

A model for a multi-agency incident command system at local government level in South Africa

PJ Brazer



orcid.org/0000-0003-4622-853X

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Promoter: Prof D Van Niekerk

Co-promoter: Dr C Coetzee

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ABSTRACT

The Constitution of the Republic of South Africa compels different government departments to protect and safeguard the inhabitants of South Africa. The changes to a democratic dispensation in 1994 brought a number of new challenges related to managing incidents, emergencies or disasters. The change from the old dispensation to the new resulted in gaps between the different government departments (intergovernmental and interorganizational in terms of disaster risk reduction (DRR). In an effort to bridge these gaps, the cabinet in 1997 established the Inter-Ministerial Committee on Disaster Management (IMC). This resulted in a cabinet resolution to follow international trends and to relook at the country's approach to civil protection. The newly elected democratic government resolved to move away from traditional thinking that viewed disasters as unstoppable forces of nature for which nothing could be done. However, the floods that took place in the Cape Flats in 1994 brought a turning point in the way incidents, emergencies or disasters were managed in South Africa.

This led to the promulgation of the Disaster Management Act (57 of 2002). The Disaster Management Act (57 of 2002) Section 1(f) provides for and emphasizes emergency preparedness, that recognize the benefits of multi-disciplinary and multi-sectoral multi-response and collaboration sharing of resources in the time of incidents, emergencies or disaster. In this regard there was acknowledgement that the saving of lives and the prevention of loss and damage to property and infrastructure and the environment also depend on rapid response and effective management of multi-agency stakeholders. An important aspect was highlighted that the probability of the occurrence of an incidents, emergencies or disasters is very high at local government level. Therefore, the government's main goal became to deliver a timely, supportive response and automatic multi-aid capacity to any area in South Africa where capacities are overwhelmed.

Subsequently, the South African government established Disaster Management Centres (DMCs) at the different levels of government (local, provincial and national) that became responsible for coordinating and linking the different multi-agency stakeholders within the disaster risk management structures as provided for in the National Disaster Management Framework of 2005.

Although, DMCs were established, government did not fully address the problems relating to incident command in South Africa. The absence of an Incident Command System (ICS) for multi-agency stakeholders respond to incident, emergency or disaster were identified in numerous research documents and de-briefing reports as the number one challenges experienced by multi-agency stakeholders. This led to the breakdown in the four basic management functions (planning, organizing, activating, controlling) and additional six management functions (decision making, communication, motivation coordination, delegation, disciplining) that form the basis of any response and management system. Although the Disaster Management Amendment Act No. 16 of 2015 significantly brought in a focus local municipal level disaster management, it still failed to address the issues of local level ICS.

With the above background, this thesis provides a detailed outline and analysis of the limitations, challenges and shortcomings of government in terms of the Disaster Management Act (57 of 2002) when multi-agency stakeholders respond to an incident, emergency or disaster. The intent is to address the perennial problem faced by local government in South Africa when intergovernmental and interorganizational multi-agency stakeholders to respond to incidents, emergency or disaster by proposing a model for a multi-agency ICS at local government level in South Africa.

This study addresses the disaster risk governance problematics, particularly the ways in which government should integrate intergovernmental and interorganizational multi-

agency stakeholders into an ICS that is in line with international tendencies. There is a growing consensus among researchers, scholars and disaster management practitioners regarding the statutory implementation of an ICS for South Africa. This is so because government as the main stakeholder acknowledges the need for an ICS. The central argument in this study is that an effective and efficient integrated system for intergovernmental and interorganizational multi-agency incident management is needed in South Africa. This is important because government are not designed to address this complex and boundary-crossing problem of ICS alone. It requires an integrated process to response and managing multi-agency stakeholders. Moreover, ICS until now evolved largely in isolation by these multi-agency stakeholders.

This study followed a qualitative research design aimed at building an ICS model for application at local government level in South Africa. The qualitative research focus of the thesis necessitated the use of semi-structured interviews, and observation methods to explore, define and obtain the data relevant to the research. Interviews with local government officials who are on the frontline revealed information about their needs and the frustrations they experience due to the lack of statutory regulations to guide multi-agency stakeholders when responding to incidents, emergencies or disasters. Data were supplemented and compared to international best practices through semi-structured and e-mail interviews with international experts and practitioners in ICS. The information collected from the interviews was grouped and analysed, and key concepts were identified. Comparisons were drawn between the information received from the officials involved in the multi-agency incident response environment and the theory underlying this study. To achieve this objective, the study employed both theoretical and empirical dimensions. As reflected in the response of the research subjects, information obtained

from this research and the literature study suggested that a need exists for an ICS model for local government.

The proposed model stresses the importance of intergovernmental and interorganizational integrated approach by enhancing the national statutory environment that will focus specifically on an ICS that will coordinate and monitor the respond and management of an incident and its possible escalation at local government level. The proposed ICS model will also enhance intergovernmental, interorganizational and inter-agency focus, giving structure and ability to respond. The model is based on the principle of structure follow strategy that is imperative in a fast-changing environment such as local government. The research recommends that if the government wants to manage an incident, emergency or disaster effectively and efficiently, immediate attention must be given to the implementation of a multi-agency ICS for local government.

ABBREVIATIONS

Centre for Research on the Epidemiology of Disaster	CRED
Classical organizational theories	COT
Department of Homeland Security	DHS
Department for International Development	DFID
Disaster Research Centre	DRC
Disaster management centre	DMC
Disaster risk reduction	DRR
Emergency Management System	EMS
Federal Emergency Management Agency's	FEMA
Hyogo Framework for Action	HFA
Incident command system	ICS
International Decade for Natural Disaster Reduction	IDNDR
London Emergency Services Liaison Panel	LESLP
National Disaster Management Centre	NDMC
National Disaster Management Framework	NDMF
National Incident Management System	NIMS
Sendai Framework for Disaster Risk Reduction 2015-2030	SFDRR
South Africa	SA
United Nations	UN
United Nations Development Programme	UNDP
United States Agency for International Development	USAID
United Nations International Strategy for Disaster Reduction	UNISDR
World Conference on Natural Disaster Reduction	WCNDR
United States of America	US
United Kingdom	UK

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CHAPTER 1: ORIENTATION AND PROBLEM STATEMENT

1.1 INTRODUCTION

Globally, the number of incidents, emergencies and disasters recorded has shown a drastic increase and the impact is more deadly and costly than ever (Bardalai, 2005; Berke, 1995; Berz, 1991; Bouwer, 2011; Coleman, 2006; DFID, 2004; Dilley *et al.*, 2005; ELSEVIER, 2017; Eshghi & Larson, 2008; Germanwatch, 2011; IFRC, 2010; Ingleton, 1999; Maplecroft, 2010; Mileti, 1999; Noji, 1997; Pinkowski, 2008; Schneid & Collins, 2001; UNDP, 2004; UNISDR, 2011a; UNU-EHS, 2011; USGS, 2006). Disasters have a profound effect on the number of people affected and can devastate the economies of affected countries (Fagan, 1999; Palliyaguru *et al.*, 2014; UNDP, 2004; Van Niekerk, 2004).

Disasters derail the social and economic progresses of a country and this can affect millions of people. Poor communities are disproportionately affected and this results in a high number of mortalities, and economic and social losses, which makes the poorer even poorer (CRED, 2010; Kellett & Sparks, 2012; Kotkin, 2006; Nemakonde, 2016; UN, 2014; WCNDR, 1994). Accordingly, statistics show that between 1994 and 2013, over 6 800 disaster events claimed over 1.35 million lives at an average of 68 thousand lives per year, affecting a further 218 million people with estimated economic losses totalling US\$2600 billion (CRED, 2015; Guha-Sapir *et al.*, 2016; Pelling *et al.*, 2002; Shaluf, 2007).

The Global Assessment Report of 2015 reports that 42 million lives were lost in internationally reported disasters between 1980 and 2012 (Malalgoda *et al.*, 2010;

Ofori, 2001 ; UN, 2014). The history of DRR, bares testimony to severe losses of lives and property due to both major and minor natural and human-induced disasters. Incidents, emergencies or disasters can cause enormous human suffering, substantial economic and social damage and therefore require an immediate response in the form of rescue or damage containment operations (CRED, 2015; Karp *et al.*, 2007; Ofori, 2001 ; Okumura *et al.*, 1998; Olejarski & Garnett, 2010; Parker *et al.*, 2009; Phillips *et al.*, 2008; Schneider, 2005; Schraagen & Ven, 2011; UNDP, 2004). According to DFID (2006), the effects of Disaster Risk Reduction (DRR) initiatives have now been recognized by the engineering community, scientists and the policy makers (see Section 1.2.1) (Kapucu *et al.*, 2010). DRR is aimed at tackling the fundamental elements of disaster risk: vulnerability and hazards. Subsequently, to prepare communities better for disasters the member states of the United Nations proclaimed the International Decade for Natural Disaster Reduction (IDNDR). The field of DRR has introduced a new perspective on how we see and manage a disaster (as per Sections 1.2.1 and 3.2). While the cost of prevention has to be paid in the present, its benefits lie in a distant future. Moreover, the benefits are not tangible; they are the disasters that do not happen (Kapucu *et al.*, 2010). More effective prevention strategies would save not only tens of billions of dollars, but also save tens of thousands of lives (CRED, 2010; CRED, 2015; Handmer, 1995:35; UNDP, 2004; UNISDR, 2002a; UNISDR, 2009b; USAID, 2011).

DRR can be seen as a systematic mechanism of applying of policies, strategies and practices to reduce disaster risk by analysing and managing the casual factors of disasters that include the reduction of vulnerability, improve preparedness for any

adverse situation that can lead to the achieving of disaster resilient environment that relates to an EMC (Albtoush *et al.*, 2011; AU, 2004a; AU, 2004b; AU, 2011; UNISDR, 2002b; UNISDR, 2009a; UNISDR, 2009c; UNISDR, 2009d; UNISDR, 2011a; UNISDR, 2011b).

The imminent threat and danger of adverse incidents, emergencies or disasters will not go away, in fact history and literature paints a bleak picture of what lies ahead for governments, government agencies and multi-agency stakeholders. Therefore, to be successful with DRR strategies and to improve resilience, governmental involvement is paramount in an integrated, coordinated and intergovernmental, interorganizational and multi-sectoral approach (see Section 3.2.1.5 and 3.4.1) (Cameron, 2001; Conlan, 1998; Ferejohn & Weingast, 1997 ; Kapucu, 2005; Kapucu *et al.*, 2010; Kettl, 2003; Kettl, 2004 ; Mushkatel & Wescher, 1985; O'Toole, 2000; O'Toole, 2003; Peters, 1998; Peters & Pierre, 2001; Rodríguez *et al.*, 2007; Salmon *et al.*, 2011; Sylves, 1984; Sylves, 1994; Tierney *et al.*, 2001; Townsend, 2006; Wise, 2006; Wise & Rania, 2002; Wollmann, 2003; Zhong *et al.*, 2016; Zimmerman, 1996; Zimmerman, 2002). Haigh and Amaratunga (2010) are of the opinion that enormous challenges are associated with implementing DRR initiatives and therefore interdisciplinary strategies, tools and approaches are required to ensure proper management and resourcing of risk reduction efforts.

This can be done by focusing on the issues outside the scope of any one given agency and requiring multi-organizational and multi-sector interaction (involves partnerships between various organizations and community groups) for successful policy solutions and implementations (Bowman, 2004; Donahue & Joyce, 2001; Haigh & Amaratunga,

2010; ICMA, 2006); Kamensky *et al.* (2004); (Kapucu *et al.*, 2009; Kettl, 2004 ; Mandell, 2001; Schneid & Collins, 2001; Sylves, 1984; Sylves, 1994; Sylves, 2007; Tierney *et al.*, 2001; Waugh & Sylves, 1996; Waugh, 2004; Wise, 2006; Wise & Rania, 2002; Wright, 1998; Zimmerman, 1996; Zimmerman, 2002).

South Africa (SA) has established itself as a nation at the forefront of integrating DRR in its public sector by developing a Disaster Management Act and a disaster Management Policy Framework in line with UN guidelines on DRR (Pelling & Holloway, 2006; Reid, 2005; South Africa, 2002a; South Africa, 2005; Van Niekerk, 2005; Van Niekerk, 2006; Van Niekerk, 2014). The first action was to replace the outdated Civil Protection Act (67 of 1977). The Civil Protection Act (67 of 1977) did not make any provision for a standard for joint operations and coordinated action in responding to disaster or on any reference to the requirement for comprehensive incident command or incident management systems on the three tiers of government in South Africa (see Section 3.3.1.1). Despite the fact that these important aspect of a statutory national standard for multi-agency response to an incident, emergency or disaster was raised in the Green Paper on Disaster Management, this aspect did not received any specific attention in the Disaster Management Act (57 of 2002) (or the Disaster Management Amendment Act (16 of 2015)), although the DMA presents DRR as a multi-sectoral and multi-disciplinary in nature (DWAF, 2000; Reid, 2005; South Africa, 1977; South Africa, 1998a; South Africa, 1999b; South Africa, 2002a; South Africa, 2005; Vermaak & Van Niekerk, 2004).

In addressing this gap, this study aims to highlight the absence of a statutory national standard for multi-agency response in the context of a local government in South Africa. It is important to unravel the reasons for and the effects of creating

a model for a multi-agency ICS for the local government sphere in South Africa (see Section 6.2).

This chapter is structured as follows: having introduced the main issues necessitating the study, the chapter demarcates the research problem while at the same time identifying the need for a statutory national standard for multi-agency response for South Africa. The chapter then outlines a number of research questions and study objectives used to address the study problem. This is followed by a description of the central theoretical statement on which the study is grounded. The research strategy, which entails an analysis of existing literature and the empirical evidence, is outlined in 1.6 of this chapter. In the last instance, the structure of the thesis is briefly outlined to make it easier for the reader to follow the study.

1.2 ORIENTATION AND PROBLEM STATEMENT

DRR is a relatively new concept and is an ever-growing phenomenon that can be traced back to the 1960s. Jeggle as cited in Rosenthal *et al.* (2001), points out that since the 1960s, there has been a constant evolution and development of the common understanding of international disaster management. Palliyaguru *et al.* (2014) are of the view that an increase in natural disaster losses, policy makers, practitioners and the research community all around the world are seeking effective and efficient means of overcoming or minimizing such losses. Although various theoretical constructs are beneficial to understanding the disaster phenomenon and the means of minimizing losses, the disaster risk management process becomes less effective if the theory and practice are set apart from each other. As a start, a focus on the international history of disaster and emergency response is needed.

1.2.1 The international history of statutory national standards for multi-agency response

Efforts to react to or prevent catastrophic events have been referred to as emergency relief or disaster assistance (UNICEF, 1986), civil protection, disaster management (UNDP, 1992), humanitarian assistance (Black, 1992), disaster prevention (Kaplan, 1996), and most recently, disaster risk management (Kajl, 2002). As such, the concept of DRR was introduced (Becker *et al.*, 2013; Housner, 1989:45-46; Lechat, 1990:2; Smith, 2002:348; Twigg, 2004b).

The UNISDR defines “DRR is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events” (Davies *et al.*, 2009; DFID, 2004; Schipper, 2009 19; Tran & Shaw, 2007; Twigg, 2004b; UNISDR, 2009d:10; Wisner *et al.*, 1994)

Generally, DRR is understood as a broad development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout society. DRR is a pervasive and development issue (Emerald Insight, 2013). DRR measures can be divided into different categories, namely policy and planning measures, physical preventative measures, physical coping and/or adaptive measures and community capacity building measures (DFID, 2005). DRR is a systematic approach to identifying, assessing and reducing the risks of disaster. It aims to reduce socioeconomic vulnerabilities to disaster and dealing with the environmental and other hazards that trigger them. It is the responsibility of development and relief agencies alike and it should be an integral part of the way such

organizations do their work, not an add-on or once-off action. DRR is wide-ranging and there is potential and need for DRR initiatives in almost every sector of development and humanitarian work (Aitsi-Selmi *et al.*, 2015a; Aitsi-Selmi *et al.*, 2016).

The process of DRR is a complex, consisting of political, technical, and participatory and resource mobilization components that need to be integrated into a working system that will benefit the community at large. The importance of a scientific approach is undescribed by DRR strategies (see Section 3.2) (Aitsi-Selmi *et al.*, 2015a). Hence, DRR requires a collective effort (intergovernmental and interorganizational) from national policy decision making from governments sectors and representatives from civil society such as academic institutions, the private sector and media (Aitsi-Selmi *et al.*, 2015a; Comfort *et al.*, 2012; Kapucu, 2005; UNISDR, 2002d; Van Niekerk, 2005:60).

No single group or organization can address every aspect of DRR. DRR thinking sees disasters as complex problems demanding a collective response from different disciplinary and institutional groups in other words, partnerships. This is an important consideration, because individual organizations will have to decide where to focus their own efforts and how to work with partners to ensure that other important aspects of resilience are addressed. Consequently, governments become the key stakeholder in the developing of a national disaster mitigation programmes and other policies in conjunction with multi-agency stakeholders which would reduce the consequences of incidents, emergencies or disasters. Building a culture of prevention is not easy. As such, governments being the first responder and the one responsible for community development, has a key role to play in achieving society's resilience to disasters (Malalgoda *et al.*, 2010; UN, 1991a; UN, 1991b; UN, 1999). For governments and

stakeholders involved it meant they had to become more innovative in the management of incidents, emergencies or disasters. It involved a conceptual shift from an emphasis on disaster response to the management of risk through the integration of disaster reduction into sustainable development (Djalante, 2012; Fung, 2006; IGRP, 2010; Ikeda *et al.*, 2008; Renn, 2008; USAID, 2011).

The United Nations General Assembly in 1987/12/11 declared the 1990s as the International Decade for Natural Disasters. This can be described as the first step to lay the foundation for promoting internationally coordinated efforts to reduce material losses, social and economic disruption caused by natural hazards (such as earthquakes, tropical cyclones and other storms, tsunamis, floods, landslides, volcanic activity, wildfires, locust and similar infestations, drought and desertification, and other calamities of natural origin), especially in developing countries. The United Nations General Assembly mission for IDNDR was to improve each United Nations (UN) member countries capacity, especially in developing countries, to prevent or diminish adverse effects from natural hazards and to establish guidelines for applying existing science and technology to reduce the impact of such hazards (Aitsi-Selmi *et al.*, 2016; Anear, 1987; Smith, 2002; UN, 1991b; UN, 1999; UNISDR, 2002c:17; UNISDR, 2002d; WMO, 1997:1).

Several scholars, including Lechat (1990:2), report that the first step in the process of establishing DRR strategies began in December 1989 when the UN General Assembly adopted Resolution 42/236 on the International Ad Hoc Group of Experts on IDNDR (A/44/322–E/1989/114/Add.1, annex)ii.

The UN Resolution 42/236 set forth the goals for the United Nations to achieve with IDNDR. The goals include the improvement of countries capacity to mitigate the

effects of natural disasters as to become more resilient to the effects of natural hazards. The manner in which it must be done was to apply appropriated guidelines and strategies through existing scientific and technical knowledge of previous natural disasters to close the critical gaps, and the disseminating of this information. The development of measures for the assessment, prediction, prevision and mitigate of natural disasters through the use of technological and environmental disasters and to reduce human, economic and social losses emphasized the importance of research, technology education, training and the improvement of scientific knowledge of disaster reduction. This would improve the access to effective early warning practices at all levels of responsibility (Aitsi-Selmi *et al.*, 2015a; Aitsi-Selmi *et al.*, 2016; UN, 1989; UN, 1999; UNISDR, 2002e).

The mid-term evaluation of the Decade conducted at the World Conference on Natural DRR in Yokohama Japan on 23-27 May 1994 was to determine the progress made in the IDNDR and the development of the Yokohama Strategy and Plan of Action for a Safer World in 1994 (UNISDR, 1994; Wisner *et al.*, 2003; Wisner *et al.*, 1994). The IDNDR, the Yokohama Strategy, and Plan of Action for a Safer World (1994) were all clear calls to the member states of the UN to revisit their approach to dealing with disasters to prevent, mitigate, and establish preparedness. The Yokohama Strategy and Plan of Action for a Safer World (1994) stresses that the worldwide toll on human and economic losses is rapidly rising due to disasters. Therefore, each country has the sovereign responsibility to protect its citizens from natural disasters and that priority must be given to developing countries, in particular the least developed, land-locked countries and the small developing island states. All participants at this conference felt that the concept of disaster risk should be expand to include environmental and technological disasters and their relationship, which can have a

significant impact on social, economic, cultural and environmental systems, in particular in developing countries (see A/CONF.172/9, chap. I, resolution 1, annex I, sect.I.B) (UN, 1999; WCNDR, 1994).

The conference also paid attention to the intersectoral and cross-cutting nature of disaster prevention and relating to matters of national planning and development, the Yokohama Strategy for a Safer World. The objectives raised in the primary areas of interest as promoted by the Yokohama Strategy are emphasized in the IDNDR action plan for 1998/99 to develop greater opportunities for multi-disciplinary involvement through inter-agency and organizational partnerships. The importance of developing and strengthening national capacities and capabilities and, where appropriate, national legislation for natural and other disaster prevention, mitigation and preparedness, including the mobilization of non-governmental organization and participation of local communities, were emphasized. Guidelines for natural disaster prevention, preparedness and mitigation, containing the principles, the strategy and the plan of action is contained in A/CONF.179/2, chap. I, resolution 1, annex I. The strategy also highlight the importance of promoting and strengthening sub-regional, regional and international cooperation in the prevention, reduction and mitigation of natural and other disasters (UNISDR, 1994; UNISDR, 2002a; WCNDR, 1994). The principles of the Yokohama Strategy for a Safer World laid the foundation for the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters (WCNDR, 1994).

The HFA 2005–2015: Building the Resilience of Nations and Communities to Disasters (UNISDR) was adopted at the World Conference on disaster Reduction and subsequently endorsed by the General Assembly of the United Nations

(A/RES/60/195) in Kobe, Hyogo, Japan, 18-22 January 2005 (Botha & Van Niekerk, 2013; Von Oelreich, 2001). The HFA: The new DRR strategy reflects a global approach to the management of disasters and disaster risk. The HFA set three goals to minimize the losses of lives and social and environmental assets of communities and countries. The integration of DRR into sustainable development policies and planning the development and strengthening of institutions, mechanisms and capacities to build resilience to hazards, and the systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes became the key element of the HFA. South Africa was one of the first countries to develop an aligned DRR policy with the HFA (Botha & Van Niekerk, 2013). Although not flowing from the HFA, the South African policy was developed in parallel to the HFA.

1.2.2 The history of South Africa's statutory national standard for multi-agency response

The HFA set the priorities by ensure that DRR becomes a national and a local priority with a strong institutional basis for implementation. This should be done by identifying, assessing and monitoring disaster risks, and enhance early warning and use knowledge, innovation and education to build a culture of safety and resilience at all levels, and reduce the underlying risk factors by strengthen disaster preparedness for effective response at all levels (Botha & Van Niekerk, 2013; Twigg, 2009; Van Niekerk, 2005). South Africa's involvement in the Views from the Frontline (VFL) project in 2008–2009, and 2010–2011, focused on five priorities for action (governance for DRR, risk assessment, monitoring and warning, knowledge and education, underlying risk factors, disaster preparedness and response. All of these variables were rated below

three (out of a possible five) that gave a clear indication that South Africa could still improve significantly towards compliance with the HFA (Botha & Van Niekerk, 2013; Van Riet *et al.*, 2009:35). The HFA objectives in 2010-2011 focussed on strengthening public accountability for effective priority implementation by establishing independent local-level policy monitoring and reporting processes. It also emphasized the strengthening of collaboration between local, national, regional and international levels and to increase dialogue and interaction between local authorities, civil society and community stakeholders, in order to monitor progress, share information, formulate policy positions, develop partnerships and coalitions and contribute towards multi-stakeholder efforts to implement the HFA (Botha & Van Niekerk, 2013; GNDR, 2010:3). HFA gave context to the Sendai Framework for DRR 2015-2030 (SFDRR) that continued to support progress on reducing disaster losses worldwide. The SFDRR as all previous strategies, highlights the importance of DRR to minimize losses worldwide by implementing policies, plans and taking action (Aitsi-Selmi *et al.*, 2015a; Aitsi-Selmi *et al.*, 2015b; Aitsi-Selmi *et al.*, 2016; de la Poterie & Baudoin, 2015; EC, 2016).

