative strategy as micro stories from DMECU, the Fire Department, AbM social movement and Clare Estate informal settlement community managers. These stakeholders narrate their views to discover perspectives on fire prevention plans, strategies and the application of indigenous knowledge as a prevention measure tool for extensive fire in Clare Estate. During interaction amongst these actors, the researcher noted conflict amongst each other. This reaction ties up with the actor network theory that drives the study. As much as actors may be of equal status, it concedes that relations may need to contain conflict and all actors are unable to play the same roles in a network (Lassa 2012:6).

Creswell (2009:5) states that there are various ways of conducting qualitative research as this study also adopted narrative strategy because the researcher studied lives of individuals living in Clare Estate informal settlement. These individuals told their story to the researcher about vulnerable situations they are exposed to which are characterised by fires that inhibit their lives.

This strategy drew information from respondents in the focus group discussion conducted with the Clare Estate informal settlement community. Correspondingly, the narrative strategy captured stories and reports told by AbM social movement representatives that were interviewed by the researcher. Most importantly, a narrative strategy was most desirable for this study given that particular focus rests on the need to understand indigenous and local knowledge of the community and their incorporation in DRR as mentioned above. Accordingly, it is against such a background this study utilised narrative strategy.

According to Harper and Thompson (2011:12), a narrative strategy starts with everyday life assumptions whereby individuals organise their interpretations of reality in the form of narratives. The narrated stories do not only have different contents but also come in different forms. A narrative strategy has an interest in the everyday life experiences of individuals or a group of people. When the researcher was on the field conducting focus group discussion, community members were telling stories about their experiences of fire incidents. The exercise motivated the use of narrative strategy in the study, as it was not originally part of the research proposal. The Clare Estate informal settlement community told the researcher about the attempts they used to protect their lives from fire. AbM officials also narrated their story to the researcher about the everyday experiences of communities in informal settlements. Larsson and Sjöblom (2010:274) affirm that telling a story is a way of telling someone else about the nature, but also about the teller's identity erection. As noted in section 3.8.2 that the social movement organisation first narrated about the origins of the organisation. Municipal officials also narrated their stories about fire DRR. Harper and Thompson (2011:102) note that the narrative researcher's role is to explore different types of narrative characters and the way they connect with everyday social life. The researcher gathered data by the use of interview sessions and focus group discussion as subsequently described. These methods complement the narrative strategy. According to Fenton and Langley (2011:1177), the majority of institutional research, using a narrative approach engages a collection of stories through interviews in which narrative versions come from respondents through conversations. Larsson and Sjöblom (2010:272) report that narrative research is an auspicious approach for acquiring an in-depth understanding of people's lives and this is congruent with Harper and Thompson (2011). The researcher experienced an unpleasing situation while collecting data at Clare Estate informal settlement as the area was filthy and smelly. There were only two toilets with long queues such that the researcher was not even able to gain access to the toilet because of long queues. A significant

part of narrative strategy is to concentrate on individuals' stories that give voice of marginalised people through listening to their stories (Larsson and Sjöblom 2010:273).

### **3.5 Site, Case and Participant Selection**

Creswell (2007:147) points out that an important step in the process is to find people or a place to study and to gain access to and establish rapport with participants so that they will provide relevant data. The next section discusses the site, case and participant selection.

#### **3.5.1 Site Selection**

Fires run rampant at informal settlements. While lack of adequate housing and other development issues are problematic, strategies and policies derive from present realities. This study is necessary to establish if the municipal DRR plan is appropriate to minimize the impact of fire disasters that affect informal settlements, particularly in Clare Estate. In addition, the study is imperative to capture the work of SMOs as well as the indigenous knowledge (IK) of community members that may help with fire prevention and containment. eThekweni municipality operates a disaster management unit, includes a fire unit and governs over a number of informal settlements. One of those informal settlements is Clare Estate. Clare Estate informal settlement is in Ward 25 of the municipality in a predominantly Indian residential neighbourhood. Africans occupy the Forman and Kennedy Road informal settlement, the site of the study. eThekweni municipality and the Clare Estate community have characteristics useful to study the research problem. As a result, these sites are justifiable.

#### **3.5.2 Case Selection**

EThekweni is a Metropolitan Municipality or Category A. Category A Municipalities represent large densely urbanised regions that encompass multiple cities and so constitute a metropolis. For example, the eThekweni Metropolitan Municipality encompasses the city of Durban and surrounding towns. EThekweni Metro Municipality is South Africa's biggest port-city and after Johannesburg, it is the second largest business hub. Air pollution has increased through industrialisation of the area, which contributes to global warming thereby negatively affecting marginalised and poor people. The effect extends to climate change, which causes fires and other disasters in informal settlement because of inadequate DRR strategies in place Ngcamu (2011).

The study revolves around eThekweni Municipality's DMECU in the Province of KwaZulu-Natal, in the Republic of South Africa. EThekweni DMECU is responsible for implementing measures that reduce risk in eThekweni and surrounding areas. EThekweni DMECU is an overarching case embedded with a sub-case and the units analysis earlier indicated. This case and sub-case along with the units of analysis facilitate cross-case analysis as shown in Chapter 4. The researcher picked up this case, sub-case and the stated units of analysis for study because the researcher is looking at the effectiveness of the eThekweni Municipality DRR strategy pertaining to fires at Clare Estate. Also for the fact that DRR and management is largely a domain of local government that is municipalities through public policy, the DMECU is the department that holds knowledge and information regarding DRR at eThekweni Metro Municipality.

### **3.5.3 Sub-case selection**

As stated in section 3.4, Clare Estate (Foreman and Kennedy Road) informal settlement is the sub-case of eThekweni Municipality, simply because the city is responsible for all areas in and around eThekweni Metro Municipality. Kennedy Road in Clare Estates informal settlement is the largest informal settlement in the city. It has been in existence for the past thirty years, which is the main reason why it is a sub-case. Fires run rampant in informal settlements particularly in Clare Estate; this place has experienced fire disasters on many occasions. These incidents leave people living in these informal settlements homeless and all their belongings destroyed. Sometimes loss of life occurs. Communities at informal settlements are marginalised, oppressed and alienated. They need to be empowered to protect themselves from fire hence the study adopted the advocacy/participatory worldview. This sub-case permits the researcher to study real-life phenomena. The Clare Estate community holds knowledge and understanding of their experiences regarding fire DRR. If one talks about the informal settlement community of Clare Estate, AbM can never be left out. This is a SMO, which represents a community of informal settlements. This organisation has a better understanding of the needs of the community at large and has statistics of fire incidents in the area.

### **3.5.4 Participant Selection**

The study comprised of five stakeholder segments that is (1) three officials from DMECU, (2) four Fire Department Managers (Safety, Training, and Operations), (3) five fire fighters (FF), (4)



five Executive Management representatives of AbM SMO and (5) eleven members of the informal settlement community, which formed the focus group. Their role in implementing DRR strategies promoted the selection of municipal officials for the study. The informal settlement community members and AbM representatives were of paramount importance for the study because fires that occur at Clare Estate informal settlement directly affect them. The study also sought to determine the use of indigenous knowledge that the community applies in the prevention of fires and the extent of community involvement in the fire prevention plan of eThekweni Municipality. Municipal officials, informal settlement community members and AbM representatives are knowledgeable about disasters of fires in Clare Estate informal settlement. Each stakeholder segment is qualified to provide reliable data for the study. Creswell (2008:12) points out that it is important for the researcher to engage individuals who are eager to share information openly and honestly, and these stakeholders were willing to do so. Given that this study encapsulates both institutional and public domain that is stakeholders in the fire risk reduction governmental arena and community members were selected for participation, as illustrated in the next section in terms of sampling.

### **3.6 Sampling Population**

Prior to getting started with the field study, preparatory work of mapping what is going to take place in the actual place of study was necessary and sampling is largely one of them. Sampling is a selection of a specific subset of a population. For the purpose of this study, it was impossible to involve the entire residents of Clare Estate informal settlement in the research study hence the sample of individuals who participated in the focus group was used. They represented the entire population of Clare Estate informal settlement community. Sekaran and Bougie (2010:67) support this by stating that the importance of sampling is that it enables one to determine the adequate number of respondents from the total number of the target population. Probability sampling and non-probability sampling are types of sampling in a study. This study used non-probability sampling. Tongco (2007) affirms that the purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within. The qualitative research designs often use non-random selection for the purpose of data collection because the sampling is purposeful since the researcher involves those individuals who are knowledgeable with the study that is under investigation. In-depth description and full understanding of the phenomenon under study are the main aims of the researcher. Sampling is sensible and feasible to conduct research because it

minimises the number of units that are involved in a study to a meaningful and controllable size. There is a wide range of sampling strategies and techniques (although not important for this study) that is used in the selection of a study sample in social and qualitative research. Typically, approaches associated with probability sampling occur where all elements for example individuals, organisations in the population have an equal chance of being included in the sample (Cohen and Areili 2011:428). This includes all samples but is not limited to simple random sampling, systematic random sampling, stratified random sampling, multistage sampling, multiphase sampling, cluster sampling. According to Zikmund, Babin, Carr and Graffin (2013:66) sampling includes any process that attracts conclusions based on the capacity of a population. In short, a sample is a detachment from the bigger population. The researchers do not need to choose everyone in the population because good sample results should have the identical characteristics as the entire population.

A purposive sampling technique helped identify individuals for participating in this study. The main reason for this selection procedure is that there was a greater need to approach individuals with adequate knowledge on the subject of this study. Creswell (2009:217) confirms this by pointing out that purposive sampling means selecting participants due to their experience about the phenomenon. The inherent bias of the method contributes to its efficiency, and the method stays robust even when tested against random probability sampling. Choosing purposive sampling is fundamental to the quality of data gathered; thus, the researcher must ensure reliability and competence of the informant.

Purposive sampling serves a very specific need or purpose. It was helpful to use individual discretion in selecting interviewees, as the agenda for this research is to identify people who are knowledgeable about local government fire disaster risk plans and local indigenous knowledge. Participant availability or the researcher's personal discretion determines population elements. Exercise of individual discretion was necessary throughout the process of selecting individuals participating in the study. Table 3.1 displays the target population and sample size from the target population of the study.

**Table 3.1 Sampling Population for the Study**

<b>Stakeholder Segment</b>	<b>Target Population</b>	<b>Sample size from target Population</b>
Disaster Management & Emergency Control Unit	6	3
Fire Management	8	4
Fire Fighters	15	5
Executive Management of AbM	12	5
Clare Estate Residents	±14,000	11
<b>Total</b>		<b>39</b>

### **3.6.1 Institutional Domain**

- (i) Municipal officials from DMECU
- (ii) Fire brigade personnel (domestic fires department)
- (iii) Senior Managers/Managers from Municipal fire department

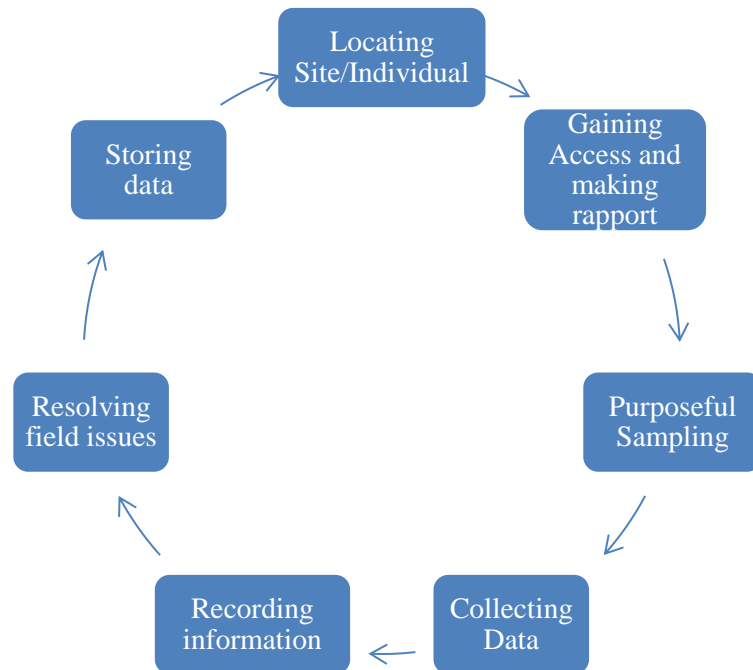
### **3.6.2 Public Domain**

- (i) Informal settlement dwellers (Foreman and Kennedy Roads in Clare Estate)
- (ii) AbM Social Movement Organisation representatives

The informal settlement community of Clare Estate and management of AbM, the SMO, represent the public domain of the study. The informal settlement dwellers were an obvious selection for the study largely because they are the community affected by fires and the Social Movement Organisations (SMOs). AbM provided valuable information on local initiatives.

### **3.7 Data Collection**

Creswell (2007:146) visualizes data collection as a series of interrelated activities aimed at collecting good information to answer emerging research questions. Figure 3.2 shows how the qualitative researcher engages in a series of activities in the process of collecting data.



**Figure 3-2 Data collection activities**

Source: Creswell (2007:147)

To illustrate the process of collecting data as depicted above, the first step for the researcher is to locate the site or people that will be under study and then gain access and establish connection with the unit. For this study, the researcher obtained gatekeepers letters from institutions where data would be collected. The researcher provided an information letter that explained the purpose of the study. The information letters are Appendix A, Appendix G1 and Appendix G2. Participants had to sign to a consent form as well to confirm that they agree to participate in the study. As noted above, the researcher selected a sample of individuals who are knowledgeable about fire disasters in informal settlements. Yin (2009:101) discusses the various sources of evidence that are mostly used in case studies and points out that researchers should be aware that a list of sources can be extensive including photographs, films, projective techniques, videotapes and psychological testing.

The researcher used interviews, focus groups, documents and photographs as data collection tools. When coupled with other forms of data collection, in-depth interviews provide the researcher with a well-rounded collection of information for analyses purposes. In order to capture all data during interviews and the focus group discussion, the researcher requested to use a tape recorder. It is important to note that on the information letter and in the consent form,

participants gave consent for use of a tape recorder and were at liberty to decline the usage thereof. During the process of data collection, it is important for the researcher to be able to resolve field issues and ensure that data is stored in a safe place for retrieval. Data collection tools are explained further below.

### **3.7.1 Focus Groups**

According to Petty, Thomson and Stew (2012:380), a focus group includes discussion on a certain topic, which consists of 6-10 people. It can either be semi structured or unstructured and this is determined by the research questions. The group members may have common or diverse experience. The researcher directs the focus group discussion and a research assistant may assist with issues that may arise during group discussion. The focus group discussion is audio recorded for transcription. This assists with acquiring and storing data efficiently. However, the researcher should be able to manage dynamics of a group and ensure everyone participates in the focus group. This method assists the researcher in achieving different narratives about the study. Contrary to the first scholars mentioned above, Suzuki, Morimoto, Mizukami, Otsuka and Isahara (2009:235) state that a focus group interview is semi-structured because the researcher arranges an interview plan before time of the interview. Suzuki *et al.*, (2009:237) further state that a focus group interview is a qualitative research method used in social research. Contrary to Petty *et al.*, (2012:380), Suzuki *et al.*, (2009:237) point out that a focus group consists of 6-12 individuals and the researcher. Farnsworth and Boon (2010:607) point out that the trademark or hallmark of focus groups is their obvious usage of group interaction to produce data and perceptions that would be less reachable without facilitation of group interaction. Farnsworth and Boon (2010:607) also report that in an individual interview less information emanates than in a focus group. New issues may rise in the focus group, which the researcher never even thought about earlier. Farnsworth and Boon's (2010:607) argument is congruent with Petty *et al.*, (2012) when pointing out that focus group discussion gives similarities and differences between the individuals participating in the focus group and that the focus group is efficient. It gives the opportunity to detect large interaction on the subject studied within a limited time.

The focus group discussion took place at Foreman Road in Clare Estate informal settlement and it consisted of a group of 11 individuals. The researcher carefully selected individuals who were willing to share their experiences at Clare Estate informal settlement and share the dynamics of

the situation in terms of fires that often occur in the area and leave people homeless and some even lose their lives owing to incidents.

The prerequisite activities that were included in planning for the focus groups were the following:

- a. Writing the question script and practicing it [this also deals with the composition and arrangement of questions, for example; (Opening questions – the icebreaker), introductory questions, transition questions, key questions, ending questions, summary question, final question.]. Appendix H is the focus group guide.
- b. Identifying and recruiting respondents/participants. It is useful to consider actual things that are necessary to pursue focus group such as the availability of the following:
  - (i) Moderator
  - (ii) Note-taker/Assistant moderator
  - (iii) Participants
  - (iv) Transcriptionist/tape recorder
  - (v) Developing a response coding system

The researcher compiled a pamphlet inviting the community of Foreman and Kennedy Road in Clare Estate to participate in the focus group. The researcher distributed pamphlets in public areas of Clare Estate informal settlements. It contained all the necessary information that is the reason for the focus group, date, venue, time and particulars of the researcher. The AbM Social Movement member who resides in Foreman Road acted as a contact person.

It was a sunny humid day in Durban. The researcher and the research assistant arrived at the venue and participants were friendly. The researcher thought, “This is going to be interesting even though the weather was against the activities of the day”. It was seething hot, making it a bit uncomfortable for a few to sit still. Nevertheless, the discussion commenced on a solid high note. Eleven people participated in the focus group; however, the pamphlet stipulated 12. The researcher had planned to divide them into two groups of six each. The weather made it impossible to divide the group and have separate discussions. There were nine males and two females. The group was a mixture of youth and middle-aged citizens. Participants were

provided with an information letter [Appendix G1 (English), Appendix G2 (isiZulu)]. They signed a consent form at the outset [Appendix G3 (English), Appendix G4 (isiZulu)]. A number of participants were not comfortable in English therefore the house agreed that we would precede in isiZulu. The transcriber later translated the discussion into English. Respondents in general seemed relaxed and were all keen to participate as the researcher asked probing questions that would allow respondents to give immense insights into the study. The respondents gave their views freely and they all engaged in the discussion. The discussion took more time than was anticipated.

### **3.7.2 Interviews**

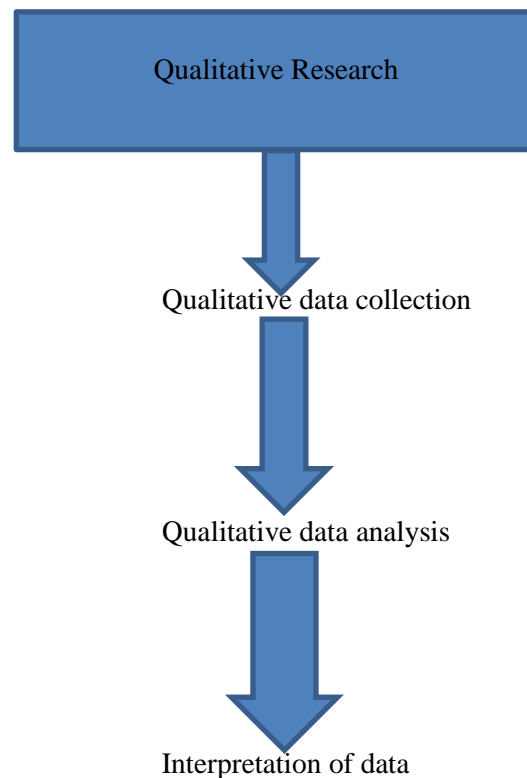
Yin (2009:106) reports that an interview is one of the most important sources of case study information. He noted that there is a difference between interviews and survey methods. Yin (2009:106) further points out the researcher has two responsibilities in the interview process i.e. following line of enquiry as reproduced by the case study protocol and questions must not be biased. For the purpose of this study, the researcher used the open-ended question for interviews. Turner III (2010:756) supports this as he points out that an open-ended interview is tremendously organised by the wording of the questions. The researcher asked similar questions of individuals. However, the questions facilitated open-ended responses. Open-ended responses permit the participants to give detailed information as much as possible. It also permits the researcher to ask probing questions.

Open-ended interviews are a common procedure of interviewing method. It allows the individuals to express their views and experiences fully. According to Frels and Onwuegbuzie (2013:188), interviews are the most appropriate method that allows the researcher to collect meaningful data. King and Horrocks (2010:6) confirm that in social science qualitative research, interviewing has become a noticeable research method. The researcher feels more comfortable with a face-to-face conversation. Creswell (2007:163) points out that one might view interviewing as a series of steps in a procedure. Kvale and Brinkmann (2009:185) as well as Rubin and Bellamy (2012:24) have advanced the steps necessary in conducting qualitative interviews. Kvale and Brinkmann (2009:185) point at seven stages of an interview inquiry report, a logical sequence of stages from thematising the inquiry, to designing the study, to interviewing, to transcribing the interview, to analysing the data, to verifying the validity, to

reliability and generalizability (if appropriate) of the findings, and finally to reporting the study. Creswell (2007:163) notes the following steps of interviewing:

- Deciding on questions that are open-ended, general and focused on understanding central phenomena in the study.
- Identifying interviewees who can best answer questions.
- Determining what type of interview is practical and will dispose the most useful information to answer research question.

The researcher used a sequential approach to collect primary data through in-depth interviews, focus groups and a few photographs. As explained by Terrell (2012:263), sequential approach is the steps used for the entire process of the study from data collection through data analysis to data interpretation. The purpose was to identify whether there are any identical data both from interviews and from the focus group. Figure 3.3 displays the sequential exploratory approach used by the researcher.



**Figure 3-3 Sequential exploratory approach**  
Source: Terrell (2012:263)



In-depth interviews focused on four stakeholder segments spanning municipal officials and a SMO, which represents community rights. The researcher as indicated in Table 3.2 interviewed seventeen participants.

Each interviewee received an information letter that describes the study (Appendix A) and they each signed a consent form (Appendix B). An interview question schedule for DMECU Officials (Appendix C), interview question schedule for fire managers (Appendix D), interview schedule questions for fire fighters (Appendix E), and lastly interview schedule questions for SMOs (Appendix F). Essentially, the study benefited from the information provided by officials currently employed within the noted departments of eThekweni Municipality. As would be expected, these individuals possess key and detailed information concerning disaster management in general and in particular, that is sensitive to the study setting, the Clare Estate informal settlement.

It is important to note that the head of DMECU requested a copy of the interview questions prior to the interview so he could familiarize himself with the questionnaire before the interview session. He initially requested for re-scheduling the appointment and eventually ended up not availing himself for the interview. However, the researcher managed to interview three officials from DMECU, which were Deputy Manager, Manager and Coordinator. As Table 3.1 shows, the researcher interviewed 5 fire fighters and 4 Fire Department managers and 4 executive committee members of AbM. Chapter 4 further explains this SMO. However, it is important to state that on the first day of the agreed interview meeting, the researcher was unable to interview the executive committee because they requested to give an overview of the organisation before the interview could commence. There was a lengthy discussion about the origins of the organisation such as reasons of its formation. They mentioned that there are underlying issues that results in fires at informal settlements particularly in Clare Estate.

Due to other commitments of executive members, they requested to arrange another day for individual interviews. Therefore, individual interviews occurred over subsequent weeks. The in-depth interviews were not only aimed at acquiring participants' roles and functions in their respective departments or organisation but were aimed at gaining a better understanding of their operations and their views regarding preventing fires in Clare Estate. Babbie (2004:241) defines in-depth individual interviews as a process whereby the researcher is not only interested in the conversation but in the process of the conversation that has come into being. The process of the

conversation that came into being throughout the all the interviews is consistent with the use of narrative strategy as earlier described.

Once data are collected, data must be analysed which is discussed next.

### **3.8 Data Analysis**

According to Creswell, (2009:199) data analysis primarily contains categorizing things, persons, events and properties, which characterize them. Data analysis assists the researcher in achieving meaningful data understanding. De Casterle, Gastmans, Bryon and Denier (2012:362) state that data analysis is an individual process as opposed to a team process. It is also a known challenge among qualitative researchers to the extent that it leads to personal frustrations. Data analysis is complex such that Grbich (2012:303) points out that qualitative data analysis is not just a matter of choosing an accepted process such as thematic analysis. After data collection, the researcher has to analyse data collected through interviews and focus group discussions in relation to the themes identified earlier. Turner III (2010:759) reports that the final component in the interview design process is the interpretation of data collected during the interview process. The researcher turns data into meaningful sense, discover what was uncovered, and assemble data using codes or themes. This helps avoid researcher bias when analysing data.

Turner III (2010:759) further states that these themes and codes express common ideas that came out from participants' interviews. Taguchi's view (2012:269) is congruent with the view by Turner III (2010) when stating that data analysis arises from data gathered from the use of data collection tools. Focus group data analysis is not an easy task as it involves multiple responses from participants. Onwuegbuzie, Dicknson, Leech, and Zoran, (2009:5) state that there are various focus group data analysis approaches suggested by Leech and Onwuegbuzie (2008), which are constant comparison analysis, classical content analysis, keywords-in-context, and discourse analysis. Constant comparison analysis can be utilised to analyse various types of data (Strauss & Corbin, 1998), including focus group data. This method has its own characteristics, which is coding, where the researcher divides data into small groups, assigning a code to each group, and assembling the codes into categories. Lastly, the researcher discovers themes after identifying the contents of each group of data. Onwuebbuzie *et al.*, (2009:6) further state that this method of focus group data analysis can be utilised where there are multiple focus groups within the same study. The classical content analysis is the same as constant comparison

analysis and the only difference is that rather than creating themes, there is a grouping of codes. There is also an analysis known as keywords in context where the aim is to establish the number of words in the context compared to other words. Lastly is the discourse analysis where this type of analyses in a focus group investigates how forms of elements such as institutions, experiences, community arise in discourse.

