Older persons' mobile phone usage in Tlokwe Local Municipality: Implications for disaster risk communication

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To my wife, my best friend and my greatest supporter. Thank you for believing in me. If not for that, this would not have been possible.

My family who supported me.

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Abstract

The pace at which the technology of mobile phones is developing, provides one with new possibilities especially when contemplating the effect that mobile phones could have on older persons' care and well-being.

The mobile phone has over the last couple of years largely replaced other devices with its capability to access the internet. This development has paved the way in which disaster risk communication can be modernised and improved, specifically to benefit at-risk older persons.

Many older persons are vulnerable because of various physical and mental difficulties which accompany ageing and as such they are frequently strongly impacted by the occurrence of disasters. It is therefore contemplated that mobile phones can be used as a communication medium to educate, inform and assist vulnerable older persons regarding disasters risks.

However, not much is known about older persons' mobile phone usage patterns in South Africa. It is therefore difficult to develop a strategy by which their vulnerability can be addressed by means of a mobile phone. It is the purpose of this study to examine older persons' mobile phone usage patterns and to converse whether these devices can be used to enhance the resilience of older persons to the effect of disaster risks.

This was achieved by firstly quantitatively examining the mobile phone usage patterns of older persons within the Tlokwe Local Municipality (TLM) to determine which functions they use and to what extent. Following this, qualitative semi-structured interviews were conducted with disaster and communication managers at the Tlokwe Disaster Management Centre (TDMC) in order to ascertain their experiences and viewpoint regarding the use of mobile phones to alleviate older persons' disaster risk.

This research established that older persons do make use of their mobile phones and also understand how to use key functions of the phone to communicate. However, the TDMC do not necessarily regard older persons as a key stakeholder during disaster communication processes and has therefore not contemplated using mobile phones to communicate with older persons about disaster risks.

Key words: older persons; mobile phone usage; disaster risk communication; two-way communication; communication management.

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CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

1.1 Contextualisation of the study

Advances in medical technology have increased the life expectancy of mankind. Although the notion of a longer life expectancy appeals to the majority of the world's population, Finnbak *et al.* (2011:2) explain that the phenomenon of ageing has reached its boiling point, and can be described as a global concern, with the number of older persons estimated to double by 2050 (WHO, 2008:3). With an elevated global life expectancy, the chance of older persons developing chronic diseases is also increased, according to McHale (2012:1). It is therefore predicted that the ever-growing world population – and the increasing number of older persons – will not only place a massive amount of pressure on economic and human resources, but will necessitate a total rethink in terms of caring and providing for the aged (Finnbak *et al*., 2011:2). The care needs of older persons are even more prominent during times of disaster (WHO, 2008:1). Disasters could be natural (floods, volcanic eruptions, tornadoes, drought, etcetera) or man-made (technological, sociological, etcetera).

The Disaster Management Act of South Africa (57/2002) clearly defines the understanding behind the term "disaster" and how it is interpreted from a management point of view. The Act stipulates that a disaster is referred to as "a progressive or sudden, widespread or localised, natural or human-caused occurrence", which "causes or threatens to cause death, injury, disease, damage to property or infrastructure and disrupts a community" (Disaster Management Act, 57/2002). The definition is also shared by the UNISDR (2009), describing a disaster as "a serious disruption of the functioning of a community or a society involving widespread human, material, or environmental losses and impacts which exceeds the ability of the affected community to cope using only its own resources."

By examining the abovementioned definitions, one can deduce that the occurrence of a disaster, in isolation, poses no or little threat to people. The real threat of an occurring disaster lies in its intrinsic potential to cause damage or harm, whether it be to people, buildings, infrastructure or systems. It is for this reason that the Disaster Management Act (57/2002) states that a disastrous occurrence can only be viewed as such when it is of such a great magnitude that the effects of the occurrence exceeds the ability of those affected by it to cope, through utilising only their own resources (Disaster Management Act, 57/2002; UNISDR, 2009).

The understanding is therefore that the severity of a disaster can only be ascertained when the coping ability of the affected person/s or communities to deal and recover from said disaster is considered. A more prepared and resourceful community, by means of their higher coping capacity, is more adept to recover from the effects of a disaster.

Van Riet (2009:1) argues that the way in which disasters are viewed have dramatically changed over the past couple of decades. According to Van Riet (2009:1), academics' views and understanding of disasters have significantly changed in that disasters are no longer seen as a sudden occurrence that inflicts damage to humanity, but must be understood as a consequence of human action, and can therefore be prepared for and ultimately mitigated.

This change in perspective, as suggested by Van Riet (2009), brings forth endless possibilities in terms of how we, as humans, prepare for the occurrence and effects of disasters. The understanding that disasters are a cause of human actions and that it can, to a certain extent, be expected, has enabled the development of the field of study known as DRR - Disaster Risk Reduction.

The focus of this research on older persons and disaster risk communication is important since between 1994 and 2003 , over 225 million people world-wide were affected by natural disasters whilst 25 400 and 8 700 people were killed due to natural disasters in 2015 and 2016 respectively (Riley, 2017). Given the estimate that older persons will represent 22% of the global population in a few years' time (WHO, 2008:3), the need to make provision for them in disaster management becomes crucial. This estimated escalation in the total number of older persons world-wide gives this research significant importance, as the situation will require more efficient ways of communicating possible disaster risks to this vulnerable[1] group. The Older persons Act of South Africa (13/2006) – although not making provision for the occurrence of disasters - state that older persons should, as far as possible, be able to access all forms of services and facilities. Furthermore, the act reiterates that older persons should have access to information and that they should receive priority in the provision of services (Older persons Act, 13/2006). Older persons are regarded as a vulnerable group by the Disaster Management Act of South Africa (Disaster Management Act, 2002).

[1]The USAID (2011) defines vulnerability as: "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard."

Vulnerability refers to people or groups' lack of capacity, while resilience refers to their capacity to cope, resist and recover from a disaster or adverse condition (Dwyer *et al*., 2004:12; Hewitt, 1997:27). Capacity then refers to people's potential to deal with risks rather than their vulnerability in view of the severity of a damaging event (Hewitt, 1997:141). According to Ngo (2012:447), older persons are particularly vulnerable to the impact of disasters because of their unique physical, social and economic needs. Older persons' vulnerability could be aggravated by their lack of mobility, medical conditions and limited resources (Duggan *et al*., 2010:2). It is important to note that not all older persons are equally vulnerable to the effects of disasters, because they differ on their level of development towards their coping capacity (UNDP, 2004:19). The level of their vulnerability is therefore determined by their lack of capacity to cope with disaster risks, and overall lack of resilience. A summary can therefore be made that vulnerability is balanced by one's coping capacities and overall resilience (World Bank, 2008).

Coping capacity refers to the ability of people to face, manage and withstand adverse conditions or disasters by utilising available skills and resources (UNISDR, 2009:8). Developing the coping capacity of people can help with strengthening their resilience towards dealing with disaster risks (UNISDR, 2004:16). Coping capacity can be measured by certain capital domains, such as social, economic, physical, human and natural capital (Mayunga, 2007). Capital domains focus on different aspects of society that may contribute to people's coping capacity and therefore their resilience towards disasters. Knowledge can contribute to the development of all the capitals (Smith *et al*., 2001). Knowledgeable and educated people, even if they are challenged by declining physical capacity, can contribute towards other capital domains. According to the UNDP (2004:19), one of the most valuable assets of human development is people's access to knowledge. Knowledge can be transferred through different technology-assisted mediums such as mobile phones (Murray & Peyrefitte, 2007:3).

Within developing country contexts and against the backdrop of a lack of formal care models for older persons, there is a general expectation that Information and Communication Technologies (ICT) applications in general, and more specifically mobile phone technology, will play an increasingly important role in the support and care management of older persons, especially in terms of their family and intergenerational relationships.

This is particularly relevant in view of the deep penetration of mobile technology in even the most resource constrained environments. According to the International Telecommunications Union (ITU) report (2015), the number of mobile cellular subscriptions in the world has grown from 2,205

billion to 7,085 billion between 2005 and 2015. Although the penetration rate is different for each region, figures provided by the ITU (2015) show that people living in low-income regions are today the majority owners of mobile phones. Even more revealing is the fact that out of the 7,085 billion mobile cellular subscriptions, 5,568 billion originate from developing countries whereas only 1,517 billion are from developed countries (ITU, 2015). ITU (2017) also provides statistical data to reveal that more than 87 million mobile phone subscriptions were active in South Africa in 2015. This amounts to about 1,6 mobile phone subscriptions per person living in South Africa (ITU, 2017).

Communication[2] has the potential to educate and raise awareness to elevate people's knowledge in order to enhance their resilience. Le Roux (2014:2) points out that strategic communication management is one of the main areas which needs attention when it comes to disaster management. When communication is applied according to the two-way symmetrical and mixed motive models, it has the potential to greatly improve the outcome of disasters as all stakeholders will be involved in the communication process. Although the two-way symmetrical communication model is beneficial for its focus on reciprocity in the communication process, various researchers rather suggested the use of the mixed motives model[3] because it is a positive model with an accurate reflection of the actual practices of communication practitioners (Plowman, 2005:131-138; Grunig *et al*., 2002:358; Plowman, 1998:237-261; Holtzhausen & Verwey, 1996:39). The mixed motive model promotes dialogue between people with the ultimate purpose of building a strong, lasting and mutually beneficial relationship, for instance older persons and disaster risk management teams. Grunig and White (1992:39) further argue that by using this model, all parties can be persuaded to each other's point of view and alter their respective behaviours. Strong relationships between parties can make goals more attainable (Grunig, 2006a:9), specifically in the context of disaster risk management.

When planning a communication strategy, objectives must be set at one of three levels (Gregory, 2010:118). The first level is raising the target audience's awareness about a specific cause. After raising awareness, the second level entails forming positive attitudes and opinions regarding the cause, which elevates into the third level that pertains to altering the target audience's behaviour (Gregory, 2010:25). Regarding disaster risk communication, these levels of objectives can be of

[2] Various entities tend to communicate to communities regarding disaster risks. These include non-governmental organisations, government entities and other organisations. For the purposes of this study the term "risk communicating agency" (RCA) will be used as enveloping term for all these different entities.

[3] When the two-way models of communication are mentioned in this study, the author refers to the two-way symmetrical, the two-way asymmetrical model within a symmetrical worldview as well as the mixed motive model.

great benefit. Although no model for risk communication currently exists in South-Africa, it can be argued that two-way communication (and two-way communication models) can effectively be used in situations where stakeholders are faced by a disaster risk (Anderson, 2009).

Communication not only plays a key role in disaster management but also in disaster response, since infrastructure often fails when disaster strikes. With the rapid onset of mobile phone technology, mobile phones can be an ideal medium to disseminate information as well as using it to facilitate two-way communication between at risk communities and RCAs. James and Versteeg (2007:1) state that mobile phones are an important aspect for development in developing countries since these devices can facilitate two-way communication and information sharing, which are of high importance to the disaster risk field.

1.2 Problem statement

In this research, the focus will be mainly on connection technologies to obtain a better understanding of older persons' mobile phone usage patterns and how it can play a role in connecting them to disaster risk managers and support networks.

Little is known about older persons' use of mobile technology (cellular phones) in developing countries and/or resource-constrained settings and specifically how it can aid in disaster risk communication. Therefore, the aim of this research is to map older persons' usage patterns of mobile technology (cellular phones) and to also explore the facilitating role of this technology in the field of disaster risk communication.

In South Africa, no study has been conducted to determine the mobile phone usage patterns of older persons. However, the fact that older persons are more vulnerable to disasters because of their advanced age and accompanying constraints are well documented (Wisner *et al*., 2012). This magnifies the notion that their safety should be a primary goal in the event of a disaster.

When a disaster situation occurs, the dissemination of information becomes crucial to ensure the safety of affected individuals or communities. The development of mobile phone technology has opened endless possibilities for the extension of communication implementation strategies and provides disaster managers with a means to reach a vast audience, often in remote areas. While mobile phones present the possibility to disseminate large quantities of information in mere seconds, the information needs to reach its intended audience. As the extent of older persons' mobile phone mastery – as well as the influence of their diverse backgrounds - and what they use their mobile phones for, if at all, are yet unknown, one cannot know whether this channel can be

successfully implemented to provide the often at risk older population with the necessary information regarding disaster situations. For the purpose of this study the assumption will be: *Older persons' mobile phone usage in the Tlokwe Local Municipality (TLM) will inform its disaster risk communication strategies.*

1.3 General research question

How can older persons' mobile phone usage in the TLM influence its disaster risk communication strategies?

1.4 Specific research questions

1.4.1 What is the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm according to literature?

1.4.2 What is the role of mobile phone usage, specifically older persons' mobile phone usage, within the framework of disaster risk and two-way symmetrical communication according to literature?

1.4.3 What is the mobile phone usage of older persons in the TLM currently?

1.4.4 What are the perceptions of the Tlokwe Disaster Management Centre (TDMC) about the role of mobile phone usage of older persons in disaster risk communication?

1.5 General research aim

To determine how older persons' mobile phone usage in the TLM can influence its disaster risk communication strategies.

1.6 Specific research aims

1.6.1 To describe the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm by conducting a literature study.

1.6.2 To describe the role mobile phone usage, especially by older persons, can play within the framework of disaster risk and two-way symmetrical communication, by conducting a literature study.

1.6.3 To establish the current mobile phone usage of older persons in the TLM by conducting surveys.

1.6.4 To describe the perceptions of the TDMC about the role of mobile phone usage of older persons in disaster risk communication by conducting semi-structured interviews.

1.7 Central theoretical argument

This study originates from the two-way communication paradigm (Grunig *et al*., 1992; 2002), supported by strategic communication management[4] as found in the Excellence Theory (Grunig *et al*., 1992; 2002) as well as stakeholder relationship management theory (Ledingham & Bruning, 2000; Ledingham & Bruning, 1998; Ferguson, 1984; Freeman, 1984).

The central argument of the two-way symmetrical model is that its primary function is to engage and thus ensure a strong, mutually beneficial relationship with strategic stakeholders based on mutual understanding and trust (Grunig & White, 1992:39). As the Excellence Theory is known for its support of a reciprocal communication process, this theory can provide much substance within the field of disaster risk communication. It must be noted that the Excellence Theory is merely one theory on which to base this study, and several other theories, depending on the focus of a study, can be employed equally as successful. However, this study is set about from a strategic communication management perspective.

Disaster risk reduction (Wisner *et al*., 2012; Kiunsi *et al*., 1999; Hewitt, 1997) as a key concept in this study will underline the possibility of enhancing resilience (Cutter *et al*., 2006; Cutter, 1996) through the use of mobile technology and the eventual enhancement of coping capacity of at risk older persons (Mayunga, 2007; Dwyer *et al*., 2004; UNDP, 2004; Cannon, 2000).

1.8 Research approach

This study is exploratory in nature because the mobile phone usage of older persons and its applications in disaster risk management have never before been investigated. This study is therefore undertaken from a qualitative research approach (Leedy & Ormrod, 2001:102). In order to achieve the research objectives set out for the purposes of this study, mixed-method research were used. Creswell *et al.* (2003:4) states that the researcher makes use of both qualitative and quantitative research methods when employing a mixed-methods research approach. According

[4]The terms *public relations, communication management and organisational communication* are used interchangeably, (Grunig, 1992:4). For the purposes of this study the term *communication management* will be used.

to Babbie and Mouton (2010:341) as well as Du Plooy (2009:139) triangulation occurs when two or more research methods in a study is used to obtain data.

Quantitative surveys were conducted by field researchers at various old age centres within the TLM in order to answer research question 3 (*What is the mobile phone usage of older persons in the TLM currently?)*. Semi-structured interviews conducted with management of the TDMC was done in order to answer research question 4 (*What are the perceptions of the TDMC about the role of mobile phone usage of older persons in disaster risk communication?).*

1.9 Research methods

1.9.1 Research approach and design

A mixed method research approach will be followed as variables can be measured and numerical data can be obtained (Creswell, 2007:4) to capture and map the user patterns of mobile devices by people older than 60 years.

Ivankova *et al*. (2007:254) state that by using a mixed methods research approach, a researcher can construct and gain knowledge on real-world issues while placing more emphasis on the research questions rather than the specific method used to collect data. Mixed-method research employs both quantitative and qualitative research methods and combines them within one study (Ivankova *et al*., 2007:260). When used in combination, quantitative and qualitative methods complement each other and allow the researcher to conduct a more complete analysis of the research problem (Ivankova *et al*., 2007:261). Ivankova *et al*. (2007:261) further state that a mixed methods research approach can be implemented to address various research problems. The mixed-methods research approach can be utilised, among others, to gain an in-depth understanding of trends and patterns within a certain context, to generate and test certain theories, to study diverse perspectives of different entities, to develop new measurement instruments, or to understand the relationship between different encountered variables.

This study employs an exploratory mixed method research design. The main aim of this design is to compare the qualitative research data with the quantitative results to eventually produce a validated conclusion. In an exploratory mixed method research design, both the quantitative and qualitative data is gathered and analysed separately. Thereafter, the two types of data are integrated and compared for interpretation (Ivankova *et al*., 2007:264).

1.9.2 Literature overview

A thorough literature study regarding two-way symmetrical communication, the Excellence Theory, as well as relationship management theory, with specific emphasis on using the two-way models of communication and stakeholder relationship-building to enhance community resilience, has been conducted.

No similar research has been conducted within South Africa, but research on communication in high risk disaster areas have been conducted in the past by Ballantyne *et al*. (2000), focusing specifically on hazard preparedness. Anderson (2009) completed a postgraduate study linking the communicative interaction between government and residents at times of environmental risk. Anderson (2009) argues for implementing a two-way communication model in disaster risk communication. Anderson's (2009) study serves as backbone for this study, showing the importance of two-way communication strategies in disaster risk communication and ensuring citizen participation. This study, however, is conducted within the South-African context.

The following databases were used: Ferdinand Postma-library catalogue, SACat, EBSCOhost: Academic Search Premier, Business Source Premier, Communication & Mass Media Complete, EconLit; MCB Emerald; ScienceDirect; SAePublications; and internet search engines. It has been determined that enough information exists to complete this study.

1.9.3 Data gathering

1.9.3.1 Quantitative surveys

Quantitative surveys are used in order for the researcher to make certain assumptions about a specific population group by means of gathering enough data so as to ascertain certain trends from the representative sample (Du Plooy, 2009). Quantitative surveys were used to gather data from older persons in the TLM to determine their mobile phone usage patterns. This enabled the researcher to establish certain trends and draw conclusions and correlations on the mobile phone usage of older persons within the TLM. The surveys were administered by field workers who captured data electronically by using mobile devices. This method was advantageous as older persons often struggle to complete surveys because of physical shortcomings. Capturing the data electronically also ensured that the data was accurate and easily accessible.

1.9.3.2 Qualitative semi-structured interviews

Semi-structured interviews enable the researcher to delve deeper in a certain subject and gain a more in-depth understanding of how interviewees see the world from their perspective (Babbie & Mouton, 2010). Semi-structured interviews were conducted with members of the TDMC. This type of research method enabled the researcher to obtain an in-depth understanding of the TDMC's understanding of the role of mobile phone usage of older persons in disaster risk communication. The interviews were recorded and transcribed verbatim to aid the researcher in the analysis. The questions for the semi-structured interviews were designed after insight was given by the literature.

1.9.4 Population and sampling

The population group in the quantitative study were people older than 60 years living in the TLM (Potchefstroom, Ikageng, Promosa) in the North-West Province of South Africa. The age of 60 years was chosen because many older persons are retired by that age and it narrowed the sample size. A purposive voluntary sampling method was chosen as three service centres for the aged within the TLM were accessed to conduct the research because of their pre-determined criteria as service centres (Nieuwenhuis, 2007), from whence participants (approximately 130) voluntarily participated. All respondents who fitted the inclusion criteria and who were willing to participate, were included in the sample.

The participants in the qualitative semi-structured interviews were also selected by means of purposive sampling (Nieuwenhuis, 2007:79). Their pre-selected criteria however differed as in this case they had been disaster and communication managers of the TDMC.

1.9.5 Data analysis

The data was analysed by means of:

- descriptive statistics to determine and describe the average trends and user patterns by calculating and interpreting the mode, median and mean scores;
- a student's t-test where group comparisons for independent samples were done to establish if two sets of data significantly differed from one another. For example, to see if there is a difference in the user patterns of people living in Potchefstroom and those living in Ikageng;

- regression where the variables were related, to determine how the dependent variable changes if the independent variable is varied. For example, whether the user patterns differ in groups of people with different levels of education; and
- a thematic analysis of the qualitative data.

1.9.6 Reliability and validity

Reliability refers to whether the same results will be obtained when the research is conducted repeatedly (Wilson & Maclean, 2011:71; Babbie & Mouton, 2010). Crönbach's alpha was calculated to determine the internal consistency reliability of the survey (McCutcheon *et al*., 2011:42).

According to McCutcheon *et al*. (2011), validity refers to whether the "measured variable is actually measuring the underlying concept or construct that it was designed to measure". Validity therefore determines whether the survey measures what it is supposed to measure. By doing a factor analysis to test the logical relationship among variables, the construct validity of the data was ensured (McCutcheon *et al*., 2011:42). The content validity of the survey was ensured by means of experts in the field of communication management, as well as the Statistical Consultancy Services of the North-West University reviewing the contents of the survey.

1.9.7 Ethical considerations

This study forms part of a larger research study, referred to as the IGNITE mobile technology study (NWU-00053-10-S1) at the North-West University, which aims to determine the mobile phone usage of older persons in the TLM to improve their care and develop intergenerational relationships. Ethical approval for this larger research project was granted by the Ethics Committee of the Faculty of Health Sciences, North-West University.

Older persons are considered to be a vulnerable group and their protection and comfort received special attention during the data gathering process. This was done by means of enough breaks during the interviews, as well as enough chairs and couches to sit on while beverages and snacks were provided.

All the respondents signed an informed consent letter agreeing to participate in the study. The letter (see Addendum A):

- described the purpose of the research and what would be expected of them if they chose to participate;

- emphasised the voluntary nature of their participation and that they could withdraw at any stage;
- promised to keep their information as confidential as possible by using respondents' numbers so that no identifying information could be shared or made known;
- gave an overview of the possible risks, as well as the precautions taken to reduce such risks, for example a debriefing discussion if they felt the need to talk to someone after their participation;
- explained that they would receive no direct benefits or compensation but that their participation could result in better care for them in the future; and
- informed them that the data would be stored at the university in a locked office and electronically on a password-protected computer for five years.

1.10 Chapter layout

Chapter 1: Introduction and problem statement

In this chapter, the origin of the study is discussed and contextualised. This chapter provides a brief outline of the key points of what is understood under disaster risk management and how vulnerability towards disasters are an ever-increasing focus point. The importance of this study, with regard to older persons' mobile phone usage is also highlighted.

The chapter gives the reader insight into the main objective of this study, as well as how the research questions will be answered.

Chapter 2: Disaster risk communication

This chapter focuses on the two-way communication paradigm, communication management according to the Excellent Theory and relationship management. The chapter will be concluded by a discussion of the nature of disaster risk communication management.

Chapter 3: Older persons: disaster risk and mobile phones

The purpose of this chapter is to discuss the way in which mobile phones as a communication medium can alleviate the vulnerability of older persons when faced with disaster risks. The focus is on mobile phones and its usage and applicability in disaster risk management.

Chapter 4: Research methodology

In this chapter the research approach and methods used for the study is discussed.

Chapter 5: Discussion of quantitative results

In this chapter, the quantitative data is analysed and discussed by means of various interpretive quantitative measures after which the results will be discussed.

Chapter 6: Discussion of qualitative results

The gathered qualitative data is analysed by means of a thematic analysis and discussed accordingly.

Chapter 7: Conclusion

In this chapter the study is concluded by answering the research questions and suggestions, based on the research findings, are provided.

CHAPTER 2: DISASTER RISK COMMUNICATION

2.1 Introduction

In the preceding chapter, the main argument and outline of this study were discussed. The purpose was to highlight the importance of disaster risk communication management to enhance older persons' resilience to disaster risks as well as the possible role that mobile phones can play within this communication process.

In this chapter, the two-way symmetrical communication paradigm is examined, as well as the focus this paradigm places on building sound relationships by means of continuous two-way communication with key stakeholders. The role a strategic communication strategist plays in this process is also discussed. The chapter ends with a discussion on how the principles applicable to the two-way symmetrical communication paradigm can inform disaster risk communication.

This chapter aims to answer the first research question as stated in Chapter 1, namely:

What is the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm according to literature?

2.2 Communication management according to the two-way symmetrical communication paradigm

Two-way symmetrical communication as a theoretical approach has its roots in research by J. E. Grunig in which he identified two patterns of public relations practice, namely synchronic (one-way) and diachronic (two-way) communication (Grunig, J.E., 2006a:156). The focus of the two-way symmetrical communication paradigm is on the statement that mutually beneficial, long-term relationships can be built through transparent and ethical communication (Grunig, L. *et al*., 2002:11; Grunig, J. & White, 1992:42-43).

The IABC Foundation commissioned a research project in 1984 to determine "how, why, and to what extent communication affects the achievement of organisational objectives" (Grunig, L.A., *et al*., 2002:ix) of which the research results were published in 1992 and in 2002. The two-way symmetrical paradigm was conceptualised after analysing the findings of the Excellence Study (Le Roux, 2013:36). The Excellence Theory followed from the Excellence Study and was derived from the two-way symmetrical paradigm.

The Excellence Theory states if communication is managed according to the two-way symmetrical communication paradigm, it can contribute to organisational performance. According to this theory, two-way symmetrical communication enables an organisation to build mutually beneficial relationships with stakeholders, to adapt to environmental changes and developments, and to align organisational goals with those of stakeholders. The communication function must furthermore be viewed as managerial (Falkheimer, 2016:1; Capriotti, 2013:7; Men & Hung, 2012:1; Grunig, L. *et al*., 2002:1, 10; Grunig, J. 2001:16; 1992:10, 24, 26; Grunig, J. & White, 1992:38, 54, 61). The Excellence Theory covers aspects such as the effective planning of communication programs, characteristics of excellent communication departments, the organisational conditions that enables excellent communication, and how an excellent communication department contributes to an organisation's bottom-line (Men & Hung, 2012: 1; Grunig, J., 1992:xiv).

2.2.1 The influence of the two-way symmetrical communication paradigm on communication management

According to Grunig, L. *et al*. (2002:11), the two-way symmetrical communication paradigm focuses on establishing mutually beneficial organisation-stakeholder relationships, meaning both parties' interests are met (Falconi, 2012:5; Steyn & De Beer, 2012:3; Grunig, L. *et al*., 2002:11). The relationship between an organisation and its stakeholders is effectively established by means of communicating in an ethical and transparent manner (Grunig, J. & White, 1992:42-43).

The abovementioned relationship is achieved by continuous dialogue between the organisation and its stakeholders where both parties share equal power to affect a change in the others' behaviour by means of two-way symmetrical communication (Grunig, L. *et al*., 2002:10, 308-309; Grunig, J. & White, 1992:39). This way of communicating also gives way to practising communication management in an ethical manner (Steyn & De Beer, 2012:10; Grunig, 2006a; Grunig, J. & White, 1992:57). By communicating in this (ethical) manner, a communication practitioner can manage the behaviour of the organisation, as well as the way in which its stakeholders view the organisation. The most important aspect to note is that central to the two-way symmetrical communication paradigm, is the aim to build a strong, mutually beneficial relationship with stakeholders by means of creating dialogue in an ethical manner and to deliver a transparent and open message to stakeholders (Wiggill *et al*., 2009:6; Grunig, J., & Grunig, L., 1992:308).

According to Ferguson (1984), the value of communication management lies in building sound relationships with strategic stakeholders and should therefore be the key focus of the communication function. With the latter in mind, Grunig L. *et al*. (2002:550) state that communication management adds strategic value to an organisation when its main purpose is to build relationships with its stakeholders. To achieve this mutually beneficial relationship, the communication function should therefore also be earmarked as a strategic management function, giving rise to *strategic* communication management (Men & Hung, 2012:2; Steyn & De Beer, 2012:2; Wiggill, 2011:6).

Moore (2010:2) describes the basis of strategic communication management as a "logical response by organisations to unfamiliar circumstances". This, according to Moore (2010:2), will happen when an organisation realises that it cannot depend on spontaneity to convey its messages to large and differing audiences, but rather needs to prepare, control and manage their communication function. Moore (2010:2) and Vieira and Grantham (2015:2) concludes that communication management should be an organised function planned for and executed by a qualified communication practitioner.

As mentioned above, communication management should be regarded as a strategic function within an organisation (Men & Hung, 2012:2; Grunig, J., 2006b:2; Lindeborg, 1994:1; Grunig, J., & White, 1992:91) and the communication practitioner should form part of what Grunig, J. and White (1992:92) call the dominant coalition. This means that communication practitioners should be in a managerial position where they can make strategic decisions within the organisation. The role that the communication manager therefore plays in establishing sound relationships cannot be underestimated (Steyn & De Beer, 2012:6). According to Grunig, J. and Grunig, L (2008:1), research points out that the involvement of a communication practitioner in a strategic managerial role is a critical characteristic of an excellent communication management function. This leads to a discussion on communication practitioner roles.