Hence, the initial implementation of the UNISDR until the SFDRR had a profound influence on South African disaster management in that it provided direction for South Africa's disaster management legislation (Pelling & Holloway, 2006; UNISDR, 2015; Vermaak & Van Niekerk, 2004). South Africa's disaster risk management environment was radically transformed by the international policies on, and mechanisms for DRR. These policies and mechanisms focus on the systematic development and application of policies and strategies to minimize avoid (prevention) or limit vulnerability and risk in societies (UN, 1991a). South Africa's response to the DRR process began with the realization that the existing legislation in the form of the Civil Protection Act (67 of

1977) cannot cope with new challenges that South Africa is facing (South Africa, 1977). According to Van Niekerk (2005), the new interest in the field of disaster management slowly but surely brought on a paradigm shift from a civil protection approach to more holistic disaster management. Van Niekerk (2005) is of the opinion that disaster management in South Africa became a reality after the floods in the Cape Flats in 1994 and the extreme hardship suffered by the poorest of the poor (Tempelhoff *et al.*, 2009). The government realized that the mechanisms exposed by the Civil Protection Act (67 of 1977) are woefully inadequate. This resulted in a cabinet resolution to follow international trends and to take a new look at the whole concept of civil protection. In 1995, cabinet resolved to assess South Africa's ability to deal with emergency response and disaster management. This resulted in the recommendation that a formal structure for disaster management be created. Consequently, South Africa embarked on a process of wide consultation with government departments and disaster management stakeholders to determine a new way forward. In 1994, the South African government entered into a disaster management policy reform process (Pelling & Holloway, 2006; South Africa, 1998a; Wentink & Van Niekerk, 2017). The government resolved to take a new look at the whole concept of civil protection and to move away from the popular belief that disasters are rare occurrences that are inevitable and unavoidable and that little can be done to prevent them or to reduce their effects (Van Riet, 2009; Van Riet & Diedericks, 2009). The transformation process from reactive to proactive began with wide consultation throughout South Africa, which culminated in the publishing of a Green Paper on Disaster Management in February 1998 (Botha & Van Niekerk, 2013; South Africa, 1998a; Van Riet & Diedericks, 2009). The Green Paper highlighted the need for a holistic mechanism for disaster management and for clearly defined roles

and functions (South Africa, 1998a). It served as the basis from which the White Paper on Disaster Management, which was gazetted in January 1999, evolved. The White Paper put forward seven key policy proposals, including a call for new legislation to give effect to the proposals (South Africa, 1998a). This process culminated in the Disaster Management Act (57 of 2002) (DMA) (Yodmani, 2001), and the National Disaster Management Policy Framework in 2005 (NDMF) (preceding the HFA). The Act and Framework facilitated a shift in traditional disaster response thinking to DRR, prevention and mitigation (Reid & Van Niekerk, 2008; Reid, 2005; Van Niekerk, 2005). The aim of the DMA is to provide for an integrated and coordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery; the establishment of national, provincial and municipal DMCs; disaster management volunteers; and matters incidental thereto (South Africa, 2002a; South Africa, 2004; South Africa, 2010b). One of the elements alluded to in the DMA and NDMF is the need for a national guideline and or system for multi-agency incident management. However, the specific guideline was not developed timeously and practitioners on the ground had to improvise to ensure effective incident, emergency and disaster response. Much of what was implemented locally was learned from the international arena (Reid, 2005). The Disaster Management Act was amended in 2015 (South Africa, 2015) by the Disaster Management Amendment Act (16 of 2015). However, beside placing a much needed emphasis on local government disaster management, the Amendment Act remained silent on issues of ICS and multi-agency incident command.

1.2.3 Early international development of ICS: the American and United Kingdom models

Incident, emergency or disaster management requires an intergovernmental and interorganizational multi-disciplinary stakeholder approach that involves partnerships between various organizations and community groups (Haigh & Amaratunga, 2010). Response to disasters, whether natural (i.e. floods, earthquakes) or human induced (i.e. terrorist attacks), is a complex process (Bigley & Roberst, 2001) that involves severe time pressure (Smith & Hayne, 1997), high uncertainty (Argote, 1982) and many stakeholders (Comfort & Kapucu, 2006; Kapucu *et al.*, 2010; Payne, 1999; Steigenberger, 2016), which results in unpredictable information needs. The need for an emergency management system is not unique to South Africa and a number of countries have developed and implemented emergency management systems. Countries that has made great strides in the development and implementation of such intergovernmental and interorganizational emergency management system is the United States of America (US) and United Kingdom (UK). The United States as well as United Kingdom has a long history of managing incidents, emergencies and disasters. The need for an emergency management system in the United States and United Kingdom UK became apparent in the 1970s, and after 40 years, the process has not been fully completed because of new threats constantly appearing.

The origin of the US ICS dates to autumn 1970 when multiple forest fires broke out simultaneously in California. The fires caused serious loss of life and property (FEMA, 1987). The disaster response operation involved the mobilization of different rescue units from all levels of government and from various jurisdictions. The post-incident review identified coordination and command problems in the collaboration between

multiple jurisdictions and rescue units. Multi-agency coordination between agencies during multi-agency emergency responses, although a key issue, remains a neglected research area (Chen *et al.*, 2007; Chen *et al.*, 2013; Dawes *et al.*, 2004a; Dawes *et al.*, 2004b; Kim *et al.*, 2006).

The UK emergency management system, the London Emergency Services Liaison Panel (LESLP), was formed in 1973 and consists of representatives from different multi-agency stakeholders. The Metropolitan Police Service, Emergency Preparedness Operational Command Unit chaired the meeting and had the mandate to invite representatives from other agencies when required, dependent on the nature and type of incident. To coordinate multi-agency stakeholders the LESLP divide the response and management of incidents, emergencies or disasters into three distinct levels of command: Gold (strategic), silver (tactical) and Bronze (operational) that represent the different functions adopted by each of the emergency services and are role-related, not rank-related. Both the US ICS and UK LESLP, out of a post-incident review, pointed out three key reasons why resources were not effectively utilized: a lack of a clear chain of command between organizations; the absence of an effective platform for integrated communications and coordination; and no advance operational planning (Chen *et al.*, 2013; Townsend, 2006; Wise, 2006; Wise & Rania, 2002). This realization that the system was not working was the birth of a new approach to developing an emergency management system that could be implemented nationally in the United States and the UK. The system in the USA is now known as the National Incident Management System (NIMS). It consists of five components that work together to form the national framework for preventing, responding to, and recovering from all types of domestic incidents, emergencies and disasters (see Sections 3.2.1.6 and 3.2.1.8). The five components are command and management; preparedness;

resource management; communications and information management; supporting technologies; and ongoing management and maintenance (Jones, 2006; Jones, 2011; Walsh *et al.*, 2011). The NIMS standardizes incident management for all hazards and across all levels of government. The NIMS standard incident command structures are based on three key constructs: the incident commander (IC); multi-agency coordination systems; and public information systems (USDHS, 2004a).

The United States and UK approaches the management of an incident, emergency or disaster holistically, resulting in the NIMS and LESLP emergency management system with its five components that are applicable before and during an incident, emergency or disaster (see Sections 2.3.3 and 3.2.1).

All the components are important for this research, but looking at South Africa, the Disaster Management Act (57 of 2002) and the National Disaster Management Framework (NDMF) cover most of the aspects mentioned in the United States' NIMS and UK LESLP. The shortcoming of the South African system lies in operational planning, multi-agency coordination, command, management, and communication (see Sections 3.2.1.1-5). The aim of the ICS model for local government is to provide a flexible core mechanism for local government to coordinate, collaborate in response and management of incidents, whether it is for local single jurisdiction events or complex incidents with national implications (see Section 3.1.1). Therefore, emphasis is placed on existing emergency management systems such as those of the United States (NIMS), and the UK which covered most of the ICS aspects. Therefore this research focuses on both the NIMS and LESLP.

1.2.4 An international focus on local government

The UNDP (2010) observes that government agencies have a critical role to play during the time of a disaster. In most countries, the central government retains authority over disaster management programmes with centralized decision making and resources (Van Riet, 2012). They often focus on developing response capabilities rather than proactive mitigation, and the local government action for disaster management is often given a lower priority (Bendimerad, 2003). Therefore, after a major disaster, decision making tends to be a centralized process, possibly due to media pressure or the inevitable high political profile of such events (Blaikie *et al.*, 1994). This has to be viewed as a hindrance to achieving disaster resilience at community and local levels (APDC, 2007). As a result, there is a strong need for the decentralization of disaster management, with local governments receiving the power to facilitate building safer communities and supporting sustainable development. Also, it is important to note that DRR should be incorporated into all development strategies, policies, programmes and investments at national and local government levels (UN, 2006). There is widespread agreement in the literature that local governments have a vital role in DRR initiatives (Botha & Van Niekerk, 2013; Reid, 2005; Manyena, 2006). Usually countries distribute functional responsibilities among the central government and subnational governments along various dimensions, including fiscal, administrative and political. Manyena (2006) identifies local authorities as the vehicles through which the disaster risk agenda could be championed as they are rooted in the local communities where disasters happen. Local authorities also assert the requirement of incorporating public participation at the local decision-making level to implement successful mitigation strategies (Pearce, 2003). Furthermore, DRR and urban sustainability are more likely to be addressed by local rather than central

governments since local governments typically have more authority over urban planning and construction supervision (Bendimerad, 2003). The UNISDR (2010) identifies local government as a first responder and the one responsible for community development and sustainable DRR. They furthermore recognize the need for empowering the local government as a key priority to encourage democratic decision making involving the citizens and all key stakeholders at the local level to ensure effective implementation of DRR measures. Government and governmental agencies have to play a critical role during the time of a disaster (see Section 1.2.1) (APDC, 2003; APDC, 2007 ; Djalante, 2012). The activities and functional responsibilities of such institutions are often not decentralized or the authority of such institutions is not adequately delegated to lower levels of the government machinery (APDC, 2007). Although, in the South African context government take the lead in the broader sense of an emergency management system, but has not up to date committed itself to a uniform ICS for South Africa. Therefore, SA government role and responsibility in this environment need to be exposed. South Africa's problems regarding a statutory national standard for multi-agency response to an incident, emergency or disaster must be scrutinized.

South Africa is generally not regarded as a country at high risk for disasters; however, the country is beset by many risks and hazards, both natural and human-made (UNDP, 2011). Legislation determines that all emergency stakeholders should be ready for any eventuality (South Africa, 1973; South Africa, 1993b; South Africa, 1996a; South Africa, 1997; South Africa, 1999a; South Africa, 2002a; South Africa, 2006). Coordination by government either by local, provincial or national (NDMC) in a multi-agency emergency response environment is of utmost importance when a disaster situation arises in South Africa (see Section 3.2.1.5). Emergency

management can be seen as the discipline that deals with risk and risk avoidance. Risk represents a broad range of issues and includes an equally diverse set of players. The range of situations that could possibly involve emergency management or an emergency management system is extensive. This supports the premise that emergency management is integral to the security of everyone's daily lives and should be integrated into daily decisions and not just called on during times of disasters (Haddow & Bullock, 2006:1). It is evident from past experiences that disaster risk management is only effective if an integrated approach is followed to manage or prevent a disaster (Reid, 2005; South Africa, 1998a). Enormous challenges are associated with implementing DRR initiatives and therefore interdisciplinary strategies, tools and approaches are required to ensure proper management and resourcing of risk reduction efforts (Haigh & Amaratunga, 2010). Disaster mitigation and response is a multi-agency and multi-sectoral activity and most countries have established national disaster response agencies, which may be decentralized to regional, district and village levels (Osei, 2007).

Recent response experiences and evaluations of disaster responders suggest that many disaster management systems fall short of the capability to cope with complexity and uncertainty during disasters (Albtoush *et al.*, 2011:55-61). FEMA (2011) reports on the post-9/11 coordination that inadequate management was the most serious issue. It involved problems such as unclear chain of command; poor communication, mostly due to different codes and systems from one department and agency to the next; lack of planning; poor supervision; and a rigid structure that did not allow for the flexibility needed in such situations (USDHS, 2008a). The above, however, is not unique to the USA but similarities can be drawn to the South African environment.

1.2.5 The government's role in a statutory national standard for multi-agency response

The main disadvantage of ICS in South Africa is the absence of a statutory national standard for multi-agency stakeholders' response to an incident, emergency or disaster. According to Reid (2005), the effective management of a disaster and of functional response measures can only be achieved through joint operations and coordinated action if resources are utilized optimally Western Cape Incident Command Summit (2013). A generic ICS should be in place to coordinate an effective multi-agency response. Government does not have the capacity to plan and manage all incidents, emergencies or disasters that may occur, therefore other stakeholders should be involved, but when different agencies work together at a local, provincial and national level, there are problems due to the difference in terminology, application and other practical arrangements such as radio frequency, to name but a few Western Cape Incident Command Summit, 2013).

The Constitution of the Republic of South Africa (from here onwards "the Constitution"), places a legal obligation on the government to ensure the health (Paton *et al.*, 2010) and safety of its citizens. Chapter 2 of the Constitution indicates that everyone is equal before the law and every person has the right to the equal protection and benefits of the law. In terms of Section 41(1) (b) of the Constitution, all spheres of government are required to secure the wellbeing of the people of the Republic of South Africa (South Africa, 1996b). South Africa (1996b) Section 152 (1) (d) also requires local government to ensure a safe and healthy environment. According to the Constitution, the government is primarily responsible for the effective implementation and management of disasters in South Africa. The Constitution (Schedule 4, Part A)

lists disaster management as a concurrent national and provincial competence. The Disaster Management Act (57 of 2002) and policy (NDMF) calls for a uniform approach to disaster management, such as an integrated multi-agency working procedure for the management of incidents, emergencies or disasters. Government institutions at all levels have an obligation to prepare themselves and the public for emergencies (Coburn *et al.*, 1991:53) and to strive towards reducing the risks that the public faces in terms of disasters. Until the publication of the NDMF in April 2005, there was no legislative or regulatory guideline in South Africa for a standard approach to disaster response or interdisciplinary or intersectoral collaboration for the management of daily emergencies, whether at local, district, provincial or national level (Van Niekerk, 2014). Although the NDMF prescribes a legislative and regulatory framework, a need still exists for a standardized approach to response management in South Africa (Reid, 2005).

1.2.6 South Africa's challenges with a statutory national standard for multi-agency response

The DMA and NDMF provides a framework and regulations for all stakeholders. The coordination of all stakeholders involved is the responsibility of the various DMCs at the various levels of government. Therefore, the responsibility of incident, emergency, and disaster management in South Africa starts with the NDMC. Therefore, any initiatives relating to the establishment of a national standard for multi-agency incident management system, have to be endorsed by the NDMC. The DMA and NDMF require that an emergency management system such as the US or UK ICS be put in place. It is within the above background that the research aims to address a number of research questions.

1.3 KEY RESEARCH QUESTIONS

The study is guided by the following key questions:

- What are the theoretical approaches underlying organizational theory as a framework for the development of a multi-agency ICS?
- What are the theoretical tenets of multi-agency emergency response and ICSs?
- How does the South African context relate to the identified models for multi-agency emergency response and ICSs?
- What are the statutory and regulatory requirements for multi-agency emergency response in South Africa?
- How do the South Africa's ICSs compare to international best practice?
- What different variables constitute a multi-agency ICS at local government level (taking international best practice into consideration)?
- How could a multi-agency ICS be structured for application by local government in South Africa (expressed as a hypothetical model)?

1.4 RESEARCH AIMS AND OBJECTIVES

To answer the research questions listed above, the research has the following objectives:

- to explore, define and analyse the theoretical approaches underlying multi-agency emergency response and ICSs;

- to describe the South African context in relation to the identified models for multi-agency emergency response and ICSs;
- to explain the statutory and regulatory requirements for multi-agency emergency response in South Africa;
- to compare the various ICSs in South Africa with international best practice;
- to identify and describe the different variables involved in a multi-agency ICS at local government level; and
- to develop and elaborate on a common multi-agency ICS to be applied by the local government in South Africa.

1.5 CENTRAL THEORETICAL STATEMENT

The Constitution, the DMA, the NDMF and the Strategic Plan for South Africa constitute key drivers for the creation of an integrated disaster management strategy for South Africa. A intergovernmental and interorganizational multi-sectoral and multi-disciplinary approach towards disaster risk management is imperative to all these laws (South Africa, 1998a). Government and emergency role-players have a key role in creating a safe and secure environment for all people of South Africa by means of an integrated DRM approach.

The following preliminary statements can be made:

- Currently, no working procedure (ICS) exists for multi-agency emergency response stakeholders (Jones, 2006; Reid, 2005; South Africa, 1998a);

- There is a lack of standardized procedures (ICS) for multi-agency emergency response stakeholders (Reid & Van Niekerk, 2008; Reid, 2005); and
- Working procedures for an ICS will enhance South Africa's ability to be effective in DM (Kruger, 2000; Walsh et al., 2011).

1.6 RESEARCH METHODOLOGY

The following Sections describe the methodology used in the research as a whole and for the development of the proposed multi-agency emergency response model.

1.6.1 Literature study

According to Cresswell (2009:25), a literature review provides a framework for establishing the importance of the study and provides a benchmark for comparing the results with other findings. Majam and Theron (2006) maintain that a literature review should explain to the reader the theoretical context of the problem being examined. A literature study involves tracing, identifying and analysing documents that contain information relating to the research problem and objectives (Struwig *et al.*, 2001). Secondary literature sources were studied to determine the approach towards multi-agency emergency response and ICS in DRR globally and in South Africa. Books, periodicals, legislation, government reports and other documents were consulted. A preliminary search at the North-West University Ferdinand Postma Library was conducted and it was clear that sufficient material and literature are available to execute the study. Books and the internet provided ample information for a literature study. International best practice was also examined.

In order to give a clear understanding of the nature and meaning of the identified problem, the available literature on statutory national standards for multi-agency response to an incident, emergency or disaster was used as the foundation for the theoretical framework for this study. In an incident, emergency or disaster the boundaries between organizational and collective behaviour are blurred and governance bureaucratic hierarchies are replaced with interorganizational network of organizations organization theory (Comfort, 1999). Therefore, modern organizational environments are becoming more complex at an increasing rate (Emery & Trist, 1965; Kauffman, 1993; Scott, 2001; Weick, 2001), largely through technical change (Comfort, 1999; Simon, 1996; Weick, 2001) and need to be managed (Thompson, 1967). Scott (2001) is of the view that the threat of the interactions of organizations in a large system can generate greater complexity than the organizations themselves. Moreover, organizations tend to move towards higher levels of complexity, largely through networks. Organizations must balance differentiation and coordination to successfully adapt to the rising environmental complexity. The understanding of the dynamic of interorganizational networks and the patterns and interaction become urgent matters both for policy makers and those who seek to understand the policy making process and implementation thereof (Alter & Jerald, 1993; Chisholm, 1998; Gidron *et al.*, 1992; Gray, 1989; Linden, 2002; Milward, 1996; O'Toole, 1997; Powell, 1990). Moreover, the available literature on a national standard for multi-agency response to an incident, emergency or disaster was scrutinized to put it into the perspective of organizational theory.

As such academic books, peer-reviewed journal articles, research reports, dissertations and monographs, government publications, non-governmental organizations (NGOs) and international multi-lateral reports and other internet sources

were consulted. This literature was thoroughly analysed, synthesized and summarized to provide a theoretical basis for the study (De Vos, 2008; Randolph, 2009).

The following databases were consulted to ascertain the availability of material for the purpose of this research:

- Catalogue of theses and dissertations of South African universities;
- Catalogue of books: Ferdinand Postma Library;
- Index of South African Periodicals;
- NFR: Nexus;
- Index to South Africa Periodicals; and
- EBSCO Academic Search Elite.

All these materials were read selectively, with preference being given to the most recent and relevant information.

1.6.2 Empirical study

In the development of an ICS model for local government the principles of empirical research were followed. Empirical research is the way of gaining knowledge by means of direct and indirect observation or experience. In order to achieve the aim and objectives of the study, an empirical study was conducted, employing qualitatively research methods that generate a vast volume of data collected from various disciplines by means of observations, field note, literature study and semi-structure interview. To make sense out of the vast volume of data collected the grounded theory was use whereby data could be organized by emerging theoretical categories

(Charmaz, 1983). The researcher aim was to keep to interpretation while still grounding it in the empirical reality reflected by the materials. Charmaz (1996:26) is of the opinion that grounded theory methods provide a set of strategies for conducting rigorous qualitative research. Strauss (1990:23) defines a grounded theory as a theory that is inductively derived from the study of the phenomenon it represents. It is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to the phenomenon. Therefore, data collection, analysis and theory stand in a reciprocal relationship with each other.

Grounded theory methods can be used for individual, interpersonal relations and the reciprocal effects between individuals and larger social processes such as social psychological topics such as motivation, personal experience, emotions, identity, attraction, prejudice and interpersonal cooperation and conflict (Charmaz, 1990). As Glaser and Strauss (1967) have argued, grounded theory methods cut across disciplines. These methods have been widely adopted in education, evaluation research, nursing and organizational studies and therefore best for this study (Charmaz, 1983; Charmaz, 2006; Chenitz & Swanson, 1998; Clegg & Hardy, 1996; Glaser, 1978; Glaser & Strauss, 1967; Guba & Lincoln, 1989; Martin & Turner, 2016; Strauss, 1990:23; Strauss & Corbin, 1994; Strauss & Corbin, 1990; Strauss & Corbin, 1998; Strauss, 1987; Turner, 1981).

1.6.3 Research design

The research design enables the researcher to determine the different perspectives held by practitioners in the field relating to the research problem of response and management of incidents, emergencies or disasters. In the response and management of incidents, emergencies or disaster different dynamics are

simultaneously occurring that need to be managed by government in conjunction with multi-agency stakeholders that emphasise intergovernmental and interorganizational, intersectional and cross-cutting involvement. Bless and Higson-Smith (1995), provide the following definition of research design: "The plan of how to proceed in the determining the nature of the relationship between variables is called research design." (Creswell & Clark, 2011:53). Hence, to fully understand the dynamics of this phenomenon, the research design set down a framework that has been created to find answers to research questions. Creswell and Clark (2011:53) further indicate that design helps guide the decisions that the researcher must make on methodology during the study and sets the logic by which researchers make interpretations at the end of the study. To achieve this objective of qualitative research design, although complex, provides various methods of data collection and analyses that is important for this study.

A qualitative research design makes use of the qualitative research process that is suitable to investigate the intergovernmental and interorganizational, intersectional and cross-cutting environment. A qualitative research means to explore and understand the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data (Holloway & Wheeler, 1996).

In this study, the qualitative research process consisted of two phases. The first phase focused on an in-depth literature study, while the second phase entailed semi-

structured interviews to extract information from respondents who are actively involved in ICS.

The target audience was international, national, and local stakeholders involved in multi-agency emergency response. The USA ICS and UK LESLP were used as benchmarks because they are already partially in use among some South African emergency stakeholders in certain contexts and therefore the advantages and disadvantages of these systems are known in the organizations that were targeted.

1.6.4 Selection of participants

Mouton (2001:50) indicates that the aim of research is often to study a representative number of people with a view to generalize the results of the study to a defined population. According to Baily (1987), the first step must be to specify the persons or groups to be studied. The objects of the study are called the unit of analysis. The unit of analysis is most often an individual person, but it may also be a club, an industry, a city, country, or state. The sum total of all the units of analysis is called the population. Each entity from the population that is the ultimate sampling element objective is called a sampling element. Often researchers are unable to study the entire population due to financial and other constraints, so they must settle for a sample.

Purposive or judgemental sampling (De Vos *et al.*, 2005; Marshall, 1996; Welman *et al.*, 2005) was utilized in this study. This enabled the researcher to rely on his expert judgement and practical knowledge of the research area in selecting units that are representative or typical of the population. Marshall (1996:523) adds that in this type of sampling, the researcher actively selects the most useful sample to answer the research question. A sample may be defined as a subset or portion of the total population. Bless *et al.* (2000:86) distinguish between probability and non-probability

sampling. The selection of participants consisted of two steps. The purpose of the first step was to determine the different dynamics involved in an emergency management system (EMS), with a specific focus on ICS internationally, nationally, provincially and locally. The purpose of the second step was to focus specifically on an EMS for South Africa and the development of an ICS for the South African environment.

In order for the researcher to obtain an initial sample with suitable characteristics during the first step, participants were selected according to the following criteria: Participants involved in EMS, ICS, and the sample must include participants on strategic, operational, and tactical levels, from various levels of government, including the international arena. A participant was regarded an individual with relevant and preferably current field experience that could provide the researcher with relevant information about the research questions (Neumann, 1997).