Creswell (2007:180) points out that data analysis in qualitative research consists of preparing and organizing data, which is text data as in transcripts, or image data as in photographs for analysis then reducing data into themes through a process of coding, and finally representing data in tables or figures that create a matrix. According to Creswell (2009:183), the process of data analysis involves making sense out of text and image data. It involves preparing the data for analysis, conducting different analyses, moving deeper and deeper into understanding the data, representing the data and doing an interpretation of the larger meaning of the data. Data from the focus group discussion and interviews were analysed separately. In Chapter 4, the researcher created various matrices and tables, which show correlation of data between different stakeholders. The researcher then created themes that emanated from data.

Participant codes in this study maintain the anonymity and confidentiality of participants. According to Saldaña, (2015:342), coding is a heuristic (from the Greek, meaning, “to discover”) and it is an exploratory problem-solving technique without formulae that are specific or processes to follow. Coding is only the initial step towards an even more severe and reminiscent, evocative analysis and interpretation of a report. Coding is not just labelling but it is linking. It leads the researcher from the data to an idea and from an idea to all the data pertaining to that idea. The professional transcriber transcribed data that were tape-recorded, and then the transcription relied upon for analysing content and categorizing similar themes. In order to analyse the content, the researcher scrutinized the transcribed data carefully.

After collection data from focus group discussion and interviews, the sequential approach analysis followed a selective coding procedure. The core category is the central event around which all other categories are integrated (Babbie 2004:499). The core of this study is to look at the effectiveness of the eThekweni Municipality’s DRR Strategy pertaining to accidental fires at Clare Estate informal settlement. Legislative framework and other DRR patterns set forth in Chapter 2 informed the core of the study. Therefore, qualitative data analysis was categorised based on DRR patterns of data. Patterns that were used are from DRM/DRR, disaster prevention

plans, and fire prevention plans, corporate community interface in DRM and DRR processes i.e. the legislated requirements, Community Development and ANT that drives the study. Babbie (2004:499) states that the key is to find the main storyline.

For this study, the researcher used a combination of excel software, content, thematic and matrix analyses to interpret data collected through in-depth interviews and focus group discussion as the study aimed to describe participant experiences in a natural setting. The researcher followed a data analysis procedure of aligning certain interview questions and focus group questions with research objectives and research questions in an effort to start determining which data would correspond with particular research objectives and research questions (Appendix I and Appendix J). Chapter 4 explains this process. The researcher engaged in cross-case analysis for different stakeholders and aligned the worldview and theoretical framework that drives the study as displayed in chapter 4, that is matrices 4.1-4.3. In Chapter 4, the researcher used Excel to generate graphs that easily narrate data sourced from the participants. The researcher depended on a combination of content, thematic and matrix analyses as next discussed.

### **3.8.1 Content Analysis**

Erdogan, Marcinkowski and Ok (2009:529) point out that content analysis is a method for studying the characteristics of written or visual communications. Erdogan *et al.*, (2009:529) further point out that due to various methods of content analysis the term has progressed. This term is now applied different ways or instances. Erdogan *et al.*, (2009:529) note that other researchers have a habit of defining content analysis as a method of data analysis used primarily in a general sense. However, content analysis provides qualitative data reduction and making meaning in taking a record of qualitative data and attempts to highlight core consistencies and meanings. Yu, Jannasch-Pennell and DiGangi (2011:733), Miles and Huberman (1994:59), Romanowski (2009:46) developed a qualitative analytical procedure where they outlined that the researcher examines the textual data in detail and takes notes. Further than that, the researcher executes data reduction by selecting, focusing, and shortening data for answering the research questions, organise, position, and displays the abridged data. Lastly, the researchers revisit the data repeatedly for verifying and confirming themes and patterns that identified from data. Vaismoradi, Turunen and Bondas (2013:400) state that content analysis is a common term for various strategies to analyse data. They further point out that it's a coding system and classifying

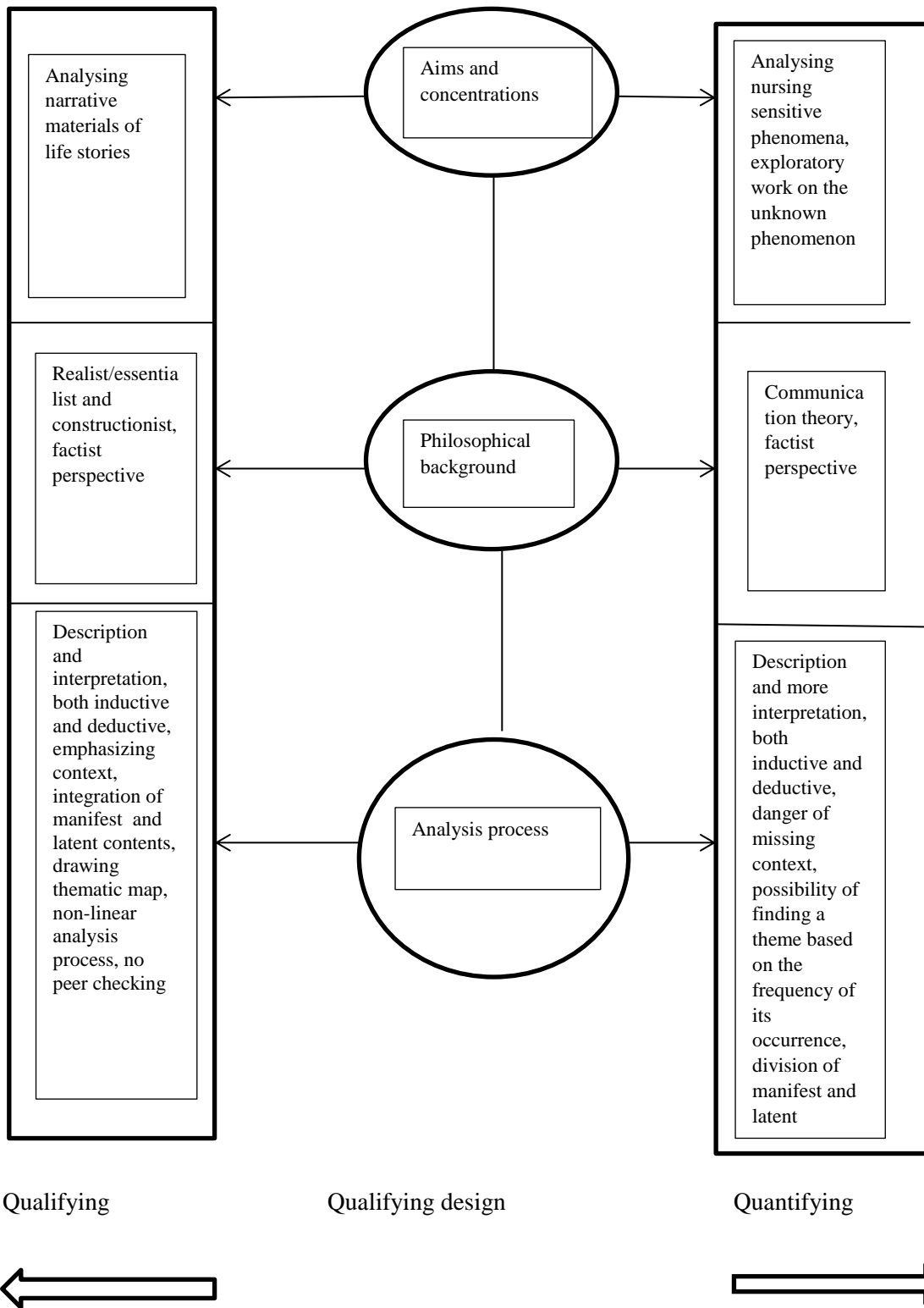
approach that is used for discovering large amounts of textual information to establish trends and patterns of words used, frequency, their relationships.

In other words, content analysis gives details of the reality in a particular social setting. It goes further than the coding of data collected from participants. It goes beyond the emerging themes that were located in the study and counting the words in the context as mentioned above. This type of analysis permits the researcher to go deep into the content of data collected from participants in order to have a better understanding of social reality of a case. For instance, in this study the researcher was not familiar with informal settlement setting particularly people often affected during fire incidents. Content analysis provided a deeper understanding of reality and dynamics faced by Clare Estate informal settlements community through data collected from participants.

### **3.8.2 Thematic Analysis**

Thematic analysis is a qualitative data analysis technique where the researcher identifies themes by using codes. Themes identification helps manage and reduce data by identifying common data from various participants. It is important for the researcher to be careful when doing this exercise because it could manipulate the whole data analyses if improperly managed. Themes identified in the study originate from raw data of participants. Themes of the study must express what the data reveal and must align with the topic. This means the researcher must be familiar with and go through the transcript repeatedly for confirming emerging themes and patterns as mentioned in 3.8.1. The researcher in this particular instance also referred back to the tape recorder in spite of transcripts in order to ensure the accuracy of data on the transcripts. Thematic analysis for this study emanated from focus group and in-depth interviews.

According to Vaismoradi, Turunen and Bondas (2013:400), it appears that both content analysis and thematic analysis share the same purpose of logic in investigating narrative materials from reality stories by breaking the text into small groups of content and submitting them to descriptive treatment. Figure 3.4 illustrates this relationship.



**Figure 3.4 Main Characteristics of thematic analysis and qualitative content analysis in the continuum of qualitative methodology**

Source: Vaismoradi, Turenen and Bondas (2013:399)

### **3.8.3 Matrix Analysis**

Coding of data from transcripts by using symbols or codes enabled the researcher to reduce and manage data. Matrices assists in analysing responses gathered in the field, in a more manageable manner, as qualitative research generally produces more data than necessary. Qualitative data is untidy and can be challenging to manage properly. Matrices command data to be in order and places data in specific data components. This assists the researcher to display the connection between data components. In the form of tables, matrices show convergence and divergence of data from different stakeholders. The advantage is that it has separate columns, which makes it easy for the researcher to concentrate on a specific row. Matrices created in Chapter 4 show the alignment of data with research questions and objectives. In chapter 4, matrices are distinguishable from tables in that matrices include raw data whereas tables organise other information. In between matrices, the researcher gives the narration and interpretation of each matrix and literature that correspond to the matrix. This is part of data analysis displayed in Chapter 4.

As mentioned above that matrices reduce data, this is the important role of matrices in qualitative research, to assist the researcher in achieving findings and triangulation of the study. Matrices assisted the researcher to consolidate the content analysis and thematic analysis.

### **3.9 Ethical Considerations**

In terms of ethical considerations, a researcher should always guard against harm to participants, especially oppressed and marginalised participants like the Clare Estate community. The subject under investigation is sensitive; therefore, the researcher maintained ethics at all times. Markula & Silk (2011:11) affirm this by noting that the researcher that is conducting social science research on human subjects should involve research ethics. Research ethics ensure that a researcher treats all research participants with dignity and respect. The guidelines of research ethics suggest that research require that research harm neither the participants nor the researcher. As the recommendation for every scientific inquiry and empirical study, this study adhered to ethical virtues for validity and reliability as well as avoiding harming the relevant participants. According to Cohen and Areil (2011:356), ethics denote regulatory codes of research practices formulated by relevant agencies and professional bodies. In accordance with the institution's

ethical procedures (UKZN Higher Degrees Committee), this study aimed to consider the ethics outlined below.

### **3.9.1 Confidentiality**

In observance of the right to individual privacy for interviewees, reporting results in a way that might identify the individual is discouraged in the research domain. Alternatively, ensuring confidentiality entails not discussing an individual with anybody else (Sekaran and Bougie, 2010:35). Information generated from this study is stored in a password protected hard drive and computer set to protect the identity of key informants in this study.

### **3.9.2 Anonymity**

The worth of anonymity is that information provided should in no way reveal the identity of its source (interview participant). Cohen and Areil (2011:358) states that violation of this rule should be made with the authority of the participants themselves. This study used pseudonyms (fictitious names) when reporting information from the respondents wherever the source of data and information emerges important.

### **3.9.3 Informed consent**

Social research broadly requires securing the co-operation of interview participants prior to the actual collection of data. This study solicited the consent of individuals who assisted in the investigation and other significant stakeholders identified in this research through a translatable written and or verbal preamble attached to surveys or verbally communicated prior to face-to-face interviews. On the day of the interview, the researcher presented the participants with information letters, which contained information about the study and reason for the study. The information letter stated clearly that the participation of the candidate is voluntary and there is no monetary gain. Information letter is Appendix A. The researcher also prepared the information letter and consent form for focus group which were both in English and isiZulu. Information letter for focus group in English attached as Appendix G1 and information letter for focus group in isiZulu attached as Appendix G2. Consent form for focus group in English is Appendix G3 and consent form for focus group in isiZulu attached as G4. Participants read and signed the consent form to show agreement to participate in the research.



### **3.10 Validity and Reliability in Qualitative Studies**

Validity and reliability take on different meanings in qualitative research than that used for quantitative research. In qualitative studies, the worth of the findings of the study rests on the credibility of its findings and their applicability to other contexts. According to Flora and Flora (2014:199), reliability and validity of studies are integral for the interpretation of empirical evidence. In this study, the researcher ensured validity and reliability through careful moderation of focus group and in-depth interview sessions. Focus groups are in any case widely acknowledged in qualitative study for their high face validity. Additionally, the researcher focused on key questions posed in a manner to guard against bias and unclear responses. Conformability, a phenomena relating to the consistency of similar of results (Flora and Flora, 2014), was established in this study by checking the agreement in self-reports of information and participant results regarding the local knowledge in fire disaster management. Another aspect strengthening findings in this study was guarantee of trustworthiness. The latter focuses more on ensuring credible results and this study applied several processes during data collection for instance adhering to ethical procedures, data analysis and presentation of findings.

Gunawan (2015:4) point out that the study is only trustworthy if the reader of the study concluded as such after evaluation of the research. The author further argued that trustworthiness links to credibility, which responds to the positivist notion of internal validity, dependability that relates more to reliability, transferability that is an external validity and confirmability which is an issue of demonstration.

#### **3.10.1 Credibility**

The drive of the study is the attainment of the truth, possibly multiple truths. The researcher lives close to Clare Estate, and is aware of fires that took place at Clare Estate informal settlements over many years. The researcher observed the tragedy of people losing all their belongings with no place to sleep, and the researcher has spent more time with people at Clare Estate informal settlement listening to stories of their living conditions. This interaction increased possibilities of credibility reports. Further than that, the researcher was presented with the DVD of the life of people living in Clare Estate by AbM. Spending more time with people of informal settlement resulted in acquiring credible findings. Hussein, Jakubec and Osuji

(2015:1183) pointed out that credibility relates to checking vibrancy and faithfulness in the narration of the phenomenon. That is the probability that the study findings will sound true to other people in similar circumstances.

### **3.10.2 Dependability**

Gunawan (2015:4) states that the process of research includes maintaining the strength of data. This strategy is to keep and review data over a period. The researcher recorded in-depth interviews and focus group discussion to ensure dependability and a professional transcriber provided professional services, including translating focus group data obtained in isiZulu. The researcher then crosschecked the audio tape with the transcript. Accuracy of data was ensured by using the tape recorder and should the need arise to confirm certain information it would be possible to do so; as the researcher continued to listen to tapes, comparing the transcription with the actual tape-recording.

### **3.10.3 Transferability**

According to Gunawan (2015:4) in research, it is important to provide expressive information so that those concerned about the subject matter can evaluate whether the findings would be useful elsewhere. To pursue this strategy the researcher used multiple methods of collecting data i.e. in-depth interviews and focus group discussion. By using the multiple sources of data, the findings could be robust enough to be recognisable by those in similar contexts who may believe the findings from the study transferable. Further than that, triangulation of data collection methods (interviews and focus group) could help one determine whether transferability of the findings would be useful.

### **3.10.4 Confirmability**

This strategy is about confirming findings of the study by other studies. For this study triangulation ensured confirmability. The study employed different informants and different data collection tools i.e. interviews and focus group. Confirmability includes, for example, respondents reviewing study results to determine whether the results resonate with the participants (Gunawan 2015:4).

### **3.11 Limitations of the study**

Many other potentially useful insights from the study were not thoroughly analysed due to the limited scope of the Masters dissertation. However, one limitation worth mentioning is the unavailability of Kennedy Road residents to participate in the study, despite the researcher's efforts to engage them. Furthermore, AbM provided the researcher with the contact persons for Kennedy Road residents. On the day of focus group discussion, the contact person was not present, there was no one at the venue, and the contact person's cell phone was off. It was very difficult to get hold of the suggested contact person. Empty promises that did not materialise e.g., when the researcher had made an appointment with the contact person who did not show up and the cell phone would always be off. The researcher ended up going house-to-house explaining verbally to the residents the purpose of the study, and the reason why it was important to have a focus group discussion, but still they would not show up at the venue as agreed. Despite several attempts to meet up with the group of residents from Kennedy Road informal settlement, they were not willing to participate in the focus group discussion. As highlighted earlier, the emphasis of this study is limited to merely describing relationships as opposed to in-depth analysis.

The researcher also encountered problems in conducting an in-depth interview with the Head of DMECU. As mentioned in 3.8.2, the Head of the unit rescheduled the meeting but the meeting did not take place because he could not honour appointments with the researcher after several attempts.

Other limitations include time and finance. The researcher is a full time employee and parent. The researcher was responsible for financing her study; however, the employer was also of assistance.

### **3.12 Chapter Summary**

This chapter dealt with the research design, methods and worldview that underpin the study. The study adopted a qualitative research design with a case study and narrative strategy. Embedded in the case are a sub-case and multiple units of analysis as covered in this chapter. Given that this study's sample encapsulated both the institutional and public domain participants, focus group discussions and in-depth interviews, were data collection tools. This

chapter set out sampling selections and data analysis techniques for the study. The chapter concluded by explaining ethical issues and study limitations. The next chapter will focus on data presentation and analysis.

## **CHAPTER 4**

### **DATA PRESENTATION, ANALYSIS AND FINDINGS**

#### **4.1 Introduction**

The previous chapter discussed the research design, methods and other components of the study including sampling, ethical considerations, trustworthiness of data quality control and it concluded by discussing the limitations of the study. This chapter first provides a brief overview of eThekweni Municipality DMECU. This chapter will address the alignment of research questions, objectives of the study, philosophical worldview and theoretical framework of the study. Evidence from raw data that obtained through in-depth interviews and focus group discussions are next. This chapter presents and analyses data collected for the study of an assessment of effectiveness of the eThekweni Municipality DRR Strategy pertaining to fires at Clare Estate informal settlements, South Africa. Using narrative strategy, this chapter highlights responses from interviewees and discussion that emanated from focus group participants, in respect to objectives and research questions of the study. The analysis will follow the sequential approach as previously outlined. The researcher used content, thematic and matrix analyses. After presentation of cross-case analysis of data, triangulation of data concludes the chapter.

#### **4.2 Case Context of Disaster Management and Emergency Unit of eThekweni Municipality**

This section discusses how the DMECU operates and how fire managers and fire fighters address fires in informal settlements. Clare Estate informal settlement is a subcase of the study. According to eThekweni's IDP (IDP 2014/2015:17) the population of eThekweni was 3.09 million in 2001 then has grown at an average annual percentage of 1.13% per annum to reach 3.44 million in 2011 (Statistics South Africa 2011). The force that drives this growth is migration, mortality, HIV and fertility. The table below presents the demographics of eThekweni for the period of 2012-2021.

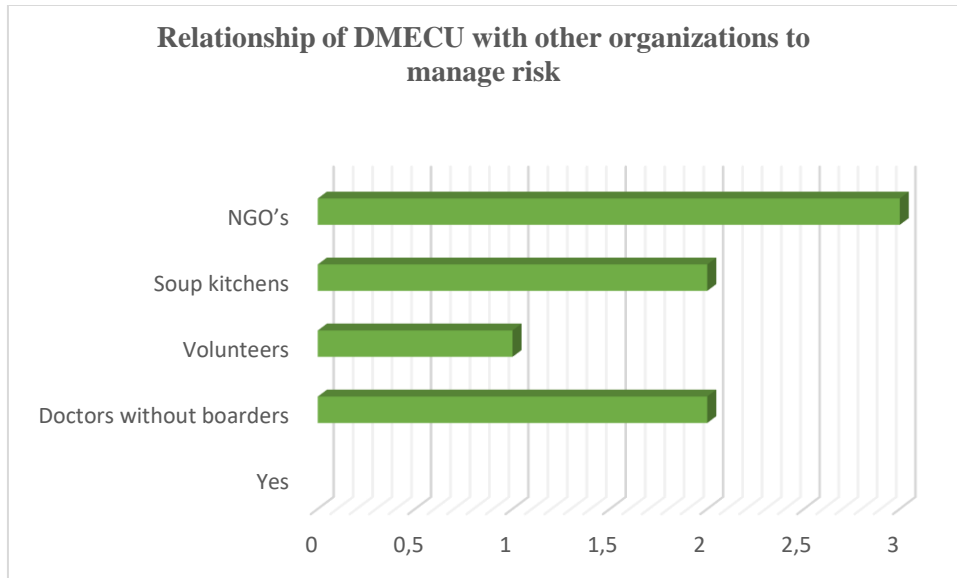
**Table 4.1: eThekweni Demographic Projections**

<b>Year</b>	<b>Population Estimates</b>
2012	3 446 447
2013	3 480 726
2014	3 517 157
2015	3 555 868
2016	3 596 543
2017	3 638 918
2018	3 682 524
2019	3 727 032
2020	3 772 097
2021	3 818 499

Source: eThekweni Transport Authority cited in eThekweni 2014/2015 IDP

eThekweni's IDP (2014/2015 IDP: 19) states that migration of population to eThekweni is a vital contributing factor to population growth. According to Census 2011, the province that had most migrants was KZN. Many migrants reside in informal settlements. Migrants from other countries, 15% of them live in informal settlements and 35% migrants are from Eastern Cape. Migration creates problems to the deployment of the labour force, rendering of social services, provision of infrastructure such as, housing and basic household services.

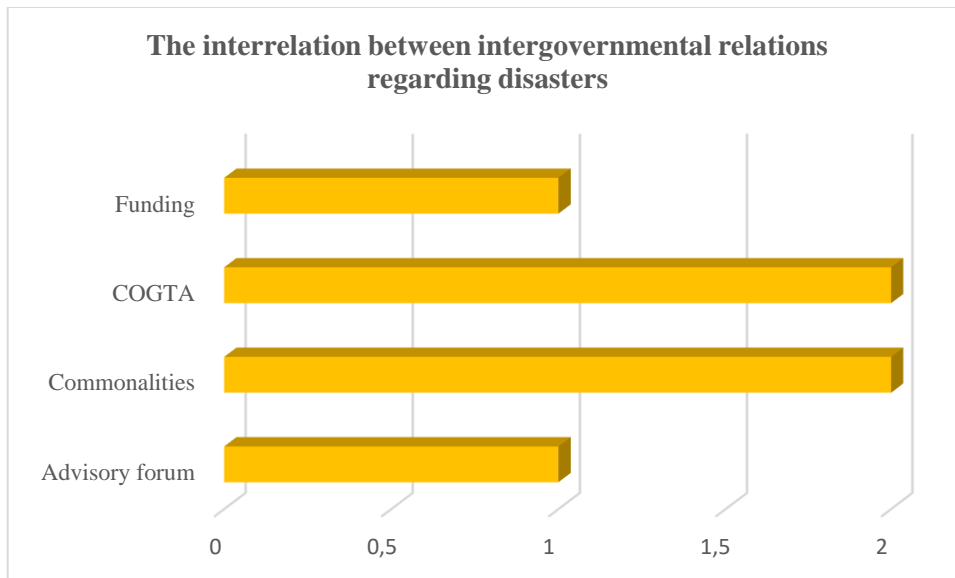
eThekweni Municipality DMECU plays a major role in implementing appropriate measures that reduces risks in eThekweni and surrounding areas especially in the South Durban Basin, which is concentrated with industries, the area is high risk on disasters. The objectives of the DMECU are to develop a continuous network of business, government and communities to facilitate DRR. As depicted in graph 4-1, DMECU has a working relationship with other organisations for managing disaster risks.



**Graph 4-1: Relationship of DMECU with other organizations to manage disaster risk**  
 Source: Fieldwork by researcher

The DMECU have relationship with other stakeholders to manage disasters when they have occurred in Clare Estate such as NGO's who contributes things like blankets, clothing etc. Soup kitchens provide soup for the victims, volunteers and doctors without boarder assist with health facilities to the victims.

The DMECU develops a clear plan for emergency procedures and DM, that shows the roles and responsibilities of each of the agencies in the event of accident and highlights potential risks and identify appropriate mitigation measures and audit. The DM plan of eThekwini Municipality involves national and provincial government for maintaining intergovernmental relations as no sphere of government can work in isolation. The eThekwini Municipality also has a relationship with COGTA; provincial and municipal DRM practitioners attend meetings on monthly basis to discuss commonalities and differences in DRM within the province. During the interview at DMECU, DMU1 stated that the interdepartmental committee/advisory committee of the city began in 2013. Intergovernmental relations play a massive role in terms of funding for dealing with disasters. Graph 4-2 shows the interrelation between intergovernmental relations regarding disasters.