2.2.1.1 Communication practitioner roles

Referring to the above, Dozier (1983) identified two main roles in categorising communication practitioners' activities, namely communication technicians and communication managers. The communication technician is charged with technical aspects of communication, such as writing press releases and designing pamphlets and brochures, while the communication manager is responsible for making strategic decisions and conceptualising and managing communication programmes (Vieira & Grantham, 2015:2; Steyn & Puth, 2000:16; Dozier, 1984:16-17).

Communication managers are also responsible for making decisions on communication policies and make use of formal and informal research to plan and facilitate communication programmes (Vieira & Grantham, 2015:2; Wiggill, 2011b:3; Steyn & Puth, 2000:16).

Steyn and Puth (2000:16-20) further differentiated between the roles of the communication manager and strategist by stating that while a communication practitioner in a managerial role should make use of research to plan and evaluate their work, a strategist focuses on monitoring relevant environmental development, anticipates its consequences for the organisation and plays a pivotal role at top management level to prepare the organisation for such developments. It is this use of research, which assists management in gathering, interpreting and using strategic information (environmental scanning) being the primary differentiator between the managerial role and the role of a communication strategist (Nothhaft, 2010:2; Steyn and Puth, 2000:16). Steyn and Puth (2000:16-17) and Wiggill (2011b:3) state that environmental scanning is essential in managing the current turbulent environment that organisations find themselves in. Steyn and Puth (2000:16) elaborate on this by stating that communication strategists conduct environmental scanning in order to obtain information "about what is going on in the external environment." This implies that the strategist also identifies those stakeholders who might be affected the most by the organisation's decisions and behaviour, as well as those who can affect the organisation in turn with their decisions and behaviour. The communication manager then develops communication strategies and plans, with the assistance of the strategist, to address the developments and engage in two-way communication with the stakeholders involved (Steyn & De Beer, 2012:3).

The communication strategist will not be able to function without the application or use of two-way communication. The latter is essential to determine stakeholders' views and needs regarding certain issues that might influence them or the organisation. It is therefore necessary to provide an overview of the communication models in this discussion.

2.2.1.2 Communication models

From the nineteenth century, various models of communication by practitioners have been used. These models are described as the press agentry model, the public information model, the two-way asymmetrical communication model and the two-way symmetrical communication model (Grunig, J., & Grunig, L., 1992:285). The four models of how organisations communicate with their stakeholders can be placed on a continuum to provide an understanding of the differences between them (Grunig, J., & Grunig, L., 1992:312).

Two factors, namely purpose and direction, determines the model of communication being utilised. The purpose of the communication generally refers to the organisation's reason for communicating, whereas the direction indicates the flow of communication between the organisation and the intended recipients, therefore one-way or two-way (Grunig, J., & Grunig, L., 1992:287).

- Press agentry model

The first communication practitioners were the press-agents of the mid-19th century, who promoted performers, for example circus performers, by any means possible, even if not always truthfully. These agents' main purpose was to promote and they used propaganda to achieve their goals by means of a one-way flow of information (Grunig, J., & Grunig, L., 1992:287).

- Public information model

The public information model developed after large organisations realised they need to react after they were vilified in the media by 'muckraking' journalists for not communicating truthfully about their actions (Grunig, J. & Grunig, L., 1992:288). These organisations started to hire their own journalists to fulfil their communication management needs by writing press-handouts that explained their actions to the media and the public, therefore defending their actions. Even though the communication practitioners mostly chose to only report the good of the organisation, the information their hand-outs contained were generally honest and accurate, unlike communication according to the press-agentry model (Grunig, J. & Grunig, L., 1992:288). The public information model's flow of information is also one-way, ie. the dissemination of information from the organisation to the public.

- Two-way asymmetrical model

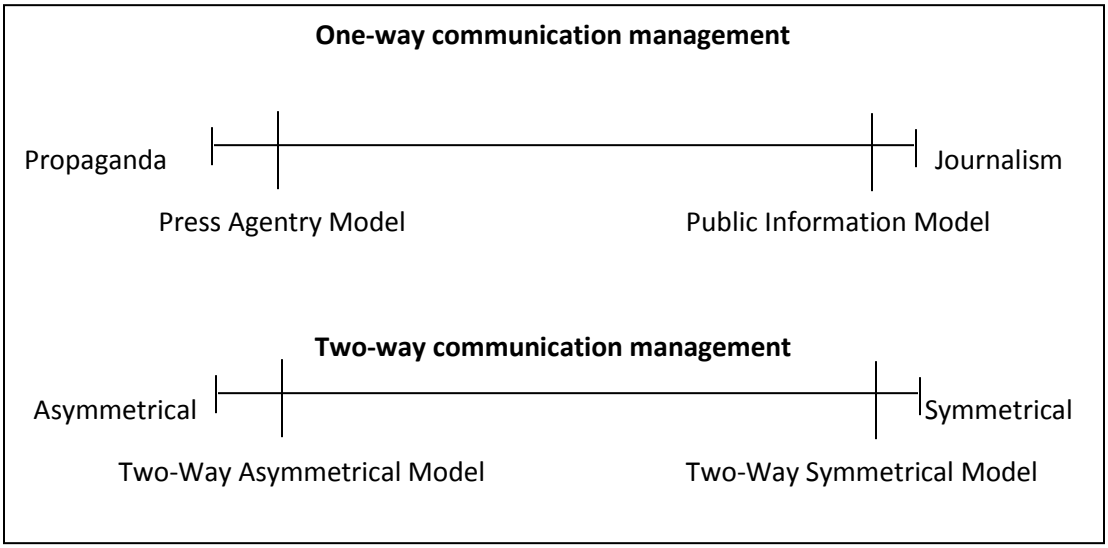
Introducing research into communication management evolved the field in its entirety when the idea of two-way information flow was introduced (Grunig, J., & Grunig, L., 1992:288). With two-way information flow referring to both sending and receiving information, practitioners started to seek information from and provide information to their stakeholders. After the culmination of World War II, communication practitioners realised that it is possible to manipulate people and persuade them by 'engineering content' to suit the audiences' needs (Grunig, J., & Grunig, L., 1992:288). The two-way asymmetrical model therefore makes use of research to understand the motivation of stakeholders and to identify the messages that will most likely lead to beneficial behaviour from stakeholders towards the organisation.

- Two-way symmetrical model

Unlike the two-way asymmetrical model, its symmetrical counterpart's purpose is not to persuade and manipulate stakeholders. The main purpose of the two-way symmetrical model is to facilitate communication and understanding between the organisation and its stakeholders in order to build strong, mutually beneficial relationships. This model also makes use of research, but the primary objective is to initiate understanding rather than persuasion (Grunig, J., & Grunig, L., 1992:289). The two-way symmetrical model of communication is usually associated with words such as 'interpretation' and 'understanding viewpoints' (Grunig, J., & Grunig, L., 1992:289).

According to Grunig and White (1992:39), all the models, except for the two-way symmetrical model, can be regarded as asymmetrical models, which in its bare essence means that they try to change the behaviour of stakeholders without changing the behaviour of the organisation. The two-way symmetrical model is therefore viewed as an ethical and normative way to communicate with the stakeholders of the organisation. The nature of the one-way and two-way models are depicted in the following figure:

Figure 2.1 – Communication models



Source: Grunig & Grunig (1992:312)

- Mixed-motive model

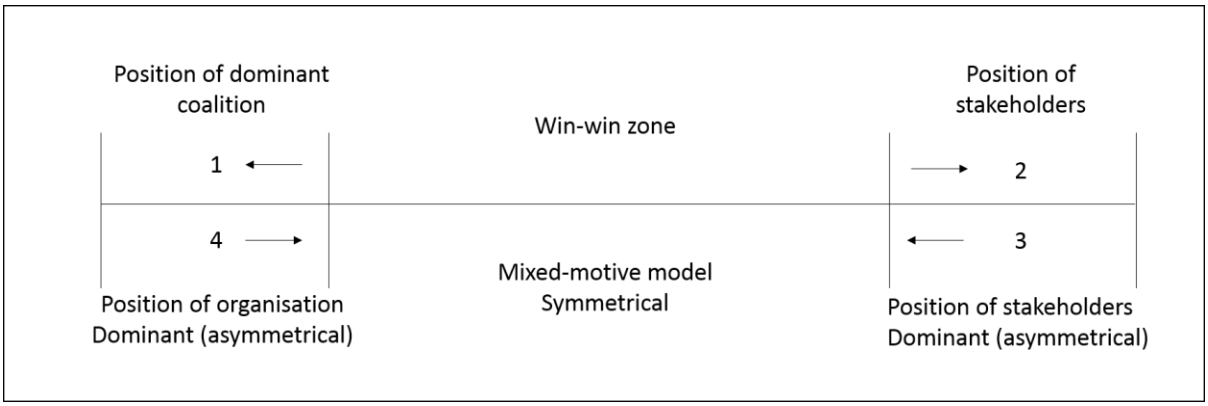
Grunig (1992) received much criticism that the proposed two-way symmetrical communication model is unattainable and not a realistic portrayal of communication management practice. The

idea of the mixed-motive model was thus formulated, although Grunig *et al*. (2002) still maintained that the two-way symmetrical communication model should be the normative model for ethical communication. Wiggill (2009:44-46) described the mixed-motive model as the intent to communicate in a two-way asymmetrical manner and to design communication programs based on the two-way asymmetrical model, within a symmetrical worldview where communication practitioners have both the goodwill of their organisation and their stakeholders at heart.

Grunig *et al*. (2002) concluded that the mixed-motive model is the practical application of the two-way symmetrical communication model because communication practitioners should balance the interests of both the organisation and its stakeholders, but still with the intent to manage open, ethical and transparent communication (Le Roux, 2014:5; Botan & Hazleton, 2006:40; Grunig, J. *et al*., 2002:358). According to Grunig and White (1992:48), the mixed-motive model is based on reciprocal communication, thus organisations will negotiate with and concede to their stakeholders and vice versa. Dozier *et al*. (1995:48-49) state that even though the organisation and its stakeholders have different interests and sometimes contrasting ideals, by practising the mixed-motive model, a middle ground can be reached by being open to negotiate and make compromises, therefore persuading each other.

According to Grunig and Grunig (1992:310), many scholars argue that the use of persuasion is not inherently unethical. Stating that both the organisation and the stakeholders persuade each other simultaneously, thus restoring the symmetry within this dialogue. Several researchers have since regarded the mixed-motive model as the normative model and most accurate manifestation of the actual real-life communication practice (Plowman, 2005:131-137; Grunig, L. *et al*., 2002:358; Holtzhausen & Verwey, 1996:39). The nature of the mixed motive model is depicted in the following figure:

Figure 2.2 – Mixed-motive model



Source: Wiggill, 2009:39; Dozier *et al*., 1995:48

It is clear from the above discussion that if communication is managed according to the two-way symmetrical communication paradigm, as operationalised by the Excellence Theory, it should lead to strong, mutually beneficial relationships between an organisation and its stakeholders. Relationship management, the most important outcome of strategic communication management, is discussed in the following section.

2.3 Relationship management

Cutlip *et al*., (1994:2) state that communication management is "the management function that establishes and maintains mutually beneficial relationships between an organization and the stakeholders on whom its success or failure depends". Ledingham and Bruning (1999:1; 158) add that communication management should in its bare essence be described as the management of the relationship between an organisation and its stakeholders. Ledingham (2003:1) notes that relationship management is the idea that communication balances the various concerns of both the organisation and its stakeholders by continuously developing their mutual relationship.

According to Ledingham and Bruning (1998:63), building relationships with stakeholders is a two-tiered approach. In the first place, the organisation should focus on building a relationship with its identified stakeholders after which it should live up to and communicate said promises. It is argued that when an organisation communicate its actions and thus confirm that it delivers on the promises they made, the stakeholders in turn remain loyal and display trust in the organisation (Wiggill, 2011a:7). It is then stated that to achieve this mutual trust, an organisation must focus on building symmetrical relationships with its stakeholders (Wiggill, 2011a:7).

According to Hung (2005:416), multiple relationship types (symbiotic, manipulative, etcetera) can exist between an organisation and its stakeholders. It is however important for the purpose of this study to focus on the relationships considered to be mutually beneficial of nature. Two types of relationships, communal and exchange, between an organisation and its stakeholders are therefore considered (Wiggill *et al.,* 2009:6; Hon & Grunig, 1999:20):

- Communal relationships

In a communal relationship, one party within the relationship provides certain benefits to the other party to please the receiving party without necessarily expecting anything in return. This type of relationship usually shows one party's concern towards the other. It is argued that this type of relationship should be entertained for an organisation to build lasting a relationship with its stakeholders (Wiggill, 2009:48; Hung 2007:456).

- Exchange relationships

In contrast, an exchange relationship is characterised by one party providing something to the other because they previously received or expect to receive something in the future. This type of relationship is normally seen in an economic environment and usually involves monetary exchange, for example (Wiggill, 2009:48; Hung 2007:456; Hung 2005:396).

In communal relationships, a focus on mutually beneficial outcomes exists, as well as promoting justice between the various parties partaking in the relationship and thus contribute to what is called a win-win situation for both the organisation and its stakeholders (Wiggill, 2009:48). To achieve the relationships described with stakeholders, it becomes necessary for the organisation to put certain relationship-building strategies in place.

2.3.1 Relationship building strategies

Hung (2007:459) states that it is important to note that building relationships is a continuous process and from time to time it will become necessary for the organisation to mend broken relationships. Hung (2004:266) and Hung (2001:16), building on previous authors' research (Grunig, J., & Huang, 2000; Hon & Grunig. J., 1999), stipulates certain relationship-building strategies of a symmetrical nature, which can be successfully utilised to cultivate strong relationships between the organisation and its stakeholders:

- Access

The organisation provide its stakeholders access to their decision-making processes and the stakeholders in turn do the same.

- Positivity

The organisation focuses on being positive and do what is necessary for their stakeholders to feel content within the relationship.

- Openness or disclosure

Openness entails being willing to engage in conversations regarding the status of the relationship whereas disclosure is regarded as an ethical communication practice.

- Assurances of legitimacy

The organisation and its stakeholders express their willingness to maintain the existing relationship, which will ultimately lead to a more satisfactory response to the relationship from both parties.

- Networking

The organisation must exert and apply effort to build networks with the groups, which their stakeholders regard as important.

- Sharing of tasks

The organisation and its stakeholders solve problems together.

- Dual concern

The interests of the stakeholders are balanced with those of the organisation.

- Cooperating

The organisation and its stakeholders work together to blend their interests and to form mutually beneficial relationships.

- Being unconditionally constructive

The organisation tries to do what it thinks is constructive in the relationship even if it influences its own position negatively within the relationship.

- Win-win or no deal

If the organisation cannot reach agreement with its stakeholders on a certain matter to the benefit of both parties, the deal is called off.

All these strategies above are described as symmetrical as both the organisation and its stakeholders equally influence one another and always have the relationship at heart. When these strategies are correctly applied, it is argued that certain relationship outcomes will be achieved (Hung, 2001:25).

2.3.2 Relationship outcomes

Hon and Grunig (1999:18-20) identify four relationship outcomes, namely: trust, control mutuality, commitment and satisfaction. These outcomes are used to evaluate the relationship between an organisation and its stakeholders (Men and Hung, 2012:3; Grunig, 2006a:168; Hung, 2004:266; Hung, 2001:25):

- Trust

Trust is an important concept when considering manager-employee relations, how organisations handle crises, and the role it plays in negotiation and conflict management. Trust can therefore be considered as an important building block in relationships and is also widely used in measuring both interpersonal and organisational communication. Hung (2001:27) elaborates on trust as a relationship outcome by discussing three dimensions which elevate trust:

  - Dependability – when there are inconsistencies in an organisation's communication and behaviour, trust levels tend to decrease.
  - Competence – indicates the capability of an organisation to perform the duties and tasks that are expected.
  - Integrity – refers to a communication agency's sense of fairness and also whether its communication is consistent with its actions.

- Control mutuality

This concept openly accepts that there exist power imbalances and power shifts in relationships. Control mutuality therefore refers to how the different parties within the relationship agree on the amount of power which each should have to influence the other. Control mutuality in a relationship therefore also refers to the way in which ethical two-way symmetrical communication is practiced.

- Commitment

Commitment refers to the intention of the parties within the relationship to continue with the relationship. It therefore shows the desire of all parties to maintain rather than terminate said relationship.

- Satisfaction

Although relational satisfaction is considered a difficult concept to measure accurately, it remains an important concept to evaluate. In short, relational satisfaction implies that all parties reap certain rewards from participating in the relationship. This implies that stakeholders are satisfied by their relationship with the organisation because they feel valued and important.

The above discussion on communication management according to the two-way symmetrical paradigm, leads to the following theoretical statement:

Central theoretical statement 1

Communication management, according to the two-way symmetrical paradigm, have the following key features:

- the communication management function has a strategic managerial role;
- the senior communication practitioner should function as a strategist performing environmental scanning;
- to conduct environmental scanning, the strategist needs to engage in two-way communication with stakeholders;
- environmental scanning and two-way communication should lead to strong organisation-stakeholder relationships characterised by:
    - trust;
    - mutual control;
    - commitment; and
    - relationship satisfaction.

In the following section, the nature of disaster risk communication is discussed by first highlighting the functions of disaster risk communication, the communication needs of communities affected by disaster risk, and credible disaster risk communication.

2.4 Disaster risk communication

Heilbrun *et al*. (2010:1) define disaster risk communication as "an important vehicle for the scientific understanding of the perception of and response to various kinds of threats," while Leiss (1996:86) describes it as "the flow of information and risk evaluations back and forth between academic experts, regulatory practitioners, interest groups, and the general public." Communication management in disaster management theory has only recently become a topic of consideration. However, the benefits and necessity of communication management, especially in a changing environment, such as disaster risk management, cannot be underestimated. Although communication management theory has been developed within a corporate setting, its core principles have the potential to inform disaster risk communication.

To fully understand disaster risk communication, one must familiarise oneself with the magnitude of disaster risk reduction (DRR). Le Roux (2014:3) states that the term *disaster risk reduction* (as mentioned in Chapter 1) encompasses the complete management of "hazards, vulnerability and disaster risk." Le Roux (2014:3) states that disaster risk communication refers to managing communication, as most frequently applied in an organisational context (Le Roux 2014:4) during all the phases of disaster management. Therefore, Wiggill (2016:4) argues that disaster risk communication aimed specifically at communities who are impacted by disasters, is a purposeful and deliberate flow of information between different individuals, groups and organisations, all of which are related by means of potential disaster. Le Roux (2014:2) therefore makes special mention of the fact that this type of communication is planned for and deliberate.

Le Roux (2014:1) further states that communication, from a disaster risk reduction point of view, is arguably one of the most cited areas where development is needed, pinpointing the fact that disaster risk communication is often reduced to reputational management instead of aiding to alleviate disaster risks. Le Roux (2014:3) therefore unequivocally states that there is a "lack of information on the aspect of communication management within the disaster risk reduction paradigm."

First, it is imperative to discuss the different phases where disaster communication is needed in order to understand the full extent of disaster risk communication.

2.4.1 Phases of disaster management

Le Roux (2014:3) describes disaster risk reduction as "all pre- and post-disaster phases such as disaster planning, preparedness, prevention, mitigation, warning, recovery and rehabilitation" (Le

Roux: 2014:3). Adding to this, although referring to flood risk management, Demeritt and Nobert (2014:1) concede that risk communication plays an ever-increasing role in disaster management. The problem however, is that there are varying conflicting stances on how, when, why and what message should be transmitted (Demeritt & Nobert, 2014:1).

O'Neill (2004:1) outlines that several changes in the way disasters are perceived and coped with have necessitated disaster managers to communicate risks and therefore there is a need for a disaster risk communication model. These shifts, according to O'Neill (2004:1), include:

- the need for greater community participation;
- the need to form and enhance partnerships;
- locally focused and integrated planning;
- a declining level of trust in government;
- an increasingly complex communication environment; and
- a community that is sophisticated in reading[5] and interpreting communications.

O'Neill (2004:5) posits that the abovementioned shifts have necessitated "the need for innovation, rigorous planning and an evidence-based culture in the design of community safety programs."

The shift in stakeholders' perception and activities requires attention. While progress have been made in developing educational tools to inform communities regarding disaster risks, little research has been conducted to effectively develop a model that captures the relationship between vulnerable communities and their participation in disaster risk reduction programs (Rød *et al*., 2012:3; Regehr *et al*., 2008:6; O'Neill, 2004:5). Building relationships and trust between the communicator (in this case mostly government agencies) and its stakeholders, as lobbied by the two-way communication paradigm, should therefore be seen as an unavoidable journey to mitigate the abovementioned obstacles.

To develop a trusting relationship, the correct message must be transmitted to the correct audience. The specifics of the message that is transmitted is even more complicated because a disaster risk can present itself in different phases. O'Neill (2004:14) states that there are four

[5] In contrast with first world countries, high levels of illiteracy such as in third world countries can hinder and inhibit the communication process dramatically.

stages in which a disaster can occur. The specific phase in which the disaster occurs will invariably alter the type of message being transmitted (O'Neill, 2004:14). These four stages are:

- before the disaster;
- the warning phase;
- during and immediately post-disaster; and
- the recovery phase.

It is noteworthy that the Disaster Management Act (57/2002) makes no provision for phases of disasters but rather filters this responsibility down to provincial government (Disaster Management Act, 57/2002). In South Africa, and more specifically the TLM, which falls under the Dr Kenneth Kaunda District Municipality (KKDM), disaster risk management is also divided in four phases according to the KKDM Disaster Management Plan (KKDM, 2009:71-84). These phases are the following:

- disaster reduction;
- response to the disaster;
- recovery from the disaster; and
- rehabilitation after the disaster.

The phases, as discussed by O'Neil (2004), closely resemble the phases outlined within the KKDM (2009), but are slightly different. Most notably, South African disaster management plans also include the rehabilitation phase. In this study, the first phase – disaster risk reduction – is deemed important and therefore focus will be given to this phase in particular.

The type of communication and messages to the affected communities differ, depending on the varying phases. O'Neill's phases (2004), as well the four phases mentioned in the KKDM Disaster Management Plan (2009), show that during the first and fourth phases, communication needs to be two-way symmetrical in nature while the second and third phases are more asymmetrical and contain crisis communication (Le Roux, 2013:6).

The disaster risk reduction phase is the first phase where disaster centres attempt to reduce the disaster risk faced by communities. The KKDM Disaster Management Plan (2009:32) highlights that the 'local sphere' or the community is really the first responder when a disaster threatens. In the KKDM Disaster Management Plan (2009:32), provision is therefore made for community members to participate in disaster management forums within their respective wards, a process

that is steered by the responsible Disaster Risk Management Centre. These wards aim to promote, amongst others, protocols for disaster risk reduction planning, early warnings, emergency, preparedness, emergency communication, data collection, disaster response and recovery, and recruiting and managing ward volunteers.

According to the KKDM Disaster Management Plan (2009:32-33), these disaster management ward structures should also actively participate in and promote the following:

- awareness programmes amongst communities in the ward;
- development of a culture of risk avoidance and behaviour to commonly encountered hazards;
- development of a disaster risk profile, a risk reduction strategy, contingency plans for priority disaster risks, and a response and recovery operational guide for the affected ward(s); and
- training and capacity building programmes for residents in the ward.

In the first phase, before a disaster occurs, or otherwise called disaster risk reduction, O'Neill (2004:14) notes the focal points and objectives that should be aspired to. The message relayed to communities should be tailor-made to reach the following objectives:

- build the resilience of the affected community;
- strengthen the authority of emergency agencies;
- raise awareness of hazard and risk;
- encourage appropriate safety behaviour;
- reassure that family safety is achievable; and
- inform the affected community about warnings.

Considering these objectives, it should also be stated that when communicating a disaster risk, it is important that the message gets across urgently and is understood by the intended recipients so that they can respond. According to Heilbrun *et al*. (2010:2), research suggests that there are several factors that influence the capacity of recipients to understand a disaster risk message and respond accordingly. Heilbrun *et al*. (2010:2) lists the following:

- the clarity and specificity of the message;
- the entity disseminating the message;
- the nature of the threat;

- the specific location threatened;
- when the disaster risk might occur;
- the probability of the disaster risk occurring; and
- what actions should be taken to mitigate the disaster risk's effects.

For the purpose of this study, it is important to focus on the second aspect mentioned by Heilbrun *et al*. (2010:2), namely the entity who is disseminating the message. With such a focus, communication and relationship management theory comes into play since the affected community should trust this entity to have their best interests at heart. Such a trusting relationship can only be achieved by means of two-way communication. This can however only be achieved when the communication that the community receives translates to them.

To build a relationship with affected communities, it should be kept in mind that communities facing disaster risk have certain communication needs that should to be addressed (Wiggill, 2016:5-6; Fitzpatrick-Lewis *et al*., 2010:13; Frewer, 2004:392; Trettin & Musham, 2000:420–422), such as:

- communities require clear and direct information from a designated facility and not the media or filtered down from government;
- communities want to have access to all information and want to be able to participate in disaster risk communication;
- the affected communities want to feel that disaster risk communication should be focused on them as citizens by being more consultative and inclusive;
- communities want to have clear rules and procedures regarding disaster risk management; and
- they want to be part of the decision-making process.

By studying these needs, it becomes clear that communities want to feel that they can actively contribute to disaster management planning and that they can form part of the decision-making process, highlighting their need for two-way communication and mutual control. Wiggill (2016:6) argues in this regard that when an affected community is part of decision-making processes and is provided with access to information while receiving transparent messages, it contributes to establishing stronger relationships between the respective parties.

The varying phases in which a disaster can present itself, as well as the specific needs of the community, have a major effect on the type of message that needs to be communicated. While

the message is of utmost importance, the need to be credible while communicating this message is extremely important to ensure that the message is delivered and accepted.

2.4.2 Credible disaster risk communication

In order to reduce the vulnerability of at-risk communities, and more importantly, improve their disaster preparedness, it is necessary to ask the correct questions and engage in narratives to understand a community's situation better. To communicate effectively, is an important aspect of improving disaster preparedness but also a significant facilitator in advancing coping capacities within a community.

It is essential to note that Heilbrun *et al*., (2010:2) specifically state that the conveyor of the message has an important role to play to ensure that the message's recipients respond favourably. This view is shared by Leiss (1996:3) and Abraham (2011), who state that source credibility forms an integral part of risk communication as this aspect will determine whether people, who might be at risk, will respond to the message. Leiss's (1996:3) view directly relates to the importance of relationship-building and in particular strengthening trust as discussed above (see section 2.3.1). Leiss (1996:3) further lists message clarity and the effective use of communication channels to convey messages properly to affected communities.

However, Leiss (1996:3) argues that the most important aspect of risk communication is to focus on the needs and the perceived reality of the audience. As mentioned above, Steyn and Puth (2000) argue that for the communication management function to be successful, the communication practitioner should practice environmental scanning to identify and get to know their stakeholders. Steyn and Puth's (2000) argument also correlate with that of Leiss (1996), who states that risk communication should be tailor made according to the needs of the affected community.

According to Peters *et al*., (1997:1), the problem in trusting the source of the message originates from what they call a "long-term decline in public confidence and trust" in institutions such as government departments. Peters *et al*. (1997:1) unequivocally state that trust and credibility are of extremely high importance to determine decision-making when at risk. At this point, the importance of relationship-building between the disaster centre and the affected community will be deemed as critical. This view is also shared by Frewer (2004:3), who states that if an untrustworthy source is to share disaster risk information, it appears the communicator is only concerned with his own interests rather than those of the affected communities. Frewer (2004:3)

and Abraham (2011) therefore argue that the relationship between the risk communicator and the affected communities should be established and articulated before the need to communicate risk is necessary. If not, the receiver might well be opposed to the message being shared. Wiggill's (2013; 2016) and Frewer's (2004) explanation of the need to have a well-established relationship and for that relationship to be transparent when communicating risk, directly echoes the view of Grunig, J. *et al.* (1992) regarding the need of transparency in communication management as advocated by the two-way symmetrical communication paradigm.

The amount of information which stakeholders receive, contributes significantly to the trustworthiness and credibility of the source (Wiggill, 2016; Peters *et al*., 1997:11). Peters *et al*. (1997:10) deduced that the leading determinant variable contributing to the trust and credibility of a source is when the source of a message displays knowledge and expertise in its specific field. Peters *et al*. (1996:5) furthermore found that all three determinants greatly influence trust and credibility, with special mention of honesty. Peters (1997:6) states that communities feel a sense of empowerment when they perceive that the information they receive is honest. Peters *et al.'s* (1997) findings were corroborated by Wiggill's (2016) research in a South African environment. Grunig *et al*. (1992) also mention the facilitation of trust by communicating in an ethical manner, thus showing openness and honesty in the communication process so that the receiver will view the message as honest and the source as credible. Therefore the determinants for building a trusting relationship between risk communicating agencies (RCAs) and affected communities are (Peters *et al*., 1997):

- Knowledge and expertise

The RCA should display knowledge and expertise towards the subject matter through their communication, which should portray that they are experts in their field and their knowledge is reliable.