Twenty (20) participants (international and local practitioners of IC) were targeted. Participants were also requested to indicate whether they are available for follow-up interviews. The researcher also identified a representative international sample for semi-structured face-to-face interviews. These interviews were possible because the target audience and the researcher attended the same international ICS course in the USA over a period of three weeks. The aim of these interviews was to obtain more in-depth descriptions of the ICS in their territories / countries.

1.6.5 Data collection tool: semi-structured interviews and observations

The specific qualitative data collection tool used for the international and local component of this study was semi-structured interviews (face-to-face and emailed questionnaires were used as follow-up). Semi-structured interviews include pre-determined questions (in the form of a questionnaire) that are presented to all

respondents systematically and consistently. Therefore, qualitative semi-structured interviews with open-ended questions were used to probe the perspectives of professionals with different backgrounds. The choice of qualitative interviews provided the possibility of gathering in-depth information (Trost, 2007). Semi-structured interviews are, compared to unstructured interviews, not so time-consuming to conduct (Bernard, 2006). All informants had busy schedules and were only available for a limited time and therefore semi-structured interviews were chosen. Semi-structured interviews are flexible and allow the participants to express themselves in their own way. At the same time, the interviews were structured enough so that the interviewer obtained adequate information during the limited time (Bernard, 2006). The information obtained provided not only answers, but also the reasons and reasoning for the answers (IFRC, 2007:61). An advantage of interviews compared to structured questionnaires is that with interviews, there are possibilities to repeat or to rephrase questions when needed and to get a feeling for which questions are difficult to answer (Bernard, 2006). According to Berg (1995), the interviewer has the freedom to adapt, develop and generate questions as the interview progresses. The interviewers are permitted to probe and deviate from these questions (Berg, 1995).

Furthermore the data collected is supplemented by the knowledge and understanding gained by the researcher through almost 30 years of observing, and being directly involved in the implementation of various ICSs in South Africa from the perspective of a police officer. These years of involvement in ICS in South Africa provided the researcher with unique and nuanced knowledge of a multi-sectoral and multi-agency incident management environment.

1.6.6 Data analysis and interpretation

The researcher analysed the data and supplemented the discussion with verbatim quotes from the original transcripts and tape-recorded copies. Coding was implemented to arrange data into specific themes and sub-categories. Codes were labelled to assign units of meaning to the information obtained.

The analysis was done by re-organizing the participant's ideas and perceptions as collected during the interviews. Meaningful conclusions were drawn. This data reduction method of analysis, which is descriptive in nature, is often used in qualitative research (Creswell, 2003:155). The data were analysed according to the eight steps of data analysis (Tesch, 1990). These steps are:

- a thorough reading of all transcribed material while making notes;
- considering the substance of interviews, the underlying meaning;
- compiling a list of all topics that surface throughout the research;
- clustering these topics;
- applying a clustered list to consider the data by coding the topics and correlating coding with data;
- elaborating on the topics with the aim of turning them into certain categories and determining interrelationships;
- making a final decision on the coding of the categories and alphabetizing the list;
and
- if necessary, recording existing data.

1.6.7 Methods to ensure trustworthiness

The term “trustworthiness” refers to the way in which the inquirer is able to persuade the audience that the findings of the study are worth paying attention to and that the research is of high quality (Johnson & Turner, 2003). The researcher achieved this through member checking. Identified themes were discussed with participants to ensure that they are accurate and dependable (Creswell, 2003; Creswell, 2009). In addition, the researcher triangulated all data collected during the research process, including the results of the questionnaire and interviews, to search for common themes. The researcher aimed to eliminate bias that might be brought to the study by constantly reflecting on the research process.

1.6.8 Methods to ensure validity and reliability

Validity is concerned with just how accurately the observable measures actually represent the concept in question or whether they in fact represent something else (Bless & Higson-Smith, 1995:129). Hence, EMSs are mostly based on standards, therefore, to validate the data collected the data were evaluated according prescripts, policy and standards (Altheide & Johnson, 1994).

Bless *et al.* (1997) state that reliability is the extent to which the observable measures that represent a theoretical concept are accurate and stable when used in several studies. Reliability reflects on the consistency in measures, which is the degree to which the questionnaire produces equivalent results for repeated trials.

1.6.9 Ethical considerations

Strydom (2002:63), draws on the work of (Babbie, 1998) and says that: “Anyone involved in research needs to be aware of general agreements about what is proper and improper in scientific research.” The research was carried out with the consent of the relevant parties. Information obtained during the research process was treated as confidential and this assurance was given to participants.

All interviews were conducted on a voluntary basis. The introduction to each interview ensured that respondents were made aware of their voluntary participation and no one was prevented from discontinuing their participation in the interview. The confidentiality of the information provided by each respondent was guaranteed. Interviews were conducted in a safe environment, adhering to safety conditions, policies and legislation. The willingness of respondents to participate was considered. The privacy, confidentiality and anonymity of participants were ensured. According to Burns (2000), both the researcher and participant must have a clear understanding of the confidentiality of the results and the findings of the study.

All participants’ information and responses shared during the study were kept private and the results are presented in an anonymous manner to protect the participants. All audio recordings will be destroyed as soon as the study has been completed.

1.7 CONTRIBUTION OF THIS STUDY

Multi-sectoral role-players in South Africa implement a number of operational actions for managing and taking control of a major emergency or disaster. However, South Africa EMS do not provide a structure for a standardized approach to developing, coordinating and implementing emergency management programmes across all

stakeholders by establishing guiding principles, processes and a common terminology. South Africa do not have a statutory national standard (ICS) for multi-agency response to an incident, emergency or disaster. Although SA is an important stakeholder in Africa and is represented on different international forums (UN, 2004), South African government agencies, emergency stakeholders and private companies are mostly left to their own devices when it comes to the management of an incident, emergency or disaster. This study contributes a model based on the international best practices for incident management, grounded in field research including observation. These principles were adjusted for the South African environment and stakeholders so that it can be implemented at local government level. The model provides a refined look at ICS at local government in South Africa, building on existing research and current practices. The model is the first to attempt to give a complete overview of what is needed for ICS at local government level in South Africa. It is envisioned that the model will provide multi-agency incident management role-players insights into how an ICS should function, its challenges and possible benefit.

1.8 THESIS CHAPTER LAYOUT

Chapter 1: Introduction

Chapter 1 provides a general overview of the study, including an introduction and rationale for the study. This chapter also contains the research problem, research questions and purpose of the study.

Chapter 2: Overview of organizational theory

This chapter outlines the conceptual framework for the study by providing a literature exploration with regard to the concept of ICS and the multi-agency concept. The role and responsibility of government and multi-agency role-players in a multi-agency emergency response for disaster are discussed from a local and international perspective.

Chapter 3: A general overview of ICS

The third chapter describes the different dynamics and models of ICS employed locally and globally. Selected case studies are discussed.

Chapter 4: Research methodology

Chapter 4 provides an in-depth description of the research process, including research design and methodology.

Chapter 5: Empirical findings

Chapter 5 presents the data and the analysis of the data. The results are presented in accordance with the themes identified.

Chapter 6: Conclusion and recommendations

In Chapter 6, the researcher summarizes the results of the study and presents conclusions and recommendations drawn from the study.

Chapter 7: A model for ICS at local government level in SA

Chapter 7 contains a model as it emerged from the data.

1.9 CONCLUSION

The South African disaster management system is in line with UNDRRS that highlight intergovernmental and interorganizational multi-agency stakeholders in the response and management of incidents, emergencies or disasters. The various international strategies emphasize the important role and responsibility of government in this cross-sectoral function.

The manner in which this must be done, is to develop a comprehensive framework that helps to ensure a coordinated and organized approach to incidents, emergencies or disasters. Although, the South African DMA and the NDMF prescribe that all stakeholders must work together in an integrated manner, the DMA and NDMF are not prescriptive on the format of the ICS. Therefore, a standardized working procedure should be developed that accommodate all multi-agency stakeholders. The problem under investigation in this thesis is the improving of incident command in South Africa by developing an ICS model for local government that will improve and enhance South Africa's intergovernmental and interorganizational multi-agency response and management of incidents, emergencies or disasters. Hence, the proposed model is considered a dynamic model that is able to maintain government, multi-interdependency between events, actions, actors, context and the other factors involved in the process. It remains imperative to ground the research within a theoretical context when investigating and possibly solving this problem.

The need for revising EMS in South Africa has reached a point where government should address the situation because local government, organizations and stakeholders in the disaster management fraternity are experimenting with different ICSs to establish what will be most suitable for South Africa. This chapter provides an

overview of the study and identifies the need for an ICSs for local government. Moreover, the chapter provides an orientation of the study, clearly demarcating the problem statement and the study questions. To address the identified problem and the research questions, the study provides a number of research objectives to help direct the study. The central theoretical statements on which the study is grounded were highlighted, followed by the research methods applied in the study. The chapter concluded by mapping out the structure of the thesis to make it easier for the reader to follow the study.

Chapter 2 provides grounding in and focus on organizational theory and management principles applicable on ICS for South Africa. Chapters 1, 2 and 3 highlight, assess, discuss and synthesize the available body of knowledge on EMSs and how ICSs are applied in intergovernmental, interorganizational multi-agency stakeholder processes. In doing so, these chapters address the first objective of the study, namely to investigate, assess and discuss the theories and practices.

CHAPTER 2: OVERVIEW OF ORGANIZATIONAL THEORY

2.1 INTRODUCTION

Chapter 1 provided an overview of the study and emphasized the need for a multi-agency ICS for local governments in South Africa. Although South Africa as a country has made huge strides in the implementation of the UNDRRS (General Assembly Resolution 42/169 – through the HFA and SFDRR), a number of issues still have to be address by government.

Managing multi-organizational emergency and search and rescue activities in response to a disaster is an organizational problem because the basic management functions (planning, organizing, activating and evaluating) and five additional functions (decision making, communication, motivation, coordination and delegation) need to be executed. In an incident, emergency or disasters external change can have a positive or negative effect on an organization and sub-units (see Sections 3.2.1.4) (Bigley & Roberst, 2001). In an incident, emergency or disaster, the capacities needed exceed single organization resources and this requires cooperation among organizations that need to be coordinated. Therefore, the effective integration of multi-agency stakeholders into one team can improve response to, and management of incidents, emergencies or disasters (Auf der Heide, 1989; Bigley & Roberst, 2001; Kroon, 1997; Paton & Flin, 1999).

Given this nature of reaction to disaster, organizational theory can contribute to the development of effective structures. The purpose of this chapter is to highlight, assess, discuss and synthesize the existing body of knowledge and assumptions on organizational theory, organizations, and ultimately the government's role in developing and implementing an ICS for local government. This chapter provides a

solid foundation for the development and discussion of an ICS model for local government in South Africa. The first Section aims to provide an overview of organizational theory and to explain its origins. The second part of the study focuses on organizations and how organizational theories influence an organization. The discussion below therefore focuses on the dominant organizational approaches as they pertain to risk management. Moreover, this study does not advance any particular theory, but rather seeks to emphasize the role that different theories play in structuring organizations. Therefore, it is imperative to study how organizations are organized in general and during the response and manage of an incident, emergency or disaster and generally to understand how they work.

2.2 OVERVIEW OF ORGANIZATIONAL THEORIES

Organization cannot exist in isolation from the external environment (ecology, government policies, trade systems, technological environment and cultural beliefs) (Aldrich, 1999; Fimreite & Lægreid, 2005). Organization theory aims to establish a particular pattern with structure, involving people, task and techniques (Clegg & Hardy, 1996; Leavitt, 1962; Smith & Dowell, 2000; Starbuck, 2003). 'Structure' in this study refers to the coordination public sector organizations, and specifically government departments and ministries (Bigley & Roberst, 2001; Parker, 1992). Such an understanding is suited as the structure involved has many components that are central to a successful disaster response operation (Choo & Nadarajah, 2014; Comfort, 2007 191; Linnenluecke & Griffiths, 2013; Nolte & Boenigk, 2011; Wolbers & Boersma, 2013).

The evolution of organizational theories affords a historical perspective on thinking about workplaces and organizations over more than a 100-year period (Daft, 2010a).

A significant change occurred in the twentieth century. The era before this time was known for its authoritarian (top-down bureaucracy) style of managing (Giblin, 2013). This authoritarian style was followed by a leadership model that emphasizes open communication and broad collaboration. A number of transition points can be highlighted from the Cold War civil defence style to an all-hazards focus leadership model. Fundamental cultural changes in this era included a mission adjustment, and the fact that relationships with the public changed, as did relationships with other governmental and NGOs. The twenty-first century is known for the effective interactions between multi-agency stakeholders, government officials and communities, and the broader disaster relief community. As Waugh and Streib (2006) indicate, modern emergency management can be seen as a paradox. On the one side is the emergency response that need meticulous organization and planning and on the other side emergency managers have to innovate, adapt and improve because plans, regardless of how well they were compiled, seldom fit the circumstances of the incident, emergency of disaster. Therefore, command and control styles of management emphasize the importance of a clear hierarchy of authority where the government, NGOs and the affected community forms a network that works towards a common goal (Britton, 1988; Dunbar & Starbuck, 2006; Dynes, 1970; Fritz & Mathewson, 1956 867; Gonzalez, 2010; Hall & O' Toole, 2000; Hicks & Gullet, 1975 ; Hood, 1991; Moynihan, 2009; Nystrom & Starbuck, 1981; Pelling, 2007; Provan & Kenis, 2008).

Shafritz *et al.* (2011:223) are of the opinion that it is not an exaggeration to say that the world is ruled by the underlying premises of organizational theory. This has been true ever since humankind first organized itself for hunting, war, and even family life. Indeed, the only novel thing about organizational theory is the study of it.

Organizational theory originally developed in an effort to understand organizations in the private sector, however the general principles are largely transferable to the public sector (Baker, 1969; Bovaird & Löffler, 2009; Box, 1999; Boyne, 2002; Clegg & Hardy, 1996; Lynch & Cruise, 2006; Sayre, 1953; Schneider, 2011).

Organization theory in the public sector can be an asset to managers at all levels Baker (1969). Organization theory can assist with setting programme objectives, overcome constraints, and accomplishing mandated purposes. In the public sector environment, different dynamics are at work. Therefore, theoretical and conceptual knowledge can improve service delivery if public workers, can identify the factors that affect organizational performance, determine how these factors interrelate, and decide how best to resolve problems and attain goals. Knowledge of organization theory can also create new ways of viewing organizational challenges and open up new avenues for pursuing change. In short, organization theory, supported by intuition and common sense, can be a powerful guide to action (Comfort *et al.*, 2012; Nelson, 1982).

Organizations consist of internal (employees, managers, owners) and external actors (customers, suppliers, creditors) (Lubell, 2015). Hence all stakeholders need to work together to achieve this goal. If the organizational theory is implemented correctly, the organization will achieve the set goals. Figure 2.1 illustrates the different multi-agency stakeholders (actors) that contribute to understanding of organizational theory.

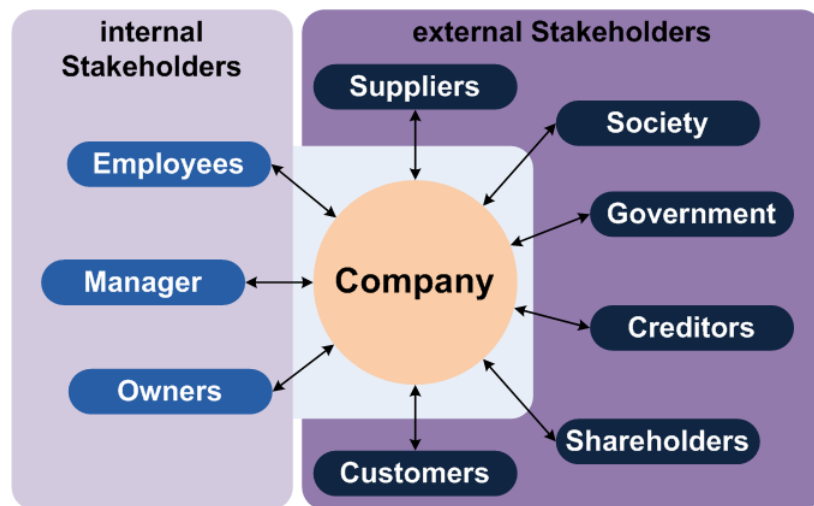


Figure 2-1 Organizational theory and actors

Source: Adapted from (Schermerhorn, 2016)

Organizational theory is the field of study that concerns itself with how organizations can be structured or designed (Atkinson, 1971; Daft, 2007; Daft & Lengel, 1986; Lægaard & Bindslev, 2006). It refers to how processes in organizations can be designed to improve organizational effectiveness. Organizational theory is fundamental for management at all levels if they are to achieve organizational goals and ensure organizational survival and effectiveness. Organizational theory can be classified into three broad subfields:

- The first subfield focuses on the organization itself. It is known as the macro-perspective and is evident from Weber's theory of bureaucracy (Scott, 1992).The purpose is to seek and explain how and why organizations behave as they do. According to Cummings (1978), this subfield typically investigates structural arrangements (e.g. levels of hierarchy, lines of authority, and degrees of departmentalization) and how they are affected by goals, strategies, size, technologies, and environmental constraints.

- The second subfield is generally referred to as organizational behaviour and focuses on a micro-perspective by looking at individuals and groups. It is important to understand their behaviours and interrelationships in the workplace. Works in this subfield typically investigate the attitudes, motivations, and performance levels of organizational members (Fox & Meyer, 1995:91).
- The third subfield generally refers to management theories that focus on management processes and practices (Fox & Meyer, 1995:91; Hodge & Anthony, 1979:5; Pugh, 1984:4; Robbins, 1987:6; Robbins & Barnwell, 2002:8; Starbuck, 2003:143). These brought subfields of organizational theory are active in the response and management of incidents, emergencies or disasters.

Therefore, the three subfields is prominent in the development of an ICS model for local government (Lægaard & Bindslev, 2006).

Organizational theory plays a central role because it sees and analyses organizations more accurately and more in depth than otherwise possible. Organizational theory is neither a single theory nor a unified body of knowledge. Rather, it is a diverse, multi-disciplinary field of study (Tompkins, 2005). Emphasis is placed on identifying general patterns and structures to solve a problem, to maximize efficiency and productivity, and meet the expectations of stakeholders (Dunbar & Starbuck, 2006; Schermerhorn, 2016:1). Therefore, organizational theory can be used to learn the best ways to run an organization or identify organizations that are managed in such a way that they are likely to be successful. Furthermore, organizational theory embraces multiple perspectives because of the complex nature of organizations (Hatch & Cunliffe, 2006:5). The implication of this is that there is no universal or one best way to organize and managers make decisions on current situation and act on those issues

that are key to the situation (Langston *et al.*, 2006; Thornhill & Van Dijk, 2010:102; Zakour & Gillespie, 2013; Zeithaml *et al.*, 2001).

Organizational theory can be seen as the result of an evolutionary process over a number of years that is influenced by different fields. The following theories influence organizational theory and are relevant to this study:

- the contingency theory (Daft *et al.*, 2010:686; Gibson *et al.*, 1994:7; Hatch, 2006:41; Scott & Davis, 2007:103);
- resource dependence theory (Bedeian & Zammuto, 1991:334-335; Hillman *et al.*, 2009:1404; Pfeffer & Salanick, 1978:1; Sheppard, 1995:33);
- population ecology theory (Bedeian & Zammuto, 1991:340; Daft *et al.*, 2010:195; Hall, 2002:261; Hatch, 2006:83; Robbins & Barnwell, 2002:253);
- chaos theory (Bechtold, 1997; Daft *et al.*, 2010:29; Levy, 1994; Thiétart & Forgues, 1995:19);
- game theory (Rapoport & Horvath, 1959:87-91; Varoufakis, 2008:1256).

Organizational theory holds that organizations can cope with complex environments by altering their structure. Lawrence and Lorsch (1967) state that as the environment becomes more complex, the tasks the organization performs become more complex as well. Organizations should divide the work into smaller, self-contained units, and work at integrating these units (Galbraith, 1977; Gresov, 1989; Thompson & Hawkes, 1962). Work should be divided (differentiation), but each unit should collaborate with others (integration) for the greater good of the organization as a whole. However,

organizational theory does not give guidance on how much integration there should be.

2.2.1 Organizational theories and selected schools of thought

A considerable amount of literature has been published on the long history of the Industrial Revolution that lay the foundation for organizational theories. Different perspectives pertaining to organizational theory dating back to this era brought with it the need for mass production. This that later resulted in the mushrooming of factories all over Europe. The Industrial Revolution is therefore cited as the starting point from which the perspectives of organizational theory later developed (Hatch & Cunliffe, 2006).

Management techniques and methods to improve production was not very high on the agenda and they only received attention after the Industrial Revolution (1760-1850) (Kroon, 1997). Accordingly, in the view of (Bendix, 1996), the Industrial Revolution brought along numerous challenges and changes to the industrial society because it changed the economic order and had an immense impact on the existing social structures, on the perception of individual people, and society at large, and on individuals working life. The industrial era was characterized by the concentration of great numbers of people in urban areas; increased emphasis in the work situation on specialization and the repetition of tasks; division between work and leisure and social life; domination of economic activities by production and profit; workers being regarded purely as a factor of production, with wages as the only motivation to accept work; a new employer-employee relationship; the development of the company as a form of business that contributed to the extension of management methods; and the creation of the professional manager.

With the above in mind, the following timeline in the evolution of organizational theories can be observed in the literature: classical theories or the rational goal approach (1776, 1900–1930), neoclassical theories or the human relations approach (1926–1960), contemporary approaches (1951–1975), and postmodernism (1976 to date).

2.2.1.1 *Classical theories of organization (1776, 1900-1930)*

As mentioned, the classical theories owe their origin to the Industrial Revolution, which resulted in mass production and the mushrooming of factories. The authors who developed these theories provided organizational theories with formative concepts and their ideas served as reference points around which the perspectives on organizational theory later developed (Hatch & Cunliffe, 2012). The classical theories of the organizations were developed in the late nineteenth and early twentieth centuries and were dominated by Taylor, Weber and Fayol. Other schools of organizational theory built on these arguments. Classical organizational theories focused on the formal organization and concepts to increase management efficiency (Bedeian & Zammuto, 1991:609; Crowther & Green, 2004; Fayol, 1949; Gortner *et al.*, 1989; Hodge & Anthony, 1979:29; Ott *et al.*, 2011:31,34; Parker, 1992; Robbins, 1990; Robbins & Coulter, 1996:39; Sarker & Khan, 2013 ; Shafritz *et al.*, 2011:244; Taylor, 1947).

In the classical theories of organization, business owners looked at their business differently for the first time. The division of labour improved the skill of the labourer and resulted in more productive use of machinery and more profit. The theory focuses on standardizing all the tasks in a factory. As Hissom (2009) notes, the theories highlighted careful specification and measurement of all organizational tasks. Based on his experience and observation as a manufacturing manager, Frederick Taylor

(1856–1915) developed four main principles that are applicable to all kinds of human activities that could increase efficiency in the workplace (Taylor, 1911). They include formulation of rules, laws and mathematical formula to carry out each task (Hanssen-Bauer & Snow, 1996) scientific selection of workers for each task and development of their skills; all employees should follow the developed scientific methods to carry out their tasks; and as a result of observing, recording and planning of the work, increasing the size of the management workforce. These changes could only take place if management takes responsibility for them, and it will send the messages that decisions are not made based on rules of thumb, but on actual evidence after careful study of individual situations. From this grew what can be called “scientific management” (Crossen, 2006; Farnham, 1997; Hissom, 2009; Kanigel, 1997; Szilagyi, 1984; Taylor, 1911; Wrege & Stoka, 1978).

The idea of the division of labour originally tried to improve labourer circumstances, but actually did the opposite (see Section 3.3.2.2 and 3.3.2.11) (Anderson, 1999; Hodge & Anthony, 1979:27; Kassem, 1977; Massie, 1970; McAuley *et al.*, 2007:59-60; Ott *et al.*, 2011:31,32; Scott, 1961; Shafritz *et al.*, 2011:224). As part of scientific management, Taylor pioneered the development of time and motion studies, originally under the name Taylorism, or the Taylor system, which was premised on the notion that there is “one best way” for accomplishing any given task. He sought to increase output by using scientific methods to discover the fastest, most efficient, and least fatiguing production methods (Bedeian & Zammuto, 1991; Crowther & Green, 2004:10; Hodge & Anthony, 1979:29; Ott *et al.*, 2011; Robbins & Coulter, 1996:39).