**Graph 4-2: Intergovernmental relations regarding disasters**

Source: Fieldwork by researcher

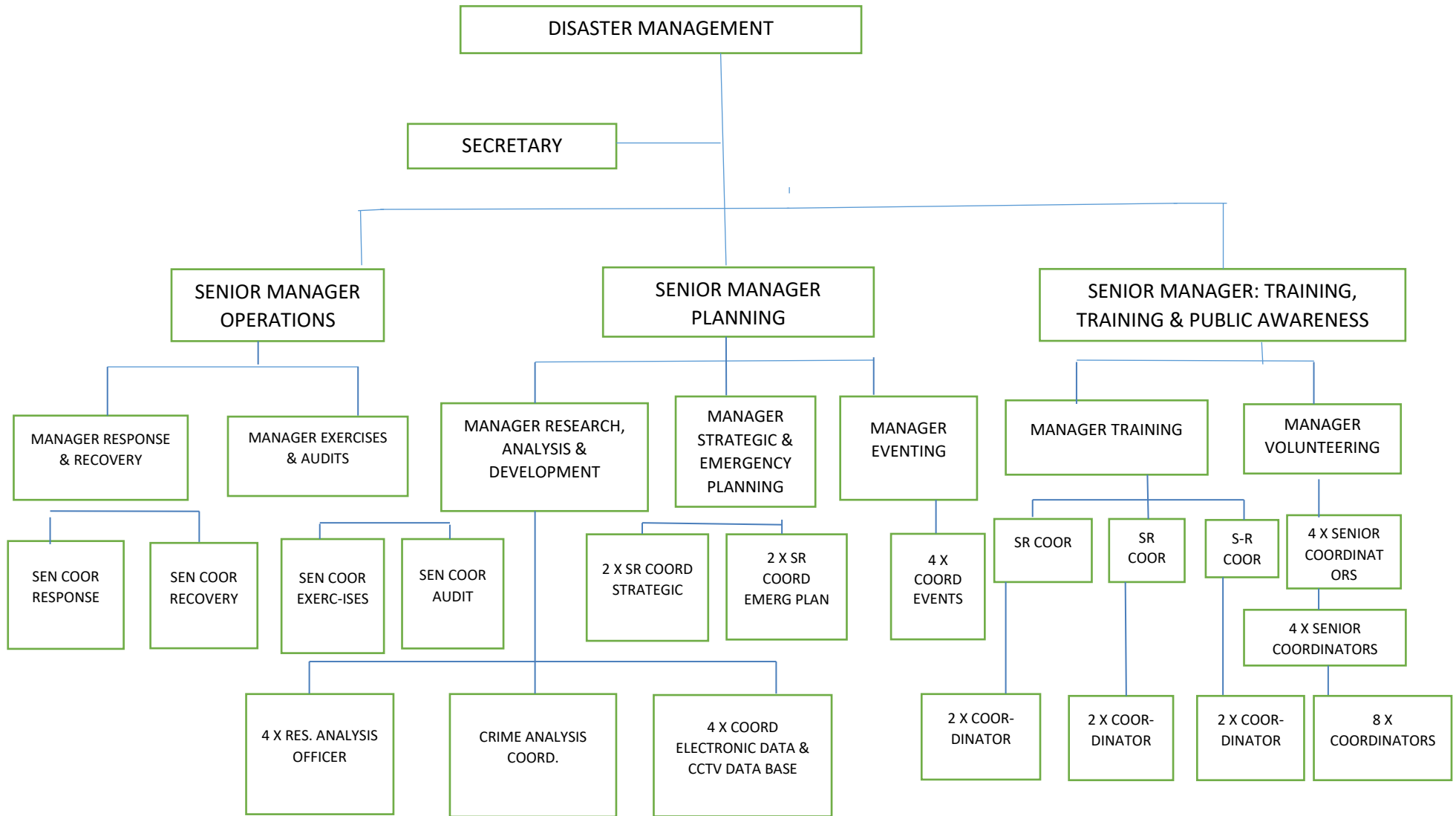
DMECU have relations with other government departments, which consist of advisory forum where they discuss disasters.

Since 2013, the forum has been operating to discuss matters of DM within the city. The city manager is the chairperson of the interdepartmental committee/advisory forum. Deputy City Manager who is in charge of clusters and units sits in the committee. There is a relationship with other government departments such as Provincial DM centre. Every District Council attends provincial practitioners' monthly meetings where plans are discussed (DMU1, DMU2, and DMU3).

The DMECU also has an emergency centre that attends to emergencies in and around eThekweni. The then Honourable Mayor, Cllr Obed Mlaba, and MEC of Co-operative Governance and Traditional Affairs, Ms Nomusa Dube opened eThekweni Municipal Disaster Management Centre (MDMC) on 01 April 2011. The state of the art MDMC enhances the safety and security of all eThekweni citizens. It came into operation in June 2010. The MDMC is located at No. 3 Jeff Taylor Road in Durban (IDP 2015/16:70). The DMECU has a 24-hour emergency call centre and resource mobilization section. There is also a municipality's closed circuit television (CCTV) camera network where responses to emergency are actioned and monitored properly. DMECU also has the Emergency Mobilising and Communications Centre (EMACC), technical services and Disaster Management departments (IDP 2015/16:70). The centre has first class facilities; it is conquerable to the best DRM centres across the globe. The



eThekwini DMECU is in charge of all disasters that occur in and around eThekwini. However, the DMECU of eThekwini Metro Municipality is short-staffed. The DMECU has only six staff members yet the organogram of the DMECU has vacant posts but due to non-availability of funding it becomes a challenge to fill those posts. DMU1 affirmed that only six staff members do everything in the DMECU, but in a normal environment one would have an operations division that deals with strategic operations and manages the disaster operations centre. Figure 4-1 shows the organogram of the DMECU.



**Figure 4-1: Disaster Management and Emergency Control Unit Organogram**  
 Source: eThekweni DMECU

According to data results, the above-depicted organogram does not mean that the DMECU of eThekweni Metro Municipality has enough staff. Lack of funding results in human resource constraints. The DMECU organogram has been in existence for more than ten years. It may have eighty to ninety approved staff members but as indicated above, the reality is, there are only six dedicated staff members who do everything. An operations division would deal with strategic operations, and manage the disaster operations centre. A planning section would handle all contingency plans that deal with environmental impact assessments (EIA) and major hazardous installations (MHI).

According to eThekweni, Metro Municipality IDP (2015/2016:71) the municipality designed the DM Framework in compliance with the Disaster Management Act (No 57 of 2002) as the Act stipulates to provide for-an integrated and co-ordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating emergency preparedness, rapid and effective response to disasters. The Council adopted the framework in September 2009. The framework derives from the four national key performance areas (KPA's) which are integrated institutional capacity for disaster risk management, disaster risk assessment, disaster risk reduction and response and recovery. From the years 2010 to 2013, 264 people have died through fire incidents in eThekweni municipal area. Seventy eight percent (78%) of people died in fire disasters in residential occupancies, 46% in formal residential and 54% in informal settlement units (IDP 2015/2016:71) . The DMECU is focusing on organizational restructuring, with a hope that it will get support on prevention of fire through education programs especially to vulnerable communities. This approach is effective in reducing the incidence of loss of life through fire in the communities. The Fire Department is important as it serves the fundamental human rights, such as right to life. As the population increases, this growth increases the fire risk and a greater demand on fire and emergency services. The function of fire department has spread beyond its traditional responsibility of firefighting (IDP 2015:2016:74).

When the researcher was conducting interviews it came out that, there is no written DRR strategy for fire prevention in informal settlements; however, the municipality uses awareness campaigns where they educate the community about fire prevention. FM1 stated, "For us to help you, you have to help yourself to reduce risk. We give people in the informal settlement information but they choose whether to use it or not. We have a couple of programmes running where operations department go to informal settlement, ordinarily on weekends to teach them on

using fire engines. Operations go out and engage with the community as far as they can”. FMI further stated that they have recently started on the PIER programmes that is Public Information Education and Relations. The slogan for PIER programme is “we are here for you” (FM1). (FM3) also confirmed that they use education as their strategy in reducing data. “The research has been done, definitely reduction of fire disasters have been noticed” FM3. DMECU officials also confirmed that the DRR strategy for fire in informal settlements is to educate the community. DMU2 and DMU3 affirmed, “DRR only focuses on preventing measures. Those preventing measures are awareness, training, and education. These measures are used in communities that are facing particular a hazard”. “DRR strategies that one can implement is extremely limited, it is awareness, community forums, workshops that we conduct in the area” (DMU2 and DMU3).

In this study, Clare Estate informal settlement in eThekweni is a subcase of DMECU, as indicated in Chapter 3. The people who occupy the shacks in Clare Estate informal settlements are mostly those who came to Durban for job opportunities and schooling. While population statistics in Clare Estate informal settlement is uncertain, community respondents and AbM social movement organization claim that there are ±14,000 residents (AbM interviewees). Clare Estate informal settlements have experienced fire incidents on many occasions and when these tragedies occur, people become homeless with all their possessions destroyed. Sometimes, people lose their lives. In most cases, fires stem from illegal connections since there is no electricity in these informal settlements. EThekweni Municipality is one of the municipalities that provide shelter, food parcels and blankets when tragic incidents of fire occurred in informal settlements. The pictures displayed in Figure 4-2 and Figure 4-3 are the evidence of what was pointed out by scholarly (Botha *et al.*, 2011) that Municipalities should provide shelter, food and blankets to the victims. EThekweni Municipality distributes food parcels and provide shelter to informal settlement dwellers that have been victims of fire.



**Figure 4-2 Food Parcels and sponge donated by eThekweni Municipality to affected residences**

Source: Researcher's fieldwork-Picture taken at Foreman Road on 15 March 2015



**Figure 4-3 Shacks burned by fire and Tents donated by eThekweni Municipality**

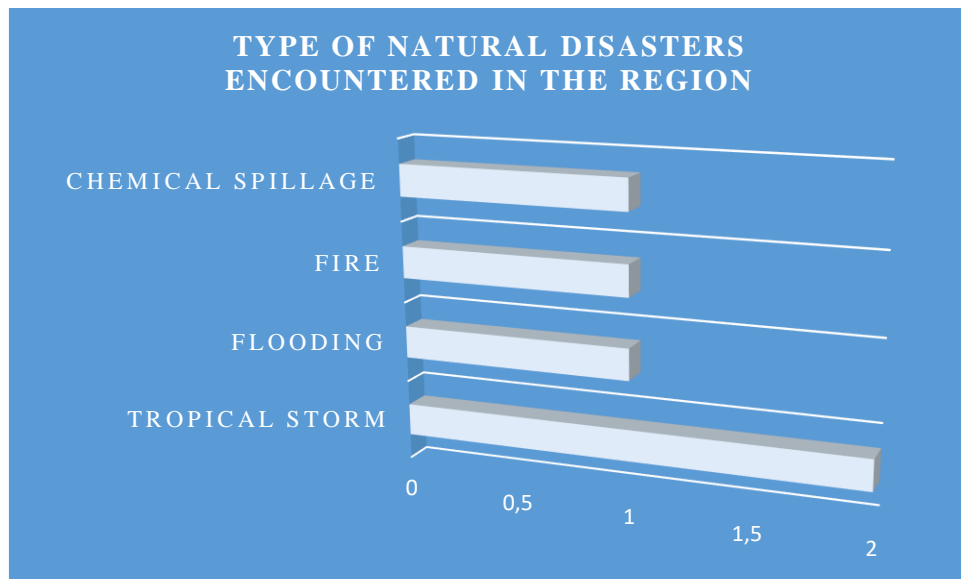
Source: Researcher's fieldwork-Picture taken at Forman Road on 15 March 2015

Pictures in Figure 4.2 and Figure 4.3 are the evidence of what was noted by Botha *et al.*, (2011) that eThekweni Municipality provides shelter and food parcels when shacks are consumed by fire. AbM is a SMO for shack dwellers. It emerged around 2005; its campaign was to promote proper housing and service delivery for those who live in informal settlements. In 2009, AbM entered into a memorandum of understanding with eThekweni Municipality toward this end. By 2010, AbM claimed more than 10,000 members (Gibson, 2011: 2, 12, 13). The AbM committee that met with the researcher emphasised that they are all elected leaders of the organisation. They serve two terms in the executive committee. They emphasised that they are all members there is no one that is greater than another person is considered. AbM organisation is a dynamic movement and democratic in nature. They advised the researcher that whenever they protest it is all about having their dignity recognised. The informal settlement community does not have basic human needs like toilets, electricity and water. They pointed out that according to their knowledge eThekweni Municipality is the only municipality that does not have a policy of providing informal settlements with electricity. However, they advised that recently, a historical event occurred, installation of electricity in *S'yanda* informal settlement near *KwaMashu*. According to them, this was the first time eThekweni Municipality installed electricity in an informal settlement. This came as a relief to them in hope that maybe one-day legal electricity will come to Clare Estate informal settlement. A few years ago, they buried a Grade 10 pupil who died because of illegal electricity connections. Electricity tripped while the girl was studying. She went to check in the electricity box and never came back; she died. Installation of electricity in Clare Estate could avoid such incidents. AbM highlighted that the organisation gets financial support from churches, NGOs, organisations from outside South Africa and individuals. Some people do not contribute with monetary value to the organisation but with their skills for example professional lawyers. Narratives from AbM executive management and Clare Estate informal settlement community members are presented further in section 4.4.4 of this chapter.

Returning to the context of the DMECU, the unit is in the process of developing a DRM plan. “Currently we are looking at all the risk within the Municipality and from there we will be able to come up with the disaster management plan” DMU3. Even though the Municipality is working on the DRM plan, they are aware that they have vulnerable communities in informal settlements. “We have vulnerable communities all over the city particularly, people living in informal settlements” (DMU1, DMU2 and DMU3). Chemical facilities have been identified as

a huge risk and contributing factor in disasters around eThekweni. “Durban South has huge risk with those technological risk chemical facility and oil refineries.” (DMU1 and DMU2).

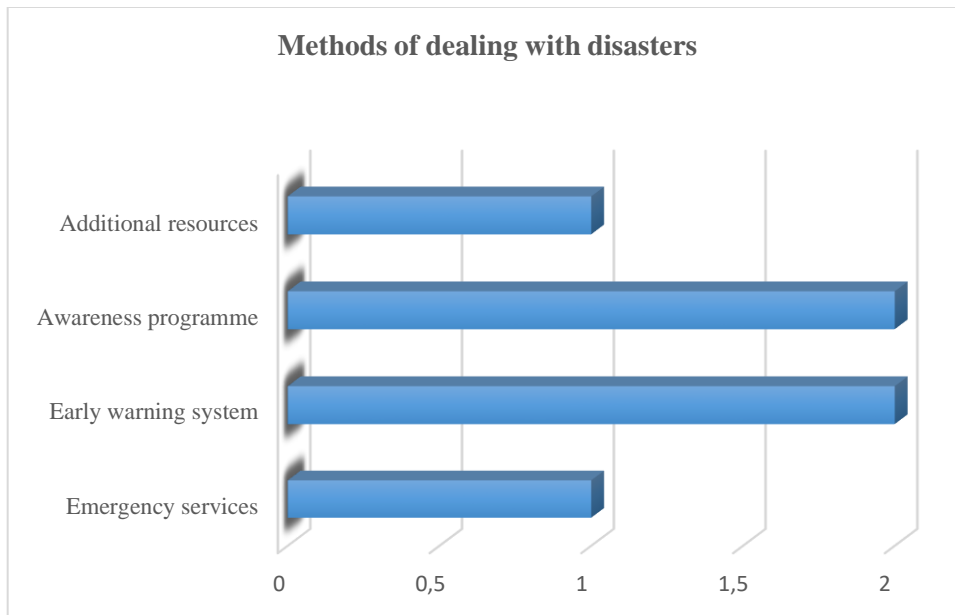
DMECU officials advised the researcher during the interviews that most of the natural disasters are weather related like tropical storms. The region experienced many severe weather storms. As shown in Graph 4-3 some of regional disasters include flooding, fire as well as chemical spillage. “The region has a number of informal settlements; shack dwellers are often affected by flooding disasters and economy of the region is mostly affected when chemical spillage occurs” (DMU1, DMU2, DM3).



**Graph 4-3: Types of Natural Disaster encountered in the Region**

Source: Researcher’s fieldwork

The municipality has different methods of dealing with disasters shown in graph 4-3 and some of these are shown in graph 4-4. DMU1 advised the researcher that if there’s going to be a storm with lots of flooding, the emergency services such as fire department will add more staff who will be paid overtime. DM2 and DM3 expressed that early warning system, awareness programmes and additional resources are the mechanism they use in dealing with disasters.

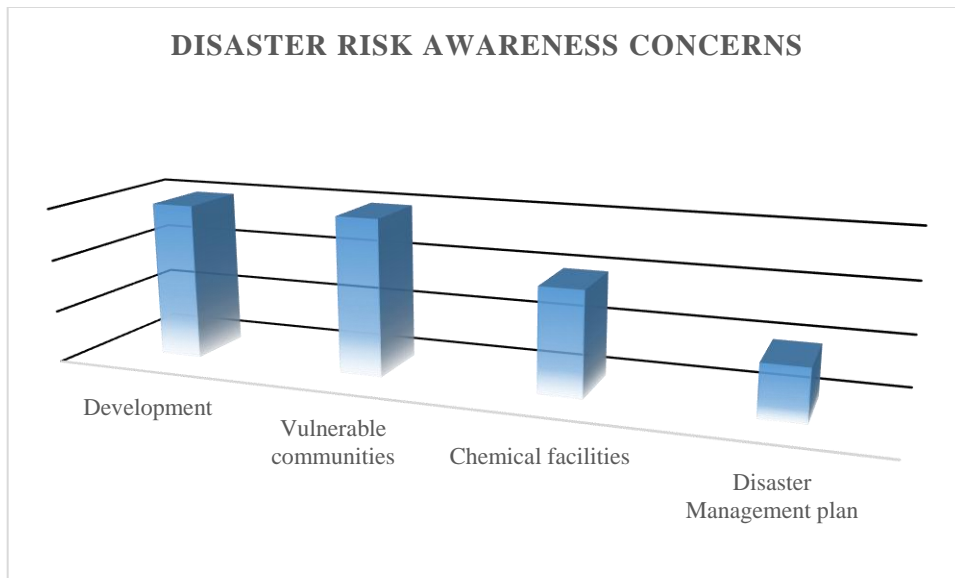


**Graph 4-4: Methods of dealing with disasters**

Source: Researcher's fieldwork

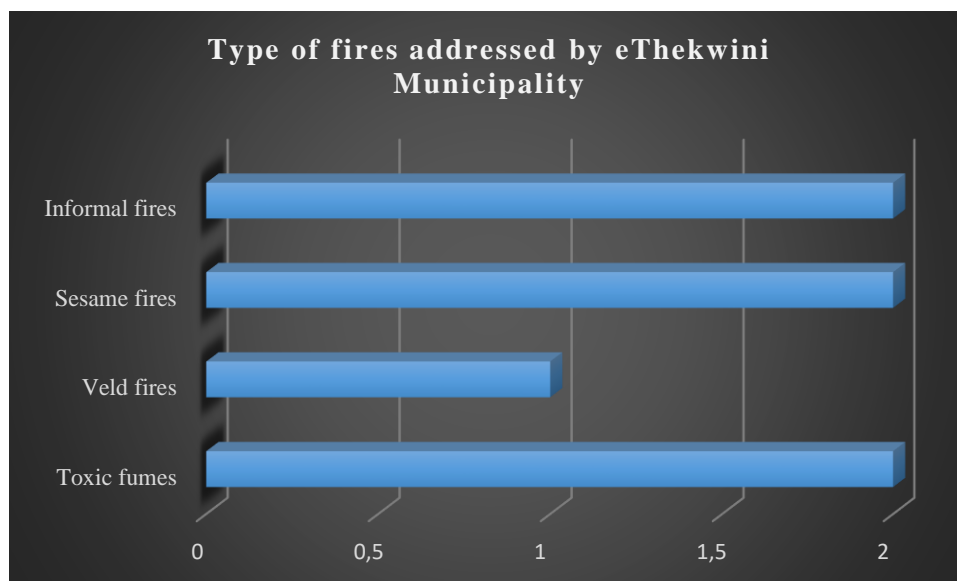
Graph 4-5 shows that the majority, from DMECU recognizes that they have vulnerable communities all over the city, particularly people living in informal settlements. Out of three officials interviewed by the researcher, two of them agreed on what Graph 4-5 depicts regarding disaster risk awareness concerns. This revealed that DRR strategies are very limited because one cannot move the chemical facilities and people living in areas with chemical facilities may not wish to move. This limits implementation of DRR strategies. Moreover, the land also requires development, which in turn has to feed the economy.





**Graph 4-5: Disaster Risk Awareness Concerns**  
 Source: Researcher’s fieldwork

Even though the municipality does not have the written fire DRR strategies as mentioned earlier, they apply DRM and DRR strategies in different types of fires such as veld fires, sesame fires, toxic fumes and informal settlement fires. The following bar Graph 4-6 shows types of fires where DRM and DRR strategies are applied.



**Graph 4-6: Types of fires addressed by eThekweni Municipality**  
 Source: Researcher’s fieldwork

### **4.3 Organisation, Presentation and Analysis of Results of Qualitative Data**

This section continues to examine the results of the qualitative data collected by the researcher as indicated in Chapter 3. The sequential approach facilitated data collection. This approach assisted the researcher with understanding the strategies of DRR and knowledge about all actors that are involved in DRR in eThekweni Metro Municipality. This section first presents and analyses data in response to achievement of the research objectives. It then presents and analyses data in a way that answers the research questions. It is worth noting that matrices display narrative from respondents. The researcher used content analysis and matrix analysis to code and collate explanations underlying the responses. It is important to explain the two analyses methods. Content analysis is to interrogate and understand responses from participants and matrix analysis is to organize and present data under analysis. The researcher reduced data to meaningful collective responses together highlighting similarity or differences yet retaining intended narrative from participants. Figure 4-4, using colour coding of a pie chart, presents the proportion of stakeholder segments as research participant.



**Figure 4-4: Stakeholder segments clustered as research participants**

Source: Researcher's fieldwork

As mentioned in chapter three, data collection tools used were interviews and a focus group. Twelve participants were from the municipality and sixteen from the community, inclusive of 11 members of focus group. These participants are broken down into five stakeholder segments. Figure 4-4 and Table 3-1 shows the amount of participants within each stakeholder segment. The following section presents data collected by the researcher from participants of each stakeholder segment.

#### **4.4 Presentation of Data, Analysis and Findings**

This section presents data analysis and findings based on emerging themes of the study, aligned with philosophical worldview, the theoretical framework that drove the study, research objectives and research questions. Section 4.4.1 shows the convergence of research objectives and research questions. Section 4.4.2 demonstrates the alignment of the theoretical framework and philosophical worldview guiding and undergirding the study as well as the themes emerging from the study. Although themes emerge during and after data analysis, themes appear early in this discussion. Whilst Section 4.4.3 illustrates the analysis of focus group data, Section 4.4.4 provides an analysis of interview data. These data are in matrices through narratives from the respondents and in line with research objectives and research questions. Thereafter, Section 4.4.5

consists of cross-case analysis of focus group and interview data, which is in line with the research objectives.

#### 4.4.1 Convergence of Research Objectives and Research Questions

It is important for the Researcher not to lose track of the research objectives and research questions throughout the study. The study should show the achieving of each Research Question and answering each Research Question.

**Table 4-2 Convergence of Research Objectives and Research Questions**

Research Objectives	Research Questions
Explore DRR plan of eThekweni Municipality to address fire prevention at Clare Estate informal settlement community.	To what extent does eThekweni Municipality DRR plan address fire prevention at Clare Estate informal settlement community?
Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.	What factors facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality?
Determine involvement of Clare Estate community members in the implementation of the eThekweni's fire disaster programmes.	How is the Clare Estate informal settlement community involved in the implementation of the eThekweni's fire disaster programs?
Examine community level initiatives in Clare Estate informal settlement to address fire prevention.	To what extent do community level initiatives in Clare Estate informal settlement address fire prevention?
Identify types of indigenous knowledge that enable Clare Estate informal settlement community members to protect themselves from fires.	How does local or indigenous knowledge enable Clare Estate informal settlement community members to protect themselves from fires?

As can be seen in Table 4-2, the research questions mirror the research objectives. The discussion next turns to the interaction between the theoretical framework, philosophical worldview and themes emerging from participant narratives.

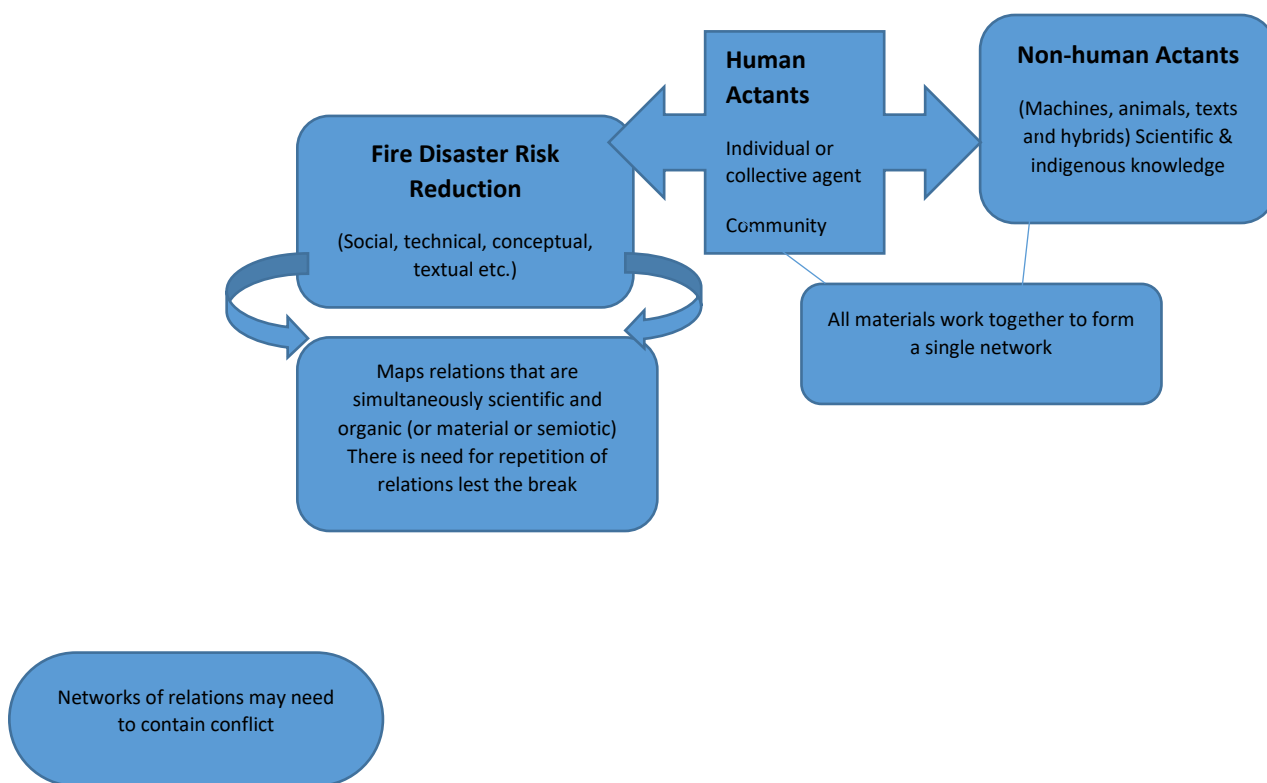
#### 4.4.2 The Theoretical Framework, Philosophical Worldview and Emerging Themes

A theoretical framework is the vehicle that drives the study and helps in answering research questions as well as achieving research objectives. The theoretical framework assisted with emergence of themes during analysis.