- Openness and honesty

The RCA should be perceived as being open and honest on the relevant disaster risk and not hiding any information that might be of importance.

- Concern and care

Lastly, the TDMCs should show that they truly care about the stakeholders and need to have their best interest at heart. The stakeholders' situation should be of great concern.

It is therefore of utmost importance to be open and honest as well as portray a great level of expertise in risk communication. These determinants corresponds with the relationship building strategies as identified by Hon and Grunig (1999) (see section 2.3.1). However, when considering the nature of risk communication, it is sometimes deemed necessary for the different parties to persuade one another to accept the other's view (see the nature of the mixed motive model, section 2.2.1.2), which will greatly benefit from a pre-existing relationship.

Although the necessity for strong, trusting relationships between RCA's and affected communities is widely acknowledged in disaster risk literature, such communication is not always facilitated by the said agencies. In the following section the different risk communication models will be discussed.

2.4.2.1 Risk communication models

Demeritt and Nobert (2014:1) identified four models of disaster risk communication which closely relates to the craft and professional communication management models as described by Grunig, J. *et al*. (1992) (see section 2.2.1.2):

- Risk government model

This model views disaster risk communication as an exercise of political power. It views the function of disaster risk communication as an instrument to bend the recipients of the message to the will of the communicator, without creating any chance of engaging in dialogue (Demeritt & Nobert 2014:11). The purpose of the model is to describe the logic behind risk communication without considering practical applications. It is therefore merely an academic explanation of risk situations (Demeritt & Nobert 2014:12).

There are certain problems that might arise from the risk government model. Most notably, this model does not provide any possibility for recipients of the message to respond and therefore no dialogue is formed between the respective parties. This model can be viewed solely as a one-way communication model whereby the communicator has all the authority and as such, it will not likely contribute to enhancing trust between the parties. This situation also implies that the relationship between the respective parties (in the study at hand between the TDMC and the affected community) will be non-existent. While the message is relayed in an authoritative manner, there is no knowledge available on the intended audience as this model is lacking opportunities for two-way communication. This risk communication model has similarities with the

the public information model (see section 2.2) in that it relays information about the disaster risk in a one-way fashion to the affected communities.

- Risk message model

The risk message model, according to Demeritt and Nobert (2014:5), concerns itself with the message being conveyed. This model is primarily focused on the message reaching its targeted audience without disruption and distortion (Demeritt & Nobert, 2014:5). This model is viewed as a one-way communication model disseminating a message in the same way that the public information model does (Grunig *et al*., 1992) (see section 2.2). The success of this model therefore is whether the necessary information was transferred and understood by the intended audience (Demeritt & Nobert, 2014:7). Although this model focuses heavily on communicating to the correct audience, no feedback is encouraged after the message has been relayed. Therefore, the audience does not have a chance to contribute nor state their views or concerns. This model will also not establish trust nor lead to a significant relationship between the respective parties as there are no engagement from the risk communicator and no significant research or environmental scanning in order to understand the audience better.

- Risk instrument model

According to the risk instrument model, disaster risk communication is regarded as a conscious instrument used to change the behaviours and attitudes of stakeholders, such as affected communities; much like the two-way asymmetrical communication model (Grunig *et al*., 1992; Demeritt & Nobert, 2014:7) (see section 2.2). This model, for example, is viewed as successful when a disaster warning initiates a response from those in danger (Demeritt & Nobert, 2014:7). The risk instrument model recognises communication as a strategic function, which aids some groups by influencing the attitudes and behaviours of others (Demeritt & Nobert, 2014:7). This model supports the notion that disaster risk communication should not only inform, but also influence (Demeritt & Nobert, 2014:7). Persuasion is therefore considered central to this model as it tries to influence its audience by means of persuasive arguments. As stated by Le Roux (2014), there are certain instances in the disaster risk phases that require forms of persuasion. Although this model encourages feedback, thereby achieving a two-way flow of information, by using this type of disaster risk communication model, the RCAs would not be required to alter their behaviours. Consequently, a distorted relationship with no consequences for the risk communicator is achieved. Another critical point is the fact that this model does not necessarily promote the use of research to formulate the correct message to the correct audience.

- Risk dialogue model

This model has similarities with the two-way symmetrical communication model, as the distinction between senders and receivers is blurred and participation is encouraged (Demeritt & Nobert, 2014:9). The risk dialogue model therefore opens the possibility for stakeholders to truly engage and participate in decision-making processes (Demeritt & Nobert, 2014:9). All parties can communicate and influence each other, resulting in cooperation regarding disaster risk policy proposals and stakeholder needs (Demeritt & Nobert, 2014:9). However, Demeritt and Nobert (2014:10) point out that several practical and political barriers obstruct the high ideals set by the risk dialogue model, such as time limits and a lack of expertise within the community, which will invariably hinder their participation, especially in a third world environment. Demeritt and Nobert (2014:10) also state that institutions often struggle to employ the risk dialogue model correctly as they struggle to open themselves up to dialogue with stakeholders. By utilising this model, RCAs will be able to form trusting relationships between both parties. This model, seemingly perfect, however leaves no way for either of the respective parties in the dialogue to persuade each other in an ethical and credible manner, which is an important aspect of disaster risk communication (Le Roux, 2014).

The necessity for persuasion in disaster risk communication is clear from the above discussion, and subsequently it will be discussed.

2.4.2.2 Persuasion in risk communication

When communicating a risk situation, it is necessary to persuade the affected community that they are at risk and need to act. Leiss (1996:6) states that information regarding risk situations must be a form of persuasive communication, necessarily to persuade the recipients of the correctness of a view, in this case of imminent danger particularly. This view is also shared by Anderson (2009:22), who states that to communicate risk effectively, it is sometimes necessary to persuade the stakeholders to accept a certain risk and take the necessary precautionary actions. Le Roux (2014:5) shares this view by stating that “in the disaster risk reduction and management context, people need to be persuaded to act in a certain way.”

Le Roux (2014:5) mentions that persuasion is necessary, for example, when affected communities are asked to evacuate their homes or avoid a specific area. In a situation like this it becomes quite evident that the need for a community to feel that their interests are being catered for by experts, as mentioned by Peters *et al*. (1997), is important. Once again this example

highlights the need for trust to be existent within the relationship between, for example, TDMC and the community it serves. It is for this reason that Leiss (1996:7) states that when considering risk communication one must concede that there are forces at work that favour “consensus building, meaningful stakeholder interaction and acceptance of reasonable government regulatory frameworks” (Leiss, 1996:7).

As mentioned above, Grunig, J. and White (1992) note that the use of persuasion, often seen as an asymmetrical form of communication practice, is not inherently unethical. Le Roux (2014:5) sums it up by stating that the mixed-motive model’s aim is to facilitate open and transparent communication, thus keeping the primary aspect of the two-way symmetrical communication model intact even when “practising incidences of asymmetrical communication, such as persuasion” (Le Roux, 2014:5). The reason that persuasion in this instance is symmetrical, is because it is used to benefit the community; it is used within a symmetrical worldview. Therefore, Le Roux (2014:5) argues that the communication practitioner, when utilising risk communication, can influence both the organisation and the community, restoring the reciprocity between the two parties.

Le Roux (2014:5) finally notes that if a trusting relationship exists between a RCA and the community, the agency is at liberty to use persuasion to motivate the affected community to act on warnings since it is issued within a symmetrical communication paradigm. Furthermore, the use of persuasion within the disaster risk communication field closely relates to what is called invitational rhetoric, as coined by Foss and Griffin (1995).

2.4.2.2.1 Invitational rhetoric

Invitational rhetoric derives from one of the seven traditions in communication theory, namely the rhetorical tradition. This tradition is more commonly known as the study of stakeholder communication. Craig (1999:15) writes the rhetorical tradition involves "the practical art of discourse." This tradition therefore focuses on how rhetoric can be used to sway and influence audiences through the skilful usage of emotion and logic in persuasion techniques (Craig, 1999:18). According to Bitzer (1968, as cited by Craig, 1999:17), the rhetorical tradition can resolve communication problems through the "artful use of discourse to persuade audiences." This tradition is therefore often viewed as patriarchal and using bias to change, control and dominate others (Foss & Griffin, 1995:1). This is a far cry from the symmetrical two-way communication model as described in section 2.2. However, realising that persuasion is sometimes deemed necessary, Foss and Griffin (1995) proposed an alternative to the classic rhetorical tradition, namely invitational rhetoric.

Foss and Griffin (1995:4) argue that invitational rhetoric involves inviting the audience to enter the world of the rhetor and see it from the rhetor's perspective. Invitational rhetoric's main focus is to create a relationship of value, which is characterised by equality between the rhetor and the audience, much like the principles of the two-way symmetrical paradigm (Foss & Griffin, 1995:4). Littlejohn and Foss (2011:208) explain that invitational rhetoric's primary goal is clarifying ideas and hence the desired outcome of this perspective will not be to change the behaviours of others, but rather to understand their different perspectives. "Invitational rhetoric is an invitation to understanding as a means to create a relationship rooted in equality, immanent value, and self-determination" (Foss & Griffin, 1995:4).

This process, according to Foss and Griffin (1995:4), leads to a deeper understanding of the other's perspective after which they present their own. Foss and Griffin (1995:4) posit that this process will eventually lead to both parties contributing to a deeper understanding of a particular issue. Foss and Griffin (1995:5) finally state that the main characteristic of invitational rhetoric is the "openness with which rhetors are able to approach their audiences", accentuating the findings of Peters *et al*. (1996) on how openness add credibility to the source of disaster risk communication. However, this will only be achieved by means of two-way communication.

In the above sections, the principles of the two-way symmetrical communication paradigm, communication practitioner roles as well as the communication models, relationship management and a description highlighting the nature and challenges of disaster risk communication have been

discussed. To be able to answer the research question leading the discussion in this chapter, namely. *What is the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm, according to literature?* it is necessary to determine how disaster risk communication should be practiced.

2.4.2.4 Credible disaster risk communication and the two-way symmetrical communication paradigm

According to the principles of the two-way symmetrical communication paradigm, organisations (in the study at hand, risk communicating agencies) should encourage and facilitate two-way communication with stakeholders (in this case, at risk communities) to build strong, trusting relationships between all parties involved. Understanding each other's views, needs and behaviour as well as reciprocity strengthens this relationship.

According to the Excellence theory, two-way communication and the resulting relationship with stakeholders will add to the organisation obtaining its goals. This is also true in the case of RCA such as disaster management centres – strong relationships with affected communities will improve their resilience to disaster risks since they trust the RCA enough to follow disaster procedures such as evacuations. However, the Excellence theory stipulates that environmental scanning is performed by a communication strategist, which implies that the risk communicating agency should appoint a trained communication practitioner to strategically engage with affected communities and relate their needs, views and fears to management.

From the literature discussed in the above sections it is apparent that relationship building is important in both the two-way symmetrical paradigm as well as disaster risk communication. It is argued that relationship building by means of engaging in two-way communication with communities is critical to foster understanding and participation on key issues such as disaster policies. By engaging in two-way communication and invitational rhetoric with risk communicating agencies, communities will be able to relate their needs regarding disaster risk management and communication to the said agencies. This will in turn help risk communicating agencies to better understand the communities within their jurisdiction, effectively creating an environment where the communicating agencies as well as the community can influence and persuade each other of their views and needs. It is therefore posited that practicing the mixed-motive model is viewed as ethical and professional because the intent is to communicate in an open and transparent way (Le Roux, 2013:5). This intent is therefore still present even when instances of asymmetrical communication, such as persuasion, is practised. This principle, where a relationship is achieved

by means of open dialogue while being open to persuasion relates to the invitational rhetoric as described by Foss and Griffin (1995). It is argued within the invitational rhetoric that a party is open to being persuaded by the other. However, this act of persuasion is conducted by means of inviting the former into the latter's vantage point and will only come to pass if said invitation is accepted. This "transaction" can however only come to be if there is a pre-existing relationship, based on understanding and reciprocity, between the parties.

Key to these relationships is developing and nurturing trust. In the two-way symmetrical paradigm Hung (2001) points to the fact that trust is one of the key principles of a sound relationship between an organisation and its stakeholders. It is noted that trust is operationalised by being dependable, trustworthy and credible. Similarly, from a disaster risk communication perspective Peters *et al.,* (1997) note that openness and honesty as well as expertise significantly contributes to the trustworthiness and credibility of the risk communicating entity. Furthermore, several authors (Wiggill, 2016:5-6; Fitzpatrick-Lewis *et al*., 2010:13; Frewer, 2004:392; Trettin & Musham, 2000:420–422) emphasized affected communities' need to be part of the decision-making processes that influence their lives, in other words to have mutual control in such matters. This implies that risk communicating agencies, especially local municipalities and disaster management centres should engage with and provide opportunities for engagement to communities to enable the latter to provide input into decision-making processes. Regarding strengthening commitment as relationship outcome, the two-way symmetrical paradigm is also directive in that engaging in two-way communication with affected communities will convince them of the risk communicating agency's commitment to being more consultative and inclusive, and having the needs of the community at heart. It is clear that managing disaster risk communication from a two-way symmetrical communication paradigm will give way to a strong, trusting relationship characterised by relational satisfaction since all parties will do their best to maintain and strengthen the relationship.

In the following theoretical statement, disaster risk communication as informed by the two-way symmetrical communication paradigm is summarised:

Central theoretical statement 2

Disaster risk communication as informed by the two-way symmetrical communication paradigm comprises the following key aspects:

- at-risk communities have definitive communication needs that should be addressed:
  - they require clear and direct information;
  - communities want to participate in disaster management decision-making processes;
  - disaster communication should be focused on the community; and
  - clear rules and procedures should be set regarding the disaster process.
- two-way communication contributes to a trusting relationship between disaster centres and the community;

The most important relationship building strategies (incorporating those identified by Hon and Grunig (1999)) to be applied in a disaster risk environment are:

- the disaster centre should display knowledge and expertise;
- the RCA should be open and honest towards the community; and
- the RCA must show concern and care for the community.

2.5 Conclusion

The two-way symmetrical paradigm argues that the most important aspect of communication management is establishing sound relationships with strategic stakeholders by means of constant two-way communication. These stakeholders are identified by a communication strategist utilising research or environmental scanning and said strategist should be involved in strategic decision-making processes. It is argued that the mixed-motive model and relationship management is the operationalisation of the two-way symmetrical paradigm. In this model, the intent is to have open and transparent dialogue, even though some shifts in power sometimes occurs.

From a disaster risk communication perspective, it is argued that disaster risk communication should encompass the whole process of disaster management. A strong relationship between risk communicating agencies and the at-risk communities in a disaster context is also deemed as critical to establish trust between the two entities. It is however argued that disaster risk communication in some incidences should be able to persuade affected communities to do what is best to decrease their vulnerability to a disaster risk. This persuasion is not deemed unethical

if the object is still to have open relationships with the stakeholders. This form of persuasion can however only occur when an existing relationship is present.

It is therefore argued that the current models of disaster risk communication do not allow for practices of asymmetrical communication within a symmetrical worldview and a mixed motive approach as lobbied in communication model theory. By applying a mixed motive approach, both the at-risk community and the risk communicating agencies will have power to influence and be influenced by the other. This will be practiced from the perspective of a pre-existing relationship where a bond of trust between the parties has already been formed.

In the next chapter, the functionality of mobile phones at times of disaster is discussed and how these devices can be utilised from a two-way symmetrical paradigm perspective. Furthermore, older persons' usage and adoption of mobile phones is discussed.

CHAPTER 3: OLDER PERSONS, DISASTER RISK AND MOBILE PHONES

3.1 Introduction

In the previous chapter, the first research question was answered by examining the core principles of disaster risk communication and how it can be informed by the two-way symmetrical communication paradigm. This chapter aims to provide some insight into how mobile phones can be used to alleviate said risks, especially focusing on the influence that it can have in mitigating the impact of disaster risk on older persons. It will therefore attempt to answer the second research question, namely: *What is the role of mobile phone usage, specifically that of* older *persons, within the framework of disaster risk communication according to literature?*

This research question will be answered by first focusing on literature that deals with Disaster Risk Reduction (DRR) and how people's vulnerability towards a disastrous situation can be reduced. The next focus of this chapter is on the effects of disasters on older persons and how their physical capabilities influence their vulnerability at times of disaster.

The chapter will then focus on the South-African landscape regarding mobile phone usage; how older persons currently make use of mobile phones and what might limit their usage of these devices. Last, the advantages of mobile phone use for disaster risk reduction will be discussed after which the benefits of older persons' usage of mobile phones at times of disaster will be highlighted.

3.2 Disaster Risk Reduction (DRR)

The UNISDR (2009) describes Disaster Risk Reduction (DRR) as the "…concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters…" The UNISDR (2009) also states that DRR involves reducing the vulnerability of people and property and the "…improved preparedness for adverse events." To reduce the vulnerability of people (and for that matter communities too), is deemed as a very important factor for the purpose of this study. Therefore, when evaluating a community's capability to cope with a disastrous event, one must first analyse its overall vulnerability towards the effect of the disaster as it directly influences its coping capacity. The understanding is that the development of coping capacity increases a community's resilience at times of disaster (UNISDR, 2007).

Disaster risk literature (Reininger, *et al*. 2013; Mayunga, 2007) concludes that DRR is dependent on the development of people's coping capacity. The UNISDR (2007) therefore states that coping

capacity development should be the central strategy on which DRR is based. The concept of capacity development can be a complete study in its own right. However, for this study, capacity development's core focus areas and elements are briefly discussed as to provide the reader with basic insight into its purpose within this study.

Coping capacity consists of various capital domains, each focusing on its own aspect of society. By improving these domains, the disaster risk that communities face can be positively influenced, in other words improving their resilience towards disastrous occurrences. According to Mayunga (2007:1), developing capacity domains is greatly influenced by the difficulty to accurately measure the concept of resilience and/or mapping its effects. To assess a community's resilience to a disaster, Mayunga (2007:5) proposes use of the capital-based approach where he includes five major forms of capital domains: social, economic, physical, human and natural.

- Social Capital

Reininger *et al*. (2013:3) explain that social capital in its simplest form is understood as the resources that a community possesses in the form of social cohesion, which can be used by individuals for "collective action and benefit". Mayunga (2007:7) also states that the power of social capital lies in its intrinsic capability to increase a community's resilience as it emphasises the aspect of "social structure, trust, norms and social networks that facilitates collective action". The notion of social capital is not a new one. A sense of community and social structure and networks have long been an integral part of a community's coping mechanism immediately after a disastrous event. Aldrich (2012) specifically examines the effects that earthquakes have on communities, with special focus on the 1923 earthquake in Tokyo and the 1995 Kobe Earthquake, and how settled social networks can alleviate the effects of disasters.

Aldrich (2012:3) explains that after the 1995 Kobe earthquake, individuals who actively participated in their communities, were engaged and developed deep social ties within their community, reported a higher level of post-disaster recovery. In his findings, Aldrich (2012:10) summarises by saying that substantial evidence exists to suggest that neighbourhoods that had a higher than average number of people taking part in political demonstrations, rallies and marches, had experienced a 2% higher population return rate than similar neighbourhoods after the earthquake. This number is in fact rather significant given the fact that the city of Tokyo had an average growth rate of below zero for a decade after the earthquake in 1923 (Aldrich, 2012:10).

According to Dynes (2005), social capital may well be the basis of resilience because it manages to provide vital information and resources at a critical point in the disaster timeline. It is for this reason Aldrich (2012:2) argues that disaster policy-makers may well wish to reallocate resources "to at least maintain, if not deepen, social networks" in populations who are particularly vulnerable. This amplifies the fact that the value of a strong social network at times of disaster cannot be stressed enough.

When discussing the importance of social capital, one must also consider the effect it has on disaster preparedness and not just on disaster recovery. Reininger *et al*. (2013:1) state that most recent studies reveal that social capital can closely be related to the ability of a community to plan for, as well as respond to disasters. In their study, Reininger *et al*. (2013) examine the effects that social capital has on disaster preparedness of low income Mexican-Americans who live in disaster prone areas. The study found that individuals, who had a greater sense of social capital, relating to fairness and trust in the community (a measure used to determine the level of social capital) had a higher "prevalence of preparedness" (Reininger *et al*., 2013:9).

The value that social capital possesses, according to Mayunga (2007:7), is that it "reflects the quantity and quality of social cooperation". This means that the community can draw on the social resources that they intrinsically possess, which in turn will advance the probability of communities addressing their collective concerns. Highlighting collective concerns normally takes place in a setting where the members of a community feel they are heard and can partake in a conversation. Mayunga (2007:7) states that this normally takes place in public meetings, informal sociability, engaging in public affairs and the forming of mutual trust. The forming of mutual trust, as explained by Mayunga (2007:7), relates directly to the core principles of the two-way symmetrical communication paradigm, as discussed in the previous chapter. Establishing relationships and trust will enable communities to communicate with policy makers in a two-way dialogue to reduce their collective vulnerability. This important narrative, according to Chamlee-Wright and Storr (2011:2), can aid in developing a positive view on recovery and therefore ultimately shape how the individual, as well as the collective group, responds to a disaster risk.

Dynes (2002:3) emphasises the importance of this narrative by stating that social capital appears in the relationships and networks formed by what is called social actors within this arena. Chamlee-Wright and Storr (2011:2) suggest that social capital can also play a definitive role in how members of a community describe themselves and their circumstances. The community's description of themselves, as well as the narrative that takes place in this process, can be of

immense value for disaster preparedness, response and recovery (Chamlee-Wright & Storr, 2011:2)

- Human Capital

Knowledge and education form key components of human capital. In their study, Muttarak and Lutz (2014:1) ask whether education is an important factor in reducing vulnerability towards natural disasters; their study specifically focuses on the 'unavoidable' effects of climate change. They hypothesise that by strengthening human capacity, with specific emphasis on education, societies can develop the "most effective long-term defence against climate change[6]" (Muttarak & Lutz, 2014:1).

Muttarak and Lutz (2014:2) argue that improved education in communities can have many positive influences, especially in reducing vulnerability to the effects of disasters. They explain that education can have both direct and indirect influences on a community. The direct influence is improving a community's cognitive and problem solving skills, knowledge and understanding of risk. While these factors can have a positive impact on vulnerability, one also has to consider the indirect effects of education, such as poverty reduction, improved access to information and more importantly, social capital, as education more often than not result in wider social networks (Muttarak & Lutz, 2014:2).

Dufty (2008:1) notes that education is a key component in building a community's resilience. According to Benadusi (2014:2), employing an education-based strategy in DRR in order to enhance resilience, as well as creating a culture of resilience within a community, is a phenomenon only recently being investigated. Benadusi (2014:2) points to the fact that DRR education has mostly focused on emergency personnel, for example fire fighters, police officers, relief workers, and hazard managers. These educational training courses were administered by experts in a top-down manner (Benadusi, 2014:2). In terms of disaster reduction education, communities and families were mostly the subjects of informational campaigns, which were organised mostly to inform communities on national security, while subjects such as capacity building and disaster preparedness were not covered (Benadusi, 2014:2). This type of one-way communication relates to the risk government model as well as the risk message model as discussed in section 2.4.2.1. In recent years, this view has changed. The UN has also more

[6] Climate change can result in hurricanes, floods, forest fires and heat waves (Muttarak & Lutz, 2014:1).

recently advocated for an increased emphasis on education in the development of DRR strategies (Benadussi, 2014:2).

According to the UNDP (2004:16), attaining education is a fundamental determinant of human vulnerability, while the report also states that by overcoming certain disparities in access to education forms part of a fundamental component of the much-needed disaster risk reduction agenda (UNDP, 2004:16). While education (and access to it) forms an integral part of the human capital of communities, knowledge for both the community and the individual cannot be disregarded.

Gaillard and Mercer (2012:2) state when discussing disaster risk preparedness and response, two types of knowledge spheres are deemed as important. On the one hand, scientific knowledge[7] about disasters and geographical elements of a certain area can prove to be life-saving when a disaster occurs. On the other hand, one must consider the local knowledge that exists within a specific community. The importance of local knowledge is highlighted in this study.

Gaillard and Mercer (2012:5) argue that 'local knowledge' of a community, disseminated by means of a two-way conversation, may not be regarded as insignificant or inferior to scientific knowledge. Mercer *et al*. (2010) state that local knowledge is a body of knowledge that is usually inherent within a local community and garnered over a significant time-period. This knowledge is usually passed on for generations and is formed by shared experience and practices within the community. Gaillard and Mercer (2012:5) further state that local knowledge continually evolves through "internal creativity, experimentation and contact with external systems and knowledge." Many researchers argue that development strategies can only be successful when the local knowledge of the community is not only recognised, but also incorporated into those strategies (Gaillard & Mercer, 2012:5). It is therefore argued that local or indigenous people, especially older persons, usually have a good understanding of the specific disaster risks that they face within their area.

By taking a community's local knowledge into account when developing DRR strategies, one effectively uses the already present structure of said community and empowers that community by means of it. Benadusi (2014:2) speaks of the importance of capacity building from the bottom-

[7] Scientific knowledge usually refers to knowledge attained by experts of their respected fields, for example geography (Gailard & Mercer, 2012:2)

up. This, in short, means that communities can become more resilient by utilising and strengthening their own inherent capabilities and settled structures. Empowering already settled structures can be very useful in enhancing a certain community's resilience to disastrous events. This view emphasises the importance of two-way communication between risk communicating agencies and affected communities, allowing the latter to partake in decisions influencing their lives.

- Economic Capital

Economic capital directly considers financial resources that people have, that enables them to achieve their livelihoods (Mayunga, 2007:7). Economic capital is an important determinant of resilience as more financial stability ensures a household has access to insurance, investments and credit. Therefore, economic capital directly influences resilience (Mayunga, 2007:7). Economic capital also specifically impacts older persons as many of them do not have the necessary financial independence and stability, which put them even more at risk (McGuire *et al*., 2007). The Government Employment Pension Fund (GEPF) in South Africa is also under severe pressure with various court cases lodged against the fund by trade unions and many retirees struggling to claim their rightful pensions (Gernetzky, 2016).

- Physical Capital

Physical capital refers to the built environment surrounding a community or town. This includes houses, apartments, businesses, public buildings and infrastructure such as hospitals, schools and police stations (Mayunga, 20017:7). Infrastructure and buildings also have a major part to play in the resilience of a disaster-affected community, as these buildings not only offer shelter, but also public services and aid (Mayunga, 2007:8).

- Natural Capital

This domain refers to natural resources for example minerals, oil, water and land as well as the ecosystem in which these resources function. According to Mayunga (2007:8), natural capital is necessary to sustain all forms of life and is therefore also a major role-player in determining a disaster affected community's resilience.

Mayunga (2007) discusses all five of these domains at length and why they are deemed necessary to adequately ascertain the coping capacity and resilience of any community. However, in this study, social and human capital are considered because mobile phones can have a direct impact on the outcome of these two capital domains, as social capital refers to class, ethnicity,

community structure and community decision-making processes, while human capital considers education, skills and knowledge (MacKendrick & Parkins 2004:4; Yodmani, 2001:4).

While the advancement of capital domains significantly reduces the effects that disasters have on communities, especially older persons are considered as a vulnerable group because of their advanced age, physical limitations and being more prone to illness.

3.3 Disasters and older persons

Much has been written about how older persons are affected by disaster situations and how they respond to them (Wisner *et al*., 2012). As mentioned above, older persons are often more vulnerable to the effects of disasters because of several factors, which will subsequently be discussed.

3.3.1 Older persons' vulnerability

The 1997 Health Impact Surveillance System for Disasters Report states that the age group of people older than 60 consistently has the highest number of death rates in disasters (CDA-ARC, 1997). Rosenkoetter *et al*. (2007) found that 15% of respondents in a study, between the ages of 60 and 90, would not be able to evacuate their homes without any assistance. This was also apparent during hurricane Katrina as many of older adults were unable to evacuate their homes; 32% had some sort of physical disability, while 17% required special equipment just to get by in their daily lives (McGuire *et al*., 2007). Some other major contributors to their vulnerability were insufficient financial independence, absent families and safeguards not being in place (McGuire *et al*., 2007). Gibson (2006) indicated that over 13 million adults in the world over the age of 50 would need assistance to help them evacuate should a disaster situation arise.

Tuohy and Stephens (2012:1) state that there are two social concerns facing older persons in the 21st century. The first being the ever-increasing concern of climate change and weather extremities. The second is the growing demographic of older persons, with more people getting older. Tuohy and Stephens (2012:1) state that the population growth of people at the age of 65 and older is predicted to increase from 550 million in the year 2000 to 973 million in 2030. This is an increase of almost double the number of older persons, globally, in a span of 30 years. An increasing number of older persons will therefore be affected by disasters as this population group keeps on expanding.

The above statement is supported by data indicating that most people, according to age, who died because of the 2004 Tsunami in Indonesia were aged above 60 (WHO, 2008:4). More recently, Barusch (2011:2) found that 65% of the people that died in Japan's 2011 earthquake and tsunami were aged 60 or older. This statistical data from recent disaster situations confirms that older persons have a greater vulnerability at times of disaster than their younger fellow citizens. Evans (2010:3-5) indicates that a few contributing factors combine to increase the vulnerability of older persons to disasters, such as poverty, illness[8] and cognitive and emotional response to disasters.