Organizational theory received attention from other researchers with other perspectives. Karl Emil Maximilian, popularly known as Max Weber (1864–1920)

presented what came to be the most influential theory on organizations, the theory of bureaucracy. The theory is propounded in three publications, namely *From Max Weber* by Greth and Mills in 1946; *Theory of Social and Economic Organization* by Parsons in 1947 and *Methodology of Social Sciences*. The theory of bureaucracy became popular in the 1940s. Henri Fayol (1841–1925) developed in 1916 the principles of management theory or administrative management. Out of the theory of bureaucracy, Fayol identified several management functions, which are known into today's modern environment as principles of management: planning, organizing, directing, coordinating and controlling, all of which are important in the functioning of an organization and ICS in general (Groth, 2012; Rodrigues, 2001; Wren & Bedeian, 2009).

Efficiency in executing these functions according to this school of thought is achieved by the adoption and implementation of the principles of management, which include division of labour; authority and responsibility; unity of command; line of authority, centralization; unity of direction; equity; order; initiative; discipline; remuneration of personnel; stability of tenure of personnel; subordination; and devotion to common cause. The only challenge was that this could not be tested because there was no big organizations at that time (Groth, 2012; Mahmood *et al.*, 2012; Rodrigues, 2001; Sarker & Khan, 2013 ; Wren & Bedeian, 2009).

The greatest contribution of the classical approach is that breaking down a particular job into its simplest component parts results in specialized and skilled workers. The classical approaches to organizational theory conceive of organizations as mechanical devices that achieve goals. This view of an organization will lead to high levels of efficiency. It is important to note that the classical theories discussed in this Section

are not the only ones. Whereas these three classical theories and others show some differences, broadly speaking, the division of labour, specialization, rules of thumb and the exclusion of personal elements from the conduct of work are common elements that are identifiable in all the theories dating from this period (Gajduschek, 2003; Gortner *et al.*, 1989; Robbins, 1990; Visitchaichan, 2003).

In the management of an incident, emergency or disaster, the traditional bureaucratic (Weber, 1947) or mechanistic systems (Burns & Stalker, 1961) discussed above ostensibly become more unreliable as situational volatility increases as the situation escalates. The most enduring idea in the bureaucratic organizational theory is that structural features such as standardization, specialization, formalization and hierarchy enable the steady, efficient functioning of organizations. However, this is suited to organizations that want to compete successfully under stable operating conditions, but such theories severely limit the organizational flexibility needed to cope effectively with complex, ambiguous and unstable task environments, such as which is found in the disaster management environment. Therefore, a growing number of managers are experimenting with new organizational forms that purportedly achieve flexibility and a degree of reliability under turbulent conditions by way of more organic and temporary work arrangements (Ilinitch *et al.*, 1996).

Given the inherent complexity and enigmatic nature of organizations and the volatility of the external environment, a need for tools to unravel the mysteries, paradoxes, and apparent contradictions that present themselves in the everyday life of organizations arose (Nadler *et al.*, 1982:1127-1136).

2.2.1.2 *The neoclassical theory of organizations (1926-1960)*

The neoclassical theory of organizations is known for focusing on coordination of the administrative units, internal-external organizational relations, and the processes used in decision making. The neoclassical approach highlighted the social facets of work groups or informal organizations that operate within a formal organization. Emphasis was placed on participative management or the decision-making process. As a proponent of this school of thought, Elton Mayo experimented at the Western Electrical Company between 1927 and 1932 and as a result, the human relations school legitimized themselves by making a number of findings. One central finding is that technocratic and bureaucratic control mechanisms have limited efficacy (Kieser, 1994:611). The neoclassical approach includes a systematic treatment of the informal organization, showing its influence on the formal structure (Scott, 1961).

The outcome of the Hawthorne experiments influenced a number of theorists to engage in conducting research in the field of interpersonal and social relations (Tompkins, 2005). These include studies by Abraham Maslow on motivation, Douglas McGregor's theory X and Y and Frederick Herzberg, to mention but a few. As a result of focusing on social and interpersonal relations, these studies were labelled the "human relations movement" (Sarker & Khan, 2013).

Elton Mayo's research confirms that workers respond to the social context of their workplace. Labourers in an organization are more than machines. Therefore, to increase productivity, the labour view should be taken into consideration. The labourer is in the frontlines every day and knows in his environment best (similar to emergency first responders). To improve productivity, the environment in which a labourer functions should be understood and human behaviours should be considered, such

as the group dynamics, conflict and motivation (Bharosa *et al.*, 2010; Docherty *et al.*, 2001; Groth, 2012; Hodge & Anthony, 1979:35; Lune, 2010:58; Ott *et al.*, 2011:92; Roethlisberger & Dickson, 1943 ; Roethlisberger & Dickson, 1939; Rotemberg, 1994; Sarker & Khan, 2013 ; Scott, 1961:10; Shafritz *et al.*, 2011:238).

2.2.1.3 *The postmodernist approach*

There is a direct link between the postmodern organizational theory and the early organizational theories that focus on an organization to increase production of wealth in terms of real goods and services. The postmodern organizational theory makes use of a combination of theories from several disciplines to suggest ways to increase production. The postmodernist theories are of the view that the organization is a system that has to change as soon as possible in its environment to secure a competitive advantage (Dame, 2012). The change in the environment should filter through the organization and the different units that form the sub-systems all have to work on the problem (Barakey, 2013; Bastedo, 2004 ; Ott *et al.*, 2011:197; Reed, 1992; Shafritz *et al.*, 2011; Zeithaml *et al.*, 2001).

The systems theory originated in the 1950 and can be attributed to the work of a biologist, Ludwig von Bertalanffy who observed the relationship between the organisms and the environment. The rationale of the theory is that the system must work together because its elements are dependent (inputs, the processes and the outputs and outcomes) on each other (Kast & Rosenzweig, 1972; Zakour & Gillespie, 2013). This is particularly relevant in the context of an ICS where there is a clear need for the system to produce tangible outputs.

In the 1960s and early 1970s, the contingency approach was developed to make systems theory principles applicable to the topic of organizational performance. The

contingency approach sees an organization as a set of interdependent parts that together constitute a whole, which in turn is interdependent on the larger environment (Bastedo, 2004 ; Zeithaml *et al.*, 2001). Contingency theories and postmodernist approaches are considered open systems because they focus on factors both inside and outside the organization. Mullins (1996:80) agrees that organizations are open systems that takes input from the environment (output from other systems – e.g. natural hazards and their impacts) and through a series of activities transforms or converts these inputs into outputs which then inputs into other systems to achieve certain objectives (such as incident management). In the open systems model, a business organization, for example, takes in resources such as people, finance, raw materials and information from its environment, transforms or converts these, and returns various forms of outputs such as goods produced, services provided, completed processes or procedures to external environment (see Section 2.4) (Scott, 2001). These outputs in turn help to achieve certain goals such as profit, market standing, level of sales or consumer satisfaction (Mullins, 1996). Therefore, open systems are considered open because they exchange resources in the form of information, energy and materials with their environment (Anderson, 1999; Bastedo, 2004 ; Kast & Rosenzweig, 1972) and they are systems because they consist of interconnected components that work together (Anderson, 1999; Nadler *et al.*, 1982). Figure 2.2 explains such an open systems model of an organization.

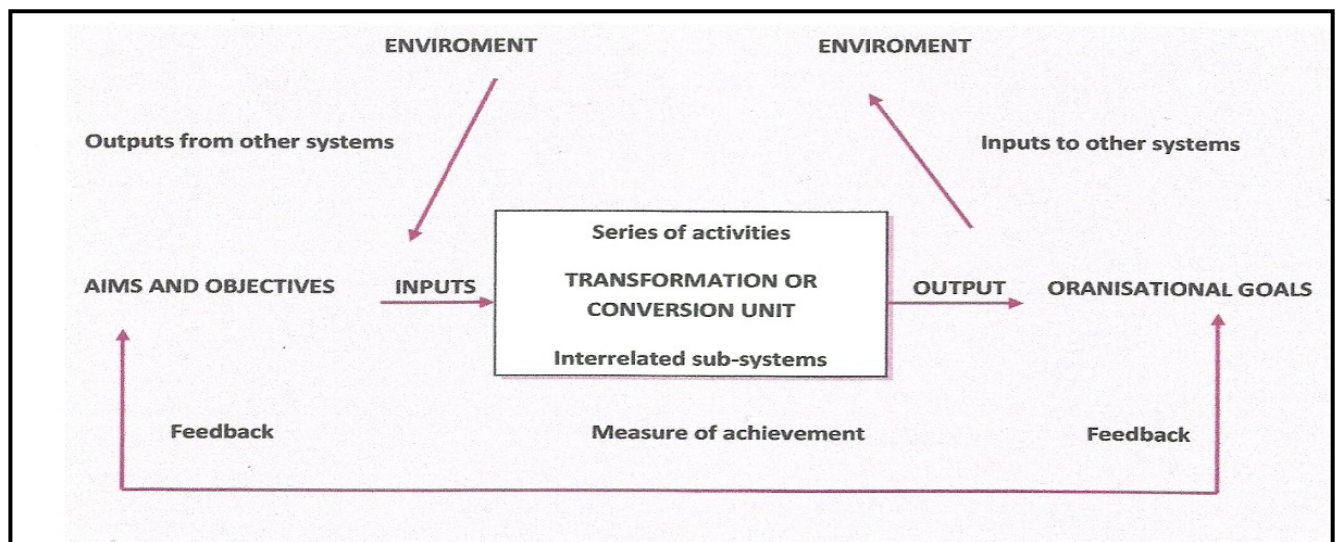


Figure 2-2 The open systems model of an organization

Source: Adapted from Mullins (1996:80)

According to Gortner *et al.* (1989), there are two main dimensions in the evolution of organizational theory, each with opposing views. First, organizations are viewed as systems, for they consist of interconnected components that work together (Anderson, 1999). By focusing on the internal characteristics of the organizations in isolation from the environment, the classical and the neoclassical theories are characterized as closed systems. The contingency theories and postmodernist approaches on the other hand are considered open systems (and well suited for this study), because they focus on factors both inside and outside the organization. Of importance is that this environment among other things consists of other organizations that exert various forces of an economic, political and social nature (Bastedo, 2004 ; Kast & Rosenzweig, 1972:450) draw attention to the fact that most systems are neither absolutely open nor absolutely closed. They are rather relatively open or relatively closed. Thus, (Kast & Rosenzweig, 1972:454) of the opinion that open and closed is a matter of degree.

Second, the ends dimension conceives of organizational structures as either rational or social (Gortner *et al.*, 1989). The rational dimension, which includes both the classical and contingency perspectives, argues that the organizational structure is a vehicle to achieve organizational objectives effectively (Gortner *et al.*, 1989). For organizations to be effective and efficient, they should be designed in such a way that they have a clear structure, a rational sense of order and stability and clear lines of authority and accountability (McAuley *et al.*, 2007). This diverse theoretical base for organizations is important because it creates more possibilities for effectively designing and managing organizations (Hatch & Cunliffe, 2006). Furthermore, organizational theory embraces multiple perspectives because organizations are too complex and malleable to ever be summed up by any single theory (Hatch & Cunliffe, 2006:5).

Important in open systems and organizational structure is cognition. Cognition is the process of perceiving signals and utilizing those signals mentally to establish a reliable prediction of future events. It is the interpretation of sensory input for strategy development and tactical decision making. Cognition in turn provides the input for communication (downstream and upstream). Communication concerns the shared development of a continuously updated holistic and share operational picture as a basis for coordination and decision making (Cramton, 2001; Reddy *et al.*, 2009; Steigenberger, 2015; Wolbers & Boersma, 2013). Cognition is important for a system (such as an ICS) to interpret outside signals and adapt accordingly.

Two effects have been observed in the interaction between the organization and the environment (Zeithaml *et al.*, 2001). The first effect is adaptation, where the elements within a system adapt to one another to preserve the basic character of the system.

The system must maintain a favourable balance of input and output transactions with the environment to survive. Organizations must adapt to the changing environment in order for them to continue to operate. If they fail to adapt they face extinction (Betts, 2011; Burnes, 2005; Davis, 2006; Scott, 1987; Scott, 1992). Secondly, the same results can be achieved from different starting points and by using a variety of paths (Nadler *et al.*, 1982:37; Zeithaml *et al.*, 2001). Similarly, within the context of incident command, adaptation to fast changing circumstances is crucial. The starting point for the constitution of the system/organization varies and therefore necessitates quick adaptation.

2.3 THE CONCEPT OF ORGANIZATION

Every aspect of society or human existence is influence by a one or the other form of organization (Atkinson, 1971; Gibson *et al.*, 1994) . According to Hall (2002:1), modern society has become a society of organizations (Bedeian & Zammuto, 1991:6; Berkhout, 2012; Ivanko, 2013; Scott & Davis, 2007:2).

In the modern era, organizations have been forced to make drastic changes to their information technology, raw materials, labour, capital and their facilities to secure their competitive advantage in the market. According to Kroon (1997) technological development, together with its economic and social consequences, has led to new insights into management. The striving for higher productivity with the aid of scientific methods demands a total shift in the thinking of employers and employees. Despite the differences among various organizations, there are at least three common factors in any organization: people, objectives, and structure. The determination of policy and decision making, the execution of work, and the exercise of authority and responsibility are carried out by different people at varying levels of seniority throughout the

organization's structure. It is possible to look at the organization in terms of interrelated levels in the hierarchical structure, for example the technical level, managerial level, and community level (Parsons, 1980). The interrelated levels of an organization are explained in Figure 2.3. In the response and management of incidents, emergencies or disaster these different levels are active from the beginning, during and after an incident, emergency or disaster. The first level focuses on the technical level and is concerned with specific operations and discrete tasks such as doing physical work in an incidents, emergencies or disasters. In a South African context this responsibility lies with local government.

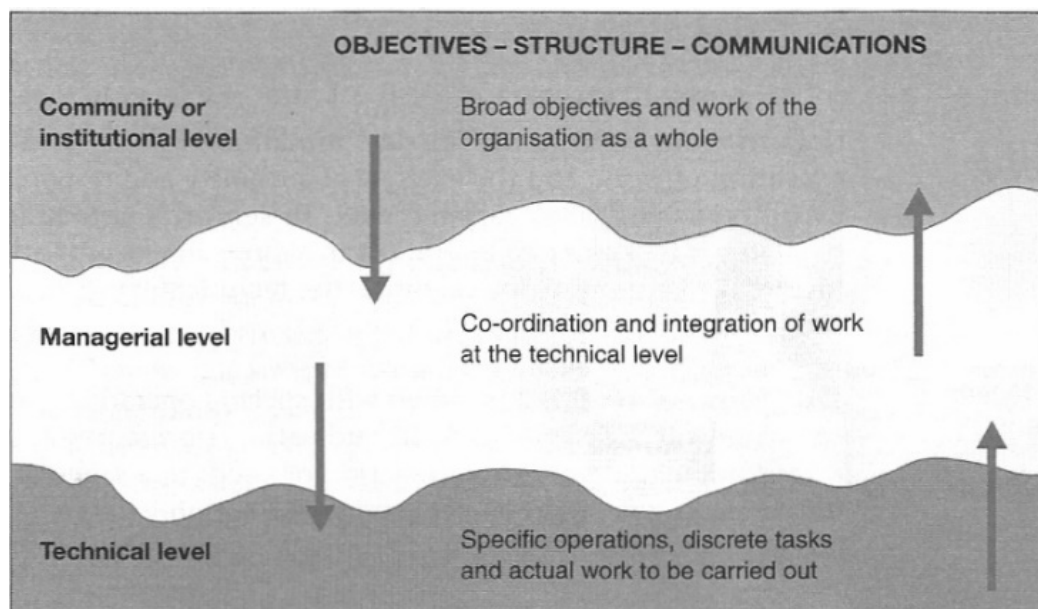


Figure 2-3 Interrelated levels of organization

Source: Adapted from Mullins (1996:334)

The second level focuses on the managerial level, which is concerned with the coordination of work at the technical level. This is typically the competency of a provincial government in South Africa.

The third level focuses on a community level or institutional level, concerned with broad objectives and the work of the organization as a whole. This is the competency of a national government. The last level is where there is an interrelationship between the levels with no clear division between the determination of policy and decision making, coordination of activities and actual execution of work. For a better understanding of organization and organization role and responsibilities in organizational theory, the different definitions applicable to organizations have to be scrutinized.

2.3.1 Various definitions related to organizations

Researchers have defined the term organization in several ways. Fox and Meyer (1995:90) indicates that an organization is an open, dynamic and complex system of cooperation that coordinates the actions of its members to enhance individual effort aimed at goal accomplishment. Elements of an organization include the human element, physical environment, work units, resources, boundaries and consumers. Berkhout (2012:91) focusses on the collectives of actors whose activities are coordinated within definable social units to achieve certain common goals. Scott and Davis (2007:29), elaborate on this view of organizations as collectives that exhibit a relatively high degree of formalization. The cooperation among participants is conscious and deliberate; the structure of relations is made explicit. A structure is formalized to the extent that the rules governing behaviour are formulated precisely and explicitly and to the extent that roles and role relations are prescribed independently of the personal attributes and relations of individuals occupying positions in the structure.

Mullins (1996:70) views an organization broadly in terms of an operating component and an administrative component. The operating component comprises the people who actually undertake the work of producing the products or providing the services. The administrative component for Mintzberg comprises managers and analysts, and is concerned with supervision and coordination. (Mintzberg, 1980; Mintzberg, 1987; Mintzberg, 1993).

Organization is often understood in terms of five basic components, namely the operational core; operational support; organizational support; top management; and middle management (Katz & Kahn, 1978). An organization is therefore a system incorporating a set of sub-systems. These sub-systems are related groups of activities that are performed to meet the objectives of the organization. Leavitt (1962) views organization as a specific configuration of the structure, people, task and techniques. Structure describes the form of departments, hierarchy and committees. It influences the organization's efficiency and effectiveness. People refer to the skills, attitudes and social interaction of the members of the organization. Task refers to the goals of the individual and the organization. Techniques refer to the methodical approach used to perform tasks. For Daft (2010:11), organizations are social entities that are goal-directed, designed as deliberately structured and coordinated activity systems that are linked to the external environment. Etzioni (1964:4) provides a similar conceptualization and defines organizations as planned units, deliberately structured for the purpose of attaining specific goals.

The common features can be identified by analysing the different definitions. Complex organizations can bring together and coordinate the human, financial, and physical resources needed to achieve the monumental tasks demanded of them. Organizations

bring together different resources to achieve desired goals and outcomes. A complex organization is an organization so large and structurally differentiated that it cannot be managed effectively by a single individual. Corporations, government agencies, hospitals, non-profits, and most voluntary associations fall into this category. Therefore, an increase in specialization and a division of labour is needed. Organizations are social entities that are goal-directed, designed as deliberately structured and coordinated activity systems that are linked to the external environment. Organizations have to accommodate the challenges of diversity, ethics and the motivation and coordination of employees. In the process, goods and services are efficiently delivered. For an organization to keep a competitive advance in a market, innovation and skills play an important role. The use of modern manufacturing, service, and information technologies can secure a compensative advantage. Create values for owners, customers and employees (Daft *et al.*, 2010:10; Gibson *et al.*, 1994:5; Hodge & Anthony, 1979:4-5; Rapoport & Horvath; Selznick, 1948:25; Tompkins, 2005).

The definitions presented above clearly indicate that an organization is in essence a social entity characterized by conscious and deliberate cooperation aimed at achieving an identified goal or set of goals in a manner that requires interaction with the environment. It is also clear that since an organization is comprised of more than one individual, structures are required to enable effective coordination of activities necessary for goal accomplishment. This is very important when responding to and the management of incidents, emergencies or disasters. A temporary organization is formed out of a number of other organizations that need to fulfil a number of actions in the different phases (warning, emergency, rehabilitation and reconstruction) (see Section 2.4) (Piotrowski, 2006).

2.3.2 The important role of organizational structure in an organization

In an organization, different actions take place simultaneously and therefore all actions must be planned meticulously for perfect execution. Therefore, structure is an imperative part of an organization. Structure provides guidelines on the division of work into activities; the linkage between different functions; hierarchy; authority structure; authority relationships; and coordination with the environment. An organization can be structured in many different ways, depending on their objectives. Structures in an organization have three components. The first is complexity (activities within the organization are differentiated). Differentiation can further divide into three dimensions. A horizontal differentiation refers to the degree of differentiation between units based on the orientation of members and the nature of tasks they perform and their education and training. A vertical differentiation that is characterized by the number of hierarchical levels in the organization. Spatial differentiation that is the degree to which the location of the organization's offices, facilities and personnel are geographically distributed. Formalization refers to the extent to which jobs within the organization are specialized. The second component is formalization, which can vary widely between and within organizations. The third component is centralization and it refers to the degree to which decision making is concentrated at one point in the organization (see Section 3.3.2.2 and 3.3.2.11) (Nystrom & Starbuck, 1981; Robbins, 1989).

The structure of an organization will determine the modes in which it operates and performs. It is an integral component of the organization. A key aspect of the structure is to provide the framework of an organization and its pattern of management (Mullins, 1996). Organizational structure is about order and achieving organizational goals and

objectives. Organizational structure affects organizational action in two different ways: first, it provides the foundation on which standard operating procedures and routines rest; second it determines which individuals get to participate in which decision-making processes. The organization as a structure includes features such as two or more persons, common goals, cooperative efforts, division of work, communication, rules and regulations; and a pyramidal shape (Mullins, 1996; Wilkinson, 2015).

Child (1984) explains that there are three key components in the definition of organizational structure. The first component designates the formal reporting relationships that include the number of levels in the hierarchy, span of control of managers and supervisors. The second component identifies the grouping together of individuals into departments and of departments into the total organization, and the last includes the design of systems to ensure effective communication, coordination, and integration of efforts across departments.

Sachdeva (1990) places emphasis on the institutional arrangements and mechanisms for mobilizing human, physical, financial and information resources at all levels of the system. Organizational structure therefore describes the organization's framework; it reveals the established pattern of relationships among the constituent parts of the organization. Nystrom and Starbuck (1981) adhere to a similar conceptualization and defines organizational structure as the institutional arrangements and mechanisms for mobilizing human, physical, financial and information resources.

The definitions concur that the following elements are identifiable in organizational structure:

- There are some institutional arrangements; and

- The organization mobilizes human, physical, financial and information resources at all levels.

2.3.3 Basic principles of organizational structure

The previous Section discussed the importance of structure in the context of an organization. This Section focuses on the basic principles of organizational structure in an organization. Daft (2004:401) identifies the following principles in an organizational structure.

The first principle is known as specialization, it facilitates the division of work into units for efficient performance. Specialization can move horizontally or vertically in an organization. Work in an organization can be divided among different departments/role-players to improve the output. This is an important aspect in the response and management of incident, emergency and disaster because ICS break down the goal into different objectives that will be executed by different components such as incident commander, liaison, information safety, operational planning logistics and finance (see Section 3.3.2.2) (Anderson, 1988). The main focus of the classical theories was on dividing work. Work can be performed much better if it is divided into components and people are encouraged to specialize by component. A negative aspect of specialization is that makes coordination difficult and obstructs the functioning of the organization. More so, in multi-agency response and management of incidents, emergencies or disasters, because the nature of the hazard will dictate the specialized skills needed and therefore influence on the overall coordination (see Section 3.2.1.5). It can also affect attitudes and work styles, namely differences in the goal orientation, time orientation, interpersonal orientation, and the formality of structure (Lawrence & Lorsch, 1967).

The second principle, coordination, refers integrating the objectives and activities of specialized departments to realize broad strategic objectives of the organization. Organizations often establish multi-disciplinary units to achieve the above. Units or groups should be placed together according to the patterns of relationships, information networks and communication (Anderson, 1988). The importance of the hierarchy of authority for coordination cannot be overemphasized. The unity of command is that every person in an organization should be responsible to one superior and receive orders from that person only. Fayol (1949) on the other hand, focuses on the important principle of efficiency and the increased productivity in an organization. According to Lindell (2007), the multi-agency stakeholders' organizational structures should be based on two basic principles:

- First, the structure used to respond to everyday emergencies should form the basis of a larger structure to deal with disasters.
- Second, the local response structure must be flexible. It must be able to expand as additional external resources are added to match the demands of the disaster (Crichton *et al.*, 2005; Wisner *et al.*, 2012).