##### 4.4.2.1 Theoretical Framework and Philosophical Worldview

Creswell (2009:5) noted that even though the philosophical worldview remains hidden in research, it still influences the practice of research and need identification in the study. Chapter

3 explained the advocacy/participatory worldview used for the study. The study adopted the ANT that drives the study as indicated in Chapter 2. Figure 2-4 is re-shown here for ease of reference.



**Figure 4-5: Actor Network Theory**

Source: Adapted by researcher from Lassa (2012:7), Kenney and Phibbs (2014:3), Stones (2010:1287) and Latour (2011:799).

The ANT draws up all actors together to form a network as depicted in Figure 4-5 where both actants, human and non-human entities work together to form a single network. Greenhalgh and Stones (2010:1287) reported that the ANT considers a network that is made of both technologies and people. The focus of interest in the ANT is not just people and things but what is of interest is the results of their position in a network and the power that emerges from dynamic configurations of human and non-human actors. ANT represents processes of interaction among actors. Those actors are largely equal except in their ability or throughput and impact or interaction with other actor. For instance, Lassa (2012:7) states that global agencies come to communities to transact their humanitarian imperatives because they are more likely to have strong connections than local relief groups in terms of post disaster organizations' networking. It is important to note that while the theory supposes that the interaction amongst actors is underpinned by a fact that they are equal, it allows conflict as all actors may not be able to play the same roles in a network. The researcher employed this theory in the study in order to explore

how networks for DRR and risk management and to understand whether there is conflict between the municipality and the community. In addition, to advocate ANT as both theory and method in order to elucidate the eThekweni Municipality's design of fire DRR and DM approaches and determine whether their scope of enquiry involves actors that are excluded, for instance, the local communities in Clare Estate informal settlement.

As mentioned at the beginning of this section, that philosophical worldview needs identification, as it influences the practice of research (Creswell 2009:9). The advocacy/participatory worldview address issues such as oppression and alienation as well as marginalization and empowerment. Advocacy/participatory research give the voice of the marginalized, oppressed and alienated participants, raising their awareness in advancing an agenda for change to improve their lives (Creswell 2009:9). This study seeks to uncover the effectiveness of the eThekweni Municipality DRR Strategy pertaining to fires at Clare Estate when it comes to community inclusion.

The philosophical worldview and theoretical framework complement one other as the framework has different actors from institutional and public domain who work together towards a single network. It is important to give meaning to each element of the theoretical framework. Actants in the ANT are different actors who participate in the network that is individuals or collective agents, the community, the municipality and SMO's. For example, disaster management representatives said, "We also provide public workshops where we train communities about disasters, what to do if there is a disaster and how can you actually prevent them". (DM1, DM2, DM3). While community members say: "We do not get much opportunities like to be trained and I strongly agree that there is nothing helpful which is done by eThekweni Municipality, they do not educate/train us on how to stop fire and there is no where we get help" (CEC3, CEC8). These two quotations contain conflict. According to DM1, 2, 3 they provide public workshops and train communities whereas community representatives revealed that they do not get any training on how to stop fires.

The informal settlement community of Clare Estate resides in a social setting where people are oppressed, marginalized, and alienated. According to Cadag and Gaillard (2011:100), collaboration between actors is essential for sustainable DRR. Government authorities, local communities, NGOs, school communities and churches all have a role to play in DRR. One community member of the Clare Estate informal settlement affirmed this by revealing that one of the IK strategies that they use in protecting themselves from fire is applying spiritual

intervention through inviting different churches for prayer. The community member said, “We invite churches and have spiritual gathering, we conduct prayer where we ask God Almighty to stop fire incidents in informal settlements and indeed since our last gathering we never had fire incidents” (CEC2). This marginalized, oppressed and alienated Clare Estates informal settlement community needs to be empowered with relevant skills so that they could be able to protect themselves from fire.

Conceptualising the link between the theoretical framework that drives the study and philosophical worldview of the study helped the researcher analyse data. Matrices 4.1 to 4.3 show data that correspond to the alignment of the theoretical framework that drives the study with each of the elements of the advocacy/participatory worldview, that is Matrix 4.1 addresses Oppression and Alienation, 4.2 addresses Marginalization and 4.3 addresses Empowerment. As these matrices show, there is a perception that people living in informal settlements are not humans therefore they are oppressed, marginalized and they are an alienated group. This was collected from a member of AbM social movement organisation who said, “I would say there is not any interest to even attempt to help because they view people who live in the shacks as not human beings but as thugs” (CEC5).

According to recent past estimates from the 2011 General Household survey administered by Statistics South Africa (StatsSA), about 1.1-million South African households lived in informal settlements described as “shacks not in a backyard” (StatsSA, 2012). Tshikotshi (2010:54) identifies the absence of affordable housing, ‘lack’ of urban policy, the legacy of apartheid planning and lack of service delivery set as contributory to deficiencies in providing formal houses for poor communities. Owing to the mentioned deficiencies poor people ended up living in informal settlement where they are oppressed and alienated. People end up living in informal settlements because this form of housing is near industries and companies that provide job opportunities. Living in informal settlements eliminates or decrease housing costs.

Miles (2011:367) confirms that there is fast growth of population in cities of less developed countries. According to Fay (2005:162) and Neuwirth (2005:64), the population growth of informal settlements leads to extensive damage in case of hazards due to use of low quality materials during shack construction as well as the congestion between shacks contributes to fire disasters. Eighty percent of municipal officials who participated in the study recognized that there are vulnerable communities all over the city living in informal settlements, which confirms that the DRR strategies are limited. Ruffin and Reddy (2015:225) point out that scholars have

identified community participation, public policy action as cornerstones for DRR to reduce vulnerability, such as that experience by Clare Estate residents. A well-informed community is a powerful force in producing local risk reduction, creating responsible people oriented in local government-driven DRR policies that reduce vulnerability. If people are vulnerable, alienated and oppressed, decision-making becomes a challenge. Matrix 4.1 turns to narrative of participants to show the relationship between oppression and alienation component of the advocacy/participatory worldview and elements of the theoretical framework; namely human and non-human actors as well as conflict.

<b>Matrix 4.1 Alignment of Theoretical Framework and Oppression and Alienation Component of Advocacy/Participatory Worldview</b>		
<b>Human Actants</b>	<b>Non-human Actants</b>	<b>Conflict</b>
<p>“Municipality doesn’t have any interest or they don’t even attempt because they view people that live in the shacks not as human beings but as thugs. I do not think there is recognition of human life by the city. There are no plans in place that protect us. They only react when a person gets killed by electricity; only react when there is fire”. <b>AB5</b></p> <p>“There is no food for people that lives there. They survive by God’s Grace. They only received R10.00 that was the last thing they received. They were given food parcels just after fire and there has been nothing else that they ever received again”. <b>CEC5</b></p>	<p>Fire</p> <p>Lack of service delivery</p> <p>DRR for fire hazards</p> <p>DM plans</p>	<p>“We are not involved in implementation fire disaster risk policy”. <b>AB2,4</b></p> <p>“We are on our own Municipality doesn’t care about us”. <b>AB5, CEC7, CEC3, CEC1</b></p> <p>“People cannot survive without food”. <b>CEC5</b></p> <p>Children end up getting sick because rubbish is not collected on time. We end up collecting this rubbish and leave it in the road, if the municipality did not collect it”. <b>CEC2.</b></p>

Matrix 4.1 shows that non-human as well as human actors are part of a network that leads to conflict that turns on basic human needs. Informal settlements tend to grow during migration from rural to urban areas. Ravallion (2001:1804), points out that the poor population grows at a high rate compared to the general population. The growth of industries and service sectors influences the trend toward poor people seeking housing in informal settlements. The main source of income of people living at informal settlements often comes from low-paying jobs. This demands that people save on housing costs. The noticeable remedy on costs for housing is to bypass procedures of getting land and opt for housing in illegal settlements. During the focus group discussion at Clare Estate informal settlement, one community member raised a concern that they live in unacceptable conditions, which affect health conditions of younger children, sometimes children end up sick because of filthiness of the place, and rubbish is not collected on time. “So much that we running short of basic services, besides fire, like rubbish in Foreman Road Municipality is failing to give out black plastics bags” (CEC2).

Marginalization of people and groups is one of the components of the advocacy/participatory worldview. The study identified marginalization and vulnerability of the Clare Estate informal



settlement community as depicted in Matrix 4.2. Van Niekerk (2014) maintains that it is imperative to note that there are high probabilities for the occurrence of hazards, increasing vulnerability and risk for marginalized poor people in urban informal areas of developing countries. The marginalization of people causes harm and death to people at informal settlements.

Matrix 4.2 Alignment of Theoretical Framework and Marginalisation Component of Advocacy/Participatory Worldview		
Human Actants	Non-human Actants	Conflict
<p>“So much that we running short of besides fire. There is no service delivery. Rubbish is not collected. Municipality is failing to distribute black plastics bags and to collect timeously. Children end up getting sick because rubbish is not collected”. CEC1</p> <p>“When a child dies through fire you find Municipality not caring for the one who has died instead caring for the one who is alive”. CEC5</p> <p>“Humans cannot survive without electricity and water. Electricity needed by my life, my life needs electricity not me because without electricity there is nothing you can do same goes with water”. CEC4</p>	<p>Fire</p> <p>Lack of proper housing</p> <p>Lack of service delivery</p> <p>DRR for fire hazards</p> <p>DM plans</p>	<p>“I would say Municipality is the cause of fire because people who live at Foreman Road, in the morning you need to queue just to go to the toilet. We have two toilets and one pipe for water and we stand in long queues for water. Our shacks are built with papers and plastics because we are not working we do not have building material. This is not a place to live, I’m telling you”. CEC10</p> <p>“The shacks are so squashed and many shacks will be burnt by fire because of the congestion but there was nothing I can do because Eskom have taken the illegal connection and had to cook because I’m tired, from work”. CEC1</p>

Data expressed in Matrix 4.2 depicts views of marginalised people living in Clare Estate informal settlements. During fieldwork at Clare Estate informal settlement, the researcher experienced some challenges. The place was smelly; rubbish was all over the neighbourhood. The researcher noted that there were only two toilets and only one pipe that supplies water to Foreman Road. Members of the informal settlement community cannot lock the toilet door because there is no lock. People die owing to connection of illegal electricity (*izinyokanyoka*). These situations further marginalise people living in informal settings. It is surprising that there are people who survive with no basic infrastructure such as toilets, water and electricity. According to Davies, Béné, Arnall, Tanner, Newsham and Coirolo (2013) institutions can give rise to forms of inequality, economic exploitation, social exclusion and political marginalisation. Matrix 4.2 displays data that illustrate that this occurs in the informal settlement of Clare Estate.

Turning to the empowerment component of the advocacy/participatory worldview, according to eThekweni DMECU, they empower the community of Clare Estate by providing community workshops and public awareness programmes to equip the community with fire prevention tools. Firstly, one affirms that eThekweni Municipality empowers community by educating them about prevention measures during workshops. Secondly, these workshops could bring change within

the community of Clare Estate, as the advocacy/participatory worldview stipulated reform of agenda. Creswell (2009:9) points out that the advocacy/participatory framework focuses on freeing individuals from societal constraints and it aims to create a political debate in order to allow change to occur. However, Matrix 4.3 shows conflicting perspectives between the municipal officials and the Clare Estate community.

<b>Matrix 4.3 Alignment of Theoretical Framework and Empowerment Component of Advocacy/Participatory Worldview</b>		
<b>Human Actants</b>	<b>Non-human Actants</b>	<b>Conflict</b>
<p>“In public workshops and public consultations where they were taking place, that is where the indigenous knowledge has been collated and they will then be added into the contingency plans and they became new contingency plans”. <b>DM1, 2, 3</b></p> <p>“We also have PDA of the number of firefighting units that would actually come out to any incident that occurs within these settlement”. <b>FMI</b></p> <p>“We also provide public workshops where we train communities about disasters, what to do if there is a disaster and how can you actually prevent them”. <b>DM1,2,3</b></p> <p>“We use bucket system as indigenous knowledge”. <b>AB2</b></p> <p>“Bucket system assists us in extinguishing fire that has occurred” <b>CC1</b></p>	<p>Educational workshops</p> <p>Indigenous knowledge</p> <p>Fire</p> <p>Lack of proper housing</p> <p>Lack of service delivery</p> <p>DRR for fire hazards</p> <p>DM plans</p>	<p>We don’t get much opportunities like to be trained and I strongly agree that there is nothing helpful which is done by eThekweni Municipality, they don’t educate/train us how to stop fire there is no where we get help”. <b>CEC3, CEC8</b></p> <p>“We live like pigs while we are human beings. Do you see how hot this house is, let say there are children, can you imagine at night when doors are closed, the Municipality do not even check if you have children or not.” <b>CEC5,10</b></p> <p>“Not a single program and I must say it’s a disgrace for the movement, for me particularly as a leader not to be informed of any programs that the shack settlement in Durban that we could utilize whether in terms of knowledge, production and sharing. We have no clue as a movement, I have no clue at a personal level reason being, as I said earlier on we are not recognized as human beings but thugs and there is no political will at all for that information to be at our disposal”. <b>AB5</b></p>

Matrix 4.3 affirms Creswell’s perspectives (2009:9) that advocacy/participatory studies often begins with important issue about problems in society such as need for empowerment. As expressed by DM1, 2, 3 they provide training to communities about disasters in order to empower them with prevention tools for fire. The theoretical framework that drives the study stipulates that there may be conflict captured during network relations. The views of DM1, 2, 3 expressed that they provide training to communities about disasters and disaster prevention yet data from community CEC3 and CEC8 reveal that the community denies getting training opportunities, such that conflict is contained in the statements. This conflict between the two domains could create positive change in a sense that when recommendations from this study are provided in Chapter 5, the recommendations will suggest what is needed to resolve the debate between the two domains.

Within actor network theory a hazard such as wild fires maybe regarded as a non-sentient actants that unintentionally influence human behaviour and modify social networks (Miles, 2012:370). DM1 and DM3 expressed that both human and non-human entities add value in fire DRR. Humans conduct workshops and convene public consultations. The municipality collects IK and

adds that knowledge to contingency plans. Both these entities reduce fire incidents. Matrix 4.3 displays that a network exists but the viability of the network is in question. While data from DM1, DM2, DM3, AB2, and CEC1 indicate all actors see IK as a fire prevention tool, data from community stakeholders contradicts that the domains work together in this regard. Nevertheless acknowledgement of the use of IK affirms a quote by Kenney and Phibbs (2015) where actor network theory explores the way in which IK, values and beliefs culminate as abstract actants that guide action.

This section discussed three components of advocacy/participatory philosophical worldview. Participant narratives provide perspectives of stakeholders. The discussion interrogated the literature in relation to the data. The following section will discuss the themes that emerged from the study with guidance from the theoretical framework.

#### **4.4.2.2 Emerging Themes from the Study**

The following themes emerged from focus group and interview data. Subsequent sections present data that led to these themes. The interaction between the theoretical framework and worldview helped the researcher in identifying the themes.

##### **Theme 1:**

Using indigenous knowledge the community is able to prevent themselves from fire.

##### **Theme 2:**

Communication particularly lack of communication between network actors.

##### **Theme 3:**

Education/Public awareness programmes are tools for eliminating fire incidences in Clare Estate informal settlement.

##### **Theme 4:**

Migration of community members is a challenge on fire prevention enforcement.

##### **Theme 5**

Problems of illegal electricity connections stem from lack of service delivery.

## Theme 6

Respect and dignity by Municipality towards shack dwellers.

To arrive at these themes, the researcher applied a number of data reduction strategies. In inverse order, an important second step in data analysis was to align the actual interview questions and the focus group guide to consider which responses may attain which study objectives. This process is shown in inverse order in Appendices I and J through the following tables.

Table 4.3 Alignment of specific interview questions to research objectives		
Appendix I	Tables in Appendix	Page
	Table A4-1 Alignment of interview questions to research objectives (Disaster Management Unit)	162
	Table A4-2 Alignment of interview questions to research objectives (Management: Fire Department)	164
	Table A4-3 Alignment of interview questions to research objectives (Fire Fighters)	165
	Table A4-4 Alignment of interview questions to research objectives (Focus Group Community)	166

Table 4.4 Alignment of primary data collection tools to research objectives		
Appendix J	Tables in Appendix	Page
	Table A4-5 Alignment of first research objective and data collection tools	167
	Table A4-6 Alignment of second research objective and data collection tools	168
	Table A4-7 Alignment of third research objective and data collection tools	169
	Table A4-8 Alignment of fourth research objective and data collection tools	170
	Table A4-9 Alignment of fifth research objective and data collection tools	171

The researcher undertook preliminary data analysis by creating the tables in Appendix J and then the tables in Appendix I. In other words, the researcher first sought to determine which aspects

of the data collection tools (interviews and focus groups) would likely yield data pertinent to certain research objectives and questions (Appendix J). Then, the researcher asked herself which data from which specific interview question is likely to be responsive to certain research objectives or research questions? These steps allowed the researcher to create matrices based on respondent narrative. This means reducing data while retaining the voice of respondents. Content and matrix analysis guided the researcher to thematic analysis. Chapter 3 explains the combination.

After themes emerged, the researcher sought to determine whether the themes are interactive with the theoretical framework. Thematic analysis assisted the researcher to demonstrate the integration of the theoretical framework with data from the study. Table 4.3 displays thematic analysis of the theoretical framework. Table 4-3 shows how components of ANT link to the themes. In other words, ANT drove the study and led to these themes.

<b>Human Actants</b>		<b>Non-human Actants</b>	<b>Conflict</b>
Municipality	Community		
<b>Theme 3:</b> Education/Public awareness programmes by municipality for fire DRR	<b>Theme 1:</b> Indigenous Knowledge.	<b>Theme 1:</b> Indigenous Knowledge	<b>Theme 2:</b> Communication, particularly lack of communication
<b>Theme 4:</b> Migration of community members is a challenge on fire prevention enforcement	<b>Theme 2:</b> Communication, particularly lack of communication between municipality and community	<b>Theme 5:</b> Problems of illegal electricity connections due to lack of service delivery.	<b>Theme 3:</b> Education/Public awareness programmes by municipality for fire DRR
	<b>Theme 5:</b> Problems of illegal electrical connections due to lack of service delivery	<b>Theme 4:</b> Migration of trained community members is a challenge on fire prevention enforcement	<b>Theme 6:</b> Respect and dignity by municipality to shack dwellers

The researcher observed that themes relating to selected components of the theoretical framework align with multiple themes. This thematic analysis proves that the theoretical framework that drives the study integrates with data from the study. It is important to note that there is divergence of perspectives from both the municipality and community regarding Theme

3 of the study. According to the municipality, they render training workshops and public awareness in terms of preventing fire, whereas the community revealed that they do not get any training from the municipality regarding fire prevention measures. “We have various programmes that we run within disaster management and they are many programmes, such as public awareness programmes that are running through the city. We have teams that go out to vulnerable communities and we look at things like reach and frequency”, said **DMU1**. “We don’t get much opportunities like to be trained if there is fire since there is something which stops the fire so we can’t get those opportunities or lecturers who can teach us”, said **CEC3**. These two quotations display divergence of perspective regarding Theme 3 as mentioned above.

The themes of the study gathered from data excerpts from focus group discussion and interviews as indicated earlier. Matrix 4.4 covers Theme 1 to Theme 2. Matrix 4.5 covers Theme 3, and Matrix 4.6 covers Theme 4 to Theme 5. Matrix 4.7 covers Theme 6. This displays how themes emerged from data collected.

<b>Matrix 4.4 Emergence of Themes 1 and 2 through narratives from interviews and focus group</b>		
<b>Theme 1:</b>	<b>Interview</b>	<b>Focus Group</b>
With Indigenous knowledge community are able to prevent themselves from fire.	<p>“In other communities they have the bucket system where they will collect water and then form a line to pass it on, to one another to catch the fire.” FF2</p> <p>Community Patrols <b>AB1,2,4</b></p> <p>Safe distance between shacks to ensure safety <b>AB5</b></p> <p>Bucket system <b>AB1,2,3</b></p> <p>“Trench digging, tyre act as lightning conductor when placed on the roof and <i>Abafana</i>. Those are the indigenous knowledges that we learn from the community and take seriously as a city and that helps in our plans” <b>DMU2</b></p>	<p>“The person who saw fire first screams to alert others, we will then take bucket to extinguish fire when that fails then we break down the shack so there will be space in between.” CEC1, CEC11</p> <p>“We cover ourselves with blanket if there is fire so that you’ll be able to escape from fire, when there are flames you will also be able to let of that blanket easy.” AB3</p> <p>“I fenced my shack so there will be no one put shack close to me, allowing of space. I also connected pipes to bring water tap in my yard”.AB5</p>
<b>Theme 2:</b> Lack of communication	<p>“Communication is a problem amongst us because fire fighters are spread all over. Also community has communication problems because you telling them what to do and they also tell you what to do.” FF5</p>	<p>“They don’t come to us to address issues” EC4</p> <p>“We would be lying to you we are not told anything.” CEC1</p> <p>“We don’t know anything” CEC1-11</p>

Matrix 4.4 indicates the value of using **IK**, which enables the community to protect themselves from fire. According to Kelman, Mercer and Gaillard (2012:13) **IK** refers to a body of data passed down through generations in a given locality and acquired through the accumulation of experiences, relationships with the surrounding environment, and traditional community traditions, practices and institutions. That knowledge is not transferable but unique and blended within a specific community, culture or society. Mercer, Kelman, Taranis and Suchet-Pearson

(2008:214) argue that scholars increasingly support the blended use of IK and scientific knowledge. Yet there is no clearly developed framework showing how the two integrate in order to reduce community vulnerability to hazards. Matrix 4.4 displays data about lack of communication between municipal officials and community. Shaw (2012:6) points out that any local community have their own local knowledge regarding vulnerabilities and capacities. The community is the source of traditional coping mechanisms suitable for their specific environment that they have developed from previous experiences in dealing with disasters. Due to exposure to hazards, the community responds first before the assistance from aid givers arrives. Matrix 4.5 displays data collected from informants about Education/Public Awareness programmes considered as a tool for eliminating fire disasters in Clare Estate informal settlement.

<b>Matrix 4.5 Emergence of theme 3 through narrative from municipal officials</b>		
<p><b>Theme 3:</b> Education/Public awareness programmes are tools used in eliminating fire incidences in Clare Estate.</p>	<p>“To go out there to continuously educate, train show people how things are done you know get the right type of people that can touch base with the communities and offer our communities to be champions.” <b>FM1, FM3</b></p> <p>“We do have a department and there is a training department that actually deals with PIER. It is more like awareness programmes. Fire awareness programmes in schools and communities.” <b>FM2</b></p> <p>“I think public education in a case if the public knows what to do in certain days and what to do when they come across fire then there will be a solution.” <b>FF4, FF3, FF1, FF5</b></p> <p>“I have recently started on the PIER programme. PIER is quite common in other parts of the country and we trying to catch up. PIER is an acronym for Public information education and relations.” <b>FM4</b></p>	<p>“We have various programmes that we run within disaster management and they are many programmes, such as public awareness programmes that are running through the city. We have teams that go out to vulnerable communities we look at things like reach and frequency.” <b>DMU1</b></p> <p>“Awareness campaigns are a way to go with educating our people.” <b>DMU3</b></p> <p>“Public awareness, training, education are preventing measures to those community that are facing hazards. We are providing education and training as well as awareness in those particular informal settlements. Our best instruments on strategies are educating and the awareness.” <b>DMU3</b></p>

Through data collected by the researcher, it seems as if DMECU and the Fire Department have common strategies regarding tools of eliminating fire incidences within the community. Public awareness programmes are part of the Disaster Management Framework (RSA 2005).

Matrix 4.6 displays data from representatives to illustrate challenges caused by migration of community and problems of illegal electrical connections. As to migration, Kelman, Mercer and Gaillard (2012:14) note that in other instances lack of local indigenous knowledge occurs owing to migration. Regarding illegal connection, Zhang (2011:473) states that the formation of informal settlements under the transformation of socialism is an unavoidable consequence of increasing social inequality, the urbanization of poverty, and spatial segregation associated with massive rural-to-urban migration.