According to Phifer (1990:1), one main reason why older persons are more likely to be vulnerable at times of disaster, is because they are less likely to receive warning (Al-Rousan *et al*., 2014:5; Phifer 1990:1). By the time the elderly receive warning of a potential disaster, the result could be fatal.

Rosenkoetter *et al*. (2007:1) elaborate on this by stating that it is often difficult to evacuate older persons because of the physical constraints they might have. What makes this fact worrisome is that in addition to this, some older persons are often less mobile, have declining health and are sometimes more reluctant to relocate (Barusch, 2011:2; Phifer, 1990:1). This situation was evident during the events surrounding hurricanes Katrina and Rita. A further problem adding to this dilemma is the efficacy of the evacuation of older persons at times of disaster, because of the said physical holdbacks and illnesses. According to Rosenkoetter *et al*. (2007:1), the events surrounding the hurricanes Katrina and Rita have re-emphasised the "need for effective preparedness", especially regarding older persons at the time of a disaster. While the evacuation of older persons during disasters remains a problem, it is important to note that older persons' risk of being affected by a serious illness during or after a disastrous occurrence, is higher than the risk faced by younger people (Rosenkoetter *et al*., 2007:2).

Rosenkoetter *et al*. (2007:1) highlight the fact that older persons are frail and can sometimes have conditions affecting their physical, cognitive and psychosocial well-being, which in turn heightens their vulnerability in a disaster (Al-Rousan *et al*. 2014:5; Rosenkoetter *et al*., 2007:1). Bei *et al*. (2013:1) elaborate by stating that there is an ever-increasing amount of literature on the psycho-social effects that disasters have on elderly victims. The most common of these are post-traumatic

[8] Underlying conditions such as cardiovascular and respiratory disease also contributes to high mortality during disasters (Evans, 2010:4)

stress disorder (PTSD), followed by emotional numbing, heightened arousal and avoidance (Chandran *et al*., 2015:2; Bei *et al*., 2013:1). In their study, Bei *et al*. (2013:10) also found that older persons have increased needs during disasters, such as access to community services, health and medical care and they also tend to be more vulnerable to disruption (Bei *et al*., 2013:10). Bei *et al*. (2013:10) furthermore mention that older persons become increasingly vulnerable to the effects of a disaster when their access to local community services and centres, as well as medical care are disrupted. Al-Rousan *et al*. (2014:5) state that many older persons have limited financial income, as mentioned regarding economic capital, which also increases their vulnerability. In the end, it is important to note that older persons have "unique needs, beliefs and circumstances" that affect their coping ability in difficult times when a disaster occurs (Rosenkoetter *et al*., 2007:2).

However, the WHO (2008:4) report makes special mention of the fact that older persons should not only be regarded as a frail and vulnerable group. The report states that although older persons make up a large part of the population and are more vulnerable during disasters, it is important to remember that this does not mean that older persons are more vulnerable in general. The WHO (2008:4) notes that older persons serve as an excellent resource for their respective families in terms of their years of experience and practical knowledge and that they can be outstanding examples of personal resilience and inspiration; closely related to the human capital as discussed earlier in this chapter. Older persons' knowledge and experience can benefit the community at large and that is why the WHO (2008:4) report states that this group should be included in disaster planning and strategies, not only to reduce their risk, but to also use them as resources to alleviate the risk of others as well (WHO, 2008:4). This view is supported by the Sendai Framework for Disaster Risk Reduction 2015-2030, which recommends that older persons, because of their wealth of experience, knowledge and skills should be included to assist with policy design and to help form plans and mechanisms for disaster reduction (United Nations, 2015:21)

3.3.2 Older persons and disaster preparedness

Henderson *et al*. (2010:2) note that the best way to cope with a disaster is to be prepared for it. However, in a disaster preparedness survey by Al-Rousan *et al*. (2014) among older persons in the USA, they found that over two-thirds of the participants have never been involved in any disaster-preparedness education, nor have they ever had a disaster emergency plan (Al-Rousan *et al*., 2014:5). As mentioned previously, the financial shortcomings of older persons often impact their resilience to disaster risks negatively, mainly because there is a correlation between older

persons with a low income and lesser disaster preparedness. Al-Rousan *et al*. (2014:5) state that the lack of income also contributes to a lack of communication equipment, thus resulting in a higher need for effective disaster planning.

Al-Rousan *et al*. (2014:5) suggest that there is in fact a great need for a "comprehensive emergency preparedness plan through cross-sector collaboration". This cross-sector collaboration is necessary to "identify and meet the specific needs of vulnerable older adults" (Al-Rousan *et al*., 2014:5). Kang (2014:1) makes special mention of the fact that when discussing and strategising the disaster preparedness of older persons, and especially those who are vulnerable, it is necessary to follow a "bottom-up" approach. This statement links to the view of Benadusi (2014:2), who states that this approach is necessary when dealing with capacity development, as mentioned previously in this chapter. Kang (2014:1) goes further and explains that this bottom-up approach, when considering disaster preparedness of vulnerable older persons, should directly "canvas the views of older persons" and formulate practical solutions to improve preparedness based on their views. This view links to the importance of local knowledge as mentioned previously and two-way communication and environmental scanning as mentioned in Chapter 2.

Duggan *et al*., (2010:3) state that their findings, based on research about older disaster survivors in both Sri Lanka and the USA, show that participants acknowledge the fact that they need to be prepared for disasters but that they unfortunately lack the necessary information to do so. All the participants in the study conducted by Duggan *et al*. (2010:3), stated that they had never received any information regarding disaster preparedness. Kang (2014:1) reiterates that disaster preparedness planners have only recently begun to understand the need to communicate with this group to fully understand their needs when a disaster occurs. Duggan *et al*. (2010:3) even explored different sources through which information could have been distributed such as mail, media and literature. Duggan *et al*. (2010:3) therefore concludes that it is important to empower older persons for them to voice their needs and in doing so their needs can be attended to. Deeny *et al*. (2010:3) elaborate by stating that older persons have life experience which needs to be heard, especially concerning disaster preparedness, meaning that their local knowledge can be used as a resource to enhance preparedness. Asking the correct questions and facilitating the necessary communication, can therefore aid in the disaster preparing phase of disaster management (Deeny *et al*., 2010:4), which refers to engaging in two-way communication with older persons. One of the ways in which to engage with older persons, is by means of mobile phones.

3.4 Mobile phone use in South Africa

Consumers today are more connected than ever before due to the proliferation of digital devices (e.g. smartphones[9], tablets) and digital platforms (Nielsen, 2014). On the African continent, mobile phone subscriptions have increased from 87 million in 2005 to 685 million in 2015 (ITU, 2015). According to Kurniawan (2008:1), mobile phones are rapidly becoming the number one feature of today's society, with South Africa being no exception. The total number of mobile phone subscriptions in South Africa in the year 2012, stood at 68,3 million compared to 8,3 million subscriptions in 2000 (ITU, 2013). According to statistics from Kemp (2016), there were 85,53 million mobile connections in South Africa in January 2016. A quick calculation suggests that in the space of 12 years, the total number of mobile phone subscriptions in South Africa have increased by 720% while the number of mobile phone subscriptions penetration rate in South Africa stands at 68% with 37.5 million unique subscribers (MyBroadband, 2017).

According to Peyper (2013:1), this number is quite believable, as a study conducted by infoDev (2013) revealed that more than 75% of people 15 years and older, who falls within low-income groups in South Africa, own a mobile phone. Added to the previous is the fact that almost half of the more than 50 million people in South Africa, live below the poverty line. The World Bank (2015) reports the total number of mobile phone subscriptions in South Africa in 2014 were 150 per every 100 people. This means that on average every South African owns 1,5 mobile phones.

The invention and development of the mobile phone have opened vast amounts of opportunities in various fields of study and it changed the way in which we communicate forever. More important, the advent of mobile phones have created endless possibilities for communication practitioners and disaster managers alike. According to Meltzer *et al*. (2014:1), the advancement of mobile technology and the way in which it is used to communicate is changing continuously and therefore messages need to be constantly adapted to ensure effective disaster risk communication processes. This has been prevalent in disastrous situations such as hurricane Sandy where the use of mobile technology was one of the successes of managing the disaster, for example, by using news and alert applications to inform people who could possibly be affected by the disaster (Meltzer *et al*., 2014:1-2).

[9] "A smartphone is a cellular telephone with an integrated computer and other features not originally associated with telephones, such as an operating system, Web browsing and the ability to run software applications" (Rouse, 2007).

3.5 Older persons' mobile phone use

As mentioned previously, human and social capital are focal points in this study, and mobile phones have the possibility to improve both these capitals in at-risk communities, and especially at-risk older persons.

According to Nycyk and Redsell (2011), older persons can be motivated to use modern technology when they see their grandchildren and younger people using computer technologies and/or by major life events such as the migration of a child away from the family home where electronic contact through mobile phones might be the only viable option to use. However, the motivation for older persons to learn these technologies, emerges mainly in those social contexts where there are collaborative learning processes based on the support and help among peers or a younger generation (Gonzales *et al*., 2012).

3.5.1 Advantages of mobile phones for older persons

The difficulties older persons face daily, which is also a major contributor to their vulnerability at times of disaster, have been discussed at length. According to Feist *et al*. (2010:1), older adults, especially in rural areas, face various issues such as the distance from health care facilities, social connectivity and accessibility to basic services. However, Feist *et al*. (2010:1) argue that new technologies such as mobile phones can aid older persons significantly in their connectivity to the outside world. Furthermore, mobile phones also offer ubiquitous communication and full-time access to vital services, improved personal communication, security by means of instant communication, social integration and overall autonomy that are of great importance to older persons' security and autonomy (Abascal & Civit, 2001:1).

Gusmano and Rodwin (2010:1) found that many older persons are socially isolated and tend to be invisible in society. Gusmano and Rodwin (2010:1) note the unfortunate fact that it often requires a crisis situation to bring forth the "issues of social isolation and vulnerability among older persons to the policy agenda". This was especially visible during the 11 September 2001 terrorist attacks in the USA, which left thousands of older New Yorkers isolated immediately after the attacks were carried out (O'Brien, 2003).

Feist *et al*. (2010:2) state that it is necessary for older persons to engage with new technologies, as "technology has emerged as a fundamental component of many everyday activities in society." Feist *et al*. (2010:2) point out that in a world where there is an increasing reliance on technology, it is of utmost importance that older persons are motivated to adopt and embrace new

technologies; technological improvements, such as mobile phones, can drastically increase their quality of life and disaster risk resilience. This is because technology such as mobile phones can provide older persons with better access to information regarding their community and be used as a tool to connect with their family, friends and community (Feist *et al*., 2010:2). This sense of community, which can be achieved by means of mobile phones, also correlates to social capital (Mayunga, 2007:7), as discussed previously in the chapter.

This becomes even more important as older persons' mobility and physical health start to decline (Feist *et al*., 2010:2). Feist *et al*. (2010:2) make a telling statement by saying that this topic, using technology to enable older persons to stay connected with others, is "under-utilized and under-researched" (Feist *et al*., 2010:2). This view, that older persons are gradually becoming more inclined to make use of new technologies, can offer some major reprieve for disaster managers.

3.5.2 Needs concerning older persons' mobile phone usage

It must be mentioned that older persons often have a totally different approach to technology than younger people (Conci *et al*., 2009:1). This can be attributed to the changes brought on by ageing to motor, sensory and cognitive ability (Conci *et al*., 2009:1). Conci *et al*. (2009:1) therefore argue that older persons might need more time to master new technology, be more prone to errors and would require more detailed steps to operate the device functionally. Gonzalez *et al*. (2012:1) however argue that for older persons to stay knowledgeable and up to date in old age, it is necessary for them to learn and use new technologies. This is also a prerequisite of older persons' ever increasing demand to integrate within an ever-evolving society (Gonzalez *et al*., 2012:2).

It is noted however, that older persons have different needs regarding their mobile phones than younger adults do, which should be considered when developing a disaster risk communication plan. Zhou *et al*. (2013:1) state that older persons do not make use of the same number of functions on their mobile phones as younger adults do. It is widely believed that older persons generally use their mobile phones only to send and receive text messages and make and receive phone calls (Zhou *et al*., 2013:1). Zhou *et al*. (2013:1) further state that older persons mostly are not receptive to use new functions and applications on their phone, mainly because new functions on phones do not take their specific requirements into account. On this point, Renaud and Van

Biljon (2010:1) argue that the design of mobile phones for older persons should be worth-centred[10] and consider the specific needs that older persons have regarding their mobile phones. This eventually also have a major effect on older persons' adoption of mobile phones (Renaud & Van Biljon, 2010:2).

According to Renaud and Van Biljon (2010:2), older persons often become frustrated by the "unrestrained explosion of features" that mobile phones offer, which just keeps on expanding as technology develops. This contributes to older persons often experiencing a feeling of helplessness when they perceive that they cannot cope with the cognitive requirements necessary to operate a modern day mobile phone (Renaud & Van Biljon, 2010:2). However, Renaud and Van Biljon (2010:2) especially mention the fact that older persons view mobile phones as a necessary tool to assist them with security, as well as autonomy. Renaud and Van Biljon (2010:2) state that older persons generally concede that they do have the desire to understand their mobile phones better to use it more effectively and feel more in control and secure.

Renaud and Van Biljon (2010:2) states that while there is a general belief among mobile phone users the world over that 'more is better', when considering older persons the exact opposite is true. When considering older persons and mobile phones, the general rule of thumb is that 'less is better', explaining that simplified phones with limited functionality often serves older persons' needs better (Renaud & Van Biljon, 2010:2).

Renaud and Van Biljon (2010:4) state that the mobile phones preferred by older persons is a phone that satisfy their needs while the phone is easy to understand and operate. Renaud and Van Biljon (2010:4) therefore outlines the considerations when contemplating older persons' adoption of mobile phones.

- Autonomy

The mobile phone market for older persons generally focuses on security-related issues. According to Renaud and Van Biljon (2010:4), older persons use mobile phones to make them feel less vulnerable. This is especially true because older persons are often alone at home and a

[10] According to Renaud and Van Biljon (2010:1), worth-centred mobile phone design refers to the maximisation of mobile phone effectiveness whilst considering and accommodating the reduced capabilities of the user.

mobile phone gives them the assurance that they can contact anybody when in need, thus giving them the means to go out on their own (Renaud & Van Biljon, 2010:4; Abascal & Civit, 2001:2).

- Relatedness

As mentioned in the previous section, older persons are often more alone as they age, mostly because they are less involved with other people as well as experiencing health issues. Older persons view their phones as an extremely important device to maintain interpersonal relationships with other people (Renaud & Van Biljon, 2010:5). This need of older persons also relates to the social capital domain by which people reduce their vulnerability because of a sense of community and relationships (Mayunga, 2007).

- Competence

Mobile phones offer older persons the means to gather information that they previously usually received from other people (Renaud & Van Biljon, 2010:4). The mobile phone is starting to replace the television as main source of information. The advent of the mobile phone has made it possible to easily access the internet, and as the rest of mobile phone users also use their mobile phones to access the internet, Renaud and Van Biljon (2010:5) argue that older persons are not much different, but that they need more assistance from the phone itself to become more accessible.

- Physical and mental limitations

Older persons often struggle to find features on a mobile phone because of their declining physical capabilities and therefore do not make use of mobile phones. Renaud and Van Biljon (2010:5) state that older persons often do not understand the menu system that is employed by mobile phone devices. Older persons prefer easy menu's that are simple to navigate and find features. Furthermore, older persons often enjoy using large screens and adjustable fonts as their eyesight declines as they age. They tend to prefer large buttons which are easy to press as older persons' manual dexterity decreases with age (Renaud & Van Biljon, 2010:5). Renaud and Van Biljon (2010:5) additionally mention that older persons often have trouble hearing and require mobiles that have a loud ringtone.

- Decreased learning rate

Renaud and Van Biljon (2010:5) state that as people age they move and perform slower and with less precision. Therefore, they often take longer to learn their mobile phone navigation menus as they have a reduced visual processing speed. However, older persons' ability to learn is not impaired, but the rate at which they learn are significantly reduced (Renaud & Van Biljon, 2010:5).

One can see from the above discussion that older persons use mobile phones, but they face several constraints in this regard. In the next section, the use of mobile phones as a communication medium in a disaster risk context is discussed.

3.6 Mobile phone use in the disaster risk communication context

The diversity of the mobile phone and more specific, the smartphone, can be considered as a very effective disaster communication tool (Meltzer *et al*., 2014:1). Even though most people have their mobile phones on them more often than not, the functionality and the various ways in which information can be disseminated via a mobile phone makes this device an exceptional medium to communicate with, especially in times disasters occur.

3.6.1 Advantages of mobile use in the disaster risk communication context

Bodoff (2003:2) refers to three types of technology-based approaches utilised by older persons: enabling technologies, automation technologies, and connection technologies. Enabling technologies allow older persons to do more for themselves and live independently. Automation technologies can be used for remote monitoring of health and household daily living, and streamlining service provision. Finally, connection technologies can promote richer contact with friends, family and work colleagues and create opportunities for personal growth and further education.

According to Meltzer *et al*. (2014:1), the smartphone applications that are able to assist disaster risk management can be divided into five categories, namely: news and alert notification, location sensing and hazard maps, disaster message boards, follow-up applications[11] and educational applications.

Mobile phones can first and foremost make phone calls when telephone lines are down while it is also possible to make use of messaging services via a mobile phone. Smartphones also have the added ability to access GPS satellites that can help people when they are isolated. Furthermore, one can download several applications that can assist with education (disaster trivia, preparedness guide, first aid information, global emergency numbers), a flashlight, first aid advice,

[11] "The term *application* or *app* is a shorter form of *application program*. An application program is a program designed to perform a specific function directly for the user or, in some cases, for another application program" (Rouse, 2007).

emergency numbers, panic buttons, compasses and disaster news (Meltzer *et al*., 2014:2; Collins, 2009:2).

Collins (2009:2) points out that the American Corporate Council's West Central Florida Chapter learned how a simple device like a mobile phone could effectively be used in disaster planning. Collins (2009:2) specifically mentions how disaster preparation, response and recovery can be aided using GPS-enabled smartphones. The development of various weather-related applications also benefit disaster response and recovery (Collins, 2009:2); for example, an application that broadcasts a warning when severe weather conditions are eminent. Furthermore, mobile phones can have a significant influence on specifically disaster preparedness with the ease of access to pertinent information regarding probable disaster situations (Collins, 2009:2). This information can include weather warnings and transportation solutions during probable evacuations (Collins, 2009:2).

The UNISDR (2004) states that one of the main reasons for loss of life during an emergency or disaster is because of the lack or delay of information containing early warning messages. According to Aloudat *et al*. (2013:1), the mere existence of a mobile device can make way to employ location-based services (LBS) for specifically this purpose, disseminating timely warnings to those who will probably be affected by a certain disastrous event.

With the application of location-based services, disaster management centres have the means to notify stakeholders of potential threats and ways of action (Aloudat *et al*., 2013:1). According to Samsioe and Samsioe (2002), location-based services is based on three key characteristics: estimating the location of a mobile device, produce a service based on the estimated location such as developing a text message when floods or fires are present, and deliver a location-based service centred on the location of the device, which indicates that the message will then be delivered to handsets based in that specific location. With this function, it would be quite feasible to utilise these services for geo-specific emergency purposes and inform residents of imminent dangers via a text message, which they opt to receive, as all handheld devices have the capability to receive messages in this manner (Aloudat *et al*., 2013:1).

This access to information via mobile phones, as mentioned by Collins (2009), have endless possibilities for the field of disaster risk communication. This is eminent in a recent case study conducted in South Africa by Quan *et al*. (2014). The authors studied the effects that timeous notifications had on limiting and eliminating malaria diagnoses. According to Quan *et al*. (2014:1), surveillance and the timely follow-up of diagnosed malaria cases, is a "key component of the

malaria elimination strategy in South Africa". In this study, a nurse was employed to use a smartphone to report all malaria cases to the provincial malaria control programme in a rural, malaria-prone area in South Africa. In turn, a text message was sent to the local malaria investigator for each positive case. Quan *et al*. (2014:2) state that this method of communication significantly improved the number of cases which were followed up within 48 hours in a rural area. This small case study sheds light on the many possibilities mobile technology have created regarding healthcare and specifically disaster preparedness and reduction.

Meltzer *et al*. (2014:1) wrote that implementing mobile phones as a communication channel into existing disaster management structures is key, as the use of it can address very specific needs because of the diversity it offers. In the study conducted by Meltzer *et al*. (2014:8), the authors note that mobile phone applications can be used very successfully in different roles in the various stages of the disaster management process. These roles include raising awareness when specific risks arise, encouraging protective behaviour, informing vulnerable groups (read older persons), informing users on the appropriate behaviour needed when a disaster occurs, as well as providing support to affected communities. These roles that a mobile phone can fulfil, directly aligns with the types of disaster risk communication which Demeritt and Nobert (2014) proposed when considering the various models of risk communication, as discussed in section 2.4.2.1. Mase (2011:2) notes that when a disaster occurs, the post-disaster period can be cumbersome as various infrastructure – including buildings, electrical supply and telecoms – can be damaged, out of order or even inaccessible. The availability of mobile phone devices with mobile connectivity in this circumstances is therefore of utmost importance (Mase, 2011:1). Mase (2011:1) further explains that maintaining an open communication channel between rescue workers and affected individuals is essential. This is also true when considering older persons and disastrous situations.

3.7 Older persons' use of mobile phones for disaster risk communication

Considering the increase in life expectancy and changing age profiles in populations, disaster risk communication aimed at older persons becomes increasingly important. The disaster risk communication needs of older persons are parallel with the exponential growth in application of information and communications technology (ICT) to social and health care and a range of associated aspects (Feist *et al*., 2010:1). ICT is rapidly changing the context within which people age, how they live, and the possibilities to communicate with them.

New technologies (especially mobile phones) offer the potential for increasing quality of life for older persons, including improved access to community information, integrated service delivery,

promotion of lifelong learning and self-efficacy, and as a medium to connect with community, family and friends (Feist *et al*., 2010). These offerings directly address the basis on which the social and human capitals are built, as discussed previously in this chapter (Mayunga, 2007). Within a developing country context and against the backdrop of a lack of formal care models for older persons, there is a general expectation that ICT applications in general and more specifically mobile phone technology, will play an increasing important role in the support and care management of older persons, especially regarding their communication needs (Feist *et al*., 2010:2).

This is particularly relevant in view of the deep penetration of mobile technology in even the most resource-constrained environments. Older persons' use of mobile technologies, mainly mobile phones, has been well-researched in developed country contexts in terms of their usage patterns, literacy and economic status. People over 65 use mobile phones for very limited purposes and they avoid using more complex functions (Kurniawan *et al*., 2006). Nevertheless, the most pervasive trend in information and communication technologies is of ever-increasing importance in the everyday life of older persons (Feist *et al*., 2010).

The argument is thus made that mobile phones offer vast opportunities to communicate not only in a one-way information sharing manner, but can also be used to establish a two-way conversation to acquire the local knowledge of the older community members and determine their needs towards disaster preparedness. It is thus argued that mobile phones can be used to build trusting relationships between older persons and relevant RCA's. This potential of mobile phones can therefore be utilised by policy makers as well as RCA's to receive information from older persons to adapt their strategies and views accordingly, as has been suggested by the two-way symmetrical communication paradigm. By keeping this in mind, mobile phones can therefore also be used to strengthen the relationship between older persons and RCA's.

3.8 Conclusion

In this chapter, the role that mobile phones can play in disaster risk communication were discussed. The special needs that older persons have regarding mobile phone adoption, as well as the mobile phone's role in a disaster risk communication were also outlined. It was found that although older persons, because of various physical shortcomings, often struggle to utilise mobile phones and especially smartphones to their full capacity, the mobile phone still offers potential for RCA's to establish a two-way conversation with older persons. The mobile phone can also be

used to build trust and strong relationships between RCA's and the older persons, effectively enhancing the latter's resilience to disaster risks.

It is therefore, as mentioned in the previous chapter, of utmost importance that strategic communication management takes centre stage when planning and developing disaster risk communication strategies. Within these strategies, the use of mobile phones as medium of communication with older persons must be highlighted. Especially when taking into account that older persons are often more vulnerable to disastrous occurrences because they might experience physical difficulty.

Furthermore, it was noted that older persons have a vast amount of indigenous knowledge which could aid disaster management centres significantly and in this endeavour the connecting with older persons by means of mobile phones becomes of utmost importance.

It was stated that not only does the use of mobile phones increase the quality of life for older persons and give them access to more services, but mobile phones can significantly enhance older persons' coping capacity towards disasters.

The next chapter outlines the research methodology which was employed by this study to first establish the mobile phone usage trends of older persons in the TLM and second to determine the TDMC's stance to and thinking about older persons and the use of mobile phones for disaster risk reduction.

CHAPTER 4: METHODOLOGY

4.1 Introduction

In the previous two chapters, the first argument indicated that a disaster is not always a sudden event and that for the most part, disasters can be planned for. Second, in disastrous times, certain groups of people tend to be more vulnerable than others, based on their financial or social standing, health, the infrastructure that surrounds them or the support of their community. It was stated that older persons tend to be more vulnerable at times of disaster because they often have declining health, limited mobility and lack of interpersonal relationships and support. Third, it was stated that disaster risk communication can significantly enhance the resilience of older persons towards disaster risks. Furthermore, the principles that underline disaster risk communication are shared in the two-way symmetrical communication paradigm. This include mainly the building of trustworthy relationships between an organisation and its stakeholders by means of creating dialogue between all parties. This relationship is characterised by the willingness of all parties to accept certain power shifts within the relationship and to be open to persuasion by the other. Lastly, it was hypothesised that mobile phones can be an excellent communication medium to be used by RCAs to assist older persons before, during and after a disaster. Older persons' needs regarding mobile phones were also discussed to enlighten the reader on the ways in which older persons usually prefer to use their mobile phones.

Chapter 1 briefly discussed the data collection methods which were employed in this study. This chapter further discusses the research design and methods that were utilised to collect the data to answer the research questions as laid out in Chapter 1. This chapter therefore discusses the research design of this study and motivate why a mixed-method research process was chosen for this study. The data analysis procedure, reliability and validity of the data and the ethical considerations of this study are finally discussed.

4.2. Research approach

For the purpose of this study the qualitative research approach with mixed methods research was implemented. According to Curry *et al*. (2009:1), qualitative research is a "form of scientific inquiry that spans different disciplines, fields and subject matter and comprises many varied approaches." Importantly, Curry *et al*. (2009:1) add that qualitative research can be specifically used to highlight different aspects regarding the research problem because qualitative research is often exploratory in nature.

Hesse-Biber (2010:1) states that a qualitative research approach's main aim is to understand how individuals derive meaning from their world. Babbie and Mouton (2010:270) add that qualitative research is especially useful to help the researcher understand the attitudes and behaviour of people within a natural setting. Hesse-Biber (2010:1) continues by explaining that the socially constructed world is not something that is void of individuals' perceptions, but is rather formed by the interactions that individuals have with the world around them. Qualitative research is adept at helping the researcher understand the world through the eyes of the actors within that world. This, according to Babbie and Mouton (2010:271), is one of the core principles of qualitative research.

Babbie and Mouton (2010:271) further state that the qualitative researcher should attempt to become more than just an observer in this 'natural setting', but rather put themselves in the shoes of the participant to better understand his/her world. It is for this reason that Leedy and Ormrod (2001:141) state researchers can consider using qualitative research when they want to achieve the following:

- Description

Qualitative studies can reveal multifaceted situations, settings, relationships, people and systems in a descriptive manner.

- Interpretation

Qualitative research can help a researcher gain more insights about a specific phenomenon and develop new concepts or theoretical perspectives about that phenomenon.

- Verification

Qualitative research allows the researcher to test whether certain assumptions made are true in a real-world context.

- Evaluation

Qualitative research provides a researcher with the means to judge the effectiveness of policies, practices and innovations.

Curry *et al*. (2009:2) adds that a qualitative research approach can be successfully employed to gain a deeper understanding of a certain research problem and most important, to "gain insights into potential causal mechanisms" (Curry *et al*., 2009:2). It is therefore insightful to note that Hesse-Biber (2010:2) states the qualitative research approach encompasses many research traditions. At the core of these traditions lies the notion that reality is socially constructed, which

also relates to the focus of this study. It is for this reason that a qualitative research approach was followed in this study with a mixed-method data collection process.

4.3 Research design

According to Creswell (2009), the use of mixed methods research have become more popular over the last 25 years. Various authors have described the implementation of mixed methods research within a qualitative approach (Johnson & Schoonenboom, 2016; Hesse-Biber, 2010; Curry *et al*., 2009) with Hesse-Biber (2010:2) stating that "the deployment of a qualitative methodology does not rule out the use of quantitative methods." Ivankova *et al*. (2007:254, 260) therefore posits that although the use of mixed methods research is relatively new, by using both qualitative and quantitative research methods, a researcher can construct and gain knowledge on real-world issues while placing more emphasis on the research questions rather than on the specific method used to collect data.