Response and the management by multi-agency stakeholders to incidents, emergencies or disasters is fragmented because of poor coordination and the absence of an EMS (Ana *et al.*, 2007; Anneli, 2006; Chen *et al.*, 2013; Comfort, 1994; Hossain, 2012; Moe & Pathranarakul, 2006; Smith & Dowell, 2000; Steigenberger, 2015; Wise, 2006). A contributing factor to poor coordination is that there is not enough information (internal / external) regularly available and it can hamper good coordination, which can affect the management of and response to an incident, emergency or disaster (Banipal, 2006; Kapucu, 2005; Lee *et al.*, 2011; McEntire, 2007; Morris *et al.*, 2007;

Salmon *et al.*, 2011; Smith & Dowell, 2000). Bharosa *et al.* (2010:50) warn that a lack of coordination can increase the number of possible failures, such as the inappropriate allocation of first responder resources, counter-productive ordering of sequential relief processes, and delayed evacuations, which often result in crisis escalation and even higher numbers of casualties. Malone (1987) indicates that from the perspective of an organization, coordination has three components:

- a set of interdependent actors engaged in the environment;
- who perform tasks of mapping goals to activities; and
- to achieve goals of better coordination performance.

Given the increasing toll of disasters, government must decide whether the risks are acceptable or not. Moreover, given the limited amount of time and resources, a decision must be made about which risks to address. Manyena (2006) is of the opinion that the development of disaster resilience by local authorities is largely dependent on the capacity of local authorities to plan and manage the development activities and this emphasizes the need for capacity development in local governments to implement proper DRR initiatives. Government, in conjunction with other stakeholders, should develop and maintain capacity for effective coordinated disaster response management (Col, 2007; Haddow & Bullock, 2006; Kapucu, 2005; Lalonde, 2004; Twigg, 2004a; Van Niekerk, 2006). Coordination is active in all organizations and more so in a multi-agency stakeholders structure (Chen *et al.*, 2008; Chen *et al.*, 2007; Chen *et al.*, 2013; Comfort *et al.*, 2004).

The third principle is the decision-making authority or chain of command in an organization that flows in a straight line from the highest level to the lowest. This,

however, is not always possible in large organizations. Fayol (1949) is of the view that members can communicate directly with counterparts in the organization. This principle of responsibility and authority focuses on the performance of certain tasks, a responsibility that should be accompanied by the proper authority. Senior people in the organization should also have the appropriate level of influence on decision making.

The fourth principle of the classical organizational theory school deals with the span of control. Span of control is the number of employees who report to a single manager or supervisor (Daft *et al.*, 2010:288-289; Fox & Meyer, 1995:121; Frank, 1971:29; Gibson *et al.*, 1994:488; Hodge & Anthony, 1991:21; Jones, 2001; Scott, 1961:10) (Fayol, 1949). If this balance is disturbed, the manager could lose management control. Therefore, it is imperative for a manager to keep the balance by manage the span of control. This can only be done by minimizing the similarity of functions; proximity of the functions to each other and to the supervisor; complexity of functions; direction and control needed by subordinates; coordination required within a unit and between units; extent of planning required; and organizational help available for making decisions (Barkdull, 1963; Frank, 1971; Gullick & Urwick, 1937:86). In the management of an incident, emergency or disaster resources are limited and need to be managed and coordinated meticulously. Hence, an ICS model for local government must assist with the span of control and coordination of all involved to secure a better and coordinated outcome.

The fifth principle relates to the departmentalization, which can be explained as the process of horizontal clustering of the different types of functions and activities on any one level of the hierarchy (typically see the “Fundamental principles of ICS” in Figure

6-1). Departmentalization is closely related to the classical bureaucratic principle of specialization and conventionally based on purpose, product, process, function, personal things and place. Departmentalization consists of functional departmentalization (grouping of activities or jobs involving common functions) and product departmentalization (grouping of jobs and activities that are associated with a specific product). Departmentalization by territory or geography involves grouping of activities and positions at a given location to take advantage of local participation in decision making. Departmentalization by process or equipment refers to jobs and activities that require a specific type of technology, machine or production process. Departmentalization makes it is easier to communicate with sub-units (as such will be the case in an emergency or incident); to apply higher technical knowledge for solving problems (i.e. the incident Commander and functional areas of ICS); greater group and professional identification (various response agencies); less duplication of staff activities; higher product quality; and increased organizational efficiency. For effective command and control, organization has to be further divided into separate units to limit the span of control of a manager to a manageable level (Filley, 1978; Gullick & Urwick, 1937; Luthans, 1986).

The sixth principle is centralization and decentralization. In any organization, certain levels can be identified. Organizational levels can include internal policies, arrangements, procedures and frameworks that permit an organization to function and deliver on its mandate. Decentralization can be explained as decision making at lower levels in the hierarchy of authority. In contrast, decision making is a centralized type of organizational structure that takes place at higher levels. The degree of centralization and decentralization depends on the number of levels of hierarchy, the degree of coordination and span of control. Centralization and decentralization can be

categorized by geographical or territorial concentration or dispersion of operations; functions; or extent of concentration or delegation of decision-making powers. In any organizational structure, centralization and decentralization can be identified. The extent of this can be determined by identifying how much of the decision making is concentrated at the top and how much is delegated to lower levels. Modern organizational structures show a strong tendency towards decentralization (Luthans, 1986; Weick *et al.*, 1999). However, in the case of an ICS, a portion of decentralization must be forsaken for the system to function adequately. This does not forsake the need for decentralization especially in the case where one would be dealing with an escalating emergency or disaster. Thus, within an ICS, the degree of centralization or decentralization is directly dependent on the amount of response agencies linked to the various work packages to be performed, and levels of decision making.

The line and staff relationship are the last principle that focuses on management. Management is held responsible for making decisions that can have a drastic effect on the organization if competitive advantage is threatened. According to Marx (1984), management is a process during which people in a leading position utilize human and other resources as efficiently as possible to provide certain products or services, with the aim of fulfilling particular needs and achieving the stated goals of the business. Any organization has line and staff personnel that have different functions, goals, cultures and backgrounds - very similar to any ICS environment. A line authority is the superior-subordinate linkages that extend throughout the hierarchy. Any organization has line and staff personnel that have different functions, goals, cultures and backgrounds - very similar to ICS environment. A line authority is the superior – subordinate linkages that extend through the hierarchy. Line employees are responsible for achieving the basic strategic objectives of the organization. Staff

employees are the administrative employees and their main function is to support and provide help to line employees to achieve organizational goals. Specialized staff conducts technical work that is beyond the time or knowledge capacities of top management, such as conducting market research and forecasting, or in the case of ICS, specialized search and rescue operations or traffic management. The general staff typically consists of staff assistants to whom managers assign work. Organizational staff (such as centralized personnel, accounting and public relations staff or the functional ICS areas (see Section 3.3.2.2) provides services to the organization as a whole. Their role is to integrate different operations across departments. For an organization to prosper, a good relationship between the line and staff must be upheld in the organizational structure (Anderson, 1988; Koontz *et al.*, 1980).

The choice of goals and strategy influences how the organization should be designed. An organizational goal is a desired state of affairs that the organization is attempting to reach. Many types of goals can be present, and each type performs a different function. Two types of goals can be identified, namely an official goal and operative goals, and both are important for the organization, but they serve very different purposes. Official goals and mission statements describe a value system for the organization and set an overall purpose and vision; operative goals represent the primary tasks of the organization. Official goals legitimize the organization (such as laws and policies calling for the implementation of an ICS); operative goals are more explicit and well defined (such as Standard Operating Procedures of various response agencies). Operative goals serve several specific purposes (Daft, 2008:65; Etzioni, 1964). Given the above conceptualization of organizations and the discussion of the

different theories of organizations, the next Section presents the influence organizational theory has on DRR.

2.4 THE INFLUENCE OF ORGANIZATIONAL THEORY ON DRR AT LOCAL GOVERNMENT LEVEL

The management of an incident, emergency or disaster does not only entail response, but also the management and directing of resources, which includes people, technology and procedures in the different phases (warning, emergency, rehabilitation and reconstruction (USDHS, 2015). Manyena (2006) is of the view that local authorities is the vehicles through which the disaster risk agenda could be championed as they are rooted in the local communities (Kettl, 2000; Pearce, 2003). Local government departments and emergency multi-agency stakeholders have a certain capacity to cope, from day-to-day under normal circumstances with their respective allocated resources. The problems originate when local government and multi-agency stakeholders cannot cope and existing capacity is depleted. They then have to request additional resources from a higher management level, and a temporary organization is formed. This temporary organization makes use of a different hierarchy and structure that need to be coordinated. One of the biggest threats to managing an emergency situation is that responders come from different backgrounds. Usually these responders have never trained together (Lui, 2004). Nevertheless, the capacity to collaborate effectively with the nation's disaster networks is essential and frequent interaction, including participation in planning and training exercises, builds that capacity (Chen *et al.*, 2007; Chen *et al.*, 2013; Dawes *et al.*, 2004b; Drabek, 1987b; Hanssen-Bauer & Snow, 1996:413-427; Lagadec, 1993; Pearson & Clair, 1998:59-67; Quarantelli, 1981; Turner, 1976; Waugh & Streib, 2006).

Figure 2-4 provides insight into the different phases that are active in incident, emergency or disaster that need to be managed accordingly to management principles. It is at this juncture that organizational theory becomes relevant. A temporary structure is established because in every phase certain organizations play a critical yet different role. Therefore, if response or management is not coordinated, it might lead to failure. From Figure 2-4 below, it is evident that in sudden onset disaster/hazard events the temporary organizational needs quickly escalate (McHugh, 1995). It is in this period (emergency phase) where an ICS is normally most active. However, given the definition of a “disaster” as per the DMA, an ICS can also be constituted prior to the onset of a hazard/disaster. This, however, has not been successfully tested in practice yet. There are various reasons for this. One of the most significant related to Section 2.3.3 above. The type of multi-agency role-players differs from hazard to hazard. Thus, a slow onset hazard/disaster will provide more warning and time to constitute an ICS. On the other hand, the role-players “responding” to a slow onset hazard/disaster is not the same as the trained response agencies in the case of a sudden onset hazards disaster (e.g. rescue personnel in the case of flash floods vis-à-vis hydrologists in the case of drought). Be that as it may, the basic need for a temporary organization remains with all of the principles and pillars as discussed above. This temporary organization might change its objectives and operations as the disaster moves through the various phases as per Figure 2-4. It is therefore valid to argue that although the principles and functional areas of the organization will remain, the role-players will differ as the situation (phases) change.

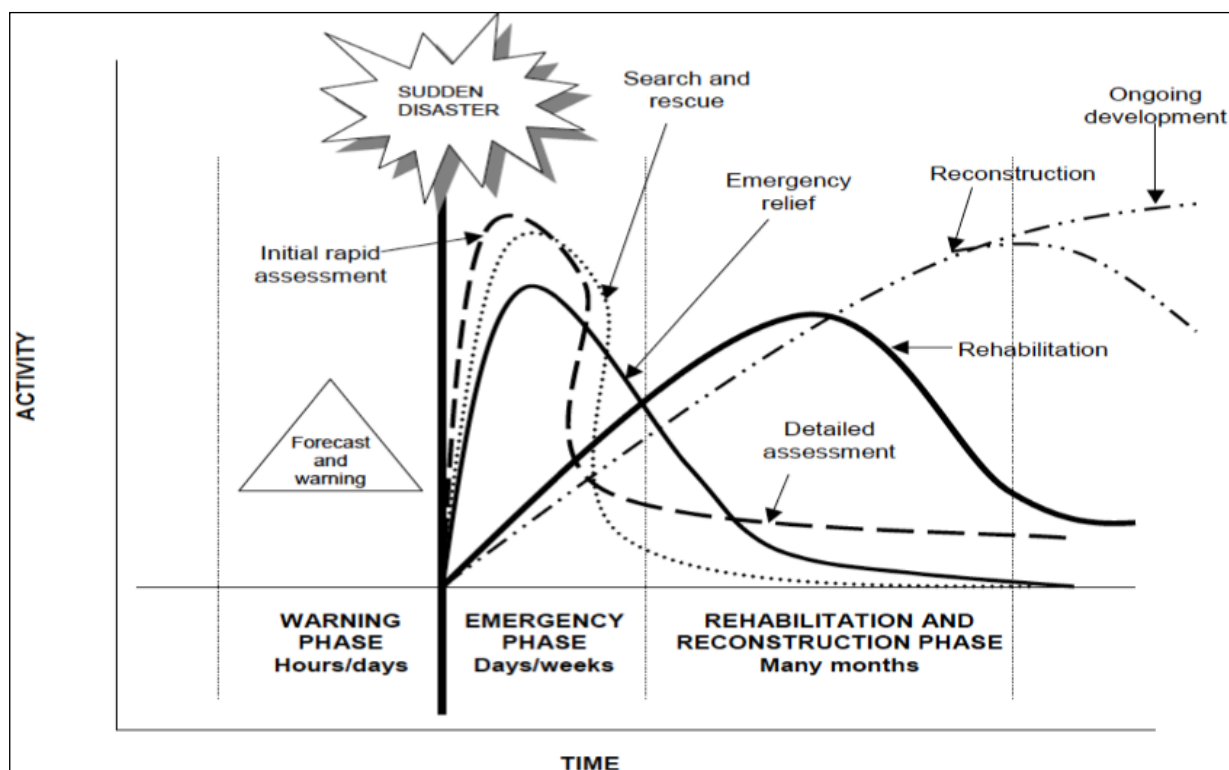


Figure 2-4 Different phases of an event, incident, emergency or disaster

Source: Adapted from the UN (1991:195)

The Constitution of the Republic of South Africa indicates that local, provincial and national government are the main stakeholders in the management of incidents, emergencies and disasters, with DMCs as the representative entities. In the South African context, legislation on the management of disasters (Disaster Management Act, 57 of 2002) tasks all spheres of government, in collaboration with civil society, to undertake to protect people, infrastructure and other national assets from the impact of disasters (National Treasury Republic of South Africa, 2000; South Africa, 1973; South Africa, 1996b; South Africa, 1997; South Africa, 1998c; South Africa, 1998d; South Africa, 2001). This cannot happen if the different levels of government and the different agencies and NGOs organizations that come together, cannot organize themselves into a workable structure (Kapucu *et al.*, 2010).

2.5 CONCLUSION

Flowing from the discussion above, it is clear that a discussion of organizational theory is not complete without a reflection on the role of power and authority in an organization. It also emerged that since an organization exists essentially to perform work necessary to achieve goals, understanding how power and authority manifests in organizations is essential. While power has various sources in an organization, authority is in essence vested in a formal position. Chapter 2 provided an in-depth investigation of the evolution of organizational theory from the classical to the postmodern era. Thereafter, the term organizational theory was defined and the role of stakeholders explained, followed by a discussion on the reason for the existence of organizations and structures. It should therefore also be evident that organizational theory assists greatly in the understanding of the formation, pillars and principles supporting temporary organizations such as an ICS.

Organizational theory, in its essence, is an interdisciplinary field that has benefited from borrowing from fields such as engineering in general and industrial engineering in particular. Other fields include psychology, sociology, political science, management, and economics, to mention but a few. It is therefore particularly suited for the investigation and explanation of the multi-agency and multi-sectoral environment of ICS. In the next chapter, the concepts and terms involved in emergency management are scrutinized, after which a number of existing ICSs are investigated to determine important aspects that have to be incorporated in an ICS for South Africa at local government level.

CHAPTER 3: LOCAL AND INTERNATIONAL PERSPECTIVES ON EMERGENCY MANAGEMENT SYSTEMS

3.1 INTRODUCTION

The magnitude of a disaster can deplete a single organization's resources in a matter of hours. Therefore, the assistance of multiple agencies is needed for an effective response. This places an enormous burden on existing infrastructure and in many cases this requirement for coordinated organizational response to incidents, emergencies or disasters cannot be met by local government (Birkland & DeYoung, 2011; McHugh, 1995; Schneider, 2005; Shaluf, 2007; Tun Lin Moe & Pairote, 2006). The main function of organizational response to an incident, emergency or disaster is to assist with minimize loss, emergency aid, to reduce the probability of secondary damage and to minimize problems for recovery operations (Ardagh *et al.*, 2012; Kapucu, 2005; Kapucu *et al.*, 2009; Leonard & Howitt, 2006; Leonard & Howitt, 2010; Moore, 2000; Perry, 2007; Schneider, 2011; Simon & Teperman, 2001) (see Sections 2.1.1 and 3.2.1.2). This implies that tasks and resources have to be shared, but there is no clear-cut responsibility or familiarity due to the crossing of jurisdictional boundaries and the absence of standardization (Auf der Heide, 1989:57,62; Kreps & Drabek, 1996:47; Perry, 1991; Quarantelli, 1966). Comfort and Kapucu (2006) explain that to integrate different multi-agency stakeholders and jurisdictions with disparate skills, knowledge and access to information for disaster response is very difficult. A temporary organizational structure is quickly formed because the capabilities of the existing authority are depleted, especially at local government level (Auf der Heide, 1989; Comfort, 1994; Leonard & Howitt, 2010; Lin *et al.*, 2006; Moynihan, 2008; Petak, 1985; Smith & Dowell, 2000; Stephenson, 2007; Weeks, 2007; Wise, 2006).

Chapter 2 provided an overview of organizational theory and its key components that are important in the development of the ICS model for local government. This chapter focuses on the importance of integrated approach to the response and management incidents, emergencies or disasters. The first Section focuses on an overview of the scientific approach that lay the foundation for modern EMS in the response and management of incidents, emergencies or disasters.

This is followed by an exploration of the key theoretical constructs employed in EMSs and a comparison between standard terminologies on which to base the development of a model for local government in South Africa. The second Section alludes to initiatives taken by government departments and private institutions to overcome the challenge of a lack of a standard ICS (USDHS, 2001). The third Section explains actions taken by government departments and private institutions in South Africa to highlight the development of an EMS for South Africa. The fourth Section explains active EMSs that are in use in other parts of the world as to draw similarities, differences and aid in the development and refinement of the model espoused in this thesis. Although, other aspects of coordination are equally important to this study, more emphasis is placed on the emergency response aspect as a coordination function.

3.2 KEY THEORETICAL CONSTRUCTS OF EMERGENCY MANAGEMENT SYSTEMS

The roots of emergency management can be traced back to the 1920s when Samuel Prince highlighted the response to the Halifax shipping explosion in 1917.

Subsequently, researchers began to look differently at disasters and change their focus on the collective behaviour of organizational reactions to various types of mass emergencies (Drabek & McEntire, 2003; Prince, 1920:97; Scanlon & Handmer, 2001). The first scientific approach towards response and management of incidents, emergencies or disasters in the 1950s focused on identifying and documenting the convergence of individuals and groups at the scene to care for, and assist the physically injured and emotionally distraught (Fritz & Marks, 1954; Fritz & Mathewson, 1957). Hence, this led to classifying into different perspectives, called the therapeutic community (Fritz, 1961), the synthetic community (Thompson & Hawkes, 1962), the mass assault (Thompson & Hawkes, 1962), the altruistic community (Barton, 1969), the utopian community (Taylor *et al.*, 1970), emergence (Parr, 1970) or emergent behaviour (Bardo, 1978; Drabek, 2016; Prince, 1920; Scanlon, 1988). The classifying of different perspectives generated new knowledge that led to the creation of the disaster Research Centre (DRC) at the Ohio State University in 1963, with its particular focus on organizational theory such as the tasking, the structures and group involvement in the disaster situations. This led to the development of the thinking on and typology of established (regular tasks, old structures), expanding (regular tasks, new structures), extending (non-regular tasks, old structures) and emergent (non-regular tasks, new structures) organizations (Britton, 1988; Dynes, 1970; Forrest, 1978; Quarantelli, 1966; Smith, 1978; Stallings, 1978).

The above was followed by the development of the Type V (or supra-organization) model, a term proposed by (Wenger, 1992:9) to denote the particular combination of all the different types of organizations during any specific disaster. It represents a systemic response that incorporates the disaster life cycle that consists of four phases,

namely response, recovery, preparedness and mitigation (Mileti *et al.*, 1975). Drabek (1987a) indicates that one thing that the field of disaster studies lacked was an updated review of the literature, particularly with reference to emergent phenomena and the coordination of multi-organizational responses. Another major benefit of these synthesizing works is that they positively influence the direction of both disaster studies and emergency management (Britton, 1999; Drabek, 1999; Drabek, 1986; Dynes, 1999; Merton, 1957; Merton, 1969; Scanlon, 1999; Wilson, 1999). Therefore, this Section will lay the foundation for the model for ICS for local government, grounded in the EMS thinking. To give substance to the study it is important to look at the different definitions that were generated over the years.

3.2.1 Definitions to explain certain main concepts pertaining to emergency management systems

This part of the chapter aims to establish an understanding of the key theoretical constructs of the study by exploring various interpolations of key terms and then drawing comparisons to derive standard terminology on which to base the development of the model. During this process any generic characteristic that emerge that can contribute to the model are also identified.

3.2.1.1 Emergency management system

The Disaster Management Act (57 of 2002) and the NDMF address a number of key aspects pertaining to DRR, but are silent on the aspect of a statutory national standard for multi-agency response for emergency stakeholders (South Africa, 2002a).

According to Reid and Van Niekerk (2008), the promulgation of disaster management legislation and policy in South Africa necessitates the development of a uniform multi-agency incident and disaster response system. The NDMF, promulgated in 2005, gives effect to the policy (Reid & Van Niekerk, 2008; Reid, 2005; Vermaak & Van Niekerk, 2004:556). Proposals and calls for the development and implementation of regulations for a national standard for multi-agency stakeholder responses. Therefore, the Disaster Management Act, NDMF lay the foundation for a South African EMS (South Africa, 2002a; South Africa, 2005).

EMSs have emerged as powerful platforms to manage an incident, EMS (Albtoush *et al.*, 2011). Moore (2008) states in (Wisner *et al.*, 2012) that a key aspect of the EMS is to manage and control a major emergency to reduce the negative impact on life, property, infrastructure and livelihood. This goal should be achieved by effective controlling of the responding processes and correct distribution of resources. The Australian EMS (AEMS) for example contains a set of arrangements, procedures, resources, personnel and relationships aimed at reducing the impact of hazards, emergencies and disasters on Australian communities (Abrahams, 2001; AEMA, 1998).

Any EMS relies on a thorough integration of emergency plans at all levels of the organization, and an understanding that the lowest levels of the organization are responsible for managing the emergency and getting additional resources and assistance from the upper levels. This system aims to reduce socioeconomic vulnerabilities to disaster and dealing with the environmental and other hazards that trigger them. Its scope is much broader and deeper than conventional emergency management and so allows DRR (Albtoush *et al.*, 2011:55; Van der Linde, 2008)

An EMS is a comprehensive system that helps to ensure a coordinated and organized approach to emergencies and disasters. EMSs should provide a structure for a standardized approach to developing, coordinating, and implementing emergency management programmes across all stakeholders by establishing guiding principles, processes and a common terminology, therefore enabling a range of stakeholders to participate in all phases of emergency management. Examples of EMSs in use in different parts of the world include the UK gold, silver and bronze system and the US incident management system (IMS), also known as ICS (BCERMS, 2016; Government of Samoa, 1997; Wisner *et al.*, 2012).

Efficient management and coordination of all elements involved in an emergency must be the ultimate objective of any EMS, otherwise control over the incident would not be achieved (Reid, 2005). Clearly, EMSs embrace operational actions of managing and taking control of a major emergency by providing a structure for a standardized approach to developing, coordinating, and implementing emergency management programmes across all stakeholders by establishing guiding principles, processes and a common terminology.

3.2.1.2 *Emergency management*

Drabek's (1991:xvii) view on emergency management is that it is a discipline and profession of applying science, technology, planning and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage

to property, and disrupt community (USDHS, 2011b). The Australian Emergency Management view emergency management as a range of measures to manage risks to communities and the environment (AEMA, 1998; AEMA, 1999; Comfort *et al.*, 2012). According to Canton (2007), emergency management rests on three pillars:

- a knowledge of history,
- an understanding of human nature expressed in the social sciences, and
- specialized technical expertise in response mechanisms.