Matrix 4.6 Emergence of themes 4-5 through narrative from interviews and focus group		
Theme	Interviews	Focus Group
<b>Theme 4:</b> Migration of community members is a challenge on fire prevention enforcement.	“Sustainability becomes an issue because you would find that the people that we may have trained over a period of time would not be present when fires occur or they have subsequently moved on and they live out of the settlements because they have been employed and they are not present.” FM1, DMU1, DMU2, DMU3	“We live in these filthy conditions because we are poor, should there developments in our socio-economic we would migrate to better environment”. CEC5,7,9
<b>Theme 5:</b> Problems of illegal electrical connections due to non-service delivery issues.	<p>“We the eThekweni Municipality, we have identified that most of the fires that occur around the informal settlements is due to the lack of electricity and illegal electrical connection (<i>izinyokanyoka</i>) because they don’t have electricity that is allocated for them to use”. <b>DMU3</b></p> <p>“The individual are stealing electricity it’s very wrong and now we as fire fighters are also in a big risk”. <b>FF3,1</b></p> <p>“Illegal connections because you can’t just put water on electricity because sometimes in the communities they start hitting you when you get there they start throwing stones at you”. <b>FF4</b></p> <p>“They start from people carelessness combines with these illegal electrical connections because you would find that in one room there are no one inside and the fire starts there and because they are clustered together then they all burn up”. <b>FF2</b></p> <p>“Most of the time fire is caused by illegal electrical connection and it’s killing us like the other time here it happened one day those electricity cables were connected and they tripped, around 12 a.m. so when they tripped they then caused fire at night and there was no one awake to fix it for us. When we woke up and there was a big fire. That is when we tried to go to the taps for water”. <b>AB2,3,4</b></p>	<p>“We all know that fire start at night, people are drunk. We try to ask people who own taverns to have a certain time to close their business. Closing late causes fire because fire usually starts from the fact that people had a lot to drink, they are drunk and when they get home, they cook using illegal electrical connection. They fall asleep then wires tripped and it cause fire.<b>CEC1, CEC2</b></p> <p>“It’s better now since we have limited the use of illegal connection of electricity while we were using illegal connection of electricity it caused problems for us, it is better than before. This has caused decline on fire”. <b>CC3</b></p> <p>“Most of us don’t know this how to use the illegal electricity, only few people know it. When it starts burning the neighbour won’t see”. <b>CEC4</b></p> <p>“Another thing that creates fire is illegal connection. If electricity has been disconnected then when it returns you found that a unattended stove is on, then that cause fire <b>CEC1</b>.</p>

Through the expression of informants, migration in Matrix 4.6 is in two folds. FM1, DMU1, DMU2, and DMU3 expressed it as a challenge, because of training they have provided to the community. After some time those community members that have been trained move from informal settlements and new people occupy the shacks. Without proper training, it becomes a problem when a fire occurs because they do not have skills of how to prevent it. In contrast, CEC5, CEC7 and CEC9 expressed that migration from informal settlement is an achievement for them since they live in unacceptable conditions. The rest of the participants in Matrix 4.6 expressed their views about challenges created by illegal electrical connection. Community members, AbM, Fire fighters and DMECU officials shared their views. During the interview, FF2 stated, “Fire is our problem, it emanates from illegal electricity connections”. Through this statement, it became clear that illegal electricity connections are the main source of extensive fire disasters in Clare Estate informal settlement. FF1, FF3, FF4 and FF5 state that people need training on how to use appliances. FF1 states that in order to prevent extensive fire damages



people need training in fire safety. Fire fighters provide evidence of fire prevention at Clare Estate as shown in bar Graph 4-7.



**Graph 4-7: Prevention of extensive fire damage at Clare Estate**

Source: Researcher's fieldwork

Graph 4-7 shows the role of service delivery for economically poor residents in informal settlements. Barrett (2010:293) notes that the World Bank (2000) reports that vulnerability to risk are as one of the defining characteristics of poverty. Owing to lack of DRR, vulnerable informal settlement communities will always be exposed to disasters in particular fires. For example, these data suggest that improved housing, electrical connections and availability of fire hydrants can help address fire DRR strategies. In other words, development is central to DRR as a way of decreasing vulnerabilities (Ruffin and Reddy 2015:221) as experienced by informal settlement dwellers. Public awareness has a role to play as well as local knowledge, such as the use of the bucket system.

With respect to the final theme, when people are oppressed, alienated and marginalised, it is highly likely that others may tend to treat them disrespectfully and consider them undignified. Informal settlements have unique challenges within their communities, and in particular with ensuring safety and security of residents in case of hazards. In spite of this, the country continues to experience rapid development [United Nations (UN), 2009; 34)], at the agency of two 'destructive' population factors namely natural increase upon already marginalized communities migration of the poor (United Nation Office for Disaster Risk Reduction UNISDR, 2009; 76).

Evidence from Roth and Becker’s study (2011; 47) reveals that in major cities in South Africa, marginalized informal communities are disproportionately vulnerable to both successive and infrequent disasters as well as everyday emergencies than those with more power (Wisner *et al.*, 2004; 28).

According to Mercer (2010:249), DRR is the systematic design and application of policies, strategies and practices to minimise vulnerabilities and disaster risks to avoid impacts of hazards. As mentioned earlier, a vulnerable community such as Clare Estate endures lack of respect and dignity owing to their socio-economic conditions, alienation and marginalisation. Matrix 4.7 displays their views.

<b>Matrix 4.7 Emergence of theme 6 through narrative from interviews and focus group</b>		
<b>Theme 6:</b>	<b>Interview</b>	<b>Focus Group</b>
Respect and dignity by municipality to shack dwellers	<p>“Not a single programme and I must say it’s a disgrace for the movement, for me particularly as a leader not to be informed of any programme that the shack settlement in Durban could utilise whether in terms of knowledge, production and sharing.</p> <p>We have no clue as a movement and I have no clue at a personal level, reason being as I said earlier on, we are not recognised as human beings but thugs and there is a political will at all for that information to be at our disposal.” <b>AB5</b></p>	<p>“Municipality only know us when they need our votes, they encourage us to vote and when we have voted we won’t see them again.” <b>CC3</b></p> <p>“I sometimes don’t understand municipality policies and disaster management there should understand our culture as blacks and respect us.” <b>CC5</b></p> <p>“I would say Municipality is the cause of fire because there are many people who live at Foreman Road, in the morning you need to queue just to go to the toilet we have two toilets, 2 for men and 2 for women. We only have one pipe for water and we stand in long queues for water. Our houses are built with papers and plastics because we are not working we do not have building material. Those toilets do not have doors if you a female you will see a male coming towards you. This is not a place to live, I’m telling you.” These toilets are dark at night there is no electricity, while you are there, you will see a person standing in front of you. We live like pigs while we are human beings. Do you see how hot this house is, let say there are children can you imagine at night when doors are closed, the municipality does not even check if you have children or not.” <b>CC5,10</b></p> <p>“As human being you can’t survive without electricity and water. Electricity and water is needed by my life not me, there is nothing you can do without these two commodities. We are not living in houses here we are thrown away”. <b>CC4</b></p> <p>“They should understand our culture as blacks and respect us” <b>CC5</b></p>

Humans feel disrespected and marginalised because of their poor background. This is affirmed by Demmer (2015:6) who stated that regardless of whether humans feel respected or not respected, the feelings can be associated with their background within the society or, in other words, to their idea of it. The negative social reputation can make people feel disrespected.

The previous section showed how the theoretical framework assisted the researcher to identify themes that emerged from the study. Appendix I and Appendix J as shown in tables 4.3 and 4.4

presented tables located in the appendix. These show early stages of data analysis. Matrices 4.4 and 4.7 also provided extracts from interviews and focus group that led to emerging themes.

It is important to note that only matrices that relate to research questions and research objectives were designed and themes relevant to research objectives. However, other themes emerged but were not relevant to the research objectives of the study. The next section presents an analysis of focus group data through matrices that contain narratives from community members in accordance with the narrative strategy that drove the research study.

#### 4.4.3 Analysis of Focus Group Data

Data collected by the researcher provides the reality of participants. The researcher’s task is to question the correspondence of data and research objectives. Creswell (2009:9) notes that the researcher should not interfere in the expression of participant’s real life experiences. This is contained in the advocacy/participatory worldview of letting the voice of participants out. It is important for the researcher to be close to the participants; hence, the researcher used the case study and narrative strategies to explore such. Matrix 4.8 to matrix 4.12 display focus group narrative in response to the research objectives, while comparing and contrasting the results of this study with the literature review in Chapter 2.

It is important to analyse what the matrices entail. The first column shows a root of inquiry. A root of inquiry is a focus group question responding to a research objective. That question or topic converts into a statement that reflects the root of inquiry. . The second column reveals the narrative from the focus group. The narrative from respondents also helps answer the question of the extent to which the eThekwini DRR addresses fire prevention at Clare Estates informal settlement. Matrices 4.8 to 4.12 follow this format to display focus group data. Matrix 4.8 shows responses about eThekwini municipality’s fire DRR plans, according to focus group participants.

<b>Matrix 4.8 Research Objective 1: Addressing fire prevention plan in Clare Estate community using disaster risk reduction plan of eThekwini Municipality: Focus Group Data</b>	
<b>Root of Inquiry</b>	<b>Focus Group</b>
Fire disaster programmes of eThekwini Municipality	“We don’t have any, we don’t know anything” <b>All</b> “It won’t give them anything in return, it won’t make them rich so they don’t care about us, we only know the fire department” <b>CEC1.</b>

Community members, who are a vulnerable population living in shacks, indicate that they are unaware of the existence of a fire prevention plan or strategies. Mercer (2010:249) points out that those strategies for DRR should include vulnerability, hazard and capacity assessments. Those strategies highlight a community’s ability to reduce their own disaster risk, specifically identifying those directly impacted by hazards, as those best placed to identify solutions for risk reduction (Wesner *et al.*,: 2004). To ensure sustainability, any DRR adopted approach should access knowledge that contributes in reducing vulnerability at informal settlements, municipalities should link DRR strategies to top-down and local government interventions (Fraser *et al.*, :2006).

As mentioned in Chapter 2, one of the components of Vision 2020 in Yarra Ranges Council municipality in Australia is to have sustainable communities. This municipality demonstrates caring for its community, especially for people living at informal settlements. They have measures to eliminate disasters in the area (*Yarra Ranges Council Fire Municipal Prevention Plan 2009 – 2012*). This is contrary to the sentiments of CEC1 who believes that eThekwini municipality does not care about its people, as there is nothing to gain in return.

Matrix 4.9 reveals that even if the community is unaware of the existence of a fire prevention plan for Clare Estates informal settlement, they want to be involved in the implementation of a fire prevention plan. Such participation could help facilitate implementation of the plan whilst lack of awareness of an implementation would hinder the municipality’s efforts to execute a fire prevention plan.

<b>Matrix 4.9 Research Objective 2: Factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekwini Municipality: Focus Group Data</b>		
<b>Root of Inquiry</b> Community role in the implementation of fire prevention plans	<b>Focus Group Narrative</b>	
	<b>Facilitation</b>	<b>Hindrances</b>
	“We all know that fire usually starts at night when people are drunk, we sometimes ask tavern owners to close in time. We try and ask them to close at specific time because fire usually starts from the fact that people had a lot to drink”. CEC1, 2	“We are not given the opportunity to participate in implementation of fire prevention plans” All “We don’t know anything about a fire prevention plan”. All

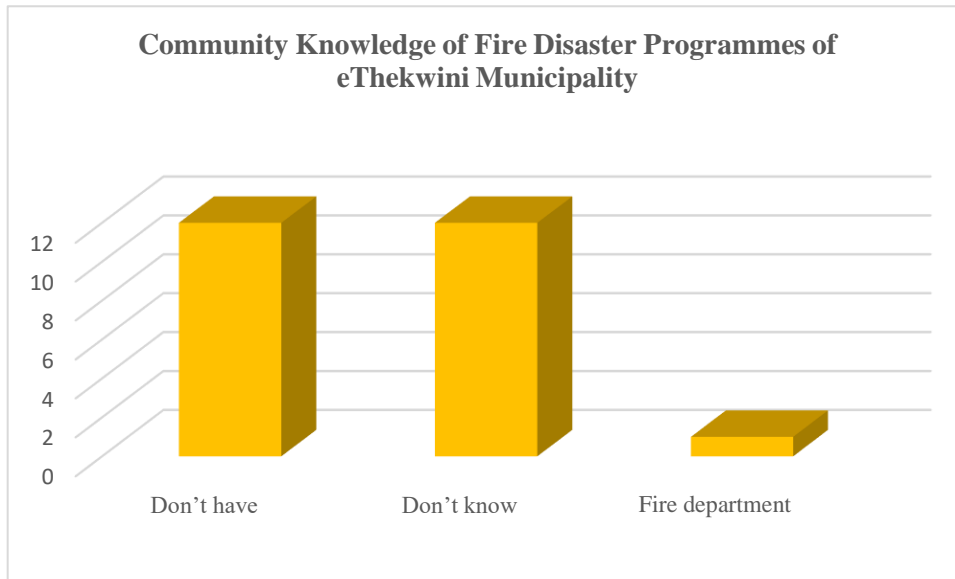
Even though the Clare Estate informal settlement is not yet involved in working with the eThekwini Municipality in implementing a fire prevention plan, they have managed to facilitate a decrease in fire incidents by trying to ask tavern owners to close early. The participatory 3-dimensional model advocated by Maceda, Gaillard, Stasiak, Le Masson, and Le Berre (2009) could be useful for the community and the municipality. Maceda *et al.*’s (2009:72) study of an attempt to integrate the Participatory 3-Dimensional Model proved useful for a number of

reasons. It integrates the participation of the population; raises community awareness of their terrain; allows the 3-dimensional mapping of natural and other hazards, vulnerabilities and capacities. This model better enables the CBDRM integration into the larger development framework for marginalised informal settlement communities. This method was successful in its implementation since neither the NGOs nor scientists were able to achieve best results with the community on their own but through working together as a team. Another study by Barrett (2010:923) pointed out that community-based risk management arrangements (CBRMAs) have the potential to fill the gap between household-level and national-level strategies for risk management. The arrangements have the ability to assist households to cope with shock. However, there is always some individual component in shock because of different experience among households.

It emerged from the focus group participants, as shown in Matrix 4.10, that they are not involved in the implementation plan of fire disaster programmes of eThekweni Municipality. It was clear that there is no communication from eThekweni Municipality regarding disaster programmes. Kelman, Mercer and Gaillard (2012) comparing different scholars, state that research has shown that policies formulated without public consultations have led to policy problems and rejection of the policy at the implementation stage on the part of the community.

<b>Matrix 4.10 Research Objective 3: Involvement of Clare Estates community members in the implementation of the eThekweni's fire disaster programmes: Focus Group Data</b>	
<b>Root of Inquiry</b>	<b>Focus Group Narrative</b>
Involvement in the implementation of the eThekweni Fire Disaster Programs	<p>“We are not involved but we want to be involved” <b>ALL</b></p> <p>“We need that because of conditions we living under that is important to us. It will enable us to help ourselves with the damages. It is important to have some knowledge; it enables you to share knowledge with others. This results in lowering damages. Instead of 100 shacks getting involved in fire maybe it will be 20. Knowledge is very important we need it as well so it will help us and also help them so that when they arrive there won't be much damage”. <b>CEC1</b></p> <p>“We are not involved there are no plans that we are involved about disaster, we would be happy to be part of it as we are South African citizens under eThekweni Municipality so we will also be seen and known to be involved. This whole thing of not involving us must end because they have this mentality that a person that lives in the shacks has no brains. We would like to be part of what they are doing”. <b>CEC2</b></p>

Although the Clare Estate informal settlement community is not involved in disaster programs of eThekweni Municipality, CEC1 and CEC2 made it clear that they would like to be involved in the implementation of fire disaster programs of eThekweni Municipality. CEC2 indicated that the municipality does not have respect for them as people living in informal settlement. Bar Graph 4-8 indicates the lack of involvement/knowledge of community regarding fire disaster programmes of eThekweni Municipality.



**Graph 4-8: Community Knowledge of Fire Disaster Programmes of eThekweni Municipality**

Source: Researcher's fieldwork

Gibson (2012) states that educating a community about fire serves as an intervention to life safety and fire prevention through educational initiatives in schools, civic and businesses associations. Responses from CEC1 and CEC2 affirm the scholar's opinion of engaging business people in addressing fire safety measures in Clare Estates. Focus group participants display the intention of longing to be involved and to add value to their community. Lixin *et al.*, (2012) report that all government departments play the dominant and leadership role in disaster prevention and reduction, in conjunction with public communities.

Responses in Matrix 4-11 show that the community does not have initiatives to prevent shack fires. However, CEC2 and CEC3 illustrate that even though they do not have community initiatives, fire incidents have decreased since they started to monitor the usage of illegal connection. In addition, lack of training opportunities are of concern to the community. Taken as a whole, focus group participants indicated that rather than the municipality showing concern for them, politicians are only concerned with obtaining votes during election time.

<b>Matrix 4.11 Research Objective 4: Community level initiatives in Clare Estate to address fire prevention: Focus Group Data</b>	
<b>Root of Inquiry</b>	<b>Focus Group Narrative</b>
Community initiative in addressing fire prevention in CE	<p>“No we don’t have” <b>ALL</b></p> <p>“No my sister, it is better now it was worse before, it is better now since we don’t use of illegal electricity. When we were using illegal electricity, it caused problems for us. It is now better than before. Change has been noticed”. <b>CEC2</b></p> <p>“What make it hard for us to play a role in our community is because the politicians are taking over even where they are not supposed to. Governments have means to go to people and inform people so that we can use those means. We don’t get much opportunities like to be trained if there is fire since there is something which stops the fire so we can’t get those opportunities or lecturers who can teach us”. <b>CC3</b></p>
Initiatives that address fire prevention in CE	No we don’t have
Municipality involvement in assisting with community generated initiatives.	<p>“In my view Municipality fail to involve people. They are only involved if there is a problem, you only see them for 5 minutes they gone. You will find nothing from them. As we speak something was on fire and some people are outside even though we are here, some were sleeping here”. They will arrive when there has been a fire and give out food parcels and sponges not knowing where you will sleep. They don’t come to us to address issues”. <b>CEC5,3</b></p> <p>“They should serve everyone what they do is wrong. They use being a comrade even if it’s not necessary”. However, when we call Disaster Management unit we find them but problem when you phone them and the fire starts and when they arrive the community we live in is so squashed even if they arrive they face the problem as disaster management because the passages are small. When you talk of Municipality is something that I do not know but I know politicians. Today it’s Municipality tomorrow they are politicians because they work as politicians. I have never seen something relating to Municipality”. <b>CEC,2</b></p> <p>“They only know us when they need votes, when we have voted we won’t see them again, nothing helpful is done by Municipality”. <b>CEC4,6</b></p> <p>“I’m the one who has lost everything through fire, I don’t have clothes and food parcels we received are finished now, I’m sleeping at people’s house because I won’t sleep in the tent. I don’t see anything being done by the municipality”. <b>CEC5</b></p>

Many community initiatives could be undertaken. For example, according to Pineda (2012:1) community based disaster risk management (CBDM) is used in developing countries which consist of disaster and vulnerability training programs. The programmes assist poor communities in bringing the resilience to disasters and building disaster risk planning while boosting self-management. Matrix 4.11 displays that the community is not happy with the municipality in terms of assisting them with initiatives of preventing fire. Turning to the fifth research objective about IK, Kelman, Mercer and Gaillard (2012) suggest that IK tends to refer to a body of data passed down through generations in a given locality and acquired through the accumulation of experiences, relationships with the surrounding environment, and traditional community rituals, practices and institutions. It emerged from the focus group that the community has different types of IK, which they apply in order to prevent fire disasters.

<b>Matrix 4.12 Research Objective 5: Types of indigenous knowledge that enable Clare Estate community members to protect themselves from fires: Focus Group Data</b>	
<b>Root of Inquiry</b>	<b>Focus Group Narrative</b>
Local or common knowledge that enables community to protect themselves from fire.	<p>“Yes we do try as my sister has said in the beginning that if there is a fire because of the way houses are built it becomes difficult for you to try out something, it’s very minimal things that you can try. We do try, if a person saw it first they would scream while the fire is still not too much. We will then take buckets to try to extinguish. If that fails then we try to break down the shack so that there will be space so that is what we try as a community”. <b>CC1, 5,11,7,8,9</b></p> <p>“We as black people we keep our culture, people here are spiritual we have tried just the other year. We have tried as a community and had a big spiritual gathering and asked big churches and asked <i>Shembe</i> church and Wesley church to have a big prayer. Praying for the fire, so we will not have to keep burying people due to fire incidents. It stopped for some time. I will not lie to you. For now there is a proposal meeting that we have to try and make a big announcement and invite all the churches and pray for these fires to come to a stop”. <b>CC2, 3, 4, 10</b></p> <p>“Since there have been pumps that have been installed in Foreman it can help us professionally if certain people can be trained. Therefore, when there is fire we will have the pipes and connect them then call the fire fighters while we are also trying to stop the fire so it won’t escalate. Once it starts burning it joins from side to side then it is not easy to get close to it”. <b>CC6</b></p>

As shown in Kelman *et al.*, (2012:13) it is easy to debate that indigenous peoples must be active players in their own communities, assessing and deciding how they would wish to reduce their own vulnerabilities and build their own capacities. This is congruent with statements made by CEC1, CEC5, CEC11, CEC7, CEC8 and CEC9 in Matrix 4.12 about the bucket system. Therefore, as participants CEC2, CEC3, CEC4, CEC10 reveal, intervention of spiritual gatherings and prayer works for them. Therefore, prayer is the IK that reduces vulnerability of the community of Clare Estate informal settlement.

The next section uses content and matrix analysis to analyse interview data

#### **4.4.4 Analysis of Interview Data**

This section displays responses to interview questions across different stakeholder segments. These segments are DMECU, Fire Department (fire managers and fire fighters as well as Executive Management of AbM, representing the community of Clare Estate informal settlement. The municipal officials are units of analysis embedded in the case of DMECU and AbM executives are units of analysis embedded in the sub-case of Clare Estate informal settlement (see Chapter 3). Matrices 4.13 to 4.19 display narrative that connects the research objectives with responses from in-depth interviews. Matrix 4.13 compares the narrative from fire managers with DMECU managers, which helps achieve the first research objective and answer the first research question.



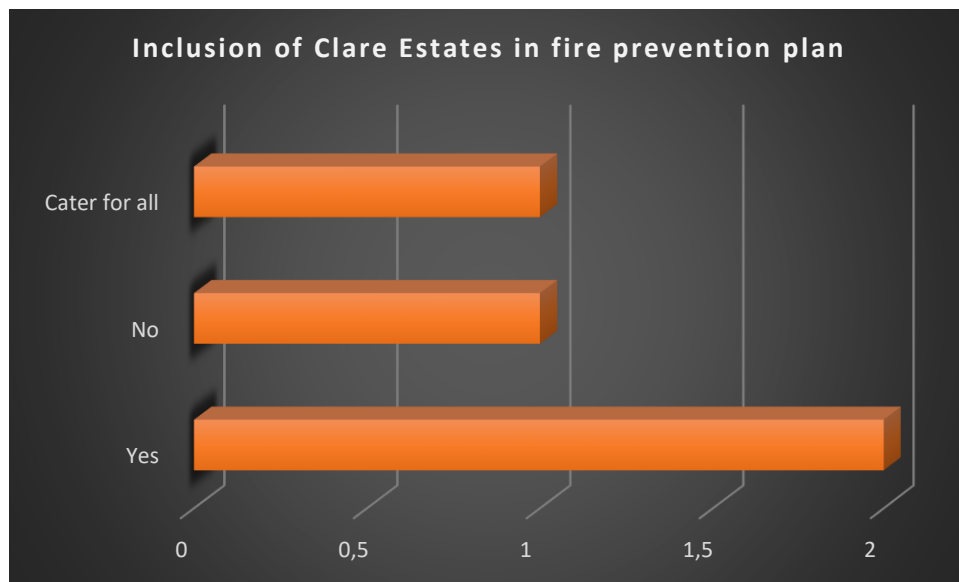
<b>Matrix 4.13 Research Objective 1: Addressing fire prevention plan in Clare Estate community: Municipal Officials</b>	
<b>Fire Managers' Narrative</b>	<b>DMU Managers Narrative</b>
“The question extends beyond the scope of what I do, I deal with the response element that responds after the fire has occurred, and we have different units within the department”. <b>FM1</b>	“We have various programs that run within disaster management like public awareness programs that are running through the city. We have teams that go out to vulnerable communities we look at things like reach and frequency”. <b>DMU1, 3</b>
“We do not have a structured programs, the unit that I am fire safety we deal with preventative measures to reduce level of risk within eThekweni municipality”. <b>FM2</b>	“We have co-operate plans that specifically identify rules and responsibility of each internal department in terms of what is expected from them before, during and after the disaster”. <b>DMU2</b>
“Yes, in terms of educating the public and research has been conducted definitely there has been a reduction of fires”. <b>FM3</b>	“One of the biggest risks that we look at in the future is associated with global warming and climate change” <b>DM1</b>
“I will advise towards training is information and education. It’s a huge tool in my arsenal, in the city’s arsenal in preventing fires and keeping people safe”. <b>FM4</b>	

Notably, the management of the Fire Department is not quite clear about eThekweni’s fire DRR strategies, as reflected from FM1, and FM2 responses in Matrix 4.13. This is disturbing because one would expect management to acquire knowledge regarding fire DRR strategies. However, FM3, FM4 indicate that educating the public serves as a strategy to prevent fires at informal settlements. As indicated in Chapter 2, Greater Shepparton City Council (2012) has a Municipal Fire Prevention Strategy, which they revise every three years to keep it up to date. This strategy helps prepare and protect the municipality, its residents and their assets from the threat of uncontrolled fires. Kusumasari and Alam (2012:360) maintain that local government considers education, and risk identification and warning tools as important factors for safety against disasters. EThekweni Municipality seems to be in line with the above. Williams (2013:270) suggests that fire DRR strategies are essential for every municipality. In contrast, Mercer *et al.*, (2008:180) indicate that DRR strategies for Yarra Ranges Council Municipality do not have a clear strategy to prevent fire.