When used in combination, quantitative and qualitative methods complement each other and allows the researcher to conduct a more complete analysis of the research problem (Ivankova *et al*., 2007:261). Ivankova *et al*. (2007:261) state that mixed methods research can be implemented to address various research problems one might encounter. Mixed methods research can therefore be used to (Ivankova *et al*., 2007:261):

- gain an in-depth understanding of certain trends and patterns within a certain context;
- generate and test certain theories;
- study diverse perspectives of different entities;
- develop new measurement instruments; and
- understand the relationship between different encountered variables.

In mixed method research collected data are numerical (quantitative) as well as text-based (qualitative) and the researcher chooses variables and units of analysis that would be the most appropriate to address the specific study's research questions (Ivankova *et al*., 2007:260). According to Cresswell *et al*. (2003), there are four main reasons why a researcher would decide to employ mixed methods research, therefore combining qualitative and quantitative research methods into one study:

- to explain or elaborate on results achieved via quantitative research with follow-up qualitative data;

- to use qualitative data to develop a new measurement instrument or theory that is subsequently tested with quantitative research;
- to compare qualitative research results with quantitative data to produce a well-validated conclusion where the results of both research methods are taken into account; and
- to enhance a certain study with a subsequent data set, be it either quantitative or qualitative.

A sequential exploratory mixed method research design was followed in this study. The main aim of this design was to use the qualitative research data to enhance the quantitative results, to eventually produce a validated conclusion as mentioned in the fourth reason for conducting mixed-method research. Ivankova *et al*. (2007:264) state that an exploratory mixed-method research design is one of the most well-known designs in mixed-method research approaches.

In a sequential exploratory mixed-method research design, the quantitative and qualitative data are gathered and analysed separately (Creswell & Plano Clark, 2011). Thereafter, the two types of data will be integrated and compared to enable interpretations (Ivankova *et al*., 2007:264). Creswell and Plano-Clark (2011) state that the qualitative data in sequential exploratory mixed-method designs is usually gathered before the quantitative data, but in the study at hand the quantitative data was gathered first. According to Merriam and Tisdell (2016:47), an exploratory design is usually implemented when little is known about the population being studied and the data gathering methods are used to 'explore' in order to obtain a more detailed understanding. This notion is emphasised by Hesse-Biber (2010:71), who states that sequential designs are employed in qualitative studies whereby the quantitative data is in fact in service of the qualitative data. Hesse-Biber (2010:71) highlights that the qualitative component in a sequential exploratory mixed-method design is "primary and is used to generate theory or specific theoretical constructs." In this study it was necessary to first obtain information on older persons' mobile phone usage, where after qualitative data from semi-structured interviews provided grounds on which theory can be developed. The mixed method research design is therefore used in cases where the researcher wants to make a well validated conclusion (Ivankova *et al*., 2007:264).

4.4 Research methods

Each specific research aim was derived from the research questions, which implies that answering the research questions leads to attaining the research aims set for this study. The first two research questions are concerned with the theoretical background and orientation to the study. Research questions 3 and 4 address the outcomes of the study since it is concerned with the findings of the study.

4.4.1 Literature review

First, a literature review was conducted to answer research questions 1 and 2. According to Du Plooy (2009:64), the purpose of a literature review is to:

- establish what research has been conducted in the specific research field and to determine whether the literature contains certain discussions regarding the specific field of focus and from which theoretical perspectives the research problem can be approached;
- establish which research methods have been used to gather the abovementioned knowledge;
- establish results that have been generated by these research; and
- enquire what was done with the results.

The first research question was answered in Chapter 2 by studying the literature relating to the two-way symmetrical communication paradigm and disaster risk communication. In Chapter 1 the first research question is stated as:

> *What is the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm according to literature?*

From the literature review the following central theoretical statements were formulated:

Table 4.1 – Central theoretical statements

Central theoretical statement 1	Communication management, according to the two-way symmetrical paradigm, have the following key features: • the communication management function has a strategic managerial role; • the senior communication practitioner should function as a strategist performing environmental scanning; • to conduct environmental scanning, the strategist needs to engage in two-way communication with stakeholders; • environmental scanning and two-way communication should lead to strong organisation-stakeholder relationships characterised by: • trust; • mutual control; • commitment; and • relationship satisfaction.
Central theoretical statement 2	Disaster risk communication as informed by the two-way symmetrical communication paradigm comprises the following key aspects: • at-risk communities have definitive communication needs that should be addressed: • they require clear and direct information; • communities want to participate in disaster management decision-making processes; • disaster communication should be focused on the community; and

	• clear rules and procedures should be set regarding the disaster process. • two-way communication contributes to a trusting relationship between disaster centres and the community; The most important relationship building strategies (incorporating those identified by Hon and Grunig (1999)) to be applied in a disaster risk environment are: • the disaster centre should display knowledge and expertise; • the RCA should be open and honest towards the community; and • the RCA must show concern and care for the community.

The second research question was also answered by means of a literature review. In Chapter 3, literature regarding older persons' mobile phone use, with emphasis on the use of mobile phones for disaster risk communication, was presented. In Chapter 3 the second research question was given as:

> *What is the role of mobile phone usage, specifically* older persons*' mobile phone usage, within the framework of disaster risk and two-way symmetrical communication according to literature?*

From this literature review, the following key points regarding older persons' mobile phone use and disaster risk communication were identified:

- older persons are often more vulnerable to disastrous occurrences because they might experience physical difficulty;
- older persons have a vast amount of local knowledge which could aid disaster management centres;
- mobile phones can significantly enhance older persons' coping capacity towards disasters; and

- the use of mobile phones can increase the quality of life for older persons and give them access to more services that will help to reduce their vulnerability.

As mentioned above, in this study an exploratory mixed-method research design was deemed appropriate to answer research questions 3 and 4, as stated in Chapter 1. First, quantitative data was collected in the TLM among older persons to establish their mobile use patterns to answer research question 3:

4.4.2 Phase 1 - Quantitative data gathering by means of surveys

In Chapter 1, the third research question was given as:

What is the mobile phone usage of older persons *in the TLM currently?*

According to Maree and Pietersen (2007a:145), quantitative research can be summed up as follows:

> "Quantitative research is a process that is systematic and objective in its ways of using numerical data from only a selected subgroup of a universe (or population) to generalize the findings to the universe that is being studied."

This entails that the researcher make certain assumptions about a group or population based on numerical data gathered in a quantitative way, if a certain section of the chosen population are represented in the sample group (Maree & Pietersen, 2007a:145). Maree and Pietersen (2007a:145) further state that there are three main elements in quantitative research that are always present, namely: objectivity, numerical data and generalisability.

Du Plooy (2009:30) states that a quantitative approach may be followed when an objective and value-free reality exists, which can be researched and adds that communication, which forms part of the social world we live in, can objectively be measured by quantitative research.

A quantitative survey was administered in order to answer the abovementioned research question, enabling the researcher to establish the difficulties older persons experience regarding the use of their mobile phones. Furthermore, mobile phone usage patterns were recorded by means of a Likert-scale.

The quantitative phase of this research took the shape of a non-experimental survey design with descriptive and exploratory features (McCutcheon *et al*., 2010). While an experimental design employs pretesting and post-testing after being subjected to some type of stimulus (Babbie &

Mouton, 2010:215), the non-experimental design do not employ a pre- and post-test formula and only establish a trend or the situation as is (McCutcheon *et al*., 2010). It is important to note that during this phase of the research the researcher merely wanted to establish what difficulties older persons experience regarding their mobile phones, as well as their mobile phone usage patterns. For this purpose, a non-experimental survey design was deemed sufficient.

Furthermore, a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population (Creswell, 2009). As the sample population was representative of the population, it was deemed sufficient to establish the mobile usage patterns of the specific population by employing a survey design.

4.4.2.1 Data gathering

The quantitative data was collected and administered by fieldworkers on mobile devices. The fieldworkers were therefore able to assist the respondents with answering the survey as to ensure that the data was captured more accurately because of the possible physical incapabilities older persons might have. The fieldworkers also explained difficult concepts to older persons regarding the survey. The survey was translated into three languages, namely English, Afrikaans and Setswana, which made it easier for all the respondents to understand the survey. All the fieldworkers received training sessions before data gathering to ensure that they understood the survey completely.

As this is a study regarding mobile phone usage, it was decided that mobile devices should be used to capture the data. This method to capture the data significantly aided the data-capturing process. By using mobile devices, the data collected was deemed more accurate and the researcher was able to immediately get feedback on each of the completed surveys. This in turn improved the quality of the data collected. The data was captured in real-time using an online survey tool, Survey Pocket[12].

[12] Survey Pocket is a mobile application that can be used to complete surveys in real time.

4.4.2.2 Population

The population of this study comprised people older than 60 years living in any of the three areas, Potchefstroom, Ikageng and Promosa, of the TLM in the North-West province of South Africa. These three areas typically have very distinct differences in terms of their residents. This is because of historical apartheid system employed by the South-African government, where people of different races were forced to live in different areas.

This can still be seen today as the Potchefstroom area typically has more white residents, while mostly black people stay in Ikageng and coloured people reside mainly in Promosa. For the purpose of this study, it was deemed necessary to include all races within the quantitative data gathering sessions as a disaster in the TLM will affect all residents. Furthermore, the TDMC serve all the people within these areas. The TLM has a fourth area, known as Mohadin, where mostly Indian people reside. Unfortunately, access to this area was restricted and research was only conducted in the three abovementioned areas.

For the purpose of this study, no restrictions were placed on the gender of the respondents and all respondents who were willing to participate were included in the study. Data was collected at various old age service centres where older persons of the different areas gather on a regular basis.

4.4.2.3 Sampling

Babbie and Mouton (2010:169) states that to "provide useful descriptions of the total population", it is necessary that the sample used in the research contain the same variables as in the population of the group being studied. For the purpose of this study, it was decided that purposive voluntary sampling would be best suited because by using it the researcher were able to select a purposive sample that closely represents a broader group enabling the researcher to generalise findings about the population (Teddlie & Yu, 2009:5).

Purposive sampling can be referred to as nonprobability sampling whereby specific cases or units are selected based on pre-determined criteria and purpose instead of randomly (Teddlie & Yu, 2009:5; Nieuwenhuis, 2007). Furthermore, the participants completed the survey voluntarily.

It should also be noted that although this specific sampling method are often employed within a qualitative setting, the specific criteria required by this study demanded a purposive sample.

According to Teddlie and Yu (2009:1), this sampling method can also be employed equally as successful within a mixed method study.

The research has been conducted at each one of three service centres for the aged in the TLM. Each area within the TLM, namely Potchefstroom, Ikageng and Promosa, has one service centre that serves the older persons of that specific area. It is however important to note that the time and date when the data was to be gathered were randomly selected and not communicated beforehand. This was done to ensure that all present and willing participants would be selected for the data gathering. A total number of 126 (N=126) respondents completed the survey. The amount of respondents at the Potchefstroom centre for the aged were higher than in both Ikageng and Promosa. This is due to voluntary nature of the sampling process whereby more respondents were present at the Potchefstroom centre than the other two during the date gathering process. It is however difficult to establish the total number of possible respondents that falls within the set age category within the TLM and therefore difficult to determine the total sample of the group.

There was a difference in the number of participants between the different areas within the TLM area. The results and conclusions on how older persons within the municipality use their phones could have been more accurate if equal samples were used. It is for this reason that the Living Standard Measure (LSM)[13] was introduced to the survey to nullify this possible unequitable outcome as respondents will fall into different LSM categories whilst the number of respondents per area within the TLM will be negated. This also aids the researcher to group the respondents within certain categories based on their LSM in order to make certain assumptions about their mobile phone usage. Unfortunately, given the historical background of South Africa, there is a clear distinction between the different areas such as the Potchefstroom town area and the Ikageng area in terms of infrastructure and development.

4.4.2.4 Reliability

According to Babbie and Mouton (2010:119), reliability means that if the same technique of a certain study is applied repeatedly to the same objects, it will yield the same result over and over again.

[13] The living standard measure is a survey used globally in order to ascertain the standard of living of people based on their assets and belongings

In this study, the reliability of the data gathered was tested by the internal reliability of the measuring instrument; also called internal consistency (Maree & Pietersen, 2007b:216). According to Maree and Pietersen (2007b:216), when a certain number of items are formulated to measure a certain construct, there should be a very high similarity between the different items because they are intended to measure the same construct. To measure the internal reliability of the instrument, the Crönbach Alpha coefficient is taken and is based on the "inter-item correlations" (Maree & Pietersen, 2007b:216). If the items measured are well correlated their internal consistency would be high and close to one on the Crönbach Alpha. However, if its correlation is low, the score on the Crönbach Alpha coefficient will be closer to zero (Maree & Pietersen, 2007b:216). The Crönbach Alpha score can be interpreted as follows:

- .90 – High reliability
- .80 – Moderate reliability
- .70 – Low reliability

According to Maree and Pietersen (2007b:216), a score of .80 on the Crönbach Alpha is usually acceptable for the reliability of the item. The total Crönbach Alpha score calculated for this study, indicated a relative high reliability of 0.894.

4.4.2.5 Validity

The validity of the instrument used in research refers to the extent in which it measures what it was originally meant to measure (Maree & Pietersen, 2007b:216). There are different types of validity that the measuring instrument must adhere to:

- Face Validity

Face validity refers to the extent to which a measuring instrument seems valid at face value (Maree & Pietersen, 2007b:217). Thus, one can ask the question: "Does the instrument appear to measure what it is supposed to measure?" (Maree & Pietersen, 2007b:217). Face validity is determined by experts who scrutinise the instrument to determine its face validity. The face validity for this survey was done by the NWU's statistical consultation services.

- Content Validity

This type of validity refers to the extent in which the measuring instrument covers all the content of the specific construct that it set out to measure (Maree & Pietersen, 2007b:217). Pietersen and

Maree (2007b:216) state that to ensure the content validity of the instrument, the researcher must present a provisional version of the measuring instrument to experts in the field for their input.

- Construct Validity

This validity is needed to standardise the instrument and refers to how well the measuring instrument measures various groups of related items (Maree & Pietersen, 2007b:217). Statistical techniques such as factor analysis and item analysis are used to determine the construct validity of the instrument (Maree & Pietersen, 2007b:217).

- Criterion Validity

This type of validity refers to how well the instrument compares to previously used instruments (criterion) that were used to measure the same constructs. The correlation between the various instruments is an indication of the criterion validity of the measuring instrument (Maree & Pietersen, 2007b:217).

For the purpose of this study, two types of validity were applied to ensure the validity of the instrument:

- Construct validity: A factor analysis was conducted to test the logical relationship among different variables in the instrument.
- Content validity: Experts of the North-West University's Statistical Consultation Statistical Services have reviewed the instrument and given their inputs to ensure that the instrument measures what it was set out to measure.

4.4.2.6 Data analysis

The quantitative data was analysed in the following ways:

- Descriptive statistics

The mean, according Maree and Pietersen (2007c:187), is the most commonly used measure of location. It is calculated as the arithmetic average of all the data values. The mean also provides the researcher with the central tendency of the data, much like the median. Mean scores are used to provide insight into the average score of the respondents' answers.

The standard deviation is a descriptive statistic, which is utilised to quantify the variation of the data set. In other words, how far apart the numbers within the data set are, where a low standard deviation shows that the data tends to be close to the mean.

- Comparisons and correlation
    - T-tests

A t-test is used under the following circumstances (Pietersen & Maree, 2007d:225):

- when two independent groups need to be compared based on their average score on a quantitative variable, for example the average IQ of males and females;
- when the average scores on two quantitative variables need to be compared in a single sample, for example pre-test and post-test in the experimental group; and
- when the average of a quantitative variable needs to be compared with a specified constant value in a single sample.

For the purpose of this study both an independent t-test as well as a one-way ANOVA-test was performed. The independent t-test was used to compare two groups, such as gender, whereas the ANOVA-test was utilised where there were more than two independent groups in the study that needed comparing, for example race. These tests also indicated whether there were statistical significant differences between the tested groups to report variable differences between the groups. If $p<0,05$, one can state that there exists a statistical difference between the two variables (Ellis & Steyn, 2003:51).

Furthermore, a Spearman rank correlation coefficient was utilised to ascertain the relationship between two ranked variables. Spearman's rank correlation determines the strength and direction of the relationship between two variables (Field, 2005:745). The Spearman rank correlation coefficient is interpreted as follows:

$|r| = 0,1$: Small correlation between variables.

$|r| = 0,3$: Average correlation between the variables.

$|r| = 0,5$: Great correlation between variables.

4.4.2.7 Survey schedule

As was mentioned previously this survey formed part of a larger research study. However, only questions relating to this specific study will be listed. Survey schedule is attached as Addendum A.

4.4.3 Phase 2 - Qualitative data gathering

Qualitative data was collected from the TDMC to establish perceptions about mobile phones, disaster risk communication and older persons to answer research question 4:

> *What are the perceptions of the* TDMC *about the mobile phone usage of older persons for disaster risk communication?*

Qualitative researchers endeavour to determine the true meaning of phenomena in a real-world context as seen through the eyes of the actors in that setting (Babbie & Mouton, 2010:271). Qualitative researchers are also interested in describing the actions of the research participants in fine detail while trying to understand the actions that these actors take within the context of their own beliefs, history and context (Babbie & Mouton, 2010:271).

Johnson and Onwuegbuzie (2004:22) state that researchers may wish to use mixed methods research for development, which is explained as "using the findings from one method to help inform the other method". In this particular study this was also helpful and indicative. The researcher was able to first establish what the mobile phone user patterns of older persons within the TLM are before exploring the perceptions of the TDMC. It is for this reason that qualitative semi-structured interviews followed the quantitative surveys to establish and understand the perceptions of the TDMC regarding older persons and their use of mobile phones.

4.4.3.1 Semi-structured interviews

Qualitative data was gathered by means of semi-structured interviews. According to Babbie and Mouton (2010:288), the interview is one of the most frequently used methods regarding qualitative data gathering. Interviews, according to Leedy and Ormrod (2012:153), can be used to gather information regarding facts, beliefs and perspectives, feelings, motives, present and past behaviour, standards for behaviour, or reasons for certain actions taken. According to Nieuwenhuis (2007:87), the semi-structured interview is most commonly used to corroborate data that emerged from other data sources – as is the case with this research. It requires the participant to answer predetermined questions, but allows the researcher leeway to probe on answers given or to ask follow-up questions for clarity (Nieuwenhuis, 2007:87). Howitt (2010:59) therefore states that qualitative interviews generates rich end extensive data from participants. Howitt (2010:61) provides key elements of the qualitative interview:

- there is no rigid structure to the interview, but the researcher does have a list of key questions;
- the researcher encourages open and elaborate answers;
- qualitative interviewers encourage rich detailed replies;
- it is essential to use some form of tape or digital recording device during the interview for the researcher to play back the interviews when doing the analysis;
- the interviewer is required to be an active listener during the interview process;
- the interview is steered by the answers provided by the interviewee;
- the interviewer is expected to probe the interviewee on previous answers given;
- the whole interview process is very flexible;
- it is ideal that the interview is conducted by the researcher him/herself;
- qualitative interviews are mostly explorative in nature; and
- additional or repeat interviews is appropriate to provide the researcher with an opportunity to reformulate ideas.

Nieuwenhuis (2007:87) states that the researcher must be attentive when conducting the interview to immediately recognise when a new line of enquiry has been introduced in the interview, so that the researcher can guide the participant back to the topic at hand. Leedy and Ormrod (2001:159) however state that there are certain downsides to qualitative semi-structured interviews as research method, one of which is that the interviewee sometimes is required to make use of his/her memory alone to answer a certain question. Second, various interviews can provide contrasting answers which will in turn make the analysis of the interviews quite complex. For the purpose of this study, the following interview schedule was used:

Table 4.2 – Interview schedule

1. What is the role of communication in disaster risk management?
2. According to you, how important is it to strategically plan communication directed at older persons? Motivate.
3. In what way do you communicate with older persons? Provide examples.
4. Do you have a communication strategy in place to communicate with older persons? Elaborate.
5. To what extent do you regard feedback (two-way communication) from the community and especially older persons as important? Motivate.
6. To what extent do you believe that strong relationships with older persons will affect the effectiveness of disaster communication?
7. To what extent does strategic communication contribute to your relationship with older persons?
8. To what extent do you ensure that older persons' concerns and problems are addressed?
9. To what extent does the TDMC approach older persons to assist in problem solving concerning disaster risks?
10. To what extent are older persons involved in decision making processes regarding disaster risk issues that influence them?
11. To what extent do you think that your relationship with older persons is open and trustworthy?
12. To what extent do you communicate with older persons to ensure that their trust in the TDMC is enhanced?
13. To what extent do you engage with older persons to establish their needs?
14. To what extent do you believe that clear and direct information regarding disaster risks is important?
15. To what extent does the TDMC focus communication goals on the needs of the community?
16. To what extent does the TDMC communicate rules and procedures to be followed during a disaster with older persons?
17. To what extent does the TDMC communicate their knowledge and expertise regarding disasters to older persons?
18. To what extent does the TDMC communicate openly and honestly regarding disasters with older persons?
19. To what extent does the TDMC show concern and care towards older persons, regarding their vulnerability to disasters?
20. To what extent do you think the older persons regard the TDMC as a credible source of disaster information? Motivate.
21. How do you believe older persons will act when you warn them of an imminent disaster?

22. To what extent would you consider older persons as being more vulnerable? Why do you say so?
23. Do you take special measures to safeguard older persons from disastrous effects? Motivate.
24. How do you experience older persons during disastrous situations (asset or liability)?
25. To what extent do you think older persons can be of benefit to the TDMC? (Do they have knowledge that the TDMC can utilise?)
26. To what extent is older persons' knowledge regarding the area and the people useful in disaster risk management?
27. How do you currently tap into older persons' knowledge base to extract useful disaster related information from them?
28. To what extent does the social ties that older persons have within the community affect their resilience towards a disaster?
29. Do you believe that it is possible to communicate disaster risks with older persons via mobile phones? Motivate.
30. To what extent do you think that older persons can use mobile phones to communicate with the TDMC?
31. In what way (possible applications), according to you, can mobile phones be used to communicate with older persons within the community regarding possible disaster risks?
32. What possible obstacles regarding communicating with older persons' by means of mobile phones do you foresee?
33. What possible advantages regarding communicating with older persons' by means of mobile phones do you foresee?
34. Do you regard immediate communication as important in disaster situations? What role can mobile phones play in this regard? Motivate?

4.4.3.2 Procedure

In this phase, participants were selected based on their knowledge and expertise on the topic. All the participants work at the TDMC and is part of the TDMC's management team. Two employees of the TDMC were interviewed at the TDMC in Tlokwe, namely the Head of the Centre and one of the staff members who works closely within the community. These two participants fulfil important roles in the Centre and its communication function. It must also be taken into account that the TLM TDMC have few staff members that deal with the communication function of the centre.

4.4.3.3 Data analysis

The semi-structured interviews were analysed by means of a thematic analysis. Thematic analysis is a method used to analyse qualitative data according to themes that emerge from the data set (Braun & Clarke, 2006:87). As the qualitative interview schedule is informed by the literature study performed in Chapter 2 and 3, the qualitative data was also analysed according to the specific theoretical statements in the literature chapters.

Braun and Clarke (2006:87) provide a step-by-step layout on how thematic analysis is conducted. The researcher should first familiarise him/herself with the data by transcribing and/or reading through the data set and pen down initial ideas or themes. After this, the researcher generates initial codes that he/she finds interesting within the data, which will help to organise the data into segments or groups. After the codes have been decided on, the researcher search for certain themes that emerge from the data set related to the codes previously created, after which these themes will be reviewed to ensure that they fall within a certain category. Eventually the themes will be named, where after the specifics of each theme will be detailed to generate a clear definition by which each theme is categorised to highlight the most important subjects that have emerged from the data set. According to Braun and Clarke (2006:83), this method of analysis provides the researcher with a rich description and understanding of the data set from which to write a comprehensive report. This procedure was followed in this study to analyse the qualitative data gathered by means of semi-structured interviews.

4.4.4 Ethical considerations

This study has been approved by the Ethics Committee of the North-West University as part of a larger research project (NWU-00053-10-S1).

For the quantitative data gathering, it was important to consider that older persons are regarded as a vulnerable group. Their protection and comfort received special attention as they were provided with ample comfort breaks and comfortable seating during the data gathering process.

All respondents in the quantitative data gathering sessions completed an informed consent letter before participating in the study. The letter explained the following:

- the voluntary nature of their participation as they may withdraw from the research at any stage;

- confidentiality (respondent numbers were used and no identifying information will be made known or shared);
- risks and benefits (possible risks pertaining to emotional vulnerability as well as precautions and possible benefits to the individual and larger community);
- compensation and costs (participants will not be compensated by monetary means for their participation, but will receive lunch packs); and
- safekeeping and storing of information (the signed letters will be stored at the university in a locked safe together with the results of the study).

All the participants in the qualitative interviews were informed of the following before their interviews commenced:

- that their participation in this study was voluntary;
- for what purpose the information they provide will be used for;
- that they may choose to end the interview at any time;
- that they will receive no monetary compensation for their participation; and
- that all the information will be considered confidential and treated as such.

4.5 Conclusion

In this chapter, the research methodology that was used in the study was discussed. It was stated that to reach the outcome of this study, a qualitative research approach with mixed-methods research would be utilised. It was explained that this study consisted of two phases, namely a quantitative and qualitative phase.

In the first phase, quantitative surveys were administered by fieldworkers to ascertain the mobile phone usage patterns of older persons within the TLM. These respondents were selected by means of purposive voluntary sample after which the data was analysed by means of statistical analysis.

In the second phase qualitative semi-structured interviews were conducted with the TDMC's management team to determine their approach to older persons and disaster management, as well as their perceptions on the use of mobile phones to communicate with this stakeholder group. This data was analysed by means of a thematic analysis.

In the next chapter the quantitative data regarding older persons' use of mobile phones in the TLM will be analysed and discussed.

CHAPTER 5: QUANTITATIVE ANALYSIS

5.1 Introduction

In the previous chapter the research methodology that was followed to achieve the outcome of this study, was discussed. The chapter highlighted the use of a qualitative research approach and a sequential exploratory mixed-method research design. Mixed-method research refers to the different research methods that were used to gather the data needed to answer research questions 3 and 5. It was explained that both quantitative (surveys) as well as qualitative (semi-structured interviews) data gathering methods were used to achieve the purpose of this study.

In this chapter the quantitative data is analysed and discussed. The data was gathered by means of a survey administered by fieldworkers to ensure that more accurate data was collected. Although the survey was translated into Afrikaans, English and Setswana, all the data gathered was compiled into one data set while keeping record of the different language groups. In total, a number of 126 (N=126) respondents completed the survey.

The quantitative data in this study was analysed to ascertain older persons' mobile phone usage patterns within the TLM. Furthermore, the quantitative data was also analysed to obtain a clear picture of the functions older persons use and whether they struggle to communicate via their mobile phones. The data collected by means of the quantitative survey was analysed to answer the third research question, namely:

What is the mobile phone usage of older persons in the TLM currently?

This chapter first covers the descriptive statistics of the respondents, delving into their age, location and their living standard measure (LSM) as well as drawing certain comparisons on these features. The respondents' view on the usability of their mobile phones is analysed next, exploring different aspects and functions that the respondents prefer or tend to use on their phones as well as their phone usage tendencies.

5.2 Descriptive statistics

The aim of the descriptive demographic statistics is to provide a more detailed picture of the respondents who completed the survey. This information therefore gives a bird's eye view of the respondents. This information is presented in the tables below distinguishing between age, sex, race, education, area of residence and also the respondents' different living standard measures.

Table 5.1 Gender of respondents

Gender	N	Valid %
Male	26	20,6
Female	100	79,4
Total	126	100

Table 5.2 Race of respondents

Race	N	Valid %
Black	32	25,4
White	81	64,3
Coloured	13	10,3
Total	126	100

Table 5.3 Location where respondents reside

Location	N	Valid %
Ikageng	27	21,4`
Promosa	17	13,5
Potchefstroom	82	65,1
Total	126	100

Table 5.4 Education of respondents

	Ikageng		Promosa		Potchefstroom		Total	
	N	% of group	N	% of group	N	% of group	N	%
No Education	6	4,8%	0	0%	0	0%	6	4,8%
Primary School	18	14,3%	9	7,1%	1	0,8%	28	22,2%
High School	3	2,4%	5	4,0%	14	11,1%	22	17,5%
Matric Certificate	1	0,8%	1	0,8%	36	28,6%	38	30,2%
Degree/Diploma	0	0%	2	1,6%	24	19,0%	26	20,6%
Post Graduate	0	0%	0	0%	6	4,8%	6	4,8%
Total	28	22,2%	17	13,5%	81	64,3%	126	100%

Table 5.5 Age of respondents

Age	N	Valid %
60-64	14	11,1
65-69	27	21,4
70-74	30	23,8
75-79	30	23,8
80-84	17	13,4
85-89	7	5,6
90+	1	0,9
Total	126	100

Most of the respondents in this study were female with a total of 79,4% (n=100). While most of the respondents (47,6%; n=60) falls within the age category of 70-79 years, a large number of respondents (21,4%; n=27) are between the ages of 65-69. Although there are a number of

respondents between the ages of 60-64 (11,1%; n=14), most people in South Africa retire at the age of 65 where after they are more likely to join an old age centre.