In emergency management a number of multi-agency stakeholders are involved and their role and responsibility in emergency management is associated with a broader set of functions that goes beyond search and rescue, emergency medical services, temporary shelter and feeding, and restoring lifelines (Albtoush *et al.*, 2011; Waugh & Streib, 2006). Traditional emergency management also includes hazard mitigation to prevent or lessen the impact of a disaster, such as building levees or moving people out of floodplains; disaster preparedness, such as emergency planning and training (Breen *et al.*, 2004) and disaster response activities, such as conducting search and rescue activities (disaster recovery, usually meaning the restoration of a lifeline and basic services) (USDHS, 2015; Waugh & Streib, 2006). In the South African environment, the government opted to use the term “disaster management” to refer to the similar and related activities. The DMA indicates that disaster management is “a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at:

- preventing or reducing the risk of disasters
- mitigating the severity or consequences of disasters

- emergency preparedness
- a rapid and effective response to disasters
- post-disaster recovery and rehabilitation”

The similarities between traditional emergency management and disaster management are therefore evident. The terms emergency management and disaster management are therefore interchangeably in this thesis to facilitate the discussion and alignment with ICS, which has a more emergency management connotation. In both cases, planning remains an integral part of the success of an ICS.

3.2.1.3 *Emergency planning*

Emergency management planning refers to the analytical and consultative process by which governments, organizations and communities determine the arrangements and related strategies that can most effectively manage the risks they face (AEMA, 1999).

A concept that seems obvious but that is often overlooked is the difference between planning for a disaster and managing a disaster. Planning puts in place the resources needed for response. It focuses on the principles that will guide response and potential tactics to be used. In essence, planning is the development of a strategy for how the community will deal with crisis. Disaster management is the tactical and operational implementation of that strategy at the time of the crisis.

Emergency planning is fundamental to an ICS because the plan describes what should happen in the event of different hazards (Canton, 2007; USDHS, 2010a; Wisner *et al.*, 2012). It plays a pivotal role because it focusses on the broad spectrum of the role and responsibilities of all stakeholders involved. The process of planning and writing the emergency plan itself involves vulnerability assessment, decisions about which

potential disasters to manage, reviews of the agent-generated and response-generated demands made by different agents, and inventories of community resources available to meet the demands and the invention of strategies for response. Drabek (1986) differentiates between emergency planning as a product and as a process, yet many still view it as a packaged product rather than a long-term, ongoing process.

An aspect that came to the forefront when perusing documents is the fact that the emphasis is usually on producing plans (paper document), but these plans are never rehearsed or reviewed. According to Drabek (1986) some obstacles observed that transpired in many countries, cities, and institutions is that they have emergency plans, but not all of them have an EMS. In most cases these plans must be implemented by a number of role-players and it rarely function in isolation.

3.2.1.4 *Response by multi-agency stakeholders to incidents, emergencies or disasters*

Response is a multi-agency and multi-sectoral activity and entails the implementation of plans and the immediate deployment of a wide range of multi-agency resources to limit the loss of life, personal injury and property damage over a time period (Cartner, 1992:245; Comfort & Kapucu, 2006; Granot, 1997; La Valla & Stoffels, 1991; Osei, 2007 ; Steigenberger, 2016; USDHS, 2008c:140; USDHS, 2013c).

The White Paper on Disaster Management (South Africa, 1999b) describes response as activities that are arranged to deal with emergency situations and can involve the evacuation of people, dealing with accidents, extinguishing fires etc. Response in a South African context is defined in the Disaster Management Act (57 of 2002) as measures taken immediately after a disaster to bring relief to people and communities

affected by the disaster. These may include officials from government, municipal organs of state and external jurisdictions; emergency and essential services response personnel; NGOs, community-based organizations; representatives of parastatals such as utility companies; community volunteers; and the private sector (Harrauld, 2006; Liu *et al.*, 2014; Lubell, 2015; Reid, 2005; Smith & Dowell, 2000).

Effective response to an incident, emergency or disaster can be explained as an immediate demand for resources and skills from a wider range of organizations or emergency agencies (response agency) than those in the immediately affected area (Comfort & Kapucu, 2006; Waugh Jr, 2003). The response agency can be any agency that can contribute positively to an occurrence. It can therefore include a myriad of disciplines from various sectors (Granot, 1997; Reid, 2005).

3.2.1.5 Coordination

Coordination is the bringing together of organizations and resources to ensure an effective emergency management response (Argote, 1982; Chen *et al.*, 2008; Comfort & Kapucu, 2006; Kapucu, 2005; Kapucu *et al.*, 2010; USDHS, 2008b) (also see Section 2.3.3). It is primarily concerned with the systematic acquisition and application of resources (organizational, personnel and equipment) in accordance with the requirements imposed by the threat or impact of an emergency or disaster. Coordination relates primarily to resources and operates vertically within an organization as a function of the authority to control (AEMA, 1998; AEMA, 1999; Chen *et al.*, 2008).

The need for coordination arises as soon as the incident, emergency or disaster occurs because different multi-agency stakeholders respond to the affected area. These multi-agency stakeholders respond according to their own processes,

information, applications and other technology (Comfort *et al.*, 2004). In the field, a number of definitions exist pertaining to coordination. According to Malone and Crowston (1990), coordination is the managing of dependences between entities. They argue that the need for coordination arises from constraints imposed on the performance of tasks by the interdependent nature of these tasks.

Multi-agency coordination typically deals with the coordination of various organizations, each with their own processes, information, applications and other technology. The National Inter-agency IMSs (NWCG, 1983) glossary of terms for the ICS describes coordination as a process that can take place within an agency or among agencies. It does not involve the command that takes place within the operational activities of an agency, but is rather a process by which the optimal utilization of resources in accordance with the situation is effected (FIREScope, 1999:6; Irwin, 1989). The focus of coordination is essentially on the procurement and optimal utilization of resources in accordance with the demands dictated by the situation.

The Victoria Emergency Management Council (VICSES) concurs that coordination takes place within an agency, in which case it applies in the context of command, but that it also applies across agencies, in which case it vests as a function of the authority in control. In other words, it is applied both vertically within agencies and horizontally across agencies (VICSES, 1997:2.5). Bots and Sol (1988) indicate that there are three perspectives on coordination:

- The first perspective is known as the internal perspective (micro-perspective), focusing on coordination among individuals. This perspective focuses on the dynamics of managing the risk, complexity, and technology within an

organization (crisis management involves the coordination of complex technical and relational systems and the design of organizational structures to prevent the occurrence, reduce the impact, and learn from a crisis) (Bigley & Roberst, 2001; Gephart *et al.*, 2009; Pearson & Clair, 1998; Perrow, 1984; Starbuck & Milliken, 1988).

- The second perspective is the external perspective (intermediate perspective), focusing on organizations. This perspective focuses on the interactions with other organizations such as external stakeholders that largely draws from theories of social perception and impression management (crisis management involves shaping perceptions and coordinating with stakeholders to prevent, solve, and grow from a crisis) (Bundy & Pfarrer, 2015; Coombs, 2007; Elsbach, 1994; Pfarrer *et al.*, 2008).
- The third perspective focuses on the macro-environment and adopts an interorganizational approach.

Coordination cannot be viewed in isolation. It forms part of a process that includes cognition, communication, coordination, command, control and lastly feedback. Cognition is the process of perceiving signals and utilizing those signals to mentally establish a reliable prediction of future events. According to Comfort (2007), cognition refers to the interpretation of sensory input for strategy development and tactical decision making and an input for downstream and upstream communication.

Continuous internal and external communication of the incident, emergency or disaster is important because this helps with coordination and decision making during the operation (Comfort, 2007 ; Cramton, 2001; Reddy *et al.*, 2009; Wolbers &

Boersma, 2013). Coordination addresses the alignment of actions and the distribution and commitment of resources, while command is the allocation of decision-making power within an emergent disaster response network and the agencies' ability and willingness to lead or be subjected to leadership (Comfort, 2007 ; Faraj & Xiao, 2006). In order to successfully manage a complex disaster response operation, all these terms must be met in a satisfactory way (Mileti, 1999). Therefore, effective coordination requires that all parties have a very good idea of the command structure. The roles the agencies involved make a joint effort with the capabilities and resources that these agencies have at their disposal (Comfort, 1994; López Carresi, 2008 ; Olejarski & Garnett, 2010; Steigenberger, 2015; Wise, 2006)(Col, 2007; Stephenson, 2007).

3.2.1.6 Incident

An incident is the least serious event where assistance is needed (typically one response agency can deal with the situation e.g. domestic fire, traffic accident or medical case). Thus an incident as an occurrence falls into the routine scope and capabilities of emergency services daily operations but it can escalate into something more significant. This is normally an event that require urgent response that either may be expected, or may occur suddenly or accidentally (La Valla & Stoffels, 1991). Hence, an incident is an occurrence, natural or human-made, that requires a response to protect life or property at a limited scale. In the US an incident can include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, tsunamis, war-related disasters, public health and medical emergencies, and other occurrences requiring an

emergency response (USDHS, 2008c). However, an incident in the South African context is a day-to-day event or situation that can be managed with existing resources on the lowest level of government. According to FIREScope (1999:6), an incident is an occurrence that requires an urgent response by emergency services to prevent or reduce the loss of life, injury, damage to property, infrastructure and the environment.

3.2.1.7 *Emergency*

The Australian Emergency Management manual refers to an emergency as an unplanned situation that arises, through accident or error, in which people and/or property are exposed to potential danger from the hazards of dangerous goods. The event, actual or imminent, endangers or threatens to endanger life, property or the environment, and requires a significant and coordinated and response. It is any event that arises internally or from external sources that may adversely affect the safety of persons in a building or the community in general and requires immediate response by the occupants (AEMA, 1998). The United States Department of Homeland Security's view of an emergency is any occasion or instance for which assistance is needed, to supplement state or local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States (USDHS, 2008c). La Valla and Stoffels (1991) refer to an emergency as an unexpected event that occurs in a short space of time and that places life and/ or property in danger; the threat needs immediate response and requires a response beyond normal incident response resources. According to Drabeck and Hoetmer (1991), an emergency is an unexpected occurrence which exceeds the capability and resource and cannot be planned for (Bosworth & Kreps,

1986 ; Drabek & McEntire, 2003; Dynes, 1970; Forrest, 1978; Kreps, 1989; Neal & Phillips, 1995; Quarantelli, 1996; Scanlon, 1999).

It is clear that there are different perspectives on emergency. For the purposes of this study, the following is highlighted. In most of the definitions, reference is made to the fact that an emergency occurs spontaneously, and that people and/or property are exposed to potential danger from the hazards of dangerous goods. The normal capacity of the response agency is exceeded, and no plans can be made beforehand. One could argue that an emergency requires more than one response agency to assist.

3.2.1.8 *Disaster*

The UN International Strategy for disaster Reduction defines a disaster as a serious disruption of the functioning of a community or society. It applies to events affecting an extensive geographical area or areas, but also includes events affecting a limited geographical area or areas (UNISDR, 2004b). La Valla and Stoffels (1991) focus more on the resources and availability of resources that is exceeded because of multiple incident sites. Carter (1991) identifies four characteristics that separate a disaster from other events, the first of which focuses on disruption in the context of the speed of onset, predictability, and extent. The second relates to effects or impact on people and includes death, injury, disease, and resulting hardship. The third characteristic is damage to or destruction of infrastructures such as lifeline facilities and essential services and communications and then finally he identifies humanitarian needs such as medical care, shelter, food, clothing and other social needs. Drabek and Hoetmer (1991) do not use separate definitions to differentiate a single manageable day-to-

day incident from incidents of greater magnitude and disasters, but rather only uses the term emergency, which is defined at three levels according to magnitude.

On the other hand, Perry (1991) differentiates between what he refers to as routine emergencies (incidents that occur regularly and can largely be anticipated) and non-routine events such as a disasters. From the literature research conducted it is fair to conclude that a disaster is an out of the ordinary event that threatens to cause or causes or serious disruption of the functioning of a community or society to such an extent that normal capacity is depleted and extraordinary measures (extra-community resources) are required to normalize the situation (Carr, 1932; Lindell & Perry., 2001; Perry, 1991; Quarantelli, 1984; Tierney *et al.*, 2001; USDHS, 2013d). The above definition is in line with that in the South African DMA.

3.3 INTERNATIONAL INCIDENT MANAGEMENT SYSTEMS

This research focuses on the two prominent international known EMSs that prescribes institutional response guidelines that help in establishing rule structures and developing a normative environment with defined tasks regarding what should be done during a response, namely the US ICS and the UK integrated EMS (gold, silver and bronze). These two systems have to a great extent influenced the current fragments ICSs in South Africa and therefore it is necessary to discuss these systems in more detail. The next Section focuses on the UK system (gold, silver and bronze) and the Section that follows focuses on US ICS.

3.3.1 United Kingdom integrated emergency management system (Gold, Silver and Bronze)

The history of UK EMS dates can be dated back over 40 years and began with the establishment of the London Emergency Services Liaison Panel (LESLP) in 1973. The LESLP plays an important role in the response and management of incidents, emergencies or disaster in the UK. In the aftermath of the Brixton riots in the mid-1980s the integrated EMS (gold, silver and bronze) was developed by the London Metropolitan Police (Arbuthnot, 2008).

The LESLP consists of a number of representatives from the Metropolitan Police Service, City of London Police, British Transport Police, the London Fire Brigade, the London Ambulance Service and local authorities. The Port of London Authority, Marine Coastguard, Royal Air Force, Military and voluntary sectors are also represented. The group meets once every three months under the chairpersonship of the Metropolitan Police Service, and the Emergency Preparedness Operational Command Unit, which was identified as the leading organization. The integrated emergency management system (Gold, Silver and Bronze) was adopted as the standard procedure among the larger English and Welsh police forces.

3.3.1.1 The principles underlying the United Kingdom Integrated Emergency Management System (Gold, Silver and Bronze)

The integrated EMS (gold, silver and bronze) subsequently became familiar to other emergency services staff, principally those of the fire and ambulance services. The UK Civil Contingencies Act of 2004 explains that emergency services in the UK include local authorities, critical supporting agencies, and the military and voluntary sector support (ACPO, 2007; Arbuthnot, 2008; UK, 2004).

The basis of response and the management to an incident, emergency or disaster is normally from the point of view of a rigid management system focusing on emergency plans, written procedures or predefined arrangements. These actions are normally executed in a military strategy fashion. The structure in place is centralized around the overall commander or IC. The emphasis in an integrated EMS (gold, silver and bronze) is based on the same principles (ACPO, 2007; Crichton *et al.*, 2005; Sikich, 1995:116-128).

The integrated EMS consists of three-tiered management structure that exists in most operational management programmes, whether it is government, military, emergency services or corporate sector. The gold (strategic), silver (tactic) and bronze (operational) represent different levels of responsibility in the management of an event, incident, emergency or disaster. Both the UK's Chief Fire Officers' Association and the Association of Chief Police Officer (ACPO) lobbied to make use of the terms gold, silver and bronze instead of strategic, tactical and operational. The reason for this was to prevent potential confusion and misunderstanding of other agencies' language (Arbuthnot, 2008; Cabinet Office, 2005). The literature indicates that individuals experienced problems with who is in charge during complex multi-agency incidents because the different levels have their own duties and functions. The response and management are normally undertaken at three levels, namely operational, tactical, and strategic, with the level responsible being dependent upon the nature and scale of the emergency. Initially, at the onset of an incident, the operational or bronze level is activated.

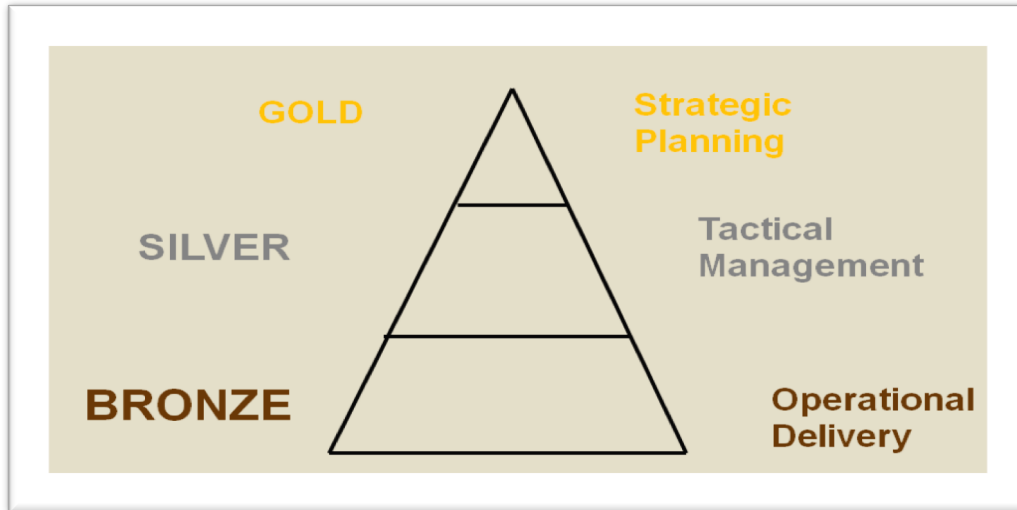


Figure 3-1: Three-tiered security/EMS

The Civil Contingencies Act of 2004 identifies the different levels in the UK EMS. Figure 3-2 illustrates the current command levels and equivalence as indicated in the Civil Contingencies Act of 2004.

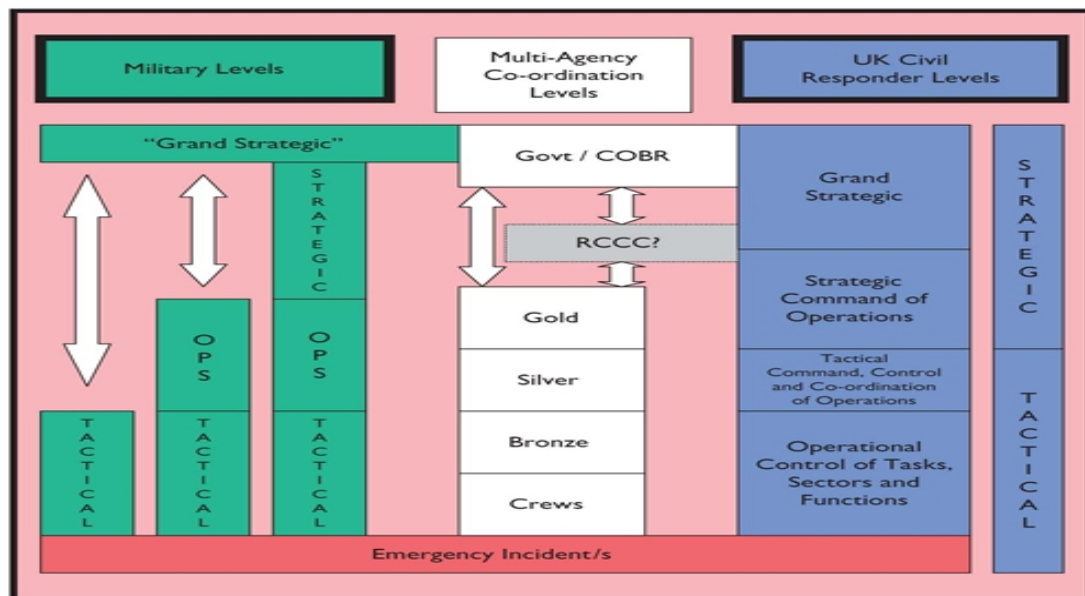


Figure 3-2: Illustrating the current command levels and equivalence

Source: Adapted from Arbutnot (2008)

The bronze command level (operational) can be described as the first responders to an incident and the people and teams who will actually do the operational work. The bronze level reflects the normal day-to-day arrangements for responding to smaller-scale emergencies. In a bronze circumstance, most emergencies can manage with the resources at hand. However, when circumstances change and requires additional resources, the situation can be reclassified and transfer to the next level of silver command (Arbuthnot, 2008).

The integrated EMS makes provision for the silver command level to be in charge of a number of bronze level teams, and one of the functions of the silver command is to coordinate the work of the individual bronze teams so that they can respond in the most effective manner to any incident that might occur. The second level, the silver or tactical level, is charged with the overall running of the incident to ensure that the operational level is supported and coordinated to achieve maximum effectiveness.

Tactical command could involve defining roles and responsibilities, creating work protocols, delivering training programmes, ensuring that the correct equipment and other resources are in place, and in general ensuring that operational capability is at the required level (Arbuthnot, 2008).

The third level, gold or strategic, known as Strategic Coordinating Group (SCG) (see Figure 3-3) involves multi-agency, strategic coordination to pull together the most senior level commanders from all relevant organizations. The gold command level is responsible for creating the overall strategy so that each team knows where they fit into the overall command structure, and how their roles contribute to the overall success of any operation (Arbuthnot, 2008). Figure 3-3 shows the inner workings of

the SCG It is this group's role and responsibility to establish the policy and strategic framework within which the silver level will operate.

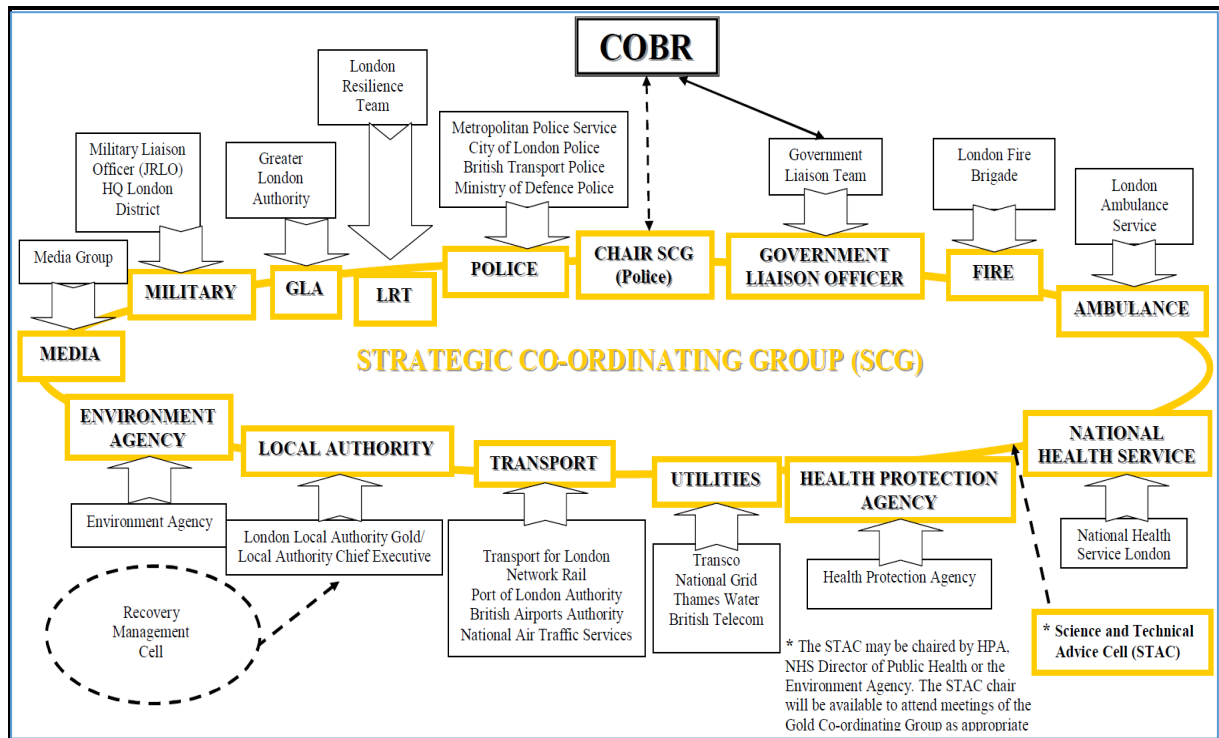


Figure 3-3: Strategic coordinating group (SCG) group

3.3.1.2 Criticism on the UK integrated Emergency Management system

In the UK, some researchers are of the view that the integrated EMS is not successful. According to Dynes (1994) the command and control model in itself is a source of many problems in the emergency management environment and should be replaced with principles of cooperation and coordination instead. The International Standards Organization in their disaster management project, which is termed Command, Control, Coordination and Cooperation, shares this notion. Other aspects mentioned is the potential for confusion, especially when operating in small groups that are initially classified as a tactical operation that have strategic impact. The Department of

Communities and Local Government, Fire and Rescue Service Manual mentions that the consistency of terminology in some occasions presents a problem (DCLG, 2008b).