Clare Estate informal settlements have experienced numerous accidents of fire that leave residents homeless and in some instances people die owing to these fire accidents as mentioned earlier in the study. A strategy for fire risk reduction in eThekweni Municipality will assist in eliminating such fire accidents, as there would be a plan when accidents occur. In Chapter 2, Williams (2013:270) points out the high impact in mega-fires; such impacts are unprecedented for the suppression costs; property losses; natural resource damages; and loss of life often involved. This is also the case with informal settlement fires, when there is fire as a non-human actants in the network that spans government and community, most of the time, loss of life occurs. Williams (2013:270) further notes that fires affect countries around the world, including those with massive firefighting capabilities and suggest that fire management programs are

essential in reducing fire risks. In Greater Shepparton City Council in Victoria, Australia, one of the components of the strategy is the Fire Access Road. This component is crucial in the ability of the municipality to access the affected households and to contain and extinguish a fire before it causes extensive damage. Henstra (2010:236-246) contends that local government plays an important role in emergency management, including developing the IMS. Similarly, at eThekweni Municipality there is a fire prevention strategy as explained by municipal respondents. However, this plan or strategy is undocumented. Documentation provided by this study could contribute to a written fire DRR strategy for informal settlements.

The ANT that drives the study illuminates challenges around agencies and actors that are involved in DRR and the kinds of connection and interaction needed between them. For example, the researcher notes contradictory statements from Fire Management personnel regarding involvement of Clare Estate informal settlement community in fire reduction planning. MF1 and MF4 agreed that the plan includes fire prevention whereas MF2 disagrees that the plan includes prevention of fire for Clare Estates communities by saying, “The plan doesn’t outline informal settlement areas”. MF3 stated that the plan not only caters for Clare Estate but for all informal settlements. The graph below depicts this contradiction.

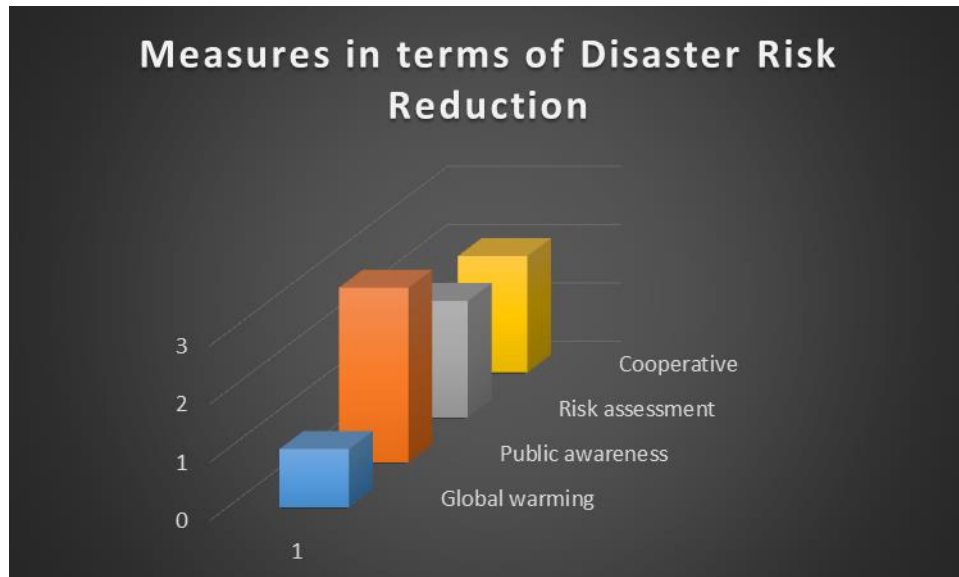


**Graph 4-9: Inclusion of Clare Estates residents fire prevention plan**

Source: Researcher’s fieldwork

Turning from the fire managers to the DRM managers, DMU1 and DMU3 express that public awareness programs are the measuring tool used for DRR plans. Graph 4-10 shows this point. However, DM2 indicates that risk assessments and co-operative plans are also the measure tool

for DRR. DM1 expressed that global warming is the biggest risk that the city considers in terms of assessing risks.



**Graph 4-10: Graph presenting measures of DRR**

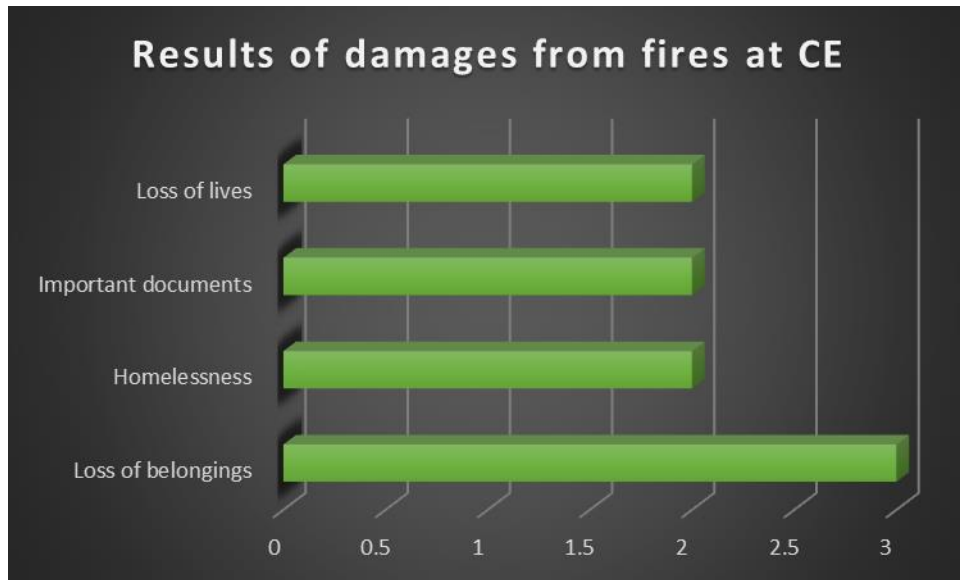
Source: Researcher's fieldwork

Taken as a whole it appears that all four measures in Graph 4-10 play a role in measuring DRR. Global warming, in terms of climate change goes hand in hand with the project that eThekwini municipality has in place with the Rockefeller Foundation. This project is responsible for managing resilience in order to absorb future hazards within the city. Mercer (2010:249) states that measures for DRR comprise hazard, vulnerability and capacity assessments. These measures highlight a community's ability to reduce their own disaster risk. Yet assessment of public awareness figures into how to measure disaster risks. Successful measures of DRR maintain resilient communities, and ensuring vulnerability is not accumulating through development efforts or other externally initiated activity (UNDP, 2004; UNISDR, 2004; DFID, 2005).

Next, Matrix 4.14 displays responses of AbM executives regarding fire disaster programmes of eThekwini Municipality. The Yarra Ranges Council in Australia stipulates that each municipality should have a municipal fire prevention plan in place, and that there is public awareness of the plan. This facilitates sharing of knowledge and details regarding fire disaster risks. (Yarra Ranges Council 2009-2012:5). Contrary to the Yarra Ranges Council, according to AbM (matrix 4.14), Fire disaster programmes of eThekwini Municipality are not communicated/shared with them.

<b>Matrix 4.14 Research Objective 1: Addressing fire prevention plan in Clare Estate: AbM Narrative</b>
“No, all I know is that there is department of disaster programs in eThekwini. Normally they would come together with other companies like Red cross and Shoprite to help with what they can help with”. <b>AbM2</b>
“I will be honest, besides those the extinguish fire, there is nothing else that I know”. <b>AbM1, 3,4</b>
“Not a single programs and I must say it’s a disgrace for the movement, for me particularly as a leader not to be informed of any programs that the shack settlement in Durban could utilize whether in terms of knowledge, production and sharing. We have no clue as a movement, I have no clue at a personal level reason being as I said earlier on we are not recognized as human beings but thugs and there is no political will at all for that information to be at our disposal”. <b>AbM5</b>

Matrix 4.14 displays that AbM does not have any idea of the fire disaster programmes of eThekwini Municipality. However, AbM executives indicate consequences of fires at Clare Estates as shown in bar Graph 4-11. AB5 further expressed that they do not even have tools that they could use as *Umbutho* in addressing fire prevention problems.



**Graph 4-11: Results of damages from fires at Clare Estate**

Source: Researcher’s fieldwork

Graph 4-11 reflects how fire damages at Clare Estate affect the socio-economic wellbeing of residents. Already a vulnerable population, fire damages exacerbate problems of residents, such as makeshift homes burnt to the ground and the need to seek identity documents from South African Home Affairs due to destruction by fire (Randfontein Herald, 2015; Mbili, 2015; The New Age, 2015; Modise, 2016).

With respect to factors that facilitate the implementation and enforcement of a fire prevention plan, Matrix 4.15 reflects narrative data from eThekwini municipal officials. All disaster management officials agree that there is an interrelation between three spheres of government when it comes to DRR. Spheres of government cannot be in isolation but they depend on one another to function. The Disaster Management Act (2002) defines the structure that governs DRM in South Africa through a hierarchical disaster management structure with a cabinet committee, an advisory forum with representatives from national and provincial departments, local government, business and civil society, as well as disaster management centres at national, provincial, metro and district levels (SANDMC 2007).

<b>Matrix 4.15 Objective 2 Factors that facilitate the implementation and enforcement of the fire prevention plan by eThekwini Municipality: Interview Data</b>	
<b>Disaster Management Unit Narrative</b>	<b>Fire Management Narrative</b>
<p>“It is good and important. It means that we are to ensure we designate information to the PDMC. We provide them with monthly reports. Also with National because funding would end up coming from national”. <b>DMU3</b></p> <p>“EThekwini Municipality has a relationship with Cooperative Governance and Traditional Affairs (COGTA) because it falls under Disaster management. There is a relationship between Provincial and National. The Province is our sister and our big brother is National”. <b>DM2</b></p> <p>“It has come together since 2012 when the city for the first time established interdepartmental committee. Deputy City manager is in charge of their clusters and their units from 2013 were the time we had a forum within the city that discussed matters of disaster management. There are task teams that report to the city’s disaster management advisory forum”. <b>DM1</b></p>	<p>“Social perspective and We need more people to go out there to continuously educate, train show people how things are done. To get right people to touch base with communities and offer our communities to be champions”. <b>FM1</b></p> <p>“We do regular visits and we receive applications. It is effective but limited because of work force. Clients of buildings request inspections and license approvals. If there is threatening situation we order them to comply within a short period of time”. <b>FM2</b></p>

The DMECU indicated there are intergovernmental relations with other stakeholders regarding prevention of fire disasters. This interrelation facilitates the implementation and enforcement of eThekwini Municipality fire prevention plan in accordance with the Disaster Management Act (RSA 2002) and the Disaster Management Framework (RSA 2005). Hence, data reveal that municipal officials comply with DRM/DRR law and policy. Next, Matrix 4.16 depicts data that expresses the hindrances to the implementation plan for fire prevention plan. The Safety Unit within the Fire Department express that clients of buildings require inspections and licence approvals for their buildings. That maintains the facilitation of implementation and enforcement of the fire prevention plan as a matter of intergovernmental relations.

Matrix 4.16: Objective 2 Factors that hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality: Public Servant Interviewees	
Disaster Management Unit Narrative	Fire Fighters Narrative
<p>“People migrate from informal settlement after they had acquired RDP houses. This is a challenge because people that leave the area have been trained and people who are not trained occupy the place. They don’t have an idea about fire prevention measures” DM1, 3</p>	<p>“Sustainability becomes an issue because you will find that people that we have trained have moved out of the informal settlements because they have been employed. So it becomes a challenge on us primarily assistance in dealing with fire depends on the community and the mind-set of the community is the challenge that if you want me to do this you must pay me”. FM1</p> <p>“Manpower, demands that we get from the city vs shortage of manpower. We prioritize; hospitals can never be like small shops. Inspection should be done at least once a year” FM2</p> <p>“Unavailability of resources e.g. breakdowns and when we get to the fire and may not be allowed to get to the fire because the crowd are hostile, they are protesting”. FM3</p>

Factors that hinder implementation and enforcement of the fire prevention plan seem to revolve around a shortage of resources. Earlier in this chapter (Section 4.2, Figure 4.1) indicates the challenge of budgetary constraints that inhibit filling the vacancies in DMECU. Municipal official respondents raise concerns about training informal settlement dwellers in fire disaster precautions and responses, only for those individuals to migrate to other areas when circumstances permit.

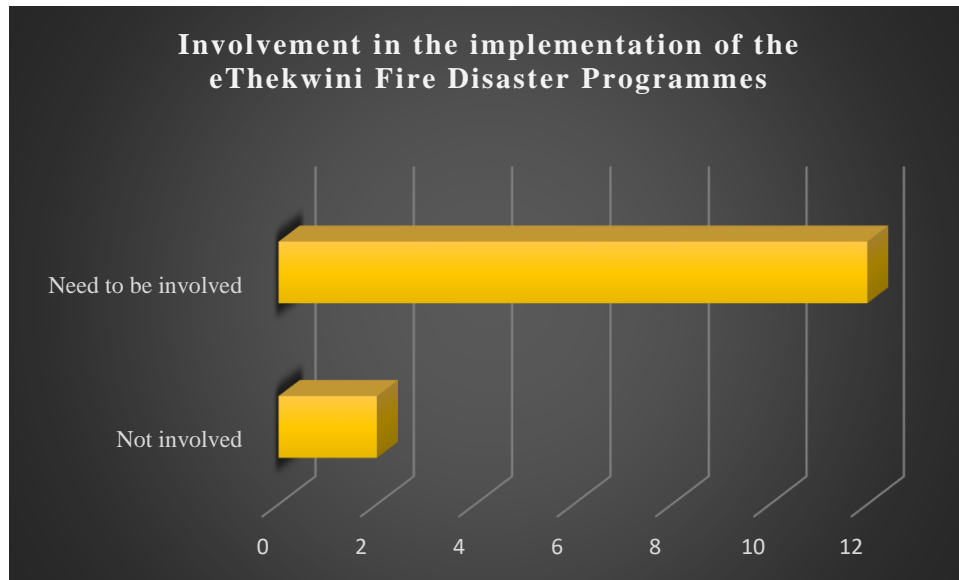
Matrix 4.17 displays that AbM is not involved in the implementation of disaster programmes of eThekweni Municipality. However, with regard to the City of eThekweni Municipality in particular, the DMECU does not agree with AbM, that they are not involved in DM programs. According to the city, they involve the community in the DRM programs. This is affirmed by DMU3 who said, “We consider indigenous information shared by the public in awareness campaigns and when interacting with the public. On our next awareness campaigns we include those IK shared by public into contingency plans”. The ANT that drives the study supposes that the relations amongst actors in the network may contain conflict and all actors are unable to play the same roles in a network.

Stakeholders include not just government but also the corporate sector and civil society. The inclusion of civil society is bringing to bear the value of indigenous or local knowledge in devising DRR programmes and strategies. Shaw (2012:3) suggests that CBDRR has different stakeholders at different levels. CBDRR is more government based, however, civil society organisations lobbied for it (Shaw 2012:3). Informal settlements known as *Imizamo Yethu* residences in Cape Town reported that fires are more likely started during fights at Shebeens

(unlicensed liquor drinking clubs) at night or when people are sleeping leaving candles or stoves burning. Such behaviour is commonly among young men living alone. Therefore, this demographic sorting at informal settlements and the subsequent drinking behaviour explains the increased risk. Therefore, the residents are aware of most causes of fire, which can assist in contributing to the implementation of disaster programmes.

<b>Matrix 4.17 Research Objective 3 Clare Estate community involvement in fire disaster programmes implementation: AbM Narrative</b>
“We are not involved what we do we do it as community leaders”. AB1
“We are not involved, we would like to be involved since the way the municipality has been doing things most of the time they don’t involve the communities in their planning. Whenever they plan for the communities, they just stay there far away. They plan for people not knowing what people need exactly at that time”. <b>AB3</b>
“No we are not involved, we would like to be involved simply because the fire disrupts us. They should involve all informal settlements dwellers not only leadership because somehow you find that an individual with knowledge of fire prevention is not available when disaster occur. Such situations forces someone else should take over. <b>AB4</b>
“Obviously not and of course we have always wanted to be involved because we always want to engage this city”. <b>AB5</b>

AbM participants at the informal settlement displayed that they are not involved in the implementation of eThekweni disaster programs as depicted in the bar graph below. However, they would like to be involved, which graph 4-12 shows. The management of AbM is of a view that if they can be involved in the implementation of disaster programs they can contribute with ideas of what the community needs. Matrix 4-17 indicates that they are not aware of any programmes run by the Municipality, meaning that there is lack of communication between the municipality and the community.



**Graph 4-12: Involvement in the implementation of the eThekweni Fire Disaster Programme**

Source: Researcher's fieldwork

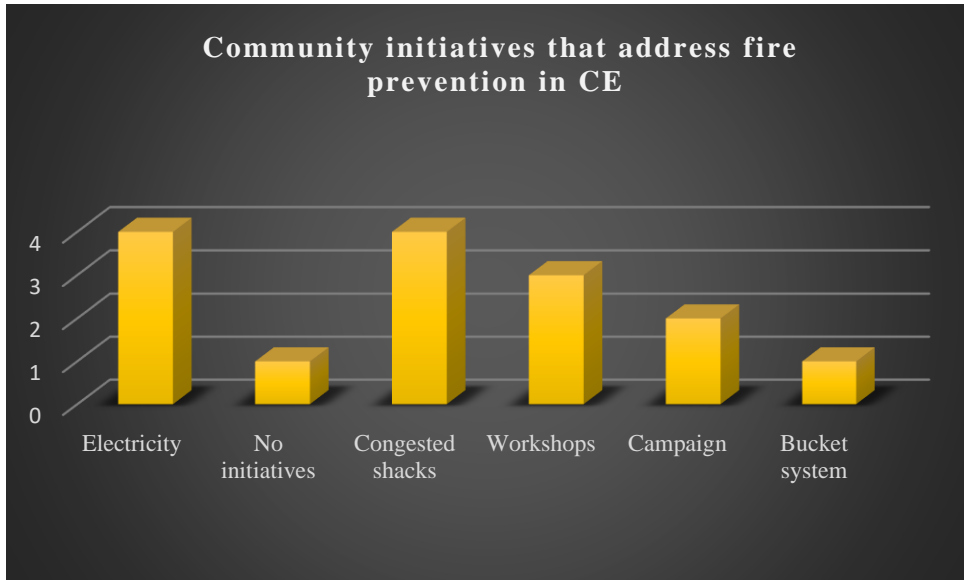
Literature reviewed in Chapter 2 showed that the Bantul local government since 2000 has made tremendous effort in involving the community to participate in municipality development and to give input in local government programmes (Kusumasari and Alam 2012). According to Kusumasari and Alam, (2012:351) Bantul District in Yogyakarta, Indonesia, used the local wisdom based recovery model. Any type of local government in developing countries might use the model. It is a recovery process from the disaster, based on local community wisdom.

Matrix 4.18 shows community initiatives expressed by the AbM SMO, which responds to research objective four.



<b>Matrix 4.18 Research Objective 4: Community level initiatives at Clare Estate in addressing fire prevention: AbM</b>
<p>“There are no initiatives, we were once visited by SOS organization they were willing to work with us as a movement and teach us how to minimize fire but the Municipality denied them. This organization was going to educate people how to prevent themselves from fire. This organization was to teach us to use the equipment of extinguishing fire without causing mud but you just spray gas and fire would vanish. That was the only initiative that we thought of but the Municipality turned us down”.</p> <p><b>AB4</b></p>
<p>“We had a rule that people should not build close to each other. We also set a rule that a person who is responsible for fire should look at the cost of other people so that they will not make that mistake again. Other shacks do have legal electricity in our area therefore, we asked the Municipality to install electricity for those people who do not have it. Illegal connection is the source of fire accidents. However, the Municipality rejected that request. We usually ask Fire department to conduct workshop in our community for fire prevention. In our community we teach people of the usage of lights that uses batteries instead of candles and looking at using other things rather than paraffin stoves.”</p> <p><b>AB3</b></p>
<p>No, we do not have initiatives. There was fire twice, fire brigades came late and there were no fire hydrants. Municipality often comes for workshops on how we can prevent ourselves from fire by not leaving stoves open and illegal electricity. Municipality help us by providing free water”.</p> <p><b>AB2</b></p>
<p>“We had a campaign where we would have community meetings and talks about the danger of the use of explosive materials such as paraffin stoves, people should guard against and look after. Also those who were connecting operation set a light they install the electricity wires badly, we are encouraging obviously, that people should connect electricity safe or dig it underneath so that the wires will not be visible for the sake of safety of children. If they are at the top they should be so high that children will not reach”.</p> <p><b>AB5</b></p>
<p>“We tell community to leave space between shacks when they build because if they are congested in case of fire everything will burn down. We also advise them they must leave space on the road so that Fire fighters, ambulances and police would be able to gain entry when there is fire. <b>AB1</b></p>

While AbM as an organisation does not have formal community initiatives, organisational leaders commented on community members’ contributions to community initiatives as reflected in bar Graph 4-12. Note that Matrices 4.17 and 4.18 only displayed responses from AbM simply because the particular responses generated stem from interview questions posed to AbM.



**Graph 4-13: Community initiatives that address fire prevention in CE**  
 Source: Researcher’s fieldwork

Literature review indicates that in some developing countries communities develop programmes that assist them in dealing with disasters. For example, Pineda (2012:708) states that the Community Based Disaster Risk Management (CBDRM) used in developing countries consists of disaster and vulnerability training programmes. This programme helps the poor communities in bringing the resilience to disasters and building disaster risk planning and self-management. Such a programme does not seem active among the network actors who participated in this study.

Matrix 4.19, which is the last matrix in this section, indicates that respondents have different forms of IK in term of protecting themselves from fire. Kelman *et al.*, (2012:13) affirm that there is no type of knowledge, indigenous or non-indigenous, that can alone be a remedy for any sustainability or development activity. Rather, different forms are required for development purposes, including indigenous knowledge. Matrix 4.19 displays that people in Clare Estate informal settlement have measures in place to protect themselves. According to Mercer, *et al.*, (2009:214) argues that an increasing growing awareness of indigenous knowledge has triggered calls for its use within DRR. The use of IK alongside scientific knowledge is worthy of consideration. However, there is no clear developed framework showing how the two may integrate to reduce community vulnerability to hazards.

The informal settlement community of Clare Estate believes in the use of IK and according to them, this is the primary tool for protecting themselves from fire. One of the community members in a focus group discussion affirmed this statement. “When a fire occurred during the night in one of shack, the mother of the kids was able to escape but the father of the house was left behind trying to save the kids. Fire was big, the father covered himself and kids with blanket he walked straight in the middle of fire. They all survived but scars are still visible, had it not been for the blanket strategy they would have not survived because of the magnitude of fire”, said CEC7. Mercer, *et al.*, (2008:214) note that even though research and development organisations have acknowledged the existence and importance of IK and strategies related to DRR, in reality, there’s little documentation of its application through official channels that exist (Dekens, 2007a). Kelman *et al.*, (2012:15) further point out that the framework for local knowledge on disaster preparedness assists in identifying the linkages and relationships between local knowledge, practices, DRR, and the influences upon them. The Dekens framework cited by Kelman *et al.*, (2009) enables an analysis of IK and its uses within disaster preparedness.

Matrix 4.19 Research Objective 5: Fire prevention through use of indigenous knowledge: Multi sector interviewees	
Indigenous Knowledge Sharing	
Disaster Management Unit Narrative	AbM Narrative
<p><b>The cities values &amp; have interest in the use of IK.</b> Examples acquired from community: Fire breakout, Trench digging, tyre act as lightning conductor when placed on the roof and <i>Abafana</i>.</p> <p>“Those are the knowledges that we take seriously as a city and that help in our plans” <b>DMU2.</b></p> <p>City incorporates local people in their task team because they understand their community and culture better regardless of provision by the city whether its relief or response.</p> <p>We collate IK from the community in public workshops/consultations and then it is added into contingency plans. Those plans are part of risk assessment. <b>DM1.</b></p> <p>IK apply in rural areas. “We consider indigenous information shared by the public in awareness campaigns and when interacting with the public. On our next awareness campaigns we include those IK shared by public” <b>DM3.</b></p>	<p>Blanket strategy <b>AB3</b></p> <p>Community patrols and protection – Ubuntu <b>AB1, 2, 4</b></p> <p>Safety Distance between shacks to ensure safety <b>AB5</b></p> <p>Bucket system <b>AB1,2,3</b></p>

It is important to note that the city values the use of indigenous knowledge by the community, as confirmed by DMU1 that the city incorporates the indigenous knowledge that they acquire from communities during Workshops/Public Awareness and add them into their contingency plan. That is an indication of how seriously the city recognizes the indigenous knowledge. DMECU mentioned several examples of indigenous knowledge for an example, trench digging. This is when the community digs a hole to allow water to flow. Thunder and storms occur during summer season, in order to avoid lightning they build trenches so that water will flow. AbM and the community use more or less similar indigenous knowledge as shown in the matrix. In Chapter 2, the researcher noted that the inclusion of civil society is bringing to bear the value of indigenous or local knowledge in devising DRR programmes and strategies. Kasperson *et al.*, (2001) and Becker *et al.*, (2008) note that vulnerability to disaster is likely to be effectively addressed by a composite approach integrating science, technology, political control and application of indigenous knowledge.