Almost a third (30,2%; n=38) of the respondents' highest level of education is a matric certificate (Grade 12). A number of respondents (20,6%; n=26) have completed a university degree or diploma, and all of these are residing in Potchefstroom. It is notable that on the other side of the coin some respondents (4,8%; n=6) had no education at all, while 22,2% (n=28) of the respondents' highest level of education is some form of primary schooling, with most of them residing in Ikageng or Promosa. This clearly shows the large divide between the various groups at the different old age centres within the TLM. Adding to this, most of the respondents were white (64,3%; n=81), while black and coloured respondents accounted for 25,4% and 10,3% of the total number of respondents respectively. This is due to the fact that more participants were present at the Potchefstroom service centre than at the other two areas (Ikageng and Promosa). To negate this difference between the number of participants, the living standard measure was introduced.

It was therefore deemed necessary to calculate the living standard measure (LSM) for the respondents. The LSM, according to the South African Audience Research Foundation (2016), is a tool widely used in South Africa to divide the population into ten LSM groups. This measure is a unique means of segmenting the South African population according to their respective living standards regardless of other factors. The LSM ranges from Category 1 (low life standard) to Category 10 (high life standard). It was necessary for the researcher to use this segmentation to derive certain conclusions regarding the different groups' respective phone usage. In the tables below the LSM scores for all the respondents are shown in accordance to where they live.

Table 5.6 LSM score of respondents in different locations (N=126)

	LSM 1 - 5		LSM 6 - 8		LSM 9 - 10		Total	
	n	% of group	n	% of group	n	% of group	N	%
Ikageng	8	6,3%	20	15,9%	0	0%	28	22,2%
Promosa	2	1,6%	15	11,9%	0	0%	17	13,5%
Potchefstroom	5	4,0%	22	17,4%	54	42,9%	81	64,3%
Total	15	11,9%	57	45,2%	54	42,9%	126	100%

It is significant to note that even though only 11,9% (n=15) of the total number of respondents falls within Category 1-5 of the LSM, more than half (n=8) of those respondents reside in Ikageng, which comprise of mostly Black residents. Most (n=22) of the total number of respondents that falls in the LSM category 6-8 (n=57) resides in Potchefstroom. Furthermore, all of the respondents (n=54) that falls within categories 9-10 of the measure stays in the Potchefstroom area, which is predominantly a White residential area. For the purpose of this study these findings are quite important to note. As mentioned in Chapter 3, infrastructure significantly impacts the vulnerability of people. Falling within a lower LSM category therefore directly impacts the vulnerability of these respondents as it indicates that they have less infrastructure and access to services than the respondents in the higher LSM categories.

There is a strong relationship between the race of the respondents and the location where they live. This, as mentioned in the previous chapter is largely due to the influence of the prior political regime where people were differentiated according to their race, and had to live in designated areas. This can be shown by doing a cross tabulation and Chi Square test to indicate the significance of the respondents' race and the area where they reside.

Table 5.7 Race * Location cross tabulation

Race	Location			Total (N)
	Ikageng (N)	Promosa (N)	Potchefstroom (N)	
Black	27	4	1	32
White	0	0	81	81
Coloured	0	13	0	13
Total	27	17	82	126

Table 5.8 Chi-Square Test

	Value	df	Significance (2-sided)
Pearson Chi-Square	204,883a	4	,000
Likelihood Ratio	188,995	4	,000
Linear-by-Linear Association	30,017	1	,000
N of Valid Cases	126		

As shown in Table 5.7, all the respondents who reside in Ikageng (n=27) were Black, while all the White respondents (n=81) reside in Potchefstroom with only n=1 Black respondent in the Potchefstroom area. All the coloured respondents (n=13) live in Promosa. The significance of the Chi Square test is rather indicative with a degree of freedom = 4, while p=,000. When p=<0,05, it indicates that there exists a statistical significant relationship between the race of the respondents and the area where they reside. It indicates that there is a vast difference between the different LSM groups where all the LSM 9-10 respondents reside in the Potchefstroom area. It should be noted that the White people that live in the Potchefstroom area falls in a higher LSM group, which implies that they have better access to services and infrastructure and in all likelihood are able to afford more advanced mobile phones. They also have higher education levels which could lead to this group being better equipped to make use of more functions on the mobile phone.

Armed with this knowledge, it is important to ascertain the tendencies regarding mobile phone usage within these different areas, especially as they differ in terms of race, location as well as LSM scores.

5.3 Phone usability

For the purpose of this study, it is important to determine how older persons within the TLM use their mobile phones. As can be seen in Table 5.9 below, most of the participants (n =118, 94,4%) use either one or more than one mobile phone daily. In total, only n=7 (5,6%) of the respondents do not own a mobile phone or use one daily.

Table 5.9 Location * Mobile phone use cross tabulation (N=125; n=1 missing)

Location	Mobile phone use			Total (N)
	None (N)	One (N)	More than One (N)	
Ikageng	5	20	2	27
Promosa	1	15	1	17
Potchefstroom	1	66	14	81
Total	7	101	17	125

Table 5.10 LSM * Number of mobile phones used cross tabulation (N=125; n=1 missing)

	LSM 1 - 5		LSM 6 - 8		LSM 9 - 10		Total	
	N	% of group	N	% of group	N	% of group	N	%
None	2	1,6%	5	4,0%	0	0%	7	5,6%
One	12	9,6%	46	36,8%	43	34,4%	101	80,8%
More than one	1	0,8%	5	4,0%	11	8,8%	17	13,6%
Total	15	12,0%	56	44,8%	54	43,2%	125	100%

This result is telling as it shows that most of the older persons, even in Ikageng where respondents were measured to fall within the lowest categories of the LSM (n=22, 81,4%) (see Table 5.9), respondents own one or more mobile phones that they use daily basis. However small, it is also worth mentioning that 5,6% (n=7) of the respondents don't have any access to a phone, which will also contribute to their increased vulnerability to disaster risks.

Considering the different LSM categories and the respondents' respective number of phones that they use on a daily basis, it is telling that approximately 95% of the participating people in all the categories make use of at least one phone daily. This tells us that all segments of the population equally make use of one phone per day. One can see that all the people in the higher end LSM categories use at least one phone per day as none of them indicated that they do not have a mobile phone. This category also has the highest number of people (n=11; 8.8%) who use more than one mobile phone daily. This is consistent with the fact that they range in the higher end LSM groups, meaning they necessarily receive a higher income.

The respondents who indicated that they use at least one phone per day, were asked what communication functions their phone, according to them, are capable of doing. The following tables indicate the frequency statistics of what functions the respondents' phone, according to them, are able to do.

Table 5.11 Phone functions as identified by the respondents (N=116; n=10 missing)

Function		N	Valid %
Calls	Yes	115	99,1%
	No	1	0,9%
SMS	Yes	99	85,3%
	No	17	14,7%
MMS	Yes	61	52,6%
	No	55	47,4%
Internet	Yes	47	40,5%
	No	69	59,5%
Emails	Yes	42	36,2%
	No	74	63,8%
WhatsApp	Yes	40	34,5%
	No	76	65,5%
Facebook	Yes	36	31,0%
	No	80	69,0%
Please call me (PCM)	Yes	65	56,0%
	No	51	44,0%

The functions that respondents indicated that their phones are capable of doing most were making and receiving calls (n=115; 99,1%), as well as sending and receiving text messages (SMS) (n=99; 85,3%). The respondents indicated least that their phone are capable of accessing Facebook (n=36; 31%) and the second least was WhatsApp (n=40; 34,5%).

All the respondents who stated that their phone were capable of performing a certain function on the phone were then asked how often they make use of this function, if at all. It must be noted that even though some respondents indicated that their phone has certain functions, some of them indicated that they do not make use of that function, as indicated on the next table. This question achieved a 0,78 on the Crönbach Alpha analysis, indicating a relative high internal reliability factor.

Table 5.12 Frequency of use of communication functions on mobile phone

Function measured	Responses	N	Valid%	Mean	Variance	Std. Deviation
Calls (n=115)	Never	1	0,9	4,32	,92	,96
	Once a month	7	6,1			
	Once a week	13	11,3			
	2-3 times per week	27	23,5			
	Daily	67	58,2			
SMS (n=99)	Never	15	15,2	4,05	2,13	1,46
	Once a month	3	3,0			
	Once a week	3	3,0			
	2-3 times per week	19	19,2			
	Daily	59	59,6			
MMS (n=61)	Never	15	24,5	2,87	2,22	1,49
	Once a month	14	23,0			
	Once a week	8	13,1			
	2-3 times per week	12	19,7			
	Daily	12	19,7			
Internet (n=47)	Never	32	68,1	1,98	2,67	1,64
	Once a month	4	8,5			
	Once a week	1	2,1			
	2-3 times per week	0	0,0			
	Daily	10	21,3			
E-mails (n=42)	Never	31	73,8	1,69	1,73	1,31
	Once a month	3	7,2			
	Once a week	1	2,4			
	2-3 times per week	4	9,5			
	Daily	3	7,1			
WhatsApp (n=40)	Never	7	17,5	4,03	2,44	1,56
	Once a month	1	2,5			
	Once a week	2	5,0			
	2-3 times per week	4	10,0			

	Daily	26	65,0			
Facebook (n=36)	Never	19	52,7	2,47	3,17	1,78
	Once a month	3	8,3			
	Once a week	2	5,6			
	2-3 times per week	2	5,6			
	Daily	10	27,8			
Please call me (n=65)	Never	49	75,3	1,69	1,71	1,31
	Once a month	2	3,1			
	Once a week	3	4,6			
	2-3 times per week	7	10,8			
	Daily	4	6,2			

More than half of the respondents who indicated that they do use the call (n=67; 58,3%) and SMS (n=59; 59,6%) functions of their mobile phones have specified that they use these functions on a daily basis. These functions also scored a mean score of 4,32 and 4,05 respectively, indicating that these functions on average are used fairly often. The call function achieved a variance of 0,92 indicating that all the responses does not vary a significant amount from the calculated mean. It should be noted that 15,2% (n=15) of the respondents who indicated that their phone has a SMS function, indicated that they never make use of that function. However, it is noteworthy that even though they do not use this function, they still know that their mobile phone possess this function (85,3%).

Even though the respondents indicated that they use the Whatsapp function less than the sms function, 65% (n=26) of those who indicated they use the WhatsApp function, do so on a daily basis. This function also achieved a relative high mean score of 4,03, indicating those participants who do make use of this function do so quite regularly.

The respondents clearly indicated that the majority of them never use the internet (n=32; 68.1%), E-mails (n=31; 73,8%), Facebook (n=19; 52,8%) and Please call me (n=49; 75,4%) functions that their mobile phones possess. Both E-mail and Please call me functions achieved a mean score of 1,69 while the responses for the E-mail function had the lowest variance between responses of 1,73. These statistics indicate that most of the respondents do not access the internet via their mobile phones nor make use of internet-based functions except for WhatsApp, which relies on an internet/mobile data connection.

While it is significant that the respondents mostly use Calls, sms messages and WhatsApp on a daily basis, it is important to establish whether there are any differences between the respondents' mobile phone usage and the area where they reside. This is important as it was pointed out previously that those respondents that stay in Ikageng and Promosa and fall within the lower LSM categories, might not make use of functions associated with more advanced mobile phones such as WhatsApp. This was done by using a One-Way ANOVA test to establish whether there are significant differences between the groups based on their locations and the functions that they use.

Table 5.13 One-Way ANOVA on mobile phone use and location

		Sum of Squares	df	Mean Square	F	Sig.
Frequency Calls	Between Locations	26,120	2	13,060	18,521	,000
	Total	105,096	114			
Frequency SMS	Between Locations	50,817	2	25,409	15,445	,000
	Total	208,747	98			
Frequency MMS	Between Locations	16,256	2	8,128	4,040	,023
	Total	132,951	60			
Frequency Internet	Between Locations	2,004	2	1,002	,364	,697
	Total	122,979	46			
Frequency E-mails	Between Locations	,035	2	,018	,010	,990
	Total	70,976	41			
Frequency WhatsApp	Between Locations	30,248	2	15,124	8,645	,001
	Total	94,975	39			
Frequency Facebook	Between Locations	4,439	2	2,219	,688	,510
	Total	110,972	35			
Frequency PCM	Between Locations	24,647	2	12,323	8,968	,000
	Total	109,846	64			

If p=<0,05, one can state that there exists a statistical significant difference between the various independent variables, which in this case is the location of the respondents. By examining the

One-Way ANOVA test, one can establish that there exists statistical significant differences on four mobile functions where the degree of freedom is 2. These four functions can be listed as follows: Calls (p=,000), SMS (p=,000), WhatsApp (p=,001), and Please call me (p=,000). To better understand why a significant difference between these groups exist, one can examine the descriptive statistics of these functions in depth.

Table 5.14 Descriptive statistics of differences based on mobile phone use and location

Function	Location	N	Mean	Std. Deviation	Std. Error
Frequency Calls	Ikageng	21	3,33	1,111	,242
	Promosa	16	4,31	,873	,218
	Potchefstroom	78	4,59	,746	,084
	Total	115	4,32	,960	,090
Frequency SMS	Ikageng	12	2,33	1,723	,497
	Promosa	12	3,42	1,730	,499
	Potchefstroom	75	4,43	1,117	,129
	Total	99	4,05	1,459	,147
Frequency WhatsApp	Ikageng	3	2,33	2,309	,333
	Promosa	4	2,00	2,000	1,000
	Potchefstroom	33	4,42	1,146	,200
	Total	40	4,03	1,561	,247
Frequency PCM	Ikageng	12	2,42	1,832	,529
	Promosa	9	2,78	1,716	,572
	Potchefstroom	44	1,27	,758	,114
	Total	65	1,69	1,310	,162

By examining the mean scores for the calls function, one can clearly see that respondents who reside in Ikageng (3,33) uses this function much less than respondents who reside in Promosa (4,31) and Potchefstroom (4,59). SMS and WhatsApp are also used more regularly by the respondents who reside in Potchefstroom, scoring mean scores 4,43 and 4,42 respectively. This is significant when compared to the respondents who reside in both Ikageng and Promosa. Considering the Please call me function, it is noteworthy that those respondents who live in

Ikageng and Promosa, use this function more regularly than those respondents who reside in Potchefstroom (mean = 1,27). This implies that respondents from Ikageng and Promosa use the Please call me function because it costs less to use, which corresponds with their LSM category (see Table 5.6).

For the purpose of this study, it is important to note that even though the respondents from Ikageng and Promosa use the Call, SMS and WhatsApp functions on their mobile phones less frequently than respondents from Potchefstroom, they still indicated that they use it and that they are able to communicate via these functions. It was deemed necessary to establish who and how often older persons contact with their mobile phones to show relevant usage patterns in people that they are in contact with.

Table 5.15 Frequency with which older persons contact other people with their mobile phones (N=113; n=13 missing)

People	Response	N	Valid %	Mean	Variance	Std. Deviation
Grandchildren	Never	31	27,5%	2,63	1,74	1,32
	Once a month	21	18,6%			
	Once a week	32	28,3%			
	2-3 times per week	17	15,0			
	Daily	12	10,6			
Children	Never	13	11,5%	3,45	1,67	1,29
	Once a month	10	8,9%			
	Once a week	33	29,2%			
	2-3 times per week	27	23,9%			
	Daily	30	26,5%			
Emergency Services	Never	99	87,6%	1,17	0,28	0,53
	Once a month	11	9,7%			

	Once a week	2	1,8%			
	2-3 times per week	0	0%			
	Daily	1	0,9%			
Younger family members	Never	20	17,7%	2,75	1,56	1,25
	Once a month	32	28,3%			
	Once a week	30	26,6%			
	2-3 times per week	18	15,9%			
	Daily	13	11,5%			
Older family members	Never	56	49,6%	2,01	1,55	1,24
	Once a month	24	21,2%			
	Once a week	15	13,3%			
	2-3 times per week	12	10,6%			
	Daily	6	5,3%			
Younger friends	Never	29	25,7%	2,59	1,56	1,29
	Once a month	30	26,5%			
	Once a week	20	17,7%			
	2-3 times per week	26	23%			
	Daily	8	7,1%			
Older friends	Never	37	32,7%	2,45	1,80	1,34
	Once a month	28	24,8%			
	Once a week	18	15,9%			

	2-3 times per week	20	17,7%			
	Daily	10	8,9%			

It is noteworthy that older persons almost never contact the emergency services (n=99; 87,6%), with only n=1 respondent contacting the emergency services on a daily basis. A little over half of the respondents indicated that they contact their grandchildren at least once a week (n=61; 53,9%) while 79,6% (n=90) of the respondents contact their children at least once a week.

Almost half of the respondents never contact family members who are older than them (n=56; 49,6%), while most of the respondents contact younger family members once a month (n=32; 28,3%) or once a week (n=30; 26,6%). Regarding their friends, some respondents indicated that they never contact their older friends (n=37; 32,7%) as well as their younger friends (n=29; 25,7%). The other respondents indicated that they contact their older (n=28; 24,8%) as well as their younger (n=30; 26,6%) friends mostly once a month, showing that they are in monthly contact with friends of all ages.

It is therefore concluded that older persons more often contact their respective family members (younger; n=63; 55,8% and older; n=54; 47,8%) with most of the respondents indicating that they contact these individuals at least once a week. They therefore have more frequent contact with family members than with friends.

It is important to note that the use of these mobile functions can significantly aid in enhancing both human and social capital as discussed in Chapter 3. While the functions can be used to inform older persons regarding disaster risk management as indicated by the human capital domain, older persons also use their phones to contact both family and friends on a fairly regular basis. This also helps to enhance their social capital domain that will invariably reduce their vulnerability to disasters.

5.4 Mobile phones' ease of use

In Chapter 3 it was explained that older persons often struggle with the use of mobile phones as they sometimes find it difficult to see the text and understand the necessary input commands to operate the phone successfully. It was therefore deemed necessary for the purpose of this study to establish with what ease older persons within the TLM make use of their mobile phones. In the following table the answers that were given after the respondents were asked to give their level of agreement towards certain statements are analysed to establish whether they experience difficulty with operating their mobile phones. This set of questions achieved a Crönbach Alpha score of ,802, indicating a relative high internal reliability.

Table 5.16 Descriptive statistics – mobile phones' ease of use

Statements	Response	N	Valid %	Mean	Variance	Std. Deviation
The phone menu is understandable (N=113; n=13 missing)	Strongly disagree	18	15,9%	2,90	1,18	1,09
	Disagree	18	15,9%			
	Agree	34	30,1%			
	Strongly agree	43	38,1%			
The letters on the phone is readable without glasses (N=113; n=13 missing)	Strongly disagree	29	25,7%	2,60	1,42	1,19
	Disagree	24	21,2%			
	Agree	23	20,4%			
	Strongly agree	37	32,7%			
I can orientate myself to do what I want on the phone (N=113; n=13 missing)	Strongly disagree	19	16,8%	2,73	1,37	1,04
	Disagree	22	19,5%			
	Agree	42	37,2%			
	Strongly agree	30	26,5%			
My airtime limits my functions (N=113; n=13 missing)	Strongly disagree	34	30,0%	2,40	1,37	1,17
	Disagree	29	25,7%			
	Agree	21	18,6%			
	Strongly agree	29	25,7%			
I know how to work with my phone (N=113; n=13 missing)	Strongly disagree	17	15,0%	2,81	1,09	1,04
	Disagree	23	20,4%			
	Agree	38	33,6%			

	Strongly agree	35	31,0%			
I am scared to try new things on the phone (N=123; n=3 missing)	Strongly disagree	29	25,7%	2,56	1,42	1,19
	Disagree	29	25,7%			
	Agree	28	15,9%			
	Strongly agree	37	32,7%			
My own abilities limit my use of the phone (N=113; n=13 missing)	Strongly disagree	18	15,9%	2,76	1,02	1,01
	Disagree	20	17,7%			
	Agree	46	40,7%			
	Strongly agree	29	25,7%			

A percentage of 68,2% (n=77) of the respondents agreed to some extent that they believe that the phone menus are understandable, with this statement achieving a mean score of 2,90 on a four-point scale. A percentage of 53% (n=60) of the respondents agreed to some extent that they can read on their phone without the use of glasses, while almost a third of the respondents (n=37; 32,7%) strongly agreed to the notion that they are able to read on their phone without the use of glasses.

A percentage of 63,7% (n=72) of the respondents indicated that they feel that they can orientate themselves on their phones with ease, showing fair levels of competency regarding mobile phone use. Almost a third of the respondents (n=34; 30,1%) strongly disagreed with the notion that a lack of airtime availability limits their use of the phone. Almost two thirds (n=73; 64,6%) of the respondents either agreed or strongly agreed with the statement that they know how their phones work. This statement achieved a relative high mean score of 2,81 while the variance and standard deviation is fairly low with scores of 1,09 and 1,04 respectively. It is an indication that most of the respondents did not differ or vary much when answering this particular question.

Although more than half of the respondents (51,4%) disagreed with the statement that they are scared to try new things on their phone, a large portion (n=37; 32,7%) of the respondents indicated that they strongly agree with the statement. This finding implies that a number of respondents still feel a level of fear when operating their mobile phones. Linked to the above was the finding that 66.4% (n=75) of the respondents feel that their own abilities limit their use of their mobile phone.

It is important for the outcome this study to determine whether there are correlations between the ease of use of the phone and the functions that older persons regularly use to determine whether they use their phones and its functions despite their perceived fears regarding mobile phone use.

5.5 Correlation between phone usage and ease of use

In order to determine whether there are a correlation between the functions of mobile phones that older persons use and the ease with which they use their phones, a Spearman correlation coefficient was used. The Spearman correlation coefficient was used to indicate whether a certain variable negatively or positively impacts another variable. Where $p<0.05$ it can be stated that there is a statistical significant difference existing between the different variables.

There is a positive correlation (p=.000; r=.581) between how often calls are made and how often sms's are sent and received. Furthermore, there exists a positive significant relationship between how often calls are made and whether the phone menu is understandable (p=.000; r=.333), whether the respondents feel that they can orientate themselves regarding the phone (p=.001; r.298) and whether the respondents know how the phone works. There is a negative significant relationship regarding the intervals of phone calls made and received. Respondents who are more scared to try new things (p=.016; r=-.226) and who feel that their airtime limit their use of the phone (p=.005; r-.263), make fewer phone calls.

When the participating older persons are of the opinion that the phone menu is understandable (p=.000; r=.444) and that they can orientate themselves regarding the phone (p=.000; r=.444), directly impacts the amount of SMS's sent and received, showing that incapability regarding the mobile phone directly impacts the sms usage patterns. Moreover, the amount of Internet used on the phone directly correlates with the regularity of the use of Email (p=.000; r=.757), WhatsApp (p=.047; r=.372) and Facebook (p=.000; r=.794). All of these functions require Internet access to work.

The regularity of the use of WhatsApp is impacted by whether the phone menu is understandable to the respondent (p=.003; r=.462), once again showing the impact incapability has on usage. The use of WhatsApp is furthermore negatively impacted by whether the respondents feel scared to try new things on the mobile phone (p=.011; r=.396). Lastly, there exists a small correlation between the use of Please call me's (which is a free service) and the amount of airtime the respondents have (p=0.20; r=.290).

Table 5.17 Correlation between older persons' mobile phone usage patterns and its perceived ease of use

		Internet	Understandable	Readable	Orientate	Airtime Limit	Know Work	Scared	Lack Ability
Frequency Calls	Correlation Coefficient	.084	.333**	.169	.298**	-.263**	.238*	-.226*	.072
	Sig. (2-tailed)	.575	.000	.073	.001	.005	.011	.016	.449
Frequency SMS	Correlation Coefficient	.046	.449**	.128	.444**	-.119	.324**	-.154	.041
	Sig. (2-tailed)	.760	.000	.211	.000	.247	.001	.132	.691
Frequency MMS	Correlation Coefficient	.142	-.041	.043	.157	.117	.118	-.075	-.101
	Sig. (2-tailed)	.371	.753	.741	.228	.367	.366	.567	.439
Internet	Correlation Coefficient	1.000	.299*	.160	.472**	-.168	.317*	-.137	-.251
	Sig. (2-tailed)		.044	.287	.001	.264	.032	.364	.093
Frequency Emails	Correlation Coefficient	.757**	.149	.036	.377*	.003	.395**	.062	-.199
	Sig. (2-tailed)	.000	.348	.823	.014	.987	.010	.698	.206
Frequency Whatsapp	Correlation Coefficient	.372*	.462**	-.106	.283	-.242	.315*	-.396*	-.299
	Sig. (2-tailed)	.047	.003	.513	.077	.133	.047	.011	.061
Frequency Facebook	Correlation Coefficient	.794**	.126	.141	.359*	.109	.352*	-.054	-.497**
	Sig. (2-tailed)	.000	.465	.414	.031	.527	.035	.756	.002
Frequency PCM	Correlation Coefficient	.105	-.040	.212	.030	.290*	.081	.162	.015

	Sig. (2-tailed)	.568	.755	.093	.812	.020	.524	.200	.905
Understandable	Correlation Coefficient	.299*	1.000	.216*	.696**	-.082	.578**	-.318**	-.043
	Sig. (2-tailed)	.044		.022	.000	.386	.000	.001	.654
Readable	Correlation Coefficient	.160	.216*	1.000	.246**	.175	.144	-.042	.207*
	Sig. (2-tailed)	.287	.022		.009	.065	.127	.656	.028
Orientate	Correlation Coefficient	.472**	.696**	.246**	1.000	-.115	.664**	-.214*	-.112
	Sig. (2-tailed)	.001	.000	.009		.224	.000	.023	.237
Airtime Limit	Correlation Coefficient	-.168	-.082	.175	-.115	1.000	-.135	.398**	.201*
	Sig. (2-tailed)	.264	.386	.065	.224		.154	.000	.033
Know Work	Correlation Coefficient	.317*	.578**	.144	.664**	-.135	1.000	-.228*	-.109
	Sig. (2-tailed)	.032	.000	.127	.000	.154		.015	.252
Scared	Correlation Coefficient	-.137	-.318**	-.042	-.214*	.398**	-.228*	1.000	.562**
	Sig. (2-tailed)	.364	.001	.656	.023	.000	.015		.000
Lack Ability	Correlation Coefficient	-.251	-.043	.207*	-.112	.201*	-.109	.562**	1.000
	Sig. (2-tailed)	.093	.654	.028	.237	.033	.252	.000	

5.6 Conclusion

The aim of this chapter was to answer the third research question, namely: *What is the mobile phone usage of* older persons *in the TLM currently?* This was done by first examining the demographic statistics of the respondents within the TLM area. The respondents' demographics, in terms of their age, race, location where they reside, highest level of education and their gender was given to provide the reader with better insights into the reality of the respondents who completed the survey.

It was established that most of the respondents, regardless of their living standard measure (LSM), own and use a mobile phone daily. These mobile phones are mainly used to make and receive calls, send and receive SMS's and to a lesser extent, send and receive WhatsApp messages. While there are differences relating to the various locations where the respondents reside and what functions of the phone they regularly use, it was established that a significant number of the respondents know how to especially use the SMS and Call functions on their mobile phones.

It was noted that most of the respondents indicated that they know how to use their mobile phones and that they understand the menu of their phone. They can read the text on their phone, even without the aid of reading glasses. It was also established that many respondents are inhibited by their own fear to try new things on their mobile phones as well as their sense of inability to fully make use of their mobile phones.

A correlation was drawn between the functions that the respondents use on their phones as well as the ease with which they use their phones. It was noted that especially their understanding of the phone's menu and their ability to orientate themselves regarding the working of the phone that plays a major role in the functions that they use as they make less use of functions when they do not understand the working of the phone or are not able to orientate themselves around the phone. This outcome is expected as one would not be able to use the phone to its full capability if one do not understand the phone or its menu. Furthermore, the presence of internet on the phone also plays a substantial role in the use of functions such as WhatsApp and Facebook as these applications make use of internet or mobile data access. It was also ascertained that the variable that most often impact their use of certain functions negatively, is the fear for trying something new. In the next chapter, the qualitative data will be analysed in order to answer the fourth research question.

CHAPTER 6: QUALITATIVE ANALYSIS

6.1 Introduction

In Chapter 5, the quantitative data from the survey was analysed to determine the mobile phone usage of older persons in the TLM. It was stated that the participating older persons, regardless of their living standard measure, make use of mobile phones. It was established that the respondents in the TLM primarily use their mobile phones to make and receive calls as well as to send and receive SMS's. Furthermore, the use of the WhatsApp functionality is used fairly regular, although the uptake of this application was not embraced by all the respondents. It was further ascertained that even though there are differences in the regularity of mobile phone usage, especially regarding the SMS functionality in different areas of the TLM, most of the respondents know how to communicate by means of SMS. It was therefore concluded that older persons can theoretically be contacted by means of mobile technology in case of disasters.

In this chapter, the data gathered by means of qualitative semi-structured interviews with management members of the TDMC was analysed to determine their perceptions towards disaster risk communication directed at older persons by means of mobile phones. This chapter will therefore aim to answer the fourth research question, namely:

> *What are the perceptions of the TDMC about the role of mobile phone usage of older persons in disaster risk communication?*

As explained in Chapter 4, the transcribed interviews were analysed thematically by means of the guidelines provided by Braun and Clarke (2007). The theoretical statements, as formulated in Chapter 2, as well as the key points outlined in Chapter 3, were used to formulate the interview schedule and were used as a guideline to evaluate the data.