The UK Fire Rescue Services' EMS focus more on urban environment were the US ICS principles of the US's IMS, US's ICS, Phoenix Fire Department's Firefighting Resources of California Organized for Potential Emergencies (FIREGROUND) and Fire Ground Command System (FGC) focus more on wildfires. The FGC system's levels of command are used in a descending order of strategic, operational and tactical. A clear difference is notable between the US and UK models' tactical and operational levels. Other differences highlighted were the strategic tier that frequently operates on-scene, with an arguably arbitrary boundary between its task and that of the IC, which in the FGC was the operational commander. These problems were evident in the London bombings on 7 July 2005 that affected the transport system. Nevertheless, when the situation occurred, there was no compliance to the guidance on the structuring of emergencies as provided by the government in Emergency Response and Recovery, or by the London Emergency Services Liaison Panel Section 6 and the London Resilience Team. In the aftermath of the disaster, questions were raised as to why the fire brigade placed silver commander on-scene in charge of each of the four incidents as per the UK FRS's ICS. The Metropolitan Police Service appointed a single tactical coordinator, titled silver London, with the senior police present at the incidents being bronzes, and a previously encountered sub-bronze designation being applied to deal with the specializations and span of control problems that an incident of that scale would demand (Brunacini, 2002; Cabinet Office, 2005 ; DCLG, 2008a; Drabeck & McEntire, 2002; Gomm, 2005; London Resilience, 2005).

Although, integrated EMS is based on the different levels (strategic, tactical and operational). This is important for the proposed ICS model for local government in South Africa. The focus of the next Section is on the US ICS.

3.3.2 The history of NIMS and ICS of the US 1970 until 2015

The California Wildfires of 1970 was a clear indication of the need for a statutory standard for multi-agency stakeholders responding to an emergency in the USA. This need for a standardized multi-agency emergency system was highlighted during a 13-day period from September 22 to October 4, 1970. Sixteen major wild land fires driven by hot, dry winds burned down one and a half million acres in southern California. It was severely damaging. The economic value of damage was \$233 million, 885 structures were destroyed, and 16 lives were lost (Chase, 1980; Cole, 2000:208; FEMA, 1987; Irwin, 1989; Jensen & Waugh, 2014; Lam *et al.*, 2010; Phillips, 1991).

Prior to the FGC and ICS and now, NIMS, a number of multi-agency stakeholders and other organization responded to the affected area in a non-structured manner. According to Toops (1990), firefighters came from the various agencies in the different spheres of government and from different states to fight the Californian fires. Although all of the responding agencies cooperated to the best of their ability, numerous problems with lack of standardized approaches, equipment, interorganizational communication, coordination, collaboration and leadership and the underestimation of the seriousness of the situation hampered their effectiveness during the operation (Jamieson, 2005).

The lack of structure in a multi-agency response led to confusion. In this confusion stakeholders reported to the wrong commanders that operated in a different manner and therefore planning and other responsibilities were not coordinated (Anderson *et*

al., 2004; Auf der Heide, 1989:157; Berke, 1995; Berz, 1991; Bouwer, 2011; Buck *et al.*, 2006; Cole, 2000; Coleman, 2006; Eshghi & Larson, 2008; Jensen & Waugh, 2014; Lagadec, 2002; Mileti, 1999:211; Noji, 1997; NRC, 2006:141; Tierney *et al.*, 2001:211; Waugh & Streib, 2006).

The United States government and multi-agency stakeholders were heavily criticized for their failure to protect lives and property and the vast destruction that occurred. Irwin (1989) indicates that to improve coordination during subsequent disasters, the United States Forest Service led a task force, Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE), that was supported by state, county, and city agencies. According to Van Gelder (1972) the task force identified a number of problems such as the lack of a common emergency radio communication, radio frequencies, common terminology, standardized equipment, overloaded spans of control, variations in emergency response, organizational structures, unreliable information, inadequate and incompatible communications, lack of inter-agency coordination, unclear lines of authority, and unclear or unspecified incident objectives. This rationale laid the foundation for the development for a standard working procedure for the USA (Auf der Heide, 1989:157; Bushman, 2012; Chase, 1980; Cole, 2000; Coleman, 1997; Compton & Granito, 2002; FEMA, 1987; FIRESCOPE, 1988; Hanssen-Bauer & Snow, 1996; Lagadec, 1993; Lindell & Perry., 2001; NRC, 2006:141; Pearson & Clair, 1998; Task Force on California's Wildland Fire Problem, 1972; Tierney *et al.*, 2001:141; Waugh Jr, 1993 ; Waugh Jr, 2002; Weick *et al.*, 1999).

The FIRESCOPE ICS primary focuses on command and control system, delineating job responsibilities and organizational structure for the purpose of managing day-to-day operations for all types of emergency incidents (Bullock *et al.*, 2006; Dittrich & di

Fenizio, 2007:4; FIREScope, 1988; Jamieson, 2005; Lilienfeld, 1978). According to Maloney and Potter (1974), the ICS in the 1970s represented one of the first practical applications of modern systems thinking to the organizational management of complex and dynamic operational problems. The key to this systems approach was the recognition that the fire problem and potential solutions must be addressed as a single entity consisting of the sum of all sub-systems and their interrelationships (Maloney & Potter, 1974). Figure 3-4 explains the different phases ICS went through from conception to recognition as a component of NIMS in the US.

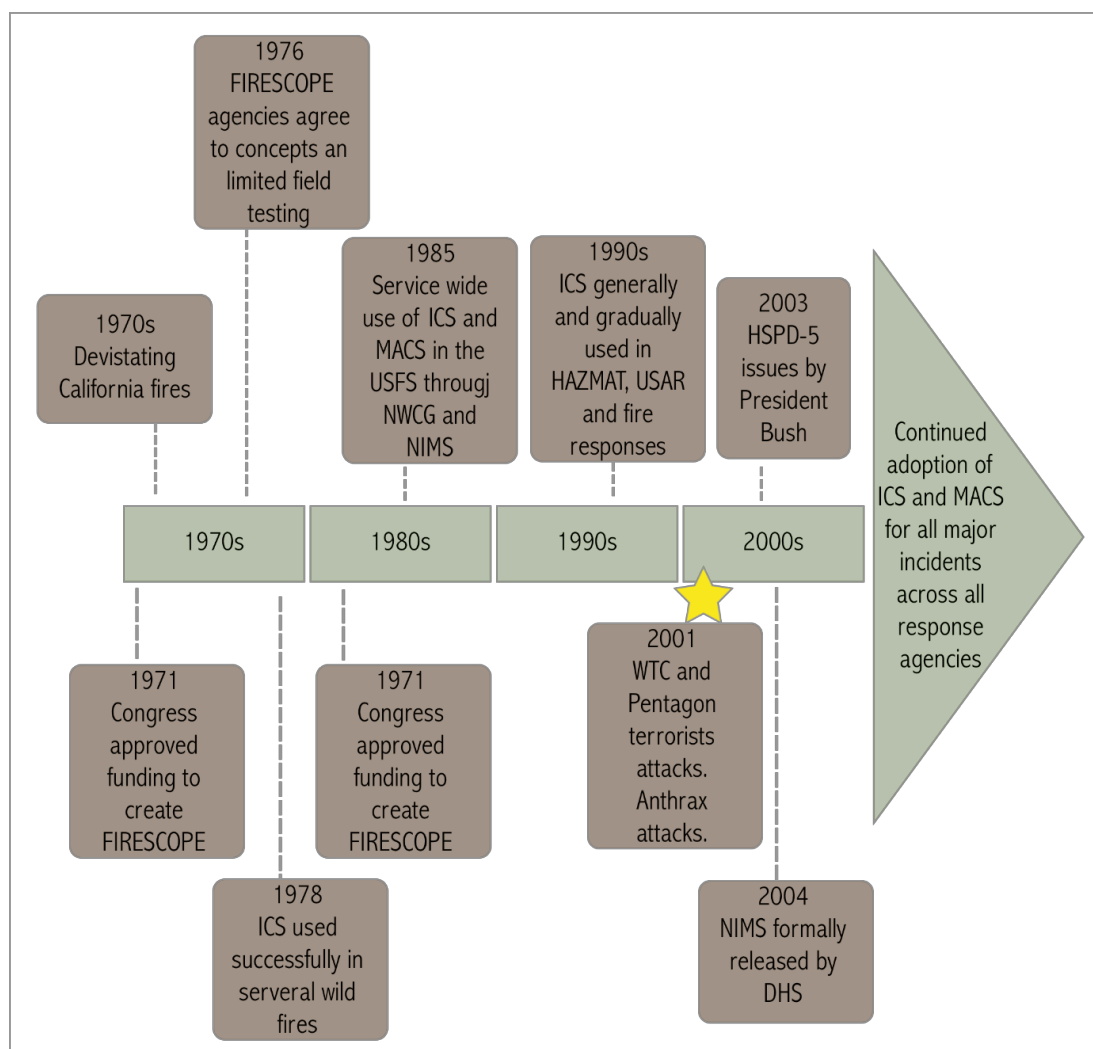


Figure 3-4: ICS development in the USA

3.3.2.1 Congress approves funding for the development of a standard for multi-agency EMSs

The US Congress in 1971 directed its attention to the southern California fire problem. During the second session of the 92nd Congress, a subcommittee of the House of Representatives, the Committee on Appropriations, recommended an appropriation of \$900 000 to strengthen fire command and control systems research at Riverside, California, and Fort Collins, Colorado. The House subcommittee further recommended that research at Riverside should concentrate on developing advanced airborne fire intelligence methods for detecting and mapping fires, including real-time telemetry of information and display at fire command control centres (FIREScope, 1988).

US Congress in 1972 requested the FIREScope coalition to develop a national system for multi-agency coordination of complex emergencies that exceed the capabilities of any single jurisdiction. This led to the development of standardized IMSs, NIMS and ICS (see Sections 3.2.1.4) (Bigley & Roberst, 2001; FEMA, 1987). The command system (ICS) and FGC provided an approach to managing any incident. The problem is divided into components of command, control structure corresponding to response abilities and objectives, and then designated officers responsible for the outcome. The system grows as the incident grows and components are added and then grouped under headings using common vocabulary so that responders from all jurisdictions know where they fit into the command structure at any given scene (Buck *et al.*, 2006:3; FEMA, 2007; Mathews, 2004; Morgan, 1986; Moynihan, 2005:8-9). Some critics of ICS argue that centralization is unrelated or even destructive towards actual response capacity and driven by a desire for political control (Waugh & Streib, 2006).

The first FIRESCOPE Technical Team was established in 1973, to guide the research team in their design. The Technical Team highlighted two important concepts, namely ICS and multi-agency coordination system. The defines ICS as “a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures and communication operating within a common organization structure.” On the other hand, FIRESCOPE (1999:ii) describes the ICS as a standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents without being hindered by jurisdictional boundaries (BCERMS, 2016; FIRESCOPE, 1988). These definitions highlight that ICS as the model tool for command, control, and coordination of a response. It provides a means to coordinate the efforts of individual agencies as they work towards the common goal of stabilizing the incident and protecting life, property, and the environment (FEMA, 2000:1-2).

The definitions highlighted some important aspects that have to be addressed. According to FEMA. (2004), the ICS is designed to be used in a variety of applications to organize field level operations for a broad range of emergencies, from small to large natural and human-made disasters. The ICS is applicable on all levels of government, and private and NGOs. According to (FEMA, 2000), ICS can be described as a generic vertical command system that can be applied to the internal operational activities of any agency responding to an occurrence. Its advantage is that it ensures a standard and coordinated approach in situations where the efforts of a collective group of agencies from the same discipline (for example fire fighters) but from different jurisdictions have to combine their efforts to achieve the objectives of the operation.

Similarly, the same will apply when multiple agencies from different disciplines are involved in combined operations such as search and rescue, providing of course that the ICS has been adopted as the standard daily operational procedure by all agencies involved. The basic concepts and principles of the ICS are as follows:

- It aims to manage most incidents locally; it is modular and scalable; it has interactive management components;
- It establishes common terminology, standards, and procedures that enable diverse organizations to work together effectively;
- It incorporates measurable objectives; it should have the least possible disruptions on existing systems and processes; it is user-friendly and applicable across a wide spectrum of emergency response and incident management disciplines (USDHS, 2008c)..

The system is designed in such a way as to progress from a single agency response to a routine incident and then to expand as the demand for additional resources increases and higher levels of decision making are required (AFAC, 1992). The ICS is a disaster management tool based on a series of rational bureaucratic principles similar to those often discussed in organizational studies as classical management theory (Morgan, 1986). It extends the domain of rationality and bureaucratic organizing to the uncertain and often chaotic environment of disaster/emergency responses. It provides a set of rules and practices to guide the actions of the various organizations responding to a disaster and creates the necessary division of labour and coordination mechanisms among them. The chain of a command intends to ensure that all

responders have an identified supervisor, that each supervisor has a manageable span of control and that lower-level actors follow orders.

According to USDHS (2008c:45), the ICS is a widely applicable management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. The ICS is a particular structural arrangement intended to facilitate crisis response. It centralizes authority in an IC who directs multiple organizations around the critical management systems needed in an emergency, i.e. planning, operations, the logistics, and administration/ finance. Another important element of the ICS is a focus on operations, planning, and the logistic ICS (Witt James Lee Associates, 2004).

Drabek and Hoetmer (1991 276) describe the ICS in more detail as a system consisting of procedures for controlling personnel, facilities, equipment, and communications that are applicable to routine daily operations and to larger and complex incidents. The similarities with the elements espoused in the organization theory discussion in the previous chapter are therefore clear.

Drabek and Hoetmer (1991 81) argue that an ICS is designed to ensure a coordinated approach to the management of emergency response operations. A system makes provision for command, control direction, and decision making when multiple agencies are involved in combined response operations. An ICS that is applicable to any occurrence is based on the following key characteristics: common terminology, a modular organization, integrated communication, unity of command, consolidated incident action plans, manageable span of control, designated incident facilities and comprehensive resource management (Cole, 2000; Pidd *et al.*, 1996).

ICS has been criticized for ignoring the importance of interorganizational relationships, the spontaneous nature of response, the role of unorganized volunteers, and the potential for conflict between organizations (Arjen & 't Hart, 2003; Drabek & McEntire, 2003; Leonard & Howitt, 2006; Moynihan, 2008; Tierney & Trainor, 2004:163-164; Waugh & Streib, 2006). Both literatures characterize the ICS as a hierarchical construct that means to control crisis response, although disagreeing on the utility of such an approach. A network governance approach challenges these competing perspectives by recasting the ICS as a formal mechanism to foster network coordination. This approach recognizes that network can be governed via centralized mechanisms (McGuire, 2006), while also acknowledging the complexities created by the network setting. The USDHS (2008c:45) indicates that the ICS is a widely applicable management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

ICS was perceived by practitioners as successful in reducing coordination problems and improving fire response effectiveness (Bigley & Roberst, 2001; Buck *et al.*, 2006; Cole, 2000; Moynihan, 2008).

3.3.2.2 *The five functional areas of an ICS*

A key aspect of the US NIMS is the ICS that is structured into five functional areas: command, operations, planning, logistics, and finance (Anderson *et al.*, 2004; Chase, 1977; Chase, 1980; Cole, 2000; Wang *et al.*, 2012). The system allows for the integration of personnel, facilities, equipment, procedures and communications within an organizational structure (FEMA., 2017; Wang *et al.*, 2012). During an emergency, the ICS-qualified personnel leaves their normal duties and are assigned to a specific

position within the ICS organizational structure (Dague & Hiram, 2015). According to Jones (2011), the IC is responsible for the command function at all times.

The term command in this section refers jointly to both the person and the function. Command sets objectives and priorities; has overall responsibility for the incident or event. The IC may use one or more deputies to perform specific tasks, reduce the IC's span of control, or work in a relief capacity. Figure 3-5 indicates the different functions in the ICS.

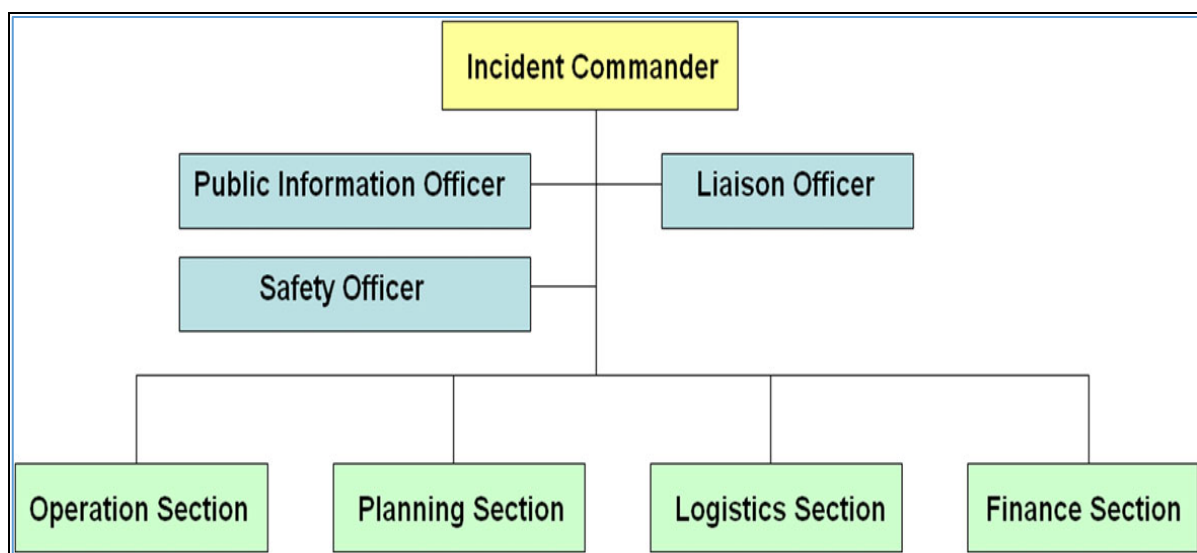


Figure 3-5: The basic organization chart of the ICS

Source: US Department of Homeland Security (2017)

The operations section chief is responsible for activities and supervises elements in accordance with the incident action plan (IAP) (see Section 6.2). The operations section conducts tactical operations to carry out the plan and develops the tactical objectives, organizes, and directs all resources. The activities are as follows: directing the execution of the IAP; activating and executing the Site Safety and Health Plan; directing the preparation of unit operational plans; requesting or releasing resources;

making expedient changes to the IAPs as necessary; reporting to the Incident Commander) IC or Unified Commander (UC) and assigning a deputy Operations Section Chief (OSC) to assist in supervising operations activities if needed (see Section 6.2) (Jones, 2011).

Another function in the ICS is the planning section, which is responsible for collecting, evaluating, disseminating and using information about the incident and status of resources. Planning develops the action plan to accomplish the objectives, collects and evaluates information, and maintains resource status. Information is needed to understand the current situation; to predict the most probable course of incident events and to prepare alternative strategies for the incident; and to forward the required incident status reports regarding the incident, emergency or disaster.

A support function that assists operational and planning is the logistics section, which is responsible for providing facilities, services, and materials in support of the incident response. Under the ICS, the logistic section brings resources to a staging area. From there the operations section dispatches them, for it commands all the activities on the site. The logistic ICS provides support to meet incident needs, resources and all other services needed to support the incident. The logistics section participates in developing and implementing the initial action plan and launches and supervises branches and units within the logistics section.

The finance / administration section is responsible for all financial and cost analysis aspects of the incident and for supervising members of the finance / administration section. Finance / administration monitors costs related to the incident and provides accounting, procurement, time recording, and cost analysis (FEMA, 2014).

The function of information gathering, analysis and sharing of information or intelligence are important elements of the ICS. In this context, intelligence includes not only national security or other types of classified information, but also other operational information critical to effective incident mitigation. Traditionally, intelligence and investigation functions were carried out as part of the planning section.

3.3.2.3 1976 FIREScope agencies agree to the concept and limited testing

In 1976, the FIREScope agencies formally agreed on the ICS common terminology and procedures. The US Forestry Service, Bureau of Land Management, and National Park Services adopted the ICS and named it the National Inter-agency IMS (Cardwell, 2000; NWCG, 1983). According to Toops (1990:31), the concept of the ICS was developed as a result of the FIREScope initiative that proved to be effective. Its implementation was initially limited to southern California and at that stage only applied to the fighting of fires.

3.3.2.4 1979 the establishment of the Federal Emergency Management Agency

The Federal Emergency Management Agency was originally established to be responsible for the development of strategic decisions to safeguard the United States of America. The history of a Federal Emergency Management Agency began about 37 years ago. In 1979, in the wake of Hurricane Agnes and the Three-Mile-High nuclear accident, Congress and President Carter through a combination of legislation and an executive order established the Federal Emergency Management Agency and the Emergency Management Council.

The Federal Emergency Management Agency (FEMA) was appointed by the President of the United States of America as the leading governmental department to coordinate all domestic emergency management stakeholders involvement in incidents, emergencies and disasters that may occur in the United States of America (Waugh Jr, 2003; Waugh & Streib, 2006:132). In theory, the creation of FEMA consolidated the disaster preparedness responsibilities performed by various federal agencies into one agency, thereby alleviating the fragmentation and communications difficulties identified in the 1970s (Sylves, 1994; Waugh & Streib, 2006:132).

The FEMA as the lead agency is responsible for emergency, preparedness and response. (Comfort *et al.*, 2012). The FEMA is the only agency within Department of Homeland Security (DHS) that takes a leading role in reducing the losses associated with non-terrorism-related disasters. According to Haddow and Bullock (2003), FEMA has lost significant visibility and financial and human resources in the reorganization. As a small agency within a massive bureaucracy, its activities are now overshadowed by much larger and better-funded entities within the DHS. Haddow and Bullock (2003) and USDHS (2003b)(2003a), argue that FEMA and emergency management are destined to lose in bureaucratic conflicts over jurisdiction and funding within the DHS because other directorates and divisions of DHS are bigger and have more political influence (USDHS; Waugh & Streib, 2006). The main aim of the FEMA as a coordinating organization underwent major changes to improve all stakeholders' involvement in incidents, emergencies, and disasters.

The executive order required that all federal agencies with disaster response capabilities and responsibilities cooperate with the FEMA and tasked the FEMA with coordinating preparedness and relief operations. While the reorganization requested

cooperation from all federal agencies with emergency response capabilities, the system did not subordinate them to FEMA.

3.3.2.5 1980 Standardized EMS for the US

During the 1980s the standardized EMS took root in California, and in 1982, it became a cornerstone of the National Inter-agency IMS. The National Fire Protection Association (NFPA) adopted and began teaching ICS, which it recognizes as the model tool for emergency management, although a number of authors felt that the ICS is far from perfect (FEMA, 1992; FEMA, 2000; Wenger *et al.*, 1990). As is the case with any rapidly growing technology, the adoption of ICSs by new user groups is rarely painless or seamless. A few fire departments in the USA have escaped the growing pains that inevitably accompany the initial integration of ICSs into traditional operational environments. Although, ICS is an approved national standard, not all organizations such as law enforcement readily adopted the concept (Ullman, 1998). Kincaid (1997) is of the view that when it comes to integrating non-government agencies and the private sector into incident operations and management, the challenges of using ICS can be even greater. In 1983, the FEMA and the National Association of Schools of Public Affairs and Administration recognized the need for a greater focus on scholarship and professional practice in emergency management. The two organizations entered into an agreement to cultivate interest in emergency management among public administration scholars. The goals were to develop a strong disaster research community and to foster a heightened standard of professional practice among public administrators in managing emergencies (Comfort *et al.*, 2012; FPP, 1983; NWCG, 1983; Sacks, 2011; Toops, 1990). In 1985, ICS was eventually applied outside its original environment, creating the danger of a suboptimal

match between governance structure and task. However, it is important to note that crisis responders were voluntarily adopting the ICS, at least in part because they perceived it as a tool to solve the problem of interorganizational coordination common to most crises (FEMA, 1992; Jensen & Thompson, 2016; Moynihan, 2009:897).

3.3.2.6 *The adoption of ICS by all stakeholders in 1990*

The ICS became compulsory for all multi-agency stakeholders in the US in the management and response to an event, incident, or emergency. In 1990 the most significant trends that occurred in the emergency services environment during the last quarter of the twentieth century has been the widespread adoption of the ICS as the model tool for the command, control, and coordination of resources and personnel at the scene of emergencies used in Hazmat, United States Forestry Services and Fire services.