Next, the researcher discusses the cross-case analysis of focus group data and interview data followed by the triangulation of the study.

#### 4.4.5 Cross-case Analysis of Data from Interviews and Focus Group

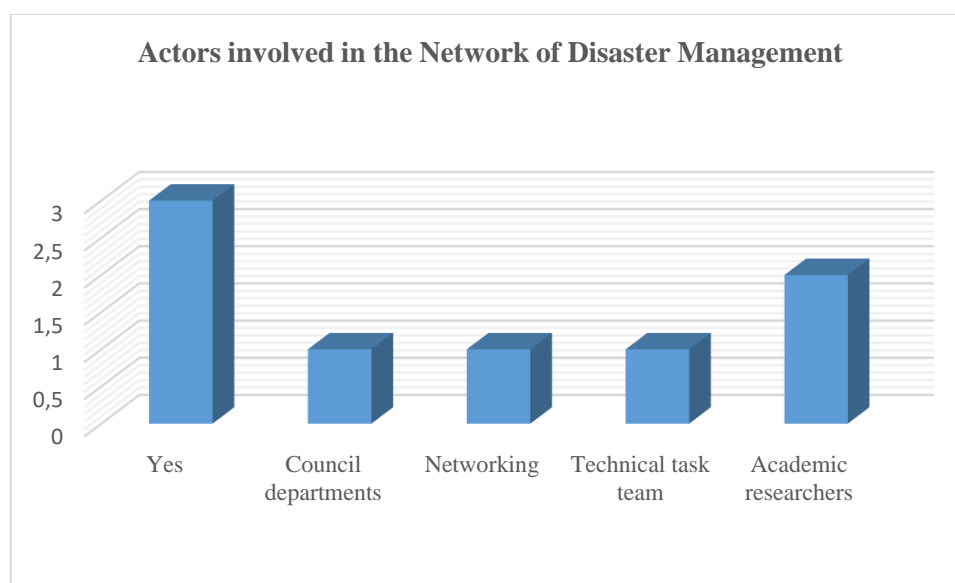
This is the final section of data analysis and presentation of findings, before the triangulation of the study. Matrices 4.20 to 4.22 compare and contrasts perspectives according to the human actants in the network. The strategies that distinguish each matrix emanate from interview questions. Matrices 4.20 displays cross case analysis of interview data from municipal officials regarding DRR planning strategies for preventing fire in Clare Estate.

Matrix 4.20 Cross-case analysis of interview narrative		
Strategies : Municipality DRRP strategies for preventing fire in Clare Estate		
Disaster Management Unit	Fire Management	Fire Fighters
“We have various programs that run within disaster management like public awareness programs that are running through the city. We have teams that go out to vulnerable communities we look at things like reach and frequency”. <b>DMU1</b>	I am looking on the side of training and education. For us to help you have to help yourself to reduce risk. We give people in the informal settlement information but they choose whether to use it or not. We have a couple of programs running where operations branch, the fire fighters on the fire engines go out to informal settlement ordinarily on weekends. <b>FM3, FM2</b>	“Educate residents about fires; water hydrants and informed committees to deal with fire.” <b>FF4,FF5,FF2</b>

Matrices 4.21 show responses from all stakeholder segments across the network on community strategies to prevent extensive fire damage.

Matrix 4.21 Cross-case analysis of focus group narrative and interview narrative				
Strategies : Community Prevention on extensive fire				
Disaster Management Unit	Fire Management	Fire Fighters	AbM Social Movement Organization	Clare Estates Community residents
“Conducting public awareness programs with communities where we train them” <b>DM2,3</b>	“As training department we offer workshops on how to prevent yourself from fire”. <b>FM4</b>	“Inform and train/ educate people about fire safety”. <b>FF1, FF3, FF4, FF5.</b>	“We educate people not to throw burning cigars on the floor” <b>AB2</b>	“We educate each other about challenges of building close to one another” <b>CEC4</b>

Graph 4-14 below depicts the actors that are involved towards the network as mentioned by DMECU during interviews with the researcher.



**Graph 4-14: Actors involved in the Network of Disaster Risk Management**  
Source: Researcher’s fieldwork

Taken together Matrix 4.21 and Graph 4-14 reflect that the municipal officials believe that they are educating the public about DRR to assist the community with fire prevention strategies. In contrast, community members believe that they are protecting themselves without municipal intervention. However, there may be other community members who do believe the municipality is providing assistance just as there may be individuals who were trained by municipal officials but found their way out of the informal settlement due to improved circumstances. In any event, municipal officials do not list community members as part of their DRM/DRR network.

Matrix 4.22 reflects that the city values and takes interest in the use of IK as indicated earlier. This confirms the point expressed by results from a study by Roth and Becker (2011:3) in Chapter 2, which highlights acknowledgement of key challenges of considering opportunities for community participation in fire safety. Examining the application of IK in DRR in a formalized municipal policy domain may locate IK and clarify its current and future role. This will not only be in fire DRR or DRM but also on resolving problems that stem from non-human network actants such as lack of service delivery and poor avenues of communication between government and local communities. These non-human actants contribute to deficiencies in existing DRM plans in several municipalities countrywide (Tshikotshi 2010).

<b>Matrix 4.22 Cross-case analysis of focus group narrative and interview narrative</b>		
<b>Strategies : Use of Indigenous Knowledge</b>		
<b>Disaster Management Unit</b>	<b>Social Movement Organization</b>	<b>Clare Estate Community residents</b>
IK is collected and collated during public workshops and public consultations, and then added into the contingency plan. <b>DMU1, DMU2, DMU3</b>	<p>“If there is fire you will cover yourself with something so that when there is fire you will be able to escape from the fire so when there are flames you will also be able to let go of it easily like a blanket”. <b>ABM3</b></p> <p>“When I was still living in shacks I used to pride myself about my shack. Strategy was to leave an acceptable distance between shacks”. <b>ABM5</b></p> <p>“Bucket system is the strategy that is common amongst community members and it works for us”. <b>AB1,2,3</b></p>	<p>Shouting strategy <b>CEC2, 3, 5</b></p> <p>Bucket system <b>CEC1, 6, 10,11</b></p> <p>Demolish Shacks <b>CEC4, 7, 8</b></p> <p>Spiritual gathering, <b>CEC3, 9</b></p> <p>Prayer (<i>Shembe, Wesley</i>) <b>CEC2, 5</b></p>

The bucket system seems to be a common IK in Clare Estate informal settlement. Focus group and AbM organization used the bucket system strategy. However, access to water is limited. There is limited literature entirely focusing on the indigenous community initiatives for mitigation of fire disasters. One rare study is by Stiger *et al.*, (2005:255). Instead, there is an abundance of studies emphasising concurrent use of indigenous practices and western knowledge [Mercer *et al.*, (2008:157), Cadag and Gaillard (2012:100), Wisner (2003)]. For

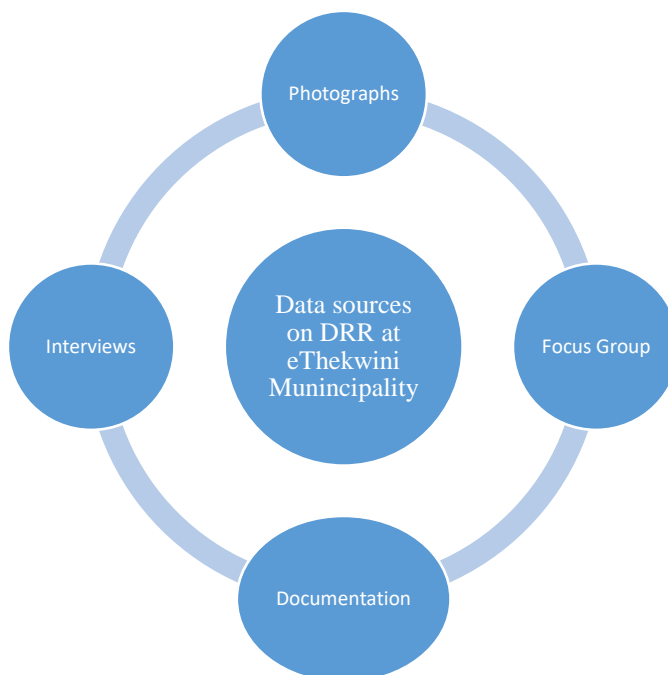
instance, a composite approach, integrating science, technology, political control and application of indigenous knowledge is likely effectively decreases vulnerability (Kasperson *et al.*, 2001; Becker *et al.*, 2008).

The next section triangulates findings from various sources of data before this chapter concludes.

#### 4.5 Triangulation of the study

The previous sections presented how the qualitative research design and case study and narrative strategies helped achieve the research objectives and helped answer the research questions of this study. The chapter highlighted how themes emerged and how data aligned with the advocacy/participatory worldview and ANT framework. The most recent cross-case analysis has led to triangulation of data as Figure 4.6 shows.

According to Flick (2004:63), triangulation refers to observation of the research issue from different data collection methods. Flick (2004:63) further states that triangulation of data involves collecting data from different sources, at different places, and from different people. Therefore, the study used a validation strategy to triangulate data.



**Figure 4.6: Triangulation of Data**

Source: Researcher's fieldwork

This study gathered information by means of interviews from different stakeholders and from a focus group discussion. Triangulation in a qualitative study can occur where more than one

case, investigator, paradigm, theory and method of data gathering and analysis in a single study. Matrices created by the researcher allowed triangulation in data analysis as most data converged with literature from secondary data and findings of the study. Triangulation contributes to confirmability and trustworthiness of the study (Gunawan 2015). Scholars such as Solway (2004:328) suggest that local government should ensure that community members receive suitable first aid training and implement community education and awareness programmes. Data across all stakeholders revealed that education and programme awareness is the measuring tool in fire prevention, except that the municipality believes it is educating the public, whilst community respondents disagree.

Botha *et al.*, (2011:98) note that the likely relief response for most South African municipalities in the occurrence of fire devastation is providing destitute residents with shelter, food parcels and blankets. Participants in a focus group discussion stated that DMECU provides such relief to victims of fire. Figure 4-2 and Figure 4-3 affirm by depicting photographs taken by the researcher on site. The study discovered that the informal settlement community of Clare Estate is not aware of any fire disaster programmes of eThekweni Municipality. Their argument is that they are not involved in the planning and implementation of DRR pertaining to fires. Further to that, community members are of the view that the problem is not about the implementation of DRR programmes, as much as it is about communication from the municipality as a whole. This is contrary to Fox, Bayat and Ferreira (2006:42), who state that policy-makers create policies for society therefore, affected communities need to be consulted at all times. Accordingly, policy makers should understand community aspirations and consult the community about policies that affect them, including at the implementation stage.

The researcher conducted in-depth interviews with different stakeholders. The study revealed that eThekweni Municipality has a problem. Members of the community migrate to other places because of poor livelihood and living conditions at Clare Estate. The biggest challenge is that people who migrate are people who have undergone training on fire fighting. After they have migrated, new people without proper training occupy the shacks. Furthermore, the documentation of the DMECU outlines the objectives of the unit that is, to develop a continuous network of business, government and communities, to facilitate DRR. The unit develops a clear plan for emergency procedures and disaster management, to define the roles and responsibilities of each of the agencies in the event of accident and highlights potential risks and identify appropriate mitigation measures and audit. However, the DMECU of eThekweni Metro Municipality is short-staffed such that the unit has only six staff members who are responsible

for all disasters in eThekweni and surrounding areas. There is also divergence of perspectives between community and the city officials in the network. According to research objective four, the community declares that they are not involved in the implementation of disaster programmes of eThekweni Municipality yet the officials say they involve the community in their DRR programmes.

#### **4.6 Chapter Summary**

This chapter provided a brief background about the case of DMECU and the sub-case of Clare estate informal settlement. It then presented and analysed data collected by the use of in-depth interviews and focus group discussion. The tables and matrices displayed the alignment of the worldview, which underpins the study as well as the theoretical framework that drives the study to generate findings. Matrices and bar graphs were data presentation tools and there was a discussion of literature in relation to matrices and graphs. A combination of content, thematic and matrix analysis led to the emergence of themes. The chapter discusses themes early on although they emerged during and after data analysis. Cross-case analysis displayed the convergence and divergence of data before highlighting triangulation of the data. The next chapter presents the summary of findings, conclusions and recommendations.



## CHAPTER 5

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter provides a brief overview of previous four chapters that were discussed in the study. It presents the findings, conclusions and the recommendations that study proposes. It also addresses gaps, which were identified in the literature review.

#### 5.2 Recapitulation of Research Objectives and Research Questions

Table 5-1 Recapitulation of Research Objectives and Research Questions

Research Objectives	Research Questions
Explore DRR plan of eThekweni Municipality to address fire prevention at Clare Estate informal settlement community.	To what extent does eThekweni Municipality DRR plan address fire prevention at Clare Estate informal settlement community?
Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.	What factors facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality?
Determine involvement of Clare Estate community members in the implementation of the eThekweni's fire disaster programmes.	How is the Clare Estate informal settlement community involved in the implementation of the eThekweni's fire disaster programs?
Examine community level initiatives in Clare Estate informal settlement to address fire prevention.	To what extent do community level initiatives in Clare Estate informal settlement address fire prevention?
Identify types of indigenous knowledge that enable Clare Estate informal settlement community members to protect themselves from fires.	How does local or indigenous knowledge enable Clare Estate informal settlement community members to protect themselves from fires?

This section presents findings that are identified from the study, and conclusions derived by the researcher. The findings and conclusions demonstrate how the objectives of the study as shown in Table 5-1 were achieved. Using ANT, finding 5.2.8 reveals that the city has interest in the usage of IK; they identify local people and put them in their task team. Public workshops identify IK for use in the city's contingency plans. Finding and conclusion 5.2.2 displays the marginalisation of society in Clare Estate. Marginalisation is a component of the advocacy/participatory worldview underlying the study. The researcher draws the findings and conclusion of the study from research objectives and research questions as presented in Chapter Each finding and conclusion presented below addressed the research objectives and answers the research questions in an orderly manner as presented in Table 5-1.

### **5.2.1 Finding:**

The study reveals that the city of eThekweni DMECU has various programmes in addressing DRR but the most appropriate in addressing fire prevention is public awareness programmes that are running through the city. Teams from the DMECU go to vulnerable communities to identify reach and frequency. Reach, means accessibility of resources to deal with disasters is the community able to reach resources that will prevent fire and identifying how frequent these disasters occur in the community. The public awareness programmes educate community on fire prevention measures.

### **Conclusion:**

The above finding leads to the conclusion that public awareness programmes are a tool for disaster reduction plan in addressing fire prevention at eThekweni DMECU. This responds to research objective one and answers research question one of the study.

### **5.2.2 Finding:**

Lack of recognition and respect has been identified by the study on the side of the social movement organisation, AbM. The city does not engage them in the DM initiatives. The leader of the organisation revealed that they are not recognised as human beings but as thugs, and even the leader of AbM finds it disrespectful and disappointing for not being engaged in implementation of DRR or any idea of DRR programmes rendered by eThekweni Municipality. Sometimes they end up engaging in protest marches and road blockages just to voice their needs.

### **Conclusion:**

It is concluded that the city does not acknowledge AbM organization as a body that represent the community of Clare Estate informal settlements. This is the body representing the community therefore, it is important to involve them in the DRR implementation plan as they have knowledge of community needs.

### **5.2.3 Finding:**

The study revealed that DMECU is understaffed and that hinders the implementation and enforcement of the fire prevention plan for the city. The current organogram shows a number of posts whilst realistically there are only six staff members who are fully functional in DMECU. There are a number of disasters around eThekweni but only few people attend to these disasters. The DMECU officials expressed that the challenge is budget and that there is no available budget to appoint new staff. The Fire Department officials also expressed the same concern.

### **Conclusion:**

This finding shows that there is lack of funding when it comes to staffing of both Disaster Management Unit and the Fire Department officials. The city should invest more on staffing because without enough and capable staff there will always be challenges not only on the fire prevention plan but also in the functioning of the department as a whole. As one of the officials explained, "It is difficult to acquire staff members for interviews during xenophobia attacks because all staff is out to attend to urgent xenophobia matters"**DM2**. This also responds to research objective three, which determines factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.

### **5.2.4 Finding:**

Conflicting with the research problem of the study, after 1994 the South African government was legally bound to provide adequate houses in ensuring safety of citizens from hazardous and extreme environments. The finding of this research study was that the city encounters challenges of migration of community members. The reason for their migration is due to a lack of housing control regulations e.g. the RDP house they have secured becomes available for occupation in other areas. The city's efforts of conducting training session in fire prevention are futile as community members migrate and new occupants of shacks come in. Chapter 1 and 4 facilitated the discovery of this finding.

### **Conclusion:**

Based on the finding this study concludes that people living in informal settlements are living under hazardous situations and extremely challenging conditions. They are always looking for

better living environments. Had it not been so, that they would continue to live at informal settlements because they are not paying any water and electricity bills whereas in the RDP houses they must pay revenue bills. This responds to research objective three, which determines factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality and research question three, which seeks to determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.

#### **5.2.5 Finding:**

The finding of the study revealed that congestion of the place and the absence of access roads at the informal settlement of Clare Estate make it difficult for the fire fighters to extinguish fires effectively. The challenge of fire extinguishers is to get to the incident scene because of congestion and no road for access makes it difficult to manoeuvre to the place. Further than that, the study disclosed that the community are not aware of Fire Department's fire emergency number. Most of the time they will call the police emergency number instead of the fire emergency number then it becomes difficult for fire fighters to arrive at the scene promptly.

#### **Conclusion:**

This demonstrates that lack of access roads and the congestion of shacks at Clare Estate informal settlement make it difficult for fire fighters to extinguish fire freely and promptly. Lack of knowledge of the fire emergency number is a disadvantage to the community such that it has an impact on escalation of fire.

#### **5.2.6 Finding:**

The study established that the informal settlement community of Clare Estate is not involved in the implementation of eThekweni's fire disaster programmes. The community members are not aware of any disaster programmes. According to respondents, the municipality does not consult them when it comes to initiating and implementing programmes. They do not have information regarding disaster programmes. However, the city trains residences but the residents subsequently move away.

The study further found that the majority of the community members are of the view that the problem is not the implementation of the disaster programmes but lack of communication from the municipality regarding informal settlement initiatives/policies. Most members of the community are not aware of any disaster programmes rendered by the municipality for Clare Estate informal settlement. This practice is contrary to scholarly views that have shown that policies formulated without public consultations lead to policy problems and rejection of the policy at the implementation stage by the community.

**Conclusion:**

Based on the finding, the municipality does not invite nor involve the community to contribute to the implementation of disaster programmes. As per community member “eThekweni Municipality fails to involve the community, we only get involved once there is an incident, they spend five minutes then they are gone”. They do not involve us at all in disaster programmes”. However, there is a contradiction because it emerged from interviews with disaster management unit officials that, community members are involved in risk assessment programmes. They give their input in risk assessment report collated by the service provider of the municipality. Findings and conclusions drawn thus far assist the study in achieving research objective three, where research objective three intends to determine the involvement of Clare Estates community members in the implementation of the eThekweni’s fire disaster programmes.

**5.2.7 Finding:**

Community initiatives in Clare Estate are non-existent particularly in fire prevention. As much as they do not have initiatives, leaders of the community educate tavern owners about the importance of closing their taverns early. After consumption of alcohol, they will go to their shacks and try to cook because of hunger; they fall asleep while food is cooking causing the shack to go up in flames. Since the request of closing early materialised in taverns, the level of fire incidents has since decreased.

**Conclusion:**

Hence, alcohol consumption has a huge impact on fires that occur at Clare Estate informal settlement. This responds to research objective two and research question two of the study.

### **5.2.8 Finding:**

The study disclosed that the city has interest in the usage of IK. One of the officials from DMECU reported that the city incorporates local people in their task team because they understand their community and culture better regardless of provision by the city whether its relief or response. This finding is a typical example of how much the city recognises the community's indigenous knowledge. "IK is collated in public workshops/consultations then added into contingency plans. Those plans are part of risk assessment" **DMU1,2,3**, said the official. One of DMECU officials made this statement during in-depth interview with the researcher. It transpired that most individuals apply IK in rural areas around eThekweni Municipality. The statement made by one DMECU official during the interview confirmed this. "IK applies in rural areas, we consider indigenous information shared by the public in awareness campaigns and when interacting with the public. On our next awareness campaigns we include those IK shared by public" **DMU2**. This is an interesting statement and finding that the community's indigenous knowledge is included in the city's awareness campaign.

### **Conclusion:**

eThekweni Municipality takes the usage of indigenous knowledge seriously and considers the community views. It is therefore, concluded that there is a contradiction between the informal settlement community of Clare Estate and DMECU officials. During the focus group discussion, the community raised issues of not being involved in any of the city's programmes yet the above finding reveals that the city collects IK and incorporates it into the city's contingency plan.

### **5.2.9 Finding:**

Use of **IK** systems at Clare Estate informal settlement enables the community to protect themselves from fire. The different sorts of IK strategies are shouting bucket technique, demolishing the burning shack, spiritual gathering, patrols and safety distance between shacks to ensure safety. Whoever saw the fire first would shout who "*Umlilo*" meaning there is fire, then the whole community would come out in numbers to distinguish the fire. They will come out with buckets from their shacks, fill them with water and extinguish the fire. If the fire escalates then they demolish or destroy that particular shack. One of the strategies shared by one community member is inviting different churches to render prayer services for God's intervention in fire incidents. One of the community members states that, "Indeed fires stopped

after we conducted prayer in our community” CEC2, 3,4,10. The finding of the study also revealed that the community organisation, which is AbM, also supports the indigenous knowledge, as they also apply the same indigenous knowledge as community members.

### **Conclusion:**

Based upon the evidence produced by the study, IK for fire prevention works for the community. Another conclusion is that the use of indigenous knowledge reduces fire incidents in Clare Estate. The above finding and this conclusion respond to research objective five and answer research question five of the study.

### **5.3 General Overarching Conclusions**

The researcher noted conflict between findings and conclusions of the study in particular DRR measures of the city. While the study has identified preventative measures applied by the disaster management unit, particularly in fire incidents at Clare Estate, the community dismisses those measures. There is a contradiction between public and institution domain. The community claims that the municipality does not train them. According to them, the municipality is not helpful in any way. This is contained in the statement made during focus group discussion by a participating community member. “There is nothing helpful which is done by eThekweni municipality. They do not teach us how to stop fire. We do not get help from anywhere. They only know us when they need our votes. They will encourage us to vote, and once we have voted, we will not see them again,” CEC4, 6.

Findings of the study revealed that the city has interest and acknowledges the use of community IK. They even incorporate the community IK into their contingency plans. The use of IK enables the community to prevent extensive fire damage. It is therefore, concluded that the community’s IK works and it plays a vital role in fire prevention. While the city recognises the use of IK, they have challenges of community members who migrate to other areas for better living conditions after training as to how to prevent fires. As mentioned in the previous paragraph, there is a contradiction between the two domains. This is a typical example mentioned in research methodology. The community claimed during data collection that the municipality does not train them in terms of fire prevention yet the municipality has challenges of community members who migrate to other areas after the municipality trained them. In addition, the IK is included in contingency plans of the municipality as the officials said.

The study's findings also revealed the fire-fighting unit is short-staffed, which is a hindering factor towards DRR implementation plan. eThekweni Municipality has different districts with different disaster management needs that need the attention of disaster management unit. Therefore, the shortage of staff makes it difficult for the unit to function fully and accordingly.

Even though the study revealed that, the community does not have initiatives in addressing fire prevention, educating tavern owners toward the strategy of closing early shows that the community does try to create initiatives to prevent fires. After this initiative, fires in the Clare Estate community decreased.

During the study, there was no documentation of strategy pertaining to fires for informal settlements at eThekweni Municipality but it came out from the data that emerged that the municipality does have a strategy although it did not appear to be in writing. Therefore, this study will assist in documenting the strategy of DRR of eThekweni municipality, particularly for fires at informal settlements. The contribution of this study will also add to the body of knowledge of DRR for fire disasters at informal settlements.

#### **5.4 Recommendations**

Based on findings and conclusions presented in Section 5.2, this section presents a set of recommendations. Namely:

- The municipality should establish communication channels with communities of Clare Estate. Prior to policies being implemented the community should be engaged and have knowledge about disaster risk reduction programmes of the city.
- The municipality should have sufficient funding facilities to have enough staff to work at the disaster management unit. Having the appropriate number of staff members will increase the effectiveness of the unit to respond promptly to disasters around eThekweni.
- The city should consider setting a rule of allowing citizens to build shacks only with materials that are fire resistant.
- There should be a set of rules to build shacks within certain parameters to allow space between shacks.
- All shacks should have legal electricity in order to eliminate illegal electricity connections, which cause fires.



- Access roads should be built in Clare Estate so that there will be access to the fire scenes to allow fire vehicles to manoeuvre to the place.
- The community should establish initiatives that will assist them with fire prevention.
- Training should be provide on how to use fire hydrants that are installed on the roads, so that when fire occurs they will be able to extinguish fire while waiting for the fire department.
- eThekweni Municipality is encouraged to involve social movement organisations such as AbM when developing Disaster Management Plans.