6.2 Strategic communication management

The participants emphasised that there is a great need to manage disaster risk communication strategically. However, the TDMC views strategic communication management mostly as a coordinating function. One participant noted in this regard:

> "Communication in disaster risk management is very key because you are playing a coordinating role. Information must cascade from all the role players."

Furthermore, the interviewees view strategic communication management as a function to inform communities about disaster risks: "…. we must communicate with the community so that they can know what they are exposed to."

Even though the participants realise the need to strategically manage communication with their stakeholders, they admitted that it is not the case within the TDMC and hence do not have a clear communication strategy: "We are not that fully functional in terms of strategically planning communication but we try to be."

This impression was supported by the other participant who noted:

> "But for now, the information that has been coming forth is just … it is information that is important for the community to have but it is not done strategically."

Referring to strategically communicating with older persons, a participant mentioned the following constraint:

> "You know what, it is one of the challenges we are currently having. I do have someone I work with; it is a social worker at social development that I work with in terms of the older generation. They have social clubs that they have currently established. So, we can access them easily, but the ones that are at home that do not have contact with these social clubs are a challenge."

This prompted the participant to acknowledge that a communication strategy is important for the TDMC:

> "That is why we have to strategically sit down and come up with a plan. We have come up with a plan but for now we haven't gone out to stakeholders to come sit around the table and see what we can do."

The participants expressed that the lack of a communication strategy is at the heart of why the TLM are struggling to reach all of their stakeholders. It was clear from the statements that the interviewees were unsure of the nature and aims of strategic communication management.

The TDMC primarily views strategic communication management as a function that is used to avoid panic regarding disasters within the community. Limiting public panic was deemed to be a key theme for the TDMC. One participant noted that: "…they must not panic," while another said while talking about strategic communication management: "It is important because if it is not properly planned it can cause panic, especially in the communities." Emphasising that public panic

should be limited, can mainly be ascribed to the fact that there are no communication strategy and/or plans in place, resulting in the TDMC being required to exercise extensive amounts of crisis communication:

> "…because at that time we were expecting heavy rainfall but not to the extent that it will result in flooding. So, I had to go and communicate that correctly so that we do not cause panic because people were stressing."

This view directly correlates with Le Roux (2014) stating that disaster risk communication is not equal to crisis communication and it should be "a planned process" (see section 2.3).

The TDMC does however strategically plan and execute awareness campaigns and educating the communities regarding disaster risks:

> "… we also have awareness programs where our officials will go to schools and do awareness days, for example seasonal awareness; when we are entering winter we go and communicate the dangers of fire and educate them on that. Or in the rainy seasons we do programs. So, that is how we communicate."

This notion was also mentioned by another participant who stated: "… to educate them that they also play a role in informing us or doing something that can reduce their risk where they are staying."

The TDMC mainly views strategic communication management as a tool to manage expectations within the community of what they as a TDMC can accomplish: "…and then the community will have an expectation which might be wrong."

This view on strategic communication management and what it entails is worrisome as the TDMC believe that as soon as they engage in two-way communication they create an unattainable expectation within the community and with older persons. The participants therefore do not view strategic communication management as a planned process of engaging in two-way communication with vulnerable older persons to determine their views and needs (environmental scanning), resulting in strong relationships, as pointed out in literature (see Chapter 2).

6.2.1 Engaging in two-way communication with older persons

The interviewees identified several barriers that prevent two-way communication between the TDMC and the TLM community, and older persons in particular. The interviewees said that they believe that the community, especially older persons, do not want to participate in dialogue with the TDMC. Following this, according to the participants, there is only a one-way flow of communication from the TDMC to older persons in the community. It is the belief of the participants that the community only expects information and do not actively want to engage in a two-way conversation in return. The situation was explained by a participant:

> "It [two-way communication] would be important, but the experience is that we do not get that. Our community is just expecting from one side, we must give. They haven't reached a stage where they can also contribute to risk reduction."

However, the same participant contradicted himself later in the interview by saying:

> "They (older persons) are always calling and some of them even come here and then we ask for their address so that we can go and do the assessment (disaster impact) there."

This is an indication that the community, and especially older persons, want to engage with the TDMC.

The abovementioned perception that older persons do not want to communicate and "only want to receive", led to the TDMC believing that two-way communication with the community, and especially older persons is not possible. The interviewees explained that there is an expectation within the community that the TDMC must only deliver services and "feed them [older persons] with information". The interviewees therefore indicated that managing community expectations are very difficult for them. It seems as though the participants feel that as soon as the community, and older persons in particular have an opportunity to participate in dialogue or raise their concerns, there is an immediate expectation that the TDMC must act on their issues. This view became apparent when one of the participants were prompted on whether older persons like to share information with the TDMC. The participant once again contradicted the previous stance that older persons do not want to engage in two-way communication by stating emphatically that they do want to share information. He furthermore stated that:

> "But what I indicated is that the only challenge is that they give the information and then want immediate effect, they expect changes to happen. But they do not understand that as the municipality we have a plan that we must follow and that those things will have to be submitted to the IDP[14] and whether or not a developmental project comes after that is something else."

Therefore there is an underlying belief that when community members are given the opportunity to engage in two-way communication they will immediately expect results from the TDMC, who in turn do not always have the necessary authority to make decisions that will result in actions. According to one participant, the lack of two-way communication and action in turn demotivates the community as a whole as they feel that they are not heard and therefore there is no use in communicating with the TDMC. This view was explained by the participant:

> "Maybe it is just that the time it takes to respond to their requests. I will give you an example: there was a community in Extension 11 [in Ikageng] who were residing in a flood line. Even if you just receive a small amount of rainfall the shacks will be flooded. So we wrote a report to counsel for them to be relocated. It took us almost two years to get them to be relocated. They are currently relocated but during that time of relocation, politics came into play as there were some leaders of the community that said they can't move there."

This feeling of powerlessness because of political barriers is a central theme within the TDMC. As mentioned above, the interviewees from the TDMC feel that they do not have the necessary authority to make decisions and act to assist a community in need: "I think politics also play a role in messing up what we are trying to achieve." One can therefore also deduce that there might be a lack of two-way communication between the TDMC and the Tlokwe Municipal Council, hence the problems.

This political interference and more importantly, the TLM's lack of action have however pushed the TDMC to go to such extremes as trying to invite older persons to the mayor's birthday party so that he can listen to their problems first hand:

[14] The Integrated Development Plan (IDP) is a five-year plan which local government is required to compile to determine the development needs of the municipality (Knysna Municipality, 2017)

> "So if these politicians can hear that we have problems with wheelchairs for older persons it will help. Social development is struggling on that part. We come in and try to collaborate with them together with the mayor's office. If these people hear the community member's problems, it makes it easier for us."

This is worrisome as the TDMC feel that they do not have a strong enough relationship to engage in dialogue with their stakeholders, referring to the older persons, municipal council as well as the mayor.

Another barrier to the two-way communication process, according to the participants, is that older persons believe they do not receive the necessary respect from the younger generation:

> "Our older persons, with the generation gap, they think we are pompous. They think we do not listen and that our respect levels have gone down."

What is enlightening though is the fact that the TDMC displays instances of willingness to be influenced by their stakeholders as is suggested by the two-way symmetrical paradigm:

> "…it is important because it helps you grow and it helps you fix where you thought you were perfect. So, it helps you fix some of the things that you were not observing."

6.2.2 Environmental scanning

Steyn and Puth (2000:20) state that research or environmental scanning (gathering, interpreting and using strategic information) is of utmost importance to manage communication and organisation-stakeholder relationships, especially in turbulent environments (see section 2.2.1.1). In the literature it is argued that for communication programmes to be successful the communication manager (in the case of this study, the communicating agency) should obtain information about the external environment by identifying stakeholders that might be influenced by the communicating agency's decisions and behaviours and/or influence the organisation similarly (Steyn & Puth, 2000).

When asked in this regard, one participant stated with conviction that the TDMC practice environmental scanning to ascertain who their various stakeholders are: "Yes, we do that, we have focus groups depending on the type of hazards and we are also aware of who is more at risk."

However, another participant noted that they target communication programmes at “everybody”, without segmenting the population:

> “So the database that we have, or should I say our scanning is … we actually did not scan, we are targeting everybody…. So we are trying to cover everybody, not a certain target. But for now our primary target is pre-school children. They learn quickly and then they go home and tell the parents what they learned at school and then the parents become involved. That is our primary key audience.”

The above response indicates however that the TDMC do not make use of environmental scanning to identify strategic stakeholders nor will they be able to determine the needs and views of these stakeholders because of the lack of two-way communication between the entity and the community. This was apparent in an example one participant used of where they (TDMC) could not disseminate a message successfully to older persons as the elderly did not understand the language that the TDMC were using. This shows that the TDMC did not conduct research on how to communicate with this group. It was also revealed that the TDMC normally disseminate the same message to everybody in the community as well as to the Tlokwe Municipal Council: “So the information we present to council and to the community is the same.” This indicates that the TDMC do not formulate tailor-made messages to different audiences, once again highlighting the fact that they do not base their communication on the needs of their stakeholders.

The participants did note that they have several capacity issues that impact communication with the community, and specifically older persons, negatively: “There are also challenges in terms of human resources on my side. I am running a unit on my own at the moment…. Yes, my capacity is a problem.” This is exacerbated by the recent addition of Ventersdorp to the TLM:

> “Since we have grown now, we are two municipalities. Again that is another challenge. I do not know the people that side, I must start from scratch. No, they do not have (a disaster centre). We must establish one there. That is another problem. We are three in the centre and we must open another centre there, so it is a major challenge”.

This lack of capacity adds to the communication problem as no-one is focusing on targeting specific audiences or determining who these audiences are.

Even though the TDMC regard older persons as a vulnerable group, they tend to group them together with other vulnerable groups, such as women and children. The TDMC is thus not creating an environment where older persons are considered a homogenous group that should be catered for in a specific way because of their unique needs:

> "But older persons and infants are more vulnerable than the other people we need to take care of. And also the women because in instances where a shack is destroyed, the woman can be raped if they do not have shelter."

6.2.2.1 Determining the needs of older persons

The participants however indicated that they have attended a ward meeting with the older persons to establish their needs: "We sat down with them and they told us their experiences and challenges. From that information we determined the needs." One participant affirmed that they attend these sessions to obtain a better grasp of the actual issues that older persons face:

> "We do that by doing risk assessment that is community based. That is how we do that, because if we do not do that we will only be able to think about their issues which are not really the issues they experience. So if we have information about the challenges and how they live, what they encounter and everything, we will be able to know their needs."

After these meetings the TDMC itself do site walks to further understand the issues that older persons face:

> "So the first day we sit with them and workshop with them about the risk assessment and then on the second day we do the site walk. We go to the field, where they live, and we see those things that they are saying is there. We will then identify the risks with them and that is how we determine their needs."

However, this is a time consuming and ongoing process, which was confirmed by one interviewee:

> "… we went to the old age homes and sat down with them for a day to collect their needs. It was a lengthy exercise and now we have their needs in black and white. The challenge is going back again, [we need] … capacity and funding from the Department of Social Development."

However, aside from engaging with older persons as mentioned above, the literature also states that at risk communities want to be, and should be, part of the decision-making processes that involve them and this should also be done on a continuous basis. This unfortunately is not the case in the TLM:

> "To tell you the truth, we do not invite them to our advisory forums. Last year the act was amended, that we must involve traditional leaders and in Potchefstroom [Tlokwe] we do not have any traditional leaders and all that, but we were thinking of substituting traditional leaders, with elderly leaders if there are any around the community. But for now we do not involve them."

6.2.2.2 Communicating with older persons

The TDMC uses mainly local radio and print media, as well as ward[15] meetings to engage with older persons:

> "We use the local radio station … and the print media, but we do not use it that much. Our main platform is through the local radio station and maybe through the speaker's office to the ward councillors to disseminate the message in their wards."

However, all these channels do not encourage two-way communication and communicating through ward councillors do not necessarily create a relationship between the TDMC and older persons. Moreover, the ward councillor do not necessarily disseminate important information concerning the views and needs of older persons back to the TDMC.

Another participant said that they use public events or communal spaces like social clubs and old age homes to engage with older persons: "Other methods that we have is to go to clinics. They have got a set date."

These venues are mostly run by municipal social workers, which is believed to have a positive influence on dialogue with older persons. Two other methods that the TDMC currently use to communicate to older persons is either by door-to-door to the elderly's house or school visits

[15] All municipalities in South Africa are divided into wards, which are served by ward councillors voted for in the municipal elections.

where they talk to the children. The TDMC believes that the children will disseminate the message to their elders who care for them:

> "The reason we came up with this strategy, was that the majority of our older persons are left at home with their grandchildren, and then their mothers go to work. The majority of the parents have died, so they are the orphans …But for now our primary target is pre-school children."

This is worrisome as they rely on the youth to disseminate their message to older persons, but admittedly state that the youth believe that they lie about disasters such as dolomite in the area: "…the youth who say we are lying." Despite the youth not believing their messages, they continue to communicate with older persons via their grandchildren.

Most of the abovementioned strategies however are not conducive to establish a relationship with older persons since most of the communication is via a third party like children, social workers or ward councillors. Since the TDMC do not conduct formal research, they have no way to determine whether their messages reach older persons at all. Furthermore, the TDMC have no way to communicate with older persons who do not attend meetings or go to the clinic: "… but the ones that are at home that do not have contact with these social clubs are a challenge." It is therefore nearly impossible for the TDMC to establish the views and needs of older persons within the TLM.

6.2.3 Relationship management with older persons

As mentioned in section 2.4.2.1, it is necessary that affected communities trust the disaster risk agencies and regard them as being a credible source of information. This implies that these agencies, in the case of this study the TDMC, build strong relationships with the affected community, characterised by trust, mutual control, commitment and satisfaction. According to Peters *et al.,* (1997:1), there are three strategies that help establish trust and credibility in communities, namely knowledge and expertise, openness and honesty, and concern and care (see section 2.4.2). These strategies resemble those identified by Hon and Grunig (1999) (see section 2.4.2).

- Knowledge and expertise

The participants believe that they portray knowledge and expertise by serving on ward meetings and also having a slot on the local radio station where they talk about disaster risks:

> "Like I indicated we present our rules to the ward committee members. We instill our knowledge and the capacity we have and everything. Also, we are currently in a process to have a slot at the community radio station … maybe once a month, just to go and speak about disaster risk management …"

One participant noted that the mere fact that they wear uniforms immediately shows to the community that they are experts in their field: "Yes, it makes a lot of difference. Previously we didn't have a uniform but we introduced it and it makes things a lot easier. Honestly, I haven't come across anyone doubting my expertise and what I do on a daily basis." The participants noted that they believe that the community trust them: "The trust is already there." However, the participants only believe this as they have not yet received complaints in this regard: "There is nothing of 'we do not want to listen to you'." One participant later said:

> "I would like to enhance it [trust] more, but going back to the challenge of capacity, we take a lot of time to get back to them ... I think we are lacking on that one."

The participants seemed uncertain of whether the TDMC's slow response has an effect on the trustworthiness. According to literature, two dimensions of trust are dependability, which refers to consistency in an organisation's communication and behaviour, and competence, which indicates the capability of an organisation to perform the duties and tasks that's expected of it (see section 2.3.2). This implies that slow or non-existent service from the TDMC could diminish trust in the entity. However, when prompted further regarding trust, one participant contradicted the other by saying that the older persons trust the TDMC to deliver on what they promise: "Yes, they know, because every time there is something, they will say 'there is a water leak' and they know that after 30 minutes the water leak will be fixed." The participant reiterated this opinion by saying: "Yes, they have trust in us and they believe that what we promise them will happen. That is why they also give us information."

One participant likened credibility to availability. He is of the opinion that because the TDMC is available to the community, it is credible and therefore trustworthy as well.

Despite the participants' firm believe in the TDMC being trustworthy, trust as an outcome of strong relationships has not yet been evaluated by the entity.

- Openness and honesty

Open and honest communication can strengthen the relationship with affected communities since it adds to trust, contributes to the community feeling more in control of their lives, demonstrates the commitment of the communicating agency and subsequently heightens relationship satisfaction. One of the participants referred to the relationship-building strategy of openness and honesty: “Yes, and if we know that something is not going to happen we are realistic and we tell them about that.” However, touching on the subject of public panic, one participant noted that although they are truthful they are careful not to cause panic:

> “To tell you the truth, we give them the whole information but some issues are sensitive and people tend to panic so we simplify issues. Not that we are not telling them the truth, but we simplify to the extent that they must not panic.”

These responses show that the TDMC feels that trust is built on honesty, which is a key finding, as they believe that their trust is earned because they deliver on promises or is honest when they cannot deliver on promises.

- Concern and care

The TDMC staff members believe they demonstrate concern and care to elderly members of the community:

> “We visited them [at the old age home], we spent the day with them, donated some blankets and matrasses. So it is one of the things we do to show that they are appreciated.”

However, as far as can be deduced, it only happened once and therefore do not amount to a continuous show of care.

When prompted further on whether the TDMC has an open, caring relationship with the elderly, one participant noted:

> “…old age homes, they have got our number. Anytime we have spoken to them, anytime is tea time. If it is 11am or 11pm we are available. It is one of the benefits, I think, that we give them. They know that anytime they need us, we are there.”

This statement is defining concern and care on a practical level. The concern however, is that this stance is reactive and not promoting two-way communication and a strong relationship in a pro-active manner.

Another example of demonstrating care and concern for the elderly took place when the TDMC assisted elderly people who were victims of a flash flood: “As the centre we went and made sure that we procure some relief packages for food for them.” These instances of concern and care demonstrates the TDMC’s commitment to their relationship with older persons, as well as adding to relationship satisfaction.

6.3 Disaster risk communication

Asking the participants about older persons and disaster situations, one participant hesitantly stated that they can be an asset, while the other participant elaborated extensively on older persons as a liability to the TDMC:

> “…they are the ones that are going to need more manpower. We will need the army to come and help us. We will have to get a special hall or specialise the hall for their needs, so they are a liability.”

This statement was preceded by the one participant saying that older persons are helpless: “…the majority of them really cannot do anything. They need to be looked after.”

The participants did note on a practical level that older persons can be helpful in the community and during disasters. The participants however only view older persons as an asset because they can come in “handy” to act as an early warning system, to calm unruly youth or convince people (of, for example, the dolomite risk) where the TDMC is not able to. This was highlighted in their comments: “They are an asset because if there are unruliness they will come in handy to call the young ones to order.”

Despite the participants’ negative view of older persons, they also acknowledge that they are available to assist the TDMC:

> “… why we are going for the older persons is that they stay at home 24/7. So, when the neighbour’s house is on fire they are there. Or when there is a burglary on the street they are there, so that is one of the key factors why we go out and communicate with older persons.”

The TDMC however, to a certain extent regard older persons' indigenous knowledge as important. This was illustrated by commenting that:

> "They have indigenous knowledge and they have a lot of information of what types of risks they have been exposed to and how they responded to that. So, the information that they have is very valuable and it needs to be recorded and documented for a learning experience for the future. That is what I believe should be done."

Using the elderly's indigenous knowledge was described:

> "They know the historical grounds of the areas and the major hazards, for example strong winds. They will tell you if the wind is coming from a westerly direction, it is heavy or if it is raining like this, it means that."

The TDMC is also aware of the importance of the elderly's indigenous knowledge, especially because an event was planned on this topic:

> "Last year we had the IDDR, the International Day for Disaster Risk Reduction, and the topic was on indigenous knowledge. So, we had an event, we called all the elderly people around Ventersdorp and Potchefstroom and we brought them together so that they can tell us where they come from and how they used to do things … and we drafted something from all the things we heard from them. We took all the feedback from the event and compiled a booklet on doing things."

It is however disappointing that the TDMC do not really value the views and knowledge of older persons regarding disaster risks:

> "They will tell you that they used to see the rain in the northern part of the country and then somebody will run up to the hill. It is not possible anymore. There is a lot of development, climate changes that affected all this. So, they can tell the time with the sun, that one still applies, but times have changed and we have developed cities now. The majority of those things are what they used to do in the villages. Now population have increased so it will be quite difficult …….. So, it will be quite difficult to incorporate that knowledge."

The result is that the TDMC only want to type up the information and store it in a library for safekeeping:

> "Currently we do not have that, but we need a library. A mini-library where we will have the video clips and that type of information. And if it comes to the push, it can be typed for safe keeping."

Although this is a step in the right direction, it shows that the TDMC do not necessarily regard the older persons as active and knowledgeable partners in the disaster planning processes while it is unfortunate that they do not really interpret and analyse this knowledge and only documents it after which it is stored without ever really being used.

It can therefore be stated that older persons are first regarded as a liability during disasters and are only seen as an asset when they can come in 'handy' for the TDMC. Unfortunately, the TDMC do not engage with older persons to empower them as an active partner for disaster risk management.

6.3.1 Older persons' mobile phone usage

The aim of this chapter is to establish the perceptions of the TDMC about the mobile phone usage of older persons for disaster risk communication. The participants were asked whether they think it is possible to communicate with older persons via mobile phones regarding disaster risks. Both respondents immediately responded with a resounding: "No". It should be noted that the participants were not asked whether older persons used a specific function on the mobile phone or not, but merely if they are able to communicate with it. When prompted further, one interviewee explained the reason for his perception:

> "My grandmother, for example, only calls. SMS nothing. She will tell me to send someone an SMS with her phone. Social media … we know it is one of the effective modes of communication at the moment, sending adverts or warnings … via SMS. Like I said, most of them [older persons] are not literate, so it is quite difficult."

The other participant explained: "The older persons do not [use the SMS function], unless I am mistaken, but I know with mine, they do not communicate with SMS's. We have to call them. They need to be called and hear the voice." It is clear from these statements that the participants from the TDMC has an imbedded perception that it is not at all possible to communicate with older persons regarding disaster risks via mobile phones, especially because older persons, according to them, do not use the SMS function. Furthermore, they base their beliefs on personal experience and not on research.

After the participants thought about the question, one participant acknowledged:

> "… so they are capable of using the cell phone … I think SMS and calling is the best. Well, our older persons are becoming educated. You have your WhatsApp groups and they are using them…"

The other participant could not perceive older persons as using mobile phones, because he said:

> "If you take the child's cell phone number, the ones that got smartphones, then you can send out messages on Facebook or on Twitter or wherever, you can send out early warnings, or MMS or SMS's."

It is clear that the TDMC has not conducted research on the best way to communicate with older persons regarding disaster risks, and they assumed that all older persons are illiterate and not capable of using mobile phones. The TDMC furthermore prefer to use other role players, like children, ward councillors and social workers, to communicate with older persons. The TDMC fails to understand that communicating directly with a specific group adds in building a strong relationship with them.

6.4 Conclusion

In this chapter, the fourth research question*: What are the perceptions of the TDMC about the role of mobile phone usage of older persons in disaster risk communication?* was answered by conducting a qualitative thematic analysis of the data obtained from semi-structured interviews with the head and public awareness officer of the entity.

It was concluded that the TDMC do not have a communication strategy, nor do they plan their communication with older persons in a strategic manner. Thus, there are few instances of two-way communication between the TDMC and older persons in the community. It was furthermore revealed that the TDMC prefer to not create opportunities for two-way communication with older persons as it can result in expectations that the TDMC might not be able to deliver on. The TDMC rarely communicate directly with older persons. They rather make use of secondary message bearers such as children and ward councillors.

The TDMC gathered indigenous knowledge regarding disaster risk reduction from older persons, but they believe that it is not relevant in modern times. They therefore only want to document the information but not make use of it.

As a result of inadequate engagement with older persons, the TDMC does not make older persons participants in the decision-making processes that relates to them. Despite no evaluation of the TDMC's actions, communication and/or the relationship with older persons, the participants indicated that they believe that this stakeholder group perceives them to be credible, trustworthy, knowledgeable and experts in their field. They have this perception because they never experienced anything to make them believe otherwise.

The TDMC explained that they are struggling to receive the necessary funding and support from the local municipality and different wards itself and sometimes feel that they cannot perform properly because of this. Insufficient funding also relates to a capacity problem at the TDMC, which impacts negatively on communication and service delivery to older persons.

One of the most important findings from the semi-structured interviews, is that the TDMC considers older persons to have limited use in disaster risk reduction. According to the participants, older persons are a huge liability during disasters and they only consider them to help with unruly youth. Following this view, the TDMC has not previously considered making older persons active partners in disaster risk reduction, or even during disasters, by communicating with them by means of mobile phones. The immediate perception of the participants was that it is not possible at all to communicate with older persons via mobile phones, because older persons are not able to use such technology. After some deliberation, they conceded that perhaps the TDMC can communicate with older persons via SMS on mobile phones since older persons are slowly embracing mobile phone technology. Therefore, it might be possible to communicate with older persons via mobile phones in the future, but not necessarily currently. Again, these conclusions were reached without referring to possible research into the best channels to communicate with older persons.

In the next chapter the final conclusions of the study are reached and the general research question is answered.

CHAPTER 7: CONCLUSION

7.1 Introduction

The purpose of this study was to determine how older persons' mobile phone usage can influence disaster risk communication strategies. In Chapter 1 disaster risk reduction and communication theory was discussed, as well as the possible use of mobile phones for disaster risk reduction. The problem statement was debated after which the general research question was formulated.

In Chapters 2 and 3 the theoretical framework of the study was discussed. In Chapter 2 the two-way symmetrical communication paradigm and disaster risk communication were deliberated, while Chapter 3 was dedicated to the topic of older persons in disasters and the possibilities of the use of mobile phones for disaster risk reduction.

In Chapter 4 the research methodology that was followed to achieve the outcome of this study was discussed. It was stated that a qualitative research approach was followed, with the use of mixed research methods. The use of quantitative surveys and qualitative semi-structured interviews were necessary to provide a nuanced answer to the research question. Furthermore, using mixed methods research ensured that the findings are more reliable. In Chapters 5 and 6 the quantitative and qualitative data were discussed and analysed respectively.

The main aim of the study was to answer the general research question, namely:

How can older persons' mobile phone usage influence disaster risk communication strategies?

The general research question will now be answered. This will be done by aligning the findings of Chapters 4 and 5 with the theory as discussed in Chapters 2 and 3. The theoretical statements given in Chapter 2 are discussed, as well as the key findings of Chapter 3 and how it relates to the specific research questions as laid out in Chapter 1.

This chapter then provides certain recommendations to the TDMC on how the mobile phone usage of older persons within the municipal area can inform their disaster risk communication strategies. The restrictions and suggestions for further research are also discussed.

In order to answer the general research question, the specific research questions as stated in Chapter 1, must first be answered. To answer research questions 1 and 2, the key findings of Chapters 2 and 3 are discussed.

7.2 Theoretical framework

Specific research question 1

What is the nature of disaster risk communication as informed by the two-way symmetrical communication paradigm, according to literature?

The literature review of this study started off with an explanation of the two-way symmetrical communication paradigm. It was stated that the two-way symmetrical communication paradigm's main focus is to establish mutually beneficial and long-term relationships with stakeholders, which is achieved by communicating in a two-way, ethical and transparent manner (Grunig, L. *et al*., 2002:11; Grunig, J. & White, 1992:42-43).

The two-way symmetrical communication paradigm states that when such a mutually beneficial relationship exists, it will result in the organisation (or in this case the TDMC) being able to adapt to environmental changes and to align its own goals with that of its stakeholders. In effect this means that both parties' interests are met (Grunig, L. *et al*., 2002:11). However, to build strong organisation-stakeholder relationships the communication practitioner must function as a strategist (Grunig, J. 1992a:10, 24, 26; 1992b:531; 2001:16; Steyn & Puth, 2000; Grunig, L. *et al*., 2002:1, 10)

The communication practitioner in the role of strategist makes use of research, or otherwise known as environmental scanning, to gather information regarding the environment and strategic stakeholders to be able to plan and facilitate communication programmes (Steyn & Puth, 2000:16). These communication programmes are designed to engage in two-way communication with strategic stakeholders to build strong relationships that are beneficial to both the organisation and its stakeholders.

It was argued that when environmental scanning is practiced by engaging in two-way communication with stakeholders a strong and lasting relationship can be established. This relationship is characterised by trust, control mutuality, commitment and satisfaction.

From the abovementioned discussion, the following theoretical statement was formalised:

Central theoretical statement 1

Communication management, according to the two-way symmetrical paradigm, have the following key features:

- the communication management function has a strategic managerial role;
- the senior communication practitioner should function as a strategist performing environmental scanning;
- to conduct environmental scanning, the strategist needs to engage in two-way communication with stakeholders;
- environmental scanning and two-way communication should lead to strong organisation-stakeholder relationships characterised by:
  - trust;
  - mutual control;
  - commitment; and
  - relationship satisfaction.

Strong relationships characterised by trust and source credibility is key in the field of disaster risk communication. To establish and enhance relationships between risk communicating agencies and communities affected by disaster risks, two-way communication needs to be implemented as conceptualised by the two-way symmetrical communication paradigm. It was also noted that to establish long-lasting relationships with affected communities, it is important that the correct message be transmitted to relevant stakeholders during different phases of the disaster risk management process (O'Neill, 2004:14).

When formulating the message, it must be taken into consideration that a community who faces disaster risk has very specific communication needs that should be addressed. These communication needs are (Wiggill, 2016:5-6; Fitzpatrick-Lewis *et al*., 2010:13; Frewer, 2004, p. 392; Trettin & Musham, 2000, p. 420–422):

- communities require clear and direct information from a designated facility and not the media or filtered down from government (which will enhance trust as a relationship outcome);

- communities want to have access to all information and want to be able to participate in decision and policy making processes (this indicates a desire for taking mutual control on issues affecting them);
- the affected communities want to feel that disaster risk communication should be focused towards them as citizens by being more consultative and inclusive (this will demonstrate mutual control and commitment as relationship outcome); and
- the community want to have clear rules and procedures regarding disaster risk management (will make the community feel safe and they will experience more relationship satisfaction).

Demeritt and Nobert (2014) identify four disaster risk communication models, namely the risk government model, risk message model, risk instrument model and risk dialogue model. The latter model allows for dialogue between the communicating agency and the affected community, but does not allow either of the respective parties to persuade each other in an ethical and credible manner. This implies that none of the identified disaster risk communication models currently adheres to the principles of the two-way symmetrical communication paradigm.

It is clear from the above-mentioned that at-risk communities have specific communication needs, and that the current disaster risk communication models can not address these needs. There are several determinants that contribute to credible disaster risk communication. These determinants include that the risk communicating agency should display knowledge and expertise regarding the specific disaster risk, be open and honest to the community by relaying all information, as well as to show concern and care towards the affected community (Peters *et al*., 1996:1). Establishing two-way communication between the risk communicating agency and the affected community is therefore of utmost importance to be perceived as being credible and trustworthy.

It was stated in section 2.2.1.2 that the mixed-motive model symbolises realistic communication practice, since it includes persuasion used within a symmetrical worldview. In the case of disaster risk communication, it is sometimes necessary to use persuasion as a communication technique, for example to convince the affected community to evacuate a high-risk area. It was argued that invitational rhetoric (see section 2.4.2.2.1) is of value in disaster risk communication as its focus is to create a relationship of value which is characterised by equality between the communicator and its audience, thereby practising the principles of the two-way symmetrical paradigm (Foss & Griffin, 1995:4).The primary objective of invitational rhetoric is to have a deeper understanding of the other party's needs and circumstances and this understanding leads to mutual respect for

different perspectives. Understanding each other's perspectives leads to stronger, deeper relationships being formed between the various parties, which is characterised by trust, control mutuality, commitment and relationship satisfaction.

From the above discussion, the following theoretical statement was conceptualised:

Central theoretical statement 2

Disaster risk communication as informed by the two-way symmetrical communication paradigm comprises the following key aspects:

- at-risk communities have definitive communication needs that should be addressed:
  - they require clear and direct information;
  - communities want to participate in disaster management decision-making processes;
  - disaster communication should be focused on the community; and
  - clear rules and procedures should be set regarding the disaster process.
- two-way communication contributes to a trusting relationship between disaster centres and the community;

The most important relationship building strategies (incorporating those identified by Hon and Grunig (1999)) to be applied in a disaster risk environment are:

- the disaster centre should display knowledge and expertise;
- the RCA should be open and honest towards the community; and
- the RCA must show concern and care for the community.

The purpose of Chapter 3 was to answer the second specific research question, namely:

Specific research question 2

What is the role of mobile phone usage, specifically older persons' mobile phone usage, within the framework of disaster risk and two-way symmetrical communication, according to literature?

In Chapter 3, it was argued that mobile phones can play a decisive role to establish two-way communication between risk communicating agencies and older persons. In this chapter, the literature regarding the concept *disaster risk reduction*, which concerns itself with alleviating the risk of disasters through systematic efforts, was first examined. From the literature, it was concluded that disaster risk reduction's aim is to reduce the vulnerability of certain groups to disaster risks, and it is necessary to enhance their coping capacity towards such risks.

There are five capital domains as explained by the capital based approach, namely the social, economic, physical, human and natural domains (Mayunga, 2007:5) Mayunga (2007:5) states that if these capital domains are enhanced the coping capacity of vulnerable groups will also improve. Two of these domains are of importance for the purpose of this study, namely social and human capital. It was argued that older persons' social capital, which entails the social cohesion within a community, as well as human capital, which entails the expansion of knowledge and education, can both be greatly influenced using mobile phones. This is because mobile phones enable people to get into contact with one another in mere seconds and with almost complete disregard of one's location. Mobile phones greatly improve the direct communication line between people and also make it easier to, for example, establish groups of people by means of applications. Access to mobile phones and internet connection can also improve people's knowledge regarding various subjects, such as the nature of a specific disaster risk, whereas there are numerous examples of health applications, which can be used to do health assessments.

It was further highlighted in this chapter that older persons are often more vulnerable to certain disaster risks as they sometimes have physical difficulties and incapabilities such as heart disease, high blood pressure, poor eyesight, slow movement, muscle and joint dysfunctions, etcetera. The mere fact that older persons have more health-related difficulties than their younger counterparts puts them in a vulnerable position as it is often difficult evacuate them during

disasters. Furthermore, it is predicted by Tuohy and Stephens (2012:1) that by 2030 the number of older persons worldwide would be almost double of that in 2000, which highlights the need for more effective means of enhancing older person's coping capabilities. One way to reduce older persons' vulnerability to disaster risks is to communicate effectively with them. It was identified from literature that older persons often do not receive early warnings to disastrous situations (Phifer, 1990:1), which is crucial to ensure their safety. This severely impacts the response time that older persons have, for example to evacuate when it is deemed necessary.

It was therefore stated that the best way to reduce the effects of disasters is that one must be prepared for it. In this instance the use of mobile phones offer possibilities such as communicating through SMSs, WhatsApp and Facebook.

Older persons' use of mobile phones can enhance both their human and social capitals as it can connect them to the world around them (such as children, grandchildren, emergency agencies) as well as inform them on how to prepare for disaster risks. The use of mobile phones can also assist older persons regarding the everyday difficulties that they face, for example that they are sometimes far from medical help. Furthermore, mobile phones have the potential to address their social isolation.

There are several difficulties that older persons' experience regarding mobile phone use. Renaud and Van Biljon (2010) point out that older persons often have physical and mental limitations that might make it difficult for them to navigate or find key features on their phone. Furthermore, older persons often have a lower learning rate or would need some assistance from other people to get to know their mobile phone. The positives of older persons using mobile phones however far outweigh these limitations as was evident in a recent case study where medical help and assistance could be provided to malaria sufferers solely by means of mobile phone technology (Quan *et al*., 2014).

Despite the many benefits older people could benefit from mobile phones, it was also argued that older people possess vast amounts of intrinsic local knowledge which could also serve the TDMC greatly Deeny *et al*. (2010:3). This knowledge should be obtained and put to use by RCAs.

In summary, the following key points regarding older persons' mobile phone use and disaster risk communication were identified and served to guide the semi-structured interviews as well as the thematic analysis of the data gathered from the said interviews:

- older persons are often more vulnerable to disastrous occurrences because they might experience physical difficulty;
- older persons have a vast amount of local knowledge which could aid disaster management centres;
- mobile phones can significantly enhance older persons' coping capacity towards disasters; and
- the use of mobile phones can increase the quality of life for older persons and give them access to more services that will help to reduce their vulnerability.

It was finally concluded that theoretically, older person's vulnerability to disaster risks can be reduced by using mobile phone technology. However, the mobile phone usage of older persons in South Africa is not known, which lead to the third specific research question.

7.3 Older persons' mobile phone usage in the TLM

The quantitative phase of this study was conducted by means of an analysis of the data generated by a survey, which was completed by N=126 older persons (age 60+) who lives within the region of the TLM. The aim of the survey was to establish the mobile phone usage patterns of older persons within this specific area. This was done to answer the third specific research question, namely:

Specific research question 3

What is the mobile phone usage of older persons in the TLM currently?

The survey mainly focused on whether older persons indeed have a mobile phone, what they use it for, and how often they make use of the several functions that the mobile phone possesses. Furthermore, the survey aimed to establish how the LSM of each of the respondents impacted the way in which they use their phones. It was also important to establish whether they contacted friends, family and community members as this enhances their social capacity as mentioned in the previous section. Last, the survey was used to establish whether older persons have trouble using their mobile phones. Finally, a correlation was drawn between the functions that the respondents use on their phone and the varying degrees of difficulty that they experience operating the phone.

It was established that most of the respondents use a mobile phone on a daily basis, regardless of which category of the LSM they fall into. The respondents indicated that they mostly use calling and SMS functions. Even though there is a slight difference regarding the regularity with which respondents with a higher LSM use certain functions, it was found that a large portion of the respondents in the lower LSM group's mobile phones can perform the same functions. Most respondents also indicated that they can use the functions.

It was further established that most of the older persons within the TLM use their phones to contact family on a weekly basis and their friends monthly. It is believed that this social contact also helps to improve their social coping capacity as mentioned by Mayunga (2007) (see section 3.2).

The data indicated that most of the older persons who participated in the study, find the phone menu understandable and can use it. The respondents also indicated that they can orientate themselves regarding the phone's usability. Furthermore, a significant number of respondents indicated that they feel that their own ability and fear of technology is the main reason why they struggle with using their mobile phones optimally.

The correlation between the functions of mobile phones that older persons mainly use and the difficulty they encounter in using it, showed significant relations between the functions that older persons use often and the degree to which they find the phone easy to use and understandable. This showed that if older persons feel that they understand and can use their mobile phone, the more functions they will use. The reverse is also true, where older persons who indicated that they are scared to try new things on their mobile phones make use of less functions on the mobile phone.

The extent to which older persons use their mobile phones within the TLM, has a significant impact on this study. It was found that older people are sufficiently capable of using their mobile phones to communicate effectively. This is however not shared by the TDMC whom has pre-determined perceptions regarding older persons and their use of mobile phones.

7.4 TDMC's perceptions about the role of mobile phone usage of older persons in disaster risk communication

In the qualitative phase of this study, semi-structured interviews were conducted with the management team of the TDMC. These interviews were conducted mainly to establish what their perceptions are regarding older persons as a stakeholder group and how they perceive older persons during disasters. Furthermore, the aim was to establish whether they believe that mobile phones can be of value as a means of communication before and during disasters.

The following section summarises the main themes that was deduced from the transcribed interviews to answer the fourth specific research question, namely:

Specific research question 4

What are the perceptions of the TDMC about the role of mobile phone usage of older persons *in disaster risk communication?*

- Strategic disaster risk communication management

The TDMC does not manage communication strategically since they do not have a risk communication strategy. The TDMC therefore do not employ a trained communication practitioner at all. It was furthermore evident from the interviews that the participants do not realise the value of strategically managed disaster risk communication as well as strong relationships with disaster risk affected communities. The participants indicated that older persons are not segmented apart from all the other vulnerable stakeholders because the elderly are not considered as a separate group with their own needs. This implies that they do not conduct environmental scanning to determine any of their stakeholders' needs and views. Furthermore, they do not segment stakeholders and communicate with them according to their needs, issues and views.

The TDMC communicates the same message to all stakeholders, irrespective of the specific stakeholders' needs and views. Furthermore, because lack of a communication strategy, distinctive and specific messages are not communicated during the different phases of a disaster.

The TDMC does regard possible disaster risks during seasonal changes as important and communicate to stakeholders when it occurs and how to manage it (see section 6.2). However, these awareness campaigns are not planned strategically and are not aimed at specific stakeholders.

Additionally, the TDMC acknowledges that older persons have indigenous knowledge that can assist them in managing disaster risks, but they intend only to record and store this knowledge. The interviewees noted that they perceive older persons' indigenous knowledge as not being relevant since it is "old knowledge and times have changed" (see section 6.2.5). This disregard for older persons' knowledge and possible contribution to disaster risk reduction is counterproductive to building strong, trusting relationships with this stakeholder group.

It was concluded that the TDMC has no intention to establish two-way communication with their stakeholders, specifically referring to older persons. The participants from the TDMC explained that they do not want to engage with older persons because they believe that as soon as they allow them to provide feedback and become part of the conversation, there will be unrealistic expectations to fulfil all their needs. The interviewees feel that they do not always have control over service delivery as there are political interferences and decisions that are being made by the Tlokwe City Council without taking the TDMC's needs and limitations into consideration. This situation effectively creates a never-ending loop and leads to the community being frustrated by the lack of action as well as the lack of communication. If the TDMC were however able to engage in two-way communication with the community, the latter will better understand their predicament, which will in turn lead to a stronger relationship between the two parties.

Despite not creating opportunities for two-way communication, the participants did regard the needs of older persons as important. However, they do not invite older persons to form part of decision-making processes and prefer not to provide full access to disaster risk information to prevent possible panic amongst the elderly. These views contradict what literature states regarding the communication needs of at risk groups, namely to receive clear information, to have access to information, focused disaster communication, clear rules and procedures, and to be part of the decision-making processes (Wiggill, 2016:5-6; Fitzpatrick-Lewis *et al*., 2010:13; Frewer, 2004:392; Trettin & Musham, 2000:420–422) (see section 2.4.1).

It can therefore be stated that the TDMC's communication actions closely relates to that of the risk government model as discussed by Demeritt and Nobert (2014) as they only see communication as an exercise of political power whereby no dialogue and no knowledge on the intended audience exist (see section 2.4.2.1)

- Disaster risk communication and relationship management

As a result of the lack of two-way communication, the relationship between the TDMC and older persons within the municipality, is deemed as not being strong. Literature states that a strong relationship is characterised by trust, mutual control, commitment and relationship satisfaction (Grunig, 2006a:168; Hung, 2004:266; Hon & Grunig, 1999) (see section 2.3.2). It is however important to note that literature suggest that if the communication needs of the at-risk community (older persons) are met, the relationship between the TDMC and older persons could be strengthened. It is therefore of utmost importance for the TDMC create opportunities for two-way communication with older persons.

Despite this situation, the interviewees believe older persons trust the entity. This belief was founded in the fact that they have never, from their perspective, experienced any situation in which they have felt distrust from older persons. They are of the opinion that they are viewed as a credible source of information (see section 6.2.4).

The participants expressed their view that older persons regard them as pompous and disrespectful. However, the older community might be correct in their assumption because of the TDMC's disregard for their indigenous knowledge and the contribution it might make to disaster risk planning.

However, these opinions should not lead to the TDMC not engaging in a two-way dialogue with older persons since many of these perceived barriers are created because of their non-existing two-way communication with their stakeholders. The fact that there is no strategic plan to communicate with the community, specifically older persons, and not prioritising two-way communication because of fear of a call for action are the primary reasons why there is no strong relationship between the TDMC and the communities they serve.

Regarding relationship building and strengthening of relationship outcomes, the interviewees believe that the TDMC is open and honest with older persons because they deliver on the promises that they make, for example fixing water leaks that could possibly create sinkholes because of the dolomite in the area. This is however contradictory to their previous statement that they do not want to engage with older persons as this will create expectations within the community. According to the interviewees, the TDMC displays its knowledge and expertise regarding disaster risk management by wearing uniforms and a slot on the local radio station. This creates an authoritative image which the community will not necessarily relate to. It was

concluded that the TDMC do not display enough care and concern as this is only done on a very practical and basic level and they do not take an in-depth interest in older persons as a group. Furthermore, it was evident from the interviews that the visits that the TDMC did conduct to older persons were once-off events. What is more disconcerting though is that the TDMC do not listen to older persons' real concerns, based on the way they dismissed older persons' indigenous knowledge.

- Perceptions on the role of mobile phone usage of older persons in disaster risk communication

The participants indicated that they regard older persons as a major liability during disasters as it is believed that they cannot do anything for themselves. This was specifically voiced by one participant.

Lastly and most important it was emphatically stated by the interviewees that older persons are not at all able to use mobile phones and therefore it cannot be used as a medium to communicate with them. They assumed that the elderly is illiterate and cannot use mobile phones' functions. However, after thinking about the question, they did come to realise that using mobile phones for disaster risk management communication with older persons might be possible. The TDMC's dismissal of using mobile phones as a medium to communicate with older persons regarding disaster risks, was not based on research, but their own flawed perceptions.

7.5 Proposed guidelines on how older persons' mobile phone usage in the TLM can inform its disaster risk communication strategies

The following guidelines can be formulated from the literature and data from the surveys and semi-structured interviews on how the mobile phone usage of older persons in the TLM can inform disaster risk communication strategies. These guidelines will be compiled to answer the general research question, namely:

General research question

How can older persons' mobile phone usage in the Tlokwe Local Municipality influence its disaster risk communication strategies?

Guideline 1: Strategic communication and relationship management

From literature, it is apparent that the communication function should be managed and planned strategically by a trained communication practitioner in the role of a strategist (Steyn & Puth, 2000; Grunig, J., 2006b:2; Lindeborg, 1994:1; Grunig, J., & White, 1992:91). The TLM and council should therefore be sensitised to the importance and benefits of managing communication strategically so that they would provide the financial means to appoint such a practitioner at the TDMC. Environmental scanning should be conducted regularly to ascertain exactly who the stakeholders of the TDMC is, what their views and needs are, and which media to use to communicate most effectively with them.

As part of the process of environmental scanning, opportunities for two-way communication with the different stakeholder groups should be created and encouraged. Regarding older persons, it is necessary to ensure them that they are heard, and that their knowledge is appreciated and included in strategy and policy formulation, as well as decision-making processes. It should be clearly visible to older persons how and where their knowledge is applied to create a safer environment for the community.

Data from the semi-structured interviews showed that the participants believe two-way communication with the elderly should be not encouraged as the perception exists that it then creates expectations that the TDMC cannot meet. However, when two-way communication exists between an organisation and its stakeholders, the organisation will be able to manage these expectations because such communication creates mutual understanding between parties.

When the TDMC manages communication with older persons strategically, they will be able to establish strong relationships, characterised by trust, mutual control, commitment and relationship satisfaction with the latter. It is therefore necessary that the TDMC engage with older persons in two-way communication. This could be achieved by implementing relationship-building strategies such as providing access to decision-making processes; focusing on positivity; being open in the relationship; assure the older persons that the TDMC is committed to the relationship; building networks with those that older persons have links with, for instance social and health services; solving problems together, for example by using older persons' prior knowledge; sharing common interests such as creating a safer environment; and cooperation, for example by empowering older persons to be the ears and eyes of the TDMC in the community. In this way older persons can be active participants in the relationship, which will benefit the TDMC in turn.

Guideline 2: Use of mobile phones to communicate with older persons

The data from the surveys clearly showed that almost all the respondents possess a mobile phone and could use at least the most basic functions of the phone, such as making and receiving phone calls and sending and receiving sms messages. The literature also showed that the opportunities that mobile phones provide regarding disaster risk communication are endless.

It was pointed out in Chapter 3 that it is an absolute necessity that older persons engage with new technology in this ever-developing society as we are continuously relying more on technological advances, especially in the mobile phone industry (Feist 2010). It is argued that technological advancements can drastically improve older persons' quality of life and more importantly in the field of disaster risk management.

Mobile phones can improve older persons' social and human capitals as discussed by Mayunga (2007). This can be done by improving their sense of community, the isolation they face and stimulation of knowledge.

In saying this, it is unfortunate that there still exists a perception that older persons do not know how to use their phones efficiently. The results from this study show that this is a misconception and that most older persons, even those in lower LSM categories can operate their mobile phones with distinction. There is a longer learning curve into the workings of the phone as pointed out by Renaud and Van Biljon (2010,) but it is also worth mentioning that older persons continuously strive to integrate with the society around them, and in that mobile phones provide them with the perfect opportunity (Gonzalez *et al*., 2012).

The TDMC do not engage with older persons on a continuous basis and therefore experience them as being a liability and all-knowing while they believe that there is no way in which they can engage with older persons by means of a mobile phone. The quantitative data however tells a different story altogether.

It is proposed that the TDMC seize this opportunity to communicate with older persons via mobile phones. This could be done by:

- conducting environmental scanning to determine the exact needs of the older person (mobile phone technology could also be applied for this purpose);
- establishing a database containing the contact details and specific needs of older persons within the community;

- using mobile phones to provide clear and direct information about disaster risks and how it can be managed;
- using mobile phone functions to provide older persons with opportunities to participate in disaster management decision-making processes, for example by using the sms function as a way to vote on a specific issue;
- sending clear rules and procedures regarding the disaster process to affected older persons who can in turn convey it to household members; and
- providing older persons with a contact number to which they can report (by means of calls or sms) possible disaster risks (early warning notifications).

By using mobile phones in the above way, older persons will experience the TDMC as being concerned about them, caring for them and acknowledging them as an integral and active part of the community. The relationship between the TDMC and the older persons in the community will be enhanced as the mobile phone provides a contact point through which both parties will be able to communicate with each other. This will also help in engaging and convincing older persons within the community to help the disaster management centre with early warning notifications. Furthermore, the TDMC will be able to display their disaster risk knowledge and expertise, which will enhance trust in the entity. Using mobile phones to communicate openly and honestly will strengthen the relationship with older persons in the community. More important, if a strong, mutually beneficially relationship is established between older person and the TDMC, the elderly can be ambassadors for the TDMC within the community.7.6 Restrictions and future research.

7.6 Restrictions of the study

For the purpose of this study, the TLM was the only municipal area which was studied. This is due to restrictions in cost and execution as well as the study forming part of a larger research study. Hence, the results in this study cannot be generalised. However, the findings can be adapted to the specific needs of other municipalities and used as guidelines.

Because the quantitative part of this study formed part of a larger interdisciplinary study, this part of the research was conducted first, however it was argued that the study still maintained all the qualities of a sequential exploratory mixed-method design.

Due to the personnel shortages at the TDMC, only two participants were available and qualified to conduct interviews with.

7.7 Future research

This research was only conducted within the TLM. From a South African disaster risk reduction point of view, it could prove significant to conduct the same study within other municipalities in South Africa.

The TDMC stated that the older persons within the TLM trust them, because they have never received any evidence to the contrary. Further research could be conducted to establish precisely how the older persons within the municipality (or other municipalities) experience the communication they receive from the TDMC, as well as their perceptions on the quality of their relationship with the TDMC.

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Addendum A: Quantitative survey

Condition	ID	Question	Answer
None	1	[Q_1] How old were you on your last birthday?	
None	2	[Q_2] What is your gender?	<1> Male <2> Female
None	3	[Q_3] What is your race?	<1> Black <2> White <3> Coloured <4> Indian
None	4	[Q_4] Where do you live?	<1> Ikageng <2> Promosa <3> Mohadin <4> Potchefstroom
None	5	[Q_5] What is your highest level of education?	<1> No education <2> Primary school <3> High school <4> Matric certificate <5> Degree/ Diploma <6> Post Graduate
None	7	[Q_7] In your house, do you have access to the following?	
		[Q_7_1] *Hot water from a geyser*	<1> Yes <2> No
		[Q_7_2] *Computer (laptop/desktop)*	<1> Yes <2> No
		[Q_7_3] *Electric stove*	<1> Yes <2> No
		[Q_7_4] *Domestic workers/gardeners*	<1> Yes <2> No

		[Q_7_5] *More than one radio*	<1> Yes <2> No
		[Q_7_6] *Flush toilet*	<1> Yes <2> No
		[Q_7_7] *Motor vehicle*	<1> Yes <2> No
		[Q_7_8] *Washing machine (clothes)*	<1> Yes <2> No
		[Q_7_9] *Refrigerator*	<1> Yes <2> No
		[Q_7_10] *Vacuum cleaner*	<1> Yes <2> No
		[Q_7_11] *Pay TV (Mnet, DSTV, TopTv)*	<1> Yes <2> No
		[Q_7_12] *Dishwashing machine*	<1> Yes <2> No
		[Q_7_13] *Home security service*	<1> Yes <2> No
		[Q_7_14] *Deep freezer*	<1> Yes <2> No
		[Q_7_15] *Microwave oven*	<1> Yes <2> No
		[Q_7_16] *House/Townhouse*	<1> Yes <2> No
		[Q_7_17] *DVD player*	<1> Yes <2> No
		[Q_7_18] *Tumble dryer*	<1> Yes <2> No
		[Q_7_19] *Home theatre system*	<1> Yes <2> No
		[Q_7_20] *Landline*	<1> Yes

			<2> No
		[Q_7_21] *Swimming pool*	<1> Yes <2> No
		[Q_7_22] *Tap water in house*	<1> Yes <2> No
		[Q_7_23] *Built in kitchen sink*	<1> Yes <2> No
		[Q_7_24] *TV set*	<1> Yes <2> No
		[Q_7_25] *Air conditioning*	<1> Yes <2> No
None	8	[Q_8] How many working cellphones are there in your household?	
None	9	[Q_9] How many cellphones do you use on a daily basis?	<1> None <2> One <3> More than one
[Q_9] ≠ 1	10	[Q_10] Explain your previous answer	
	11	[Q_11] How do you get access to the phone?	<1> Own it <2> Rent it <3> Borrow it
[Q_11] = 3	12	[Q_12] Who do you mainly borrow it from?	<1> Children <2> Grandchildren <3> Friend <4> Family member <5> Work <6> Other
None	13	[Q_13] What phone is it?	
None	14	[Q_14] What can the phone do?	
		[Q_14_1] *Make and receive calls*	<1> Yes <2> No
		[Q_14_2] *Send and receive a SMS*	<1> Yes

			<2> No
		[Q_14_3] *Send and receive a MMS*	<1> Yes <2> No
		[Q_14_4] *Go on the internet*	<1> Yes <2> No
		[Q_14_5] *Send and receive emails*	<1> Yes <2> No
		[Q_14_6] *Access to Mxit, Whatsapp, ect.*	<1> Yes <2> No
		[Q_14_7] *Access Facebook*	<1> Yes <2> No
		[Q_14_8] *Play music/radio*	<1> Yes <2> No
		[Q_14_9] *Take photos*	<1> Yes <2> No
		[Q_14_10] *Send a Please call me*	<1> Yes <2> No
		[Q_14_11] *Have a calculator*	<1> Yes <2> No
		[Q_14_12] *Have an alarm clock*	<1> Yes <2> No
		[Q_14_13] *Have games*	<1> Yes <2> No
		[Q_14_14] *Have a GPS*	<1> Yes <2> No
[Q_14_1] = 1	15	[Q_15] How often do you make and receive calls	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily

[Q_14_2] = 1	16	[Q_16] How often do you send and receive a SMS	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_3] = 1	17	[Q_17] How often do you send and receive a MMS	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_4] = 1	18	[Q_18] How often do you go on the internet	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_5] = 1	19	[Q_19] How often do you send and receive emails	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_6] = 1	20	[Q_20] How often do you use to Mxit, Whatsapp etc.	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_7] = 1	21	[Q_21] How often do you access Facebook	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_8] = 1	22	[Q_22] How often do you play music/radio	<1> Never

			<2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_9] = 1	23	[Q_23] How often do you take photos	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_10] = 1	24	[Q_24] How often do you send a Please call me	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_11] = 1	25	[Q_25] How often do you use the calculator	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_12] = 1	26	[Q_26] How often do you use the alarm clock	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_13] = 1	27	[Q_27] How often do you play games	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
[Q_14_14] = 1	28	[Q_28] How often do you use the GPS?	<1> Never <2> Once a month

			<3> Once a week <4> 2-3 times a week <5> Daily
None	29	[Q_29] To what network is the phone connected?	<1> Vodacom <2> MTN <3> Cell C <4> Virgin Mobile <5> 8ta
	32	[Q_32] Please consider the following statements:	
		[Q_32_1] The phone menu is understandable	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_2]The letters on the phone is readable without glasses	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_3]I can orientate myself to do what I want on the phone	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_4]My airtime limits my functions	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_5]I know how to work with my phone	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_6] I am scared to try new things on the phone	<1> Strongly Disagree

			<2> Disagree <3> Agree <4> Strongly Agree
		[Q_32_7]My own abilities limit my use of the phone	<1> Strongly Disagree <2> Disagree <3> Agree <4> Strongly Agree
None	33	[Q_33] What do you mainly do when you experience difficulties?	<1> Leave it <2> Try to figure it out <3> Read the manual <4> Ask for help
None	36	[Q_36]How often do you contact the following people:	
		[Q_36_1]Your grandchildren	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_2]Your children	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_3]Emergency services	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_4]Family members that are younger than you	<1> Never <2> Once a month <3> Once a week

			<4> 2-3 times a week <5> Daily
		[Q_36_5]Family members that are older than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_6]Friends that are younger than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_7]Friends that are older than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_36_8]People from church	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
None	37	[Q_37]How often are you contacted by the following people:	
		[Q_37_1]Your grandchildren	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_2]Your children	<1> Never <2> Once a month

			<3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_3]Emergency services	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_4]Family members that are younger than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_5]Family members that are older than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_6]Friends that are younger than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_7]Friends that are older than you	<1> Never <2> Once a month <3> Once a week <4> 2-3 times a week <5> Daily
		[Q_37_8]People from church	<1> Never <2> Once a month <3> Once a week

			<4> 2-3 times a week <5> Daily