### **5.5 Significance of the contribution to the body of DRR knowledge**

In Chapter 1, the researcher discussed the significance of the intentions of the study, to discover DRR planning in eThekweni Municipality pertaining to fire hazards in Clare Estate informal settlements. From the findings of the study, the researcher discovered that according to the municipality they do have planning mechanisms in place for dealing with fire hazards, although not in writing. However, this contradicts with the findings gathered from the community. According to the community, the municipality does not have measures or a plan for dealing with fire hazards at informal settlements and the community members believe themselves excluded from the DRR planning process. Identification of this contradiction between parties together with the identification of fire and lack of service delivery as non-human actors in the network, contributes to the body of DRR knowledge. This is so in terms of understanding the human and non-human actors in DRR planning for reducing fire risks. Identification of these factors, as well as factors that facilitate or hinder fire risk reduction shed light on how the community and the municipality can improve their working relationship. Understanding these factors can illuminate how to resolve conflicts by attending to DRR planning pertaining to fires at informal settlements as well as a need to focus on the socio-economic factors that lead to the rise of informal settlements. The study findings also add to the body of IK pertaining to the application of IK in urban areas when it comes to the IK strategies that seem to work effectively for the informal settlement community of Clare Estate. This shows that, unlike the belief of municipal officials that IK only applies in rural areas, Clare Estate community members still turn to IK while living in informal settlements located in urban areas.

## **5.6 Questions for Future Research**

- What strategies can allow eThekweni Municipality and informal settlement communities to work together towards DRR pertaining to fires?
- How can the municipality minimise the congestion of shacks in informal settlements?
- How can the municipality and the public ensure that citizens use materials that minimise susceptibility to hazards, particularly fire?
- How can the municipality maintain communication between institutional and public domain?
- What action can prevent migration of informal settlement communities that have gained skills in fire DRR?
- How can the municipality ensure the non-existence of illegal electricity connections at informal settlements?

## **5.7 Chapter Summary**

This chapter concludes the study. The segments presented in this section were findings and conclusions drawn from the study followed by general overarching conclusions. Recommendations emanates from findings and conclusions drawn from the study. The researcher further presented questions for future research that can be conducted to bridge the gap and contribute to the body of DRR knowledge.

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## APPENDIX A



### School of Management, IT and Governance

### College of Law and Management Studies

### School of Management, Information Technology and Governance

### Master's in Public Administration

**Researcher:** Bongwiwe Dlodla (072 3148 175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

Dear Respondent

I, Bongwiwe Dlodla am a Public Administration master's student in the School of Management, Information Technology and Governance, Discipline of Public Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled:

***'An Assessment of effectiveness of the eThekweni Municipality Disaster Risk reduction strategy pertaining fires at informal settlement: A case of Clare Estates informal settlement South Africa'***

The aim of this study is to:

- Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community.
- Examine community level initiatives in Clare Estates to address fire prevention.
- Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.
- Determine involvement of Clare Estates community members in the implementation of the eThekweni's fire disaster programmes.

- Identify types of indigenous knowledge enables Clare Estate community members to protect themselves from fires.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this research project. However, since you work with eThekweni Municipality, your organisation may benefit from the findings of this study. Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study. The interview will be recorded to allow you to listen to your responses after the interview and to assist the interviewer to capture your actual responses. Kindly indicate on the consent form whether you agree or disagree to have your interview recorded or not by ticking your choice.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about forty minutes to complete the interview questionnaire with me. I hope you will take the time to participate in the interview.

Sincerely

Investigator's signature: \_\_\_\_\_

Date: \_\_\_\_\_

*This page is to be retained by participant*

**APPENDIX B**



**School of Management, Information Technology and Governance**

**Master's in Public Administration**

**Researcher:** Bongiwe Dlodla (072 3148 175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

**CONSENT**

I, \_\_\_\_\_ (full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I agree to allow my interview be recorded.

I do not agree to allow my interview be recorded.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

## APPENDIX C

### IN-DEPTH INTERVIEW (OFFICIALS – Disaster Management and Emergency Control Unit)

- 1.1 As Disaster Management unit, how do you manage risk? (Risk Management)
- 1.2 What measures do you have/what are you doing in terms of Disaster Risk Reduction?
- 1.3 How do you distinguish between Disaster Risk Reduction and Disaster Management?
- 1.4 Do you have Disaster Risk Reduction strategies?
- 1.5 If yes, what are those strategies?
- 1.6 How long have you had those strategies?
- 1.7 What lessons have you learned in applying those strategies?
- 1.8 How did you monitor the progress in applying those strategies in previous Disasters?
- 1.9 Are there any challenges encountered when trying to execute Disaster Risk Reduction strategies and Disaster Management?
- 1.10 What instruments are used globally in DRR?
- 1.11 How effective are those Disaster risk reduction strategies?
- 1.12 What type of Natural Disasters have you encountered?
- 1.13 What are the main natural Disasters that affect eThekweni, and which part of i-Theku? (Urban or Rural)
- 1.14 How do you deal with those Disasters?
- 1.15 What type of fires do you apply Disaster Management strategies?
- 1.16 What type of fires do you apply Disaster Risk Reduction strategies?
- 1.17 What is the budget allocation for Disaster Management Unit?
- 1.18 How many staff members do you have in the unit?
- 1.19 Do you have different divisions/Department in Disaster Management unit?
- 1.20 If yes what each unit does?
- 1.21 Does Disaster Management have strategies for informal settlements and what are those strategies?
- 1.22 Does community participate in developing Disaster Management plan?
- 1.23 What is the indigenous knowledge for the Municipality when Disasters occurs?
- 1.24 How is the interrelation between intergovernmental relations regarding Disasters?
- 1.25 Do you have intradepartmental relations concerning Fire Disasters?
- 1.26 If yes what are those departments?
- 1.27 Are there any actors involved towards the network of Disaster Management?

1.28 If yes who are those Actors?

1.29 Does Disaster Management unit have any working relationship with other organisations like NGO's to manage risk? (water for instance)



## **APPENDIX D**

### **Fire Management**

- 1.1 Does Municipality DRRP have strategies in place for preventing fire in Clare Estate?
- 1.2 What are the strategies for preventing fire in Clare Estate?
- 1.3 How effective are those Disaster risk reduction strategies?
- 1.4 Do you have implementation Plan for Fire Prevention?
- 1.5 What factors facilitate the implementation and enforcement of fire prevention plan?
- 1.6 What factors hinder the implementation and enforcement of fire prevention plan?
- 1.7 Does the plan include prevention of fire in Clare Estate?

## **APPENDIX E**

### **IN-DEPT INTERVIEW (Fire Fighters)**

- 1.1 What needs to be done to prevent extensive fire damages?
- 1.2 Can unnecessary extensive fire damage be prevented?
- 1.3 Do you have emergency tools to prevent excessive fire, if yes what are those emergency tools?
- 1.5 How sufficient is your equipment to prevent excessive damage?
- 1.6 How can extensive fire damage be prevented at Clare Estate?
- 1.7 How do you access informal houses that are ravaged by fire?
- 1.8 Are there any challenges in accessing those houses?
- 1.9 Which recommendation can be made to Municipal officials regarding fire prevention?
- 1.10 Do you get assistance of preventing extensive fire from community?
- 1.11 Do you have challenges in preventing extensive fire in Clare Estate?
- 1.11 Are there any successes of implementing prevention plan on previous incidents?
- 1.12 What is the normal extent of damages each time accidental fire occurs at Clare Estate?
- 1.13 How do you measure the extent of damages?

## **APPENDIX F**

### **Abahlali baseMjondolo**

1. Do you have community initiatives to address fire prevention in Clare Estate? If yes what types of initiatives?
2. To what extent is the Municipality involved in assisting with community-generated initiatives?
3. What causes fire in Clare Estate?
4. How does community extinguish fire?
5. What is the extent of damages each time accidental fire occurs in Clare Estate?
6. Do you know about fire disaster programmes of eThekweni Municipality? If so tell about what you know.
7. What are your individual contributions in making and implementing the disaster programmes and risk reduction?
8. Do you have local or common knowledge that enables you to protect yourself from fire? If yes what is that common knowledge?
9. Have you spoken to anyone in the Municipality about your local/common knowledge or if you could be given a chance to speak to them what would you tell them?
10. How can you combine your indigenous knowledge and efforts of the Municipality?



**School of Management, IT and Governance**

**College of Law and Management Studies**

**School of Management, Information Technology and Governance**

**Master's in Public Administration**

**Researcher:** Bongiwe Dlodla (072 3148 175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

Dear Respondent

I, Bongiwe Dlodla am a Public Administration master's student in the School of Management, Information Technology and Governance, Discipline of Public Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled:

***'Effectiveness of the eThekweni Municipality Disaster Risk reduction strategy pertaining fires at informal settlement: A case of Clare Estates informal settlement South Africa '***

The aim of this study is to:

- Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estates community.
- Examine community level initiatives in Clare Estates to address fire prevention.
- Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.
- Determine involvement of Clare Estates community members in the implementation of the eThekweni's fire disaster programmes.

- Identify types of indigenous knowledge that enables Clare Estate community members to protect themselves from fires.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this research project. However, since you work with eThekweni Municipality or an NGO or live in the Clare Estates community, your organisation or community may benefit from the findings of this study. Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study. If you so permit, the focus group discussion will be recorded to allow you to listen to your responses after the focus group discussion and to assist the interviewer to capture your actual responses. Kindly indicate on the consent form whether you agree or disagree to have your focus group discussion recorded by ticking your choice.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about ninety minutes to complete the focus group discussion with me. I hope you will take the time to participate in the focus group discussion.

Sincerely

Investigator's signature: \_\_\_\_\_

Date: \_\_\_\_\_

*This page is to be retained by participant*

## APPENDIX G2



### School of Management, IT and Governance

#### College of Law and Management Studies

#### School of Management, Information Technology and Governance

##### Master's in Public Administration

**Researcher:** Bongive Dlodla (072 3148 175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

Sawubona

Igama lami ngingu Bongive Dlodla, ngingu mfundi wase Nyuvesi yakwa Zulu Natal. Ngenza izifundo zemfundo ephakeme kwi Public Administration esikoleni se Management, Information Technology and Governance, kwisigceme se Public Governance. Uyamenywa ukubamba iqhaza kulolucwaningo, isihloko salolucwaningo luthi:

**'Ucwaningo lo hlelo luka Masipala wase eThekwini lokwehlisa izingozi eziphatelene nemililo emijondolo: lolucwaningo luzokwenziwa emijondolo yase Clare Estates e Mzansi Afrika'**

Injongo yalolucwaningo:

- Ukohlola iqhaza elibanjwa uMasipala wase Thekwini kumnyango wakwa Disaster risk management ukuvikeleni kwemililo emphakathini wase Clare Estates.
- Ukuhlola iqhaza elibanjwa umphakathi wase Clare Estates ekuvikeleni kwemililo.
- Ukuthola izinto eziphumelelisa noma ezivimbela ukushicilelwa kohlelo yokuvikela imililo okwenziwa wu Masipala weTheku.

- Ukubandanyeka komphakathi wase Clare Estates ohlelweni lezinhlelo zezingozi ku Masipala weTheku.
- Ukuqoka izinhlobo eziwumkhuba ezahlukene zolwazi umphakathi wase Clare Estates ozivikela ngazo emlilweni.

Ukubamba kwakho iqhaza kulolucwaningo akuphoqiwe . Unelungelo kokuhoxisa ukubamba iqhaza kulolucwaningo noma ngabe inini. Ayikho imali ezotholwa ngokubamba iqhaza kulolucwaningo. Umnyango we skole se Management , Information Technology and Governance, kwisigceme se Public Governance sase Nyuvesi yakwa Zulu Natal, sizoqikelela ukugcina imininingwane yakho ibe yimfihlo. Imibono yakho mayelana nalolucwaningo izogodlwa. Imibuzo okuzoxoxiswana ngayo izoqoshwa ukuze owenza ucwaningo ezozithola zinjengoba zinjalo. Uyacelwa ukuba ukuveze kwi consent form ukuthi uyavuma noma awuhambisani nokuqoshwa kwengxoxo. Lokho uzokuveza ngoku faka uphawu.

Uma unemibuzo noma ufuna ukucaciselwa okuthize ngokubamba iqhaza kulolucwaningo ungangishayela ucingo noma ushayele u supervisor wami kulezizinombolo ezingaphezulu.

Kungathatha imizuzu engamashumi amane nemizuzu emihlanu ukuxoxisana ngalolucwaningo kanye nami. Ngiyathemba uzozinika isikhathi nesineke ubamba inxaxheba kulolucwaningo.

Ozithobayo

Ukusayina kowenza ucwaningo: \_\_\_\_\_

Usuku: \_\_\_\_\_

Lelikhasi elokugcinwa obamba iqhaza kulolucwaningo

**APPENDIX G3**



**School of Management, Information Technology and Governance**

**Master's in Public Administration**

**Researcher:** Bongiwe Dlodla (072 314 8175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

**CONSENT**

I, \_\_\_\_\_ hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I agree to allow my participation in the focus group to be recorded.

I do not agree to have my participation in the focus group recorded.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date



**APPENDIX G4**



**School of Management, Information Technology and Governance**

**Master's in Public Administration**

**Researcher:** Bongiwe Dlodla (072 314 8175)

**Supervisor:** Dr F.A.Ruffin (076 811 9595)

**Research Office:** Ms P.Ximba (031 260 3587)

**CONSENT**

Thina, \_\_\_\_\_ siyavuma futhi siyakuqondisisa okuqokethwe ilelikhasi nesimo socwaningo, siyavuma ukubandanyeka nalolucwaningo . Siyakuqondisisa ukuthi kusezandleni zethu ukuthi siyeke ukuzibandakanya nalolucwaningo noma ngabe isiphi isikhathi uma sithanda.

Siyavuma ukuthi ukuxoxisana kuqoshwe.

Asivumelani nokuqoshwa kwengxoxo.

\_\_\_\_\_  
Ukusayina komele ithimba lokuxoxisana

\_\_\_\_\_  
Usuku

## **APPENDIX H**

### **FOCUS GROUP**

- 1.1 Do you have community initiatives to address fire prevention in CE?
- 1.2 What type of initiatives that address fire prevention in CE?
- 1.3 What causes fires in Clare Estate?
- 1.4 How do you extinguish fire as a community?
- 1.5 What is the normal extent of damages each time accidental fire occurs at CE?
- 1.7 Do you know about fire disaster programme of eThekweni Municipality?
- 1.8 Are you involved in the implementation of the eThekweni fire disaster programmes?
- 1.9 What are your contributions in implementation of disaster programme?
- 1.10 What role do you play as the community members in the implementation of disaster programmes?
- 1.11 Do you have local or common knowledge that enables you to protect yourself from fire?
- 1.12 What is that common knowledge that enables you to protect yourselves from fire?
- 1.13 Do you engage Municipality in your indigenous knowledge or should you be given an opportunity what would you suggest to them?
- 1.14 Does that common knowledge work?

**APPENDIX I**

**Table A4-1: Alignment of interview questions to research objectives (Disaster Management Unit)**

Objectives	Interview Questions
<p>Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community</p>	<ul style="list-style-type: none"> <li>• As Disaster Management unit how do you manage risk? (Risk Management)</li> <li>• What measures do you have/what are you doing in terms of Disaster Risk Reduction?</li> <li>• How do you distinguish between Disaster Risk Reduction and Disaster Management?</li> <li>• Do you have Disaster Risk Reduction strategies?</li> <li>• What lessons have you learned in applying those strategies?</li> <li>• How did you monitor the progress in applying those strategies in previous Disasters?</li> <li>• Are there any challenges encountered when trying to execute Disaster Risk Reduction strategies and Disaster Management?</li> <li>• What instruments are used globally in DRR?</li> <li>• How effective are those Disaster risk reduction strategies?</li> <li>• What type of Natural Disasters have you encountered?</li> <li>• What are the main natural Disasters that affect eThekweni, and which part of i-Theku? (Urban or Rural)</li> <li>• How do you deal with those Disasters?</li> </ul>
<p>Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community</p>	<ul style="list-style-type: none"> <li>• What type of fires do you apply Disaster Management strategies?</li> <li>• What type of fires do you apply Disaster Risk</li> </ul>

	Reduction strategies?
Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality?	<ul style="list-style-type: none"> <li>• What is the budget allocation for Disaster Management Unit?</li> <li>• How many staff members do you have in the unit?</li> <li>• Do you have different divisions/Department in Disaster Management unit?</li> <li>• If yes what each unit does?</li> <li>• How is the interrelation between intergovernmental relations regarding Disasters?</li> <li>• Do you have intradepartmental relations concerning Fire Disasters?</li> <li>• If yes what are those departments?</li> </ul>
Determine involvement of Clare Estates community members in the implementation of the eThekweni's fire disaster programmes	<ul style="list-style-type: none"> <li>• Does Disaster Management have strategies for informal settlements and what are those strategies?</li> <li>• Does community participate in developing Disaster Management plan?</li> <li>• Are there any actors involved towards the network of Disaster Management?</li> <li>• If yes who are those Actors?</li> <li>• Does Disaster Management unit have any working relationship with other organisations like NGO's to manage risk. (water for instance)</li> </ul>
Identify types of indigenous knowledge that enable Clare Estate community members to protect themselves from fires?	What is the indigenous knowledge for the Municipality when Disasters occurs?

**Table A4-2: Alignment of interview questions to research objectives (Management: Fire Department)**

Objectives	Interview Questions
Explore disaster risk reduction plan of eThekwini Municipality to address fire prevention at Clare Estate community	<p>Does Municipality DDRP have strategies in place for preventing fire in Clare Estate?</p> <p>What are the strategies for preventing fire in Clare Estate?</p> <p>How effective are those Disaster risk reduction strategies?</p> <p>Do you have an implementation plan for fire prevention?</p>
Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekwini Municipality?	<p>What factors facilitate the implementation and enforcement of fire prevention plan?</p> <p>What factors hinder the implementation and enforcement of fire prevention plan?</p>
Explore disaster risk reduction plan of eThekwini Municipality to address fire prevention at Clare Estate community.	<p>Does the plan include prevention of fire in Clare Estate?</p>

**Table A4-3: Alignment of interview questions to research objectives (Fire Fighters)**

Objectives	Interview Questions
<p>Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community.</p>	<p>What needs to be done to prevent extensive fire damages?            Can unnecessary extensive fire damage be prevented?            Do you have emergency tools to prevent excessive fire?            How sufficient is your equipment to prevent excessive damage?            How can extensive fire damage be prevented at Clare Estate?            What recommendations can be made to municipal officials regarding fire prevention?</p> <p>Are there any successes of implementing prevention plan on previous incidents?</p> <p>What is the normal extent of damages each time accidental fire occurs at Clare Estate?</p>
<p>Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality?</p>	<p>How do you access informal houses that are ravaged by fire?            Are there any challenges in accessing those houses?</p> <p>Do you have challenges in preventing extensive fire in Clare Estate?</p>
<p>Examine community level initiatives in Clare Estate to address fire prevention.</p>	<p>Do you get assistance of preventing extensive fire from community?</p>

**Table A4-4: Alignment of interview questions to research objectives (Focus Group Community)**

<b>Objectives</b>	<b>Interview Questions</b>
Examine community level initiatives in Clare Estate to address fire prevention.	<p>Do you have community initiatives to address fire prevention in CE?</p> <p>To what extent is the municipality involved in assisting with community generated initiatives?</p>
Identify types of indigenous knowledge that enable Clare Estate community members to protect themselves from fire.	How do you extinguish fire as a community?
Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community.	<p>How do you measure the extent of damages?</p> <p>Do you know about fire disaster programme of eThekweni Municipality?</p>
Determine involvement of Clare Estate community members in the implementation of the eThekweni's fire disaster programmes.	<p>Are you involved in the implementation of the eThekweni fire disaster programme?</p> <p>What role do you play as community members in the implementation of disaster programmes?</p>
Identify types of indigenous knowledge that enable Clare Estate community members to protect themselves from fire.	<p>Do you have local or common knowledge that enables to protect yourself from fire?</p> <p>What is the common knowledge that enables you to protect yourselves from fire?</p> <p>Do you apply that local knowledge to protect yourselves from fire?</p> <p>Does that common knowledge work?</p>

**APPENDIX J**

<b>Table A4-5 Alignment of first research objective and Data Collection Tools</b>		
<b>Research Objectives</b>	<b>Focus Group Question</b>	<b>Interview Question</b>
<p><b>Objective 1:</b></p> <p>Explore disaster risk reduction plan of eThekweni Municipality to address fire prevention at Clare Estate community.</p>	<p><b>Question 7</b></p> <p>Do you know about fire disaster programs of eThekweni Municipality?</p>	<p><b>Question 1 (FM)</b></p> <p>Does the Municipality DRRP have strategies in place for preventing fire in Clare Estate, if yes what are those strategies and how effective are they?</p> <p><b>Question 1 (DMU)</b></p> <p>What measures do you have/what are you doing in terms of Disaster risk reduction?</p> <p><b>Question 7 (AB)</b></p> <p>Do you know about fire disaster programs of eThekweni Municipality?</p>



**Table A4-6 Alignment of second research objective and Data Collection Tools**

<b>Research Objectives</b>	<b>Focus Group Question</b>	<b>Interview Question</b>
<b>Objective 2:</b>  Examine community level initiatives in Clare Estate to address fire prevention.	<b>Question 1</b>  Do you have community initiative to address fire prevention in CE?  <b>Question 2</b>  What type of initiatives that address fire prevention in CE?  <b>Question 3</b>  To what extent is the Municipality involved in assisting with community-generated initiatives?	<b>Question 1 (AB)</b>  Do you have community initiative to address fire prevention in CE?

<b>Table A4-7 Alignment of third research objective and Data Collection Tools</b>		
<b>Research Objectives</b>	<b>Focus Group Question</b>	<b>Interview Question</b>
<p><b>Objective 3:</b></p> <p>Determine factors that facilitate or hinder the implementation and enforcement of the fire prevention plan by eThekweni Municipality.</p>	<p><b>Question 10</b></p> <p>What role do you play as the community members in the implementation of disaster programs?</p>	<p><b>Question 24 (DMU)</b></p> <p>How is the interrelation between intergovernmental relations regarding Disasters?</p> <p><b>Question 9 (DMU)</b></p> <p>Are there any challenges encountered when trying to execute Disaster Risk Reduction strategies and Disaster Management?</p> <p><b>Question 4 (FM)</b></p> <p>What factors facilitate the implementation and enforcement fire prevention plan?</p> <p><b>Question 7 (FM)</b></p> <p>What factors that hinder the implementation and enforcement fire prevention plan?</p>

<b>Table A4-8 Alignment of fourth Research Objective and Data Collection Tools</b>		
<b>Research Objectives</b>	<b>Focus Group Question</b>	<b>Interview Question</b>
<p><b>Objective 4 :</b></p> <p>Determine involvement of Clare Estates community members in the implementation of the eThekweni's fire disaster programs.</p>	<p><b>Question 8</b></p> <p>Are you involved in the implementation of the eThekweni fire disaster programs? If yes, what are your contributions in implementation of disaster programs and what role do you play as the community?</p>	<p><b>Question 8 (AB)</b></p> <p>As <i>Umbutho</i> are you involved in the implementation of the eThekweni fire disaster programs? If yes, what are your contributions in implementation of disaster programs and what role do you play as the community?</p>

<b>Table A4.9 Alignment of fifth Research Objective and Data Collection Tools</b>		
<b>Research Objectives</b>	<b>Focus Group Question</b>	<b>Interview Question</b>
<p><b>Objective 5 :</b></p> <p>Identify types of indigenous knowledge that enable Clare Estate community members to protect themselves from fires.</p>	<p><b>Question 11</b></p> <p>Do you have local or common knowledge that enables to protect yourself from fire? If yes what is that common knowledge and how do you apply that local knowledge?</p>	<p><b>Question 11 (AB)</b></p> <p>Do you have local or common knowledge that enables to protect yourself from fire? If yes what is that common knowledge and how do you apply that local knowledge?</p>

**Appendix K**

**Ethical Clearance Letter**



10 November 2014

Ms Bongwiwe Dlodla 201509271  
School of Management, IT and Governance  
Westville Campus

Dear Ms Dlodla

Protocol reference number: HSS/1461/014M  
Project title: Effectiveness of the eThekweni Municipality Disaster Risk Reduction Strategy pertaining to fires at informal settlements: The case of Clare Estates informal settlements

**Full Approval – Expedited Application**

In response to your application received 31 October 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

**PLEASE NOTE:** Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....  
Dr Shenuka Singh (Chair)  
Humanities & Social Sciences Research Ethics Committee

/pm

Cc Supervisor: Dr FA Ruffin  
Cc Academic Leader Research: Professor Brian McArthur  
Cc School Administrator: Ms Angela Pearce

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Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

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Website: [www.ukzn.ac.za](http://www.ukzn.ac.za)

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## **Appendix M Language Clearance Certificate**

25 Maple Crescent  
Circle Park  
KLOOF  
3610

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0823757722  
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E-mail:  
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[sathsgovender4@gmail.com](mailto:sathsgovender4@gmail.com)

## **Dr Saths Govender**

---

14 NOVEMBER 2016

TO WHOM IT MAY CONCERN

### **LANGUAGE CLEARANCE CERTIFICATE**

This serves to inform that I have read the final version of the dissertation titled:

**EFFECTIVENESS OF THE eTHEKWINI MUNICIPALITY DISASTER RISK  
REDUCTION STRATEGY PERTAINING TO FIRES AT INFORMAL  
SETTLEMENTS: A CASE OF CLARE ESTATE INFORMAL SETTLEMENTS,  
SOUTH AFRICA by B. Dlodla, student no. 201509271.**

To the best of my knowledge, all the proposed amendments have been effected and the work is free of spelling and grammatical errors. I am of the view that the quality of language used meets generally accepted academic standards.

Yours faithfully



---

**DR S. GOVENDER**  
B Paed. (Arts), B.A. (Hons), B Ed.  
Cambridge Certificate for English Medium Teachers  
MPA, D Admin.