3.3.2.7 *The new beginning of a new strategy for response and management of an emergency in the US 11 September 2001*

The terrorist attack on 11 September 2001 (widely known as 9/11), on the World Trade Centre in New York heralded a new era in emergency management in the USA. The 2004 and 2005 hurricane seasons also emphasized the fact that the existing strategy on emergency management, incident response capabilities, and coordination processes across the country was no longer effective and had to be improved. The National Research Council identified a number of problems commonly associated with response to large-scale incidents, including failure to recognize the magnitude and seriousness the event. Other problems include the delayed and insufficient responses; confusion regarding authorities and responsibilities, often resulting in major turf battles; resource shortages and misdirection of existing resources; poor

organizational, interorganizational; and public communications; failures in intergovernmental coordination; failures in leadership and vision; and inequities in the provision of disaster assistance. The literature on Hurricane Katrina came to the same conclusion, namely that the existing strategy is not working. The literature also revealed a national EMS in disarray, one that was incapable of responding effectively to the immediate needs of communities along the Gulf Coast and unprepared to coordinate the massive relief effort required to support recovery.

The findings in the literature on these issues contain the same arguments as literature on 9/11. Multi-agency stakeholders are criticized for a lack of leadership at all levels of government and the inability of the FEMA. Another problem identified was information sharing. Coordination was identified as one of the biggest problems during inter-agency disaster response and it has had a negative influence on collective decision making and actions. Kapucu (2006:207-225) suggests that the problems were probably due to the unpredictable, dynamic, and complex nature of the environment in which multiple groups of professionals need to collaborate. Nevertheless, improvements in these areas should include a new EMS. All agencies and their expertise should be used. The role of information is crucial because access to core information enhances the efficiency and effectiveness of responses and coordination throughout the network of responding organizations (Birkland, 1997; Comfort & Zagorecki, 2004; Dawes *et al.*, 2004a; Helsloot, 2005; Horan & Schooley, 2007; Junglas & Ives, 2007 ; Kapucu, 2006; NRC, 2006:141; Pan *et al.*, 2005; Sylves, 2007; Waugh & Streib, 2006).

The President's issuance of new directives, collective federal efforts that developed new preparedness and consequence management programmes, and ongoing

federally-directed reorganization and redirection of existing disaster-related programmes all owe their impetus to the 9/11 terror attacks. This led to the creation of the DHS (Bullock *et al.*, 2006; Dunaway, 2003; Kettl, 2004 ; Nicholson, 2005; Tierney, 2005).

3.3.2.8 2003: Role and responsibilities of the DHS and FEMA

The number of incidents, emergencies, and disasters in the United States has increased drastically over the past 20 years and this has put all stakeholders involved under enormous pressure. Therefore, the 9/11 terrorist attack on the US compelled the US President and Congress in conjunction with other government officials to develop a new preparedness and consequence management programmes for the US that re-organized existing disaster-related programmes. President Bush's Presidential Directive 5 (HSPD-5) called on the Secretary of Homeland Security to develop a nationwide approach for federal, state tribal and local government to work together to prepare, prevent, respond to and recover domestic incidents, regardless of cause, size or complexity (Anderson *et al.*, 2004; Anneli, 2006; Bush, 2003; Dynes, 1994; Jamieson, 2005; Nicholson, 2005; Tierney, 2005; USDHS, 2008c).

According to Bullock *et al.* (2006), the DHS was established as a result of the culmination of an evolutionary legislative process that began largely in response to criticism that increased inter-agency cooperation between federal intelligence organizations that could have prevented the 9/11 terrorist attacks. The DHS in the US and is a leading government department when it comes to the incident, emergency, and disaster management in the United States of America. The difference between the DHS and FEMA can be described as follows: "the law and policy since 9/11 is that terrorism prevention and consequence management is the primary mission of the

DHS. The FEMA's role and responsibility focuses more on non-terror, disasters and emergencies as a sub-category of domestic incident, in which the definitive incident of note is the terror attack on the United States in September 2001" (Sylvester, 2007).

The FEMA was incorporated on 1 March 2003 into the DHS (Comfort *et al.*, 2012). Tierney (2005) is of the opinion that the overall effect of the reorganization has been to expand the role of defence-related and law enforcement-orientated agencies, most of which are focused exclusively on terrorism, while correspondingly curtailing the role of agencies working in accord with all-hazards emergency management (Boyne, 2002).

One of the important actions taken by the Bush administration in 2003 began with issuing a number of directives and guidance, thereby accelerating the formation of a national preparedness goal and supporting policy and operational system. The aim of Homeland Security Presidential Directive 5 on 28 February 2003 was the development and administration of NIMS to prevent, prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies (USDHS, 2003a).

NIMS is the first standardized management approach that unified federal, state, and local lines of government for incident response in the US. NIMS is defined as a core set of doctrines, concepts, principles, terminology and organizational processes that are applicable to all-hazard situations (Anderson *et al.*, 2004; Jones, 2011; US, 2003) (Boyne, 2002; USDHS, 2008a).

3.3.2.9 2004: National incident management system formally released by DHS

The goal of NIMS is to standardize emergency management structures, processes, and terminology for preparedness, response, recovery, and mitigation across all emergency management-relevant organizations in the US (Chen *et al.*, 2008; Jensen & Thompson, 2016).

The national ICS is based on aspects such as systems engineering, project management, and organizational structure that all play an important role in the success of any organization and more so in an incident, emergency or disaster. (USDHS, 2004a; USDHS, 2005; USDHS, 2007; USDHS, 2008d; USDHS, 2010a; USDHS, 2013a; USDHS, 2013b; USDHS, 2013c; USDHS, 2013d; USDHS, 2014; USDHS, 2017). The strength of the national ICS is the fact that all best practices were incorporate into one comprehensive national approach for domestic use in the management of incident. The system is applicable at all jurisdictional levels and across all functional disciplines (Anderson *et al.*, 2004; Jones, 2011; USDHS, 2005).

A number of researchers are of the opinion that NIMS is not implemented in a standardized fashion. In their view, there is variation in the intent to do so. There are a number of variables that affect both actual implementation and implementation intent. There have also been several publications based on empirical research that NIMS is not the solution to all ICS problems (Clark, 2010; Dewalt, 2010; Henkey, 2011; Jensen, 2008; Jensen, 2010; Jensen & Yoon, 2011; McCauley, 2011; Neal & Webb, 2006; Neal & Webb, 2008; Wilson, 2010).

3.3.2.10 Overall perspective of the national incident management system

The main aim of NIMS is to structure emergency management activities related to preparedness, command and management, resource management, communication and information management, and maintenance in the US (Jensen & Thompson, 2016). NIMS is to command and control an event, incident, emergency or disaster and requires organizations (such as fire departments, emergency medical services, law enforcement agencies, public works departments, and voluntary agencies) that respond and employ the ICS to structure their activities on-scene (USDHS, 2008c).

The NIMS can be explained as the template for the management of incidents, and on the other hand, the national preparedness goal (NRF) provides the structure and mechanisms for national-level policy for incident management (USDHS, 2013a). The DHS (2004) defines the national ICS as a core set of doctrines, concepts, principles, terminology, and organizational processes that are applicable to all hazardous situations. Figure 3-6 provides an overview of NIMS.

What NIMS is:	What NIMS is NOT:
A comprehensive, nationwide, systematic approach to Incident Management	A response plan
A set of preparedness concepts and principles for all hazards	Only the Incident Command System or an organization chart
Essential principles for a common operating picture and interoperability of communications and information management	A communications plan
Standardized resource management procedures	Only applicable to certain emergency management incident response personnel
Scalable, so it may be used for all incidents	Only used during large-scale incidents
A dynamic system that promotes ongoing management and maintenance and reflects best practices and lessons learned	A static system

Figure 3-6: Overview of National Incident Management System

Source: US Department of Homeland Security (2017)

3.3.2.11 Six components of NIMS

The six NIMS components work together to form the national framework for preventing, responding to, and recovering from all types of domestic incident, emergency, or disaster (Anderson *et al.*, 2004). In Figure 3-8, the major six components are illustrated. This is followed by a discussion of these components.

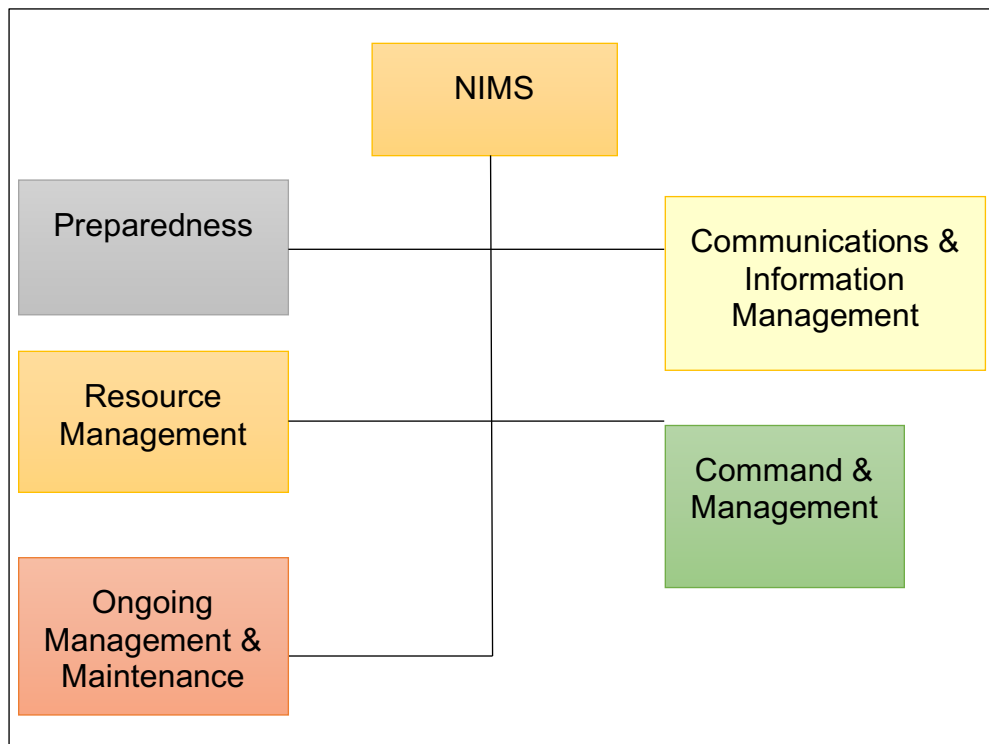


Figure 3-7: NIMS

Source: US Department of Homeland Security (2017)

Incident management priorities for the US include saving lives, stabilizing the incident and protecting the environment. The manner in which this can be done is to apply the NIMS components in accordance with the principles of flexibility standardization and unity of effort.

The first component of NIMS focuses on two principles. The NIMS framework allows for flexibility for multi-agency, multi-jurisdictional, and multi-disciplinary coordination. It is adaptable to the incident management of events that are scheduled or where there is a warning or notice and those that provide no notice. The other principles of NIMS provide an organized set of standards or an operational structure that is critical in aligning disparate organizations and agencies to work together in a predictable, coordinated manner. These principles aim towards a unity of effort. A unity of effort means coordination among varied organizations to achieve the common objective.

The unity of effort can assist organizations with specific jurisdictions and responsibilities to support each other while maintaining their own authorities.

The second component of NIMS is preparedness and can only be achieved by a continuous cycle of planning, organizing, training, equipping, practising, evaluating, and taking corrective action. Preparedness consists of three sub-components.

Sub-component 1: Planning. Specific plans must be realistic, scalable and applicable to all types of incidents, from daily occurrences to incidents requiring the activation of interstate mutual aid, to those requiring a coordinated federal response. The purpose of plans describes how personnel, equipment, and other governmental and non-governmental resources be used to support emergency management and incident response requirements. A very important aspect of plans is to integrate all relevant departments, agencies, and organizations (including the private sector and NGOs, where appropriate) to form part of the facilitation process and to coordinate emergency management and incident response activities.

Sub-component 2: Procedures and protocols. Procedures and protocols can be explained as the specific actions that can be taken to implement a plan or system. Several levels of documents assist in documenting and implementing procedures. NIMS rely heavily on Standard Operating Procedures or Operations Manuals, Field Operations Guides or Incident Management Handbooks. Protocols on the other hand can be explained as sets of guidelines that provide for standing orders, authorizations, and delegations necessary to permit the rapid execution of a task or function without seeking permission to do so.

Sub-component 3: Training and practice. Together these two elements form is a very important aspect of preparedness. Trained correctly and putting that training to use in functional exercises is critical for the successful implementation of NIMS. There should be standardized training consistent with NIMS training. Exercises should place personnel in simulated roles and allow for measuring specific objectives and incorporating corrective actions into the planning process.

Sub-component 4: Personnel qualifications and certification. This is a critical aspect of preparedness under NIMS. In an incident, emergency or disaster, different stakeholders respond, therefore the correct stakeholder should be identified for the correct work. According to Jones (2011), the national standards allow for the use of common or compatible structures for the qualification and certification of emergency management / response personnel. Standards will help ensure that these personnel possess the minimum knowledge, skills, and experience necessary to execute incident management and emergency response activities safely and effectively.

Sub-component 5: Equipment certification. Emergency management / response personnel and their affiliated organizations rely on various types and kinds of equipment to perform essential tasks. A critical component of preparedness is the acquisition of equipment that will perform to certain standards, including the capability to be interoperable with equipment used by other jurisdictions and/or participating organizations (Walsh *et al.*, 2011).

The third component of NIMS is communications and information management. Effective emergency management and incident response activities rely upon flexible communications and information systems that provide a common operating picture to

emergency management/response personnel and their affiliated organizations. Establishing and maintaining a holistic and shared picture of the operation and ensuring accessibility and interoperability are the principal goals of the communications and information management component of NIMS. Properly planned, established and utilized communications enable the dissemination of information among and between command and support elements, and, as appropriate, cooperating agencies and organizations (Jones, 2011; Walsh *et al.*, 2011).

The fourth component of NIMS is command and management, which consists of three sub-components.

Sub-component 1: ICS. The 9/11 Commission Report 2004 emphasizes the importance of an ICS. The Commission's report recommends the national adoption of the ICS to enhance command, control, and communications capabilities (USDHS, 2004b). The ICS has been established by the NIMS as the standardized incident organizational structure for the management of all incidents. Both have evolved and expanded since the terror attacks of 9/11, and both have been amended with the benefit of lessons learned from experience using NIMS and ICS (Stambaugh *et al.*, 2014). All organization's involvement in any emergency management at local, state and federal level in the United States have been mandated since 2004 to use the NIMS to structure emergency management activities related to preparedness, command and management, resource management, communication and information management and maintenance (Jones, 2011). According to Jones (2011), whether an incident occurs and it has to be managed locally within a single jurisdiction or for complex incidents with

national implications, the ICS provides a flexible core mechanism for coordinated and collaborative incident management.

Sub-component 2: Command and management are multi-agency coordination systems. Multi-agency coordination is a process that allows all levels of government and all disciplines to work together more efficiently and effectively. Multi-agency coordination occurs across the different disciplines involved in incident management, across jurisdictional lines, or across levels of government.

Sub-component 3: Command and management are public information systems. These are important because they entail the processes, procedures, and systems to communicate timely, accurate, and accessible information on the incident's cause, size, and current situation to the public, responders, and additional stakeholders (both directly affected and indirectly affected). According to Jones (2011), public information had to be coordinated and integrated across jurisdictions and across agencies / organizations; among federal, state, tribal, and local governments; and with the private sector and NGOs.

The fifth component of NIMS entails resource management that should be flexible and scalable to support any incident and be adaptable to changes. Efficient and effective deployment of resources requires that resource management concepts and principles be utilized in all phases of emergency management and incident response.

The six components of NIMS focus on the ongoing management and maintenance. Ongoing management relies on the National Integration Centre (NIC), which sets forth the responsibilities of the NIC and ongoing support of technologies to leverage science and technology to improve capabilities and lower costs (FEMA, 2017; Jones, 2011;

USDHS, 2008c; USDHS, 2010b; USDHS, 2011a; USDHS, 2013b; USDHS, 2013c; Walsh *et al.*, 2011:6-59).

As will be seen in the model in Chapter 6, all of the above components and sub-components are critical also on the South African environment of ICS.

3.4 HISTORY OF ICS IN SOUTH AFRICA

The South African government participate actively in the UNDRR process from conception until present (see Sections 1.1, 1.2.1). The DMA and NDMF, indicate SA government commitment in advancing the UN DDR strategies to prevent or minimize physical and economical losses through certain intervention. Government is important in the coordination multi-agency stakeholders in incidents, emergencies or disaster (see Section 2.4). Therefore, the DMA calls of the establishment of DMCs at national, provincial and local level to be mainly responsible for coordination of multi-agency stakeholders. However, no working procedure (ICS) exist on how the different multi-agency stakeholders must interact when respond and management of incidents, emergencies or disasters which can be traced back to initial actions instituted by the UN General Assembly in 1990. Although, the UN and its agencies implemented a number of strategies over the years, the same message was delivered: that governments are the key stakeholders in dictating the way forward in emergency and disaster management (see Section 3.3.1).

3.4.1 Local government and DRR

The implementation of DRR initiatives is very challenging because interdisciplinary strategies, tools and approaches are required to ensure proper management and resourcing of risk reduction efforts (Bendimerad, 2003; Manyena, 2006; Pearce, 2003;

Sabri & Jaber, 2007). Bendimerad (2003) is of the view that governments' efforts are more focused on developing response capabilities rather than proactive mitigation, and the local government action for disaster management is often given a lower priority. The lack of an appropriate institutional and governance framework can leave vulnerable communities unprepared (Haigh & Amaratunga, 2010; Seng, 2013). Moreover, Williams (2011), argues that shortcomings in DRR is a consequence of weak governance systems that combine political and social factors. Therefore, government is seen as the key stakeholder in the development and implementation of a statutory standard for multi-agency response to in incident, emergency or disaster management (Haddow & Bullock, 2006:1; Twigg, 2004a).

According to Twigg (2004a), governments should be the main actors in risk reduction because they are service providers to local community in a statutory or discretionary manner. Governments are in the frontline of critical development functions and have the resources, capacity and authority to undertake large-scale multi-disciplinary initiatives and a mandate to direct or coordinate the work of others (APDC, 2003; Bollin, 2003; Heijmans, 2013; Manyena, 2006; Pearce, 2003; UNISDR, 2004a; UNISDR, 2010; UNISDR, 2013; WMO, 2010 ; Yorke, 2007). Governments also play an integral part in the response to and management of incidents, emergencies or disasters and must act quickly to:

- determine the nature of the event,
- initiate an appropriate response,
- cope with the event, and
- facilitate recovery (Anneli, 2006).

3.4.2 The effect of no statutory Incident Command Systems

The development of an EMS is part of the UNDRR agenda for a country. The agenda promote the idea of government taking the lead in developing of an ICS. In the absence of a statutory incident command system, a number of government departments and multi-agency developed their own ICS. These ICSs have been implemented to varied degrees by these stakeholders. Some of these systems are still in place and one needs an understanding of these before a new integrated system can be suggested.

3.4.3 National Joint Management Manual for national, provincial and local governments involved in the response and management of chemical, biological agents or radioactive chemicals spillage

South Africa makes use of atomic energy to generate electricity in South Africa. For South Africa to receive a licence, they had to adhere to certain specifications. These specifications are highlighted in the International Atomic Energy Agency Safety Guide No. GS-G-2.1. A EMS need to be in place in an occurrence of any radioactive product spillage (IAEA, 2007).

To adhere to International Atomic Energy Agency Safety Guide No. GS-G-2.1 the Minister of Cooperative Governance on 3 February 2006, issued General Notice 143 *manual: Joint management of incidents involving chemical or biological agents or radioactive chemicals* in terms of Article 22 of the Disaster Management Act (57 of 2002). The General Notice issued by the Minister requires a standardized response and management of multi-agency stakeholders who are involved in an incident, relating to chemical, biological or radioactive chemicals. The manual is based on the principals of the US ICS (South Africa, 2006). However, the South African National

Roads Agency responsible for all roads in South Africa also developed a standardized multi-agency system for operational purposes. The next section explains the South African National Roads Agency Routine Road Maintenance Manual.

3.4.4 The South African National Roads Agency Routine Road Maintenance Manual

The Department of Transport appointed the South African National Roads Agency (SANRAL) as a service provider that assists with the management of national roads throughout South Africa (SANRAL, 2009). SANRAL prescribes ICS as a standard working procedure for response and manage of incidents, emergencies or disasters on South African roads (SANRAL, 2009). The aim of the SANRAL Routine Road Maintenance (RRM) manual is to combine the skills and knowledge that SANRAL and its partners have developed over the years. The RRM manual is a tool to assist those involved in routine road maintenance to identify remedial actions to preserve and render the road safe. The manual is a guide to take the corrective action, not only to provide a safe, efficient road network, but also to protect the environment. An important aspect highlighted in the manual is the management of the environment. Furthermore, RRM incorporates the five functional areas of command, operations, planning, logistics, and finance of the US ICS in their day-to-day work to clear the roadways of any obstruction and to restore traffic flow to normality as quickly as possible (see Section 3.4.2.1.3).

A third example of a standardized multi-agency procedure is the South African Bureau of Standards. The next section explains the all-risk emergence operation-planning standard of the South African Bureau of Standards in detail.

3.4.5 South African Bureau of Standards: all-risk emergency operation-planning standard

In 2002, the South African Bureau of Standards (SABS) approved a Code of Practice for disaster management, of which Part 2 deals with all-risk emergency operation-planning (SABS, 2002). The standard deals with management aspects of critical emergency functions, and according to the acknowledgements and bibliography, is based on the FEMA Guide for All-Hazard Emergency Operations Planning (Goss, 1996). The standard covers key aspects of incident command and incident management methodologies and takes into account relevant provisions of the then Disaster Management Bill, 2000 (South Africa, 2000). There is no legislative provision in the standard relating to its enforcement and in the literature review and research conducted in the field for this study, no evidence emerged that this standard has been formally adopted by any response agency that purports to have the need for regulations to ensure the successful application of a standard.

The literature also indicates that the need for such a standardized multi-agency process draws attention in the academic world as well. Leading researchers in the field of EMSs developed a model for a multi-agency response management system for South Africa. This system is largely based on the escalation of disasters through various level of authority (e.g. local, provincial and national), and not so much the functioning of an ICS at local government level. From the research cited below the need to bridge the implementation gap is evident and provides justification for the study in this thesis as well.

3.4.6 A model for multi-agency response management system for South Africa

The multi-agency response management system (Reid & Van Niekerk, 2008; Reid, 2005) was derived from the need for a standardized EMS (not ICS) for South Africa. The model for a multi-agency response management system provides a seamless environment for integrating and coordinating operational responses; for tactical and strategic decision making; and for invoking extraordinary powers for the effective resolution of any disaster situation. It is applicable to any type of occurrence, regardless of its origin, be it a single agency response to a routine occurrence; a multi-agency response to a single occurrence; a multi-agency response to a series of occurrences within a single jurisdiction; and multi-jurisdictional responses within a particular sphere of government (local, provincial or national) (Reid & Van Niekerk, 2008).

The theoretical and proposed multi-agency response management system for South Africa focuses on principles of organizational theory and the US ICS. The multi-agency response management system for South Africa clearly defines the different levels of response, the extent of management of each level, the scope of statutory authority for each level and their roles. It clearly indicates the communication flow and the triggers for escalating to the next level of response. Thus, the multi-agency response model provides a generic framework on which a comprehensive multi-agency response management system can be based. In addition, it facilitates and contributes substantially to establish joint standards of practice and the development of contingency plans and operational protocols (Reid & Van Niekerk, 2008).

Although a number of crucial aspects can be identified in academic studies, none of these aspects has been implemented in the South African environment. The need therefore arose for establishing a coordinating body that can facilitate a uniform ICS. The ICS Workgroup for South Africa, which consists of government departments, organizations and NGOs, introduced a South African version of the US ICS. The next section explains the work of the ICS Workgroup for South Africa.

3.4.7 The development and aim of the ICS Workgroup in South Africa

The foundation for establishing of the South African ICS began in 2003 at the International Wildfire Conference in Sydney, Australia (IFFN, 2003). One of the outcomes of the summit held in Sydney was the recommendation that ICSs becomes a global standard for all firefighting organizations internationally.

To this end, and through the Department of Agriculture, Forestry and Fisheries (DAFF), a National ICS Workgroup was established to look into the development of a uniform ICS approach for South Africa as a whole, but with particular emphasis on wildland fires. Therefore, the National ICS Workgroup of South Africa's aim was to propose an ICS for South Africa that incorporate all existing response structures in South Africa into a single workable system. Figure 3-8 represent the working of the National ICS Workgroup and its stakeholders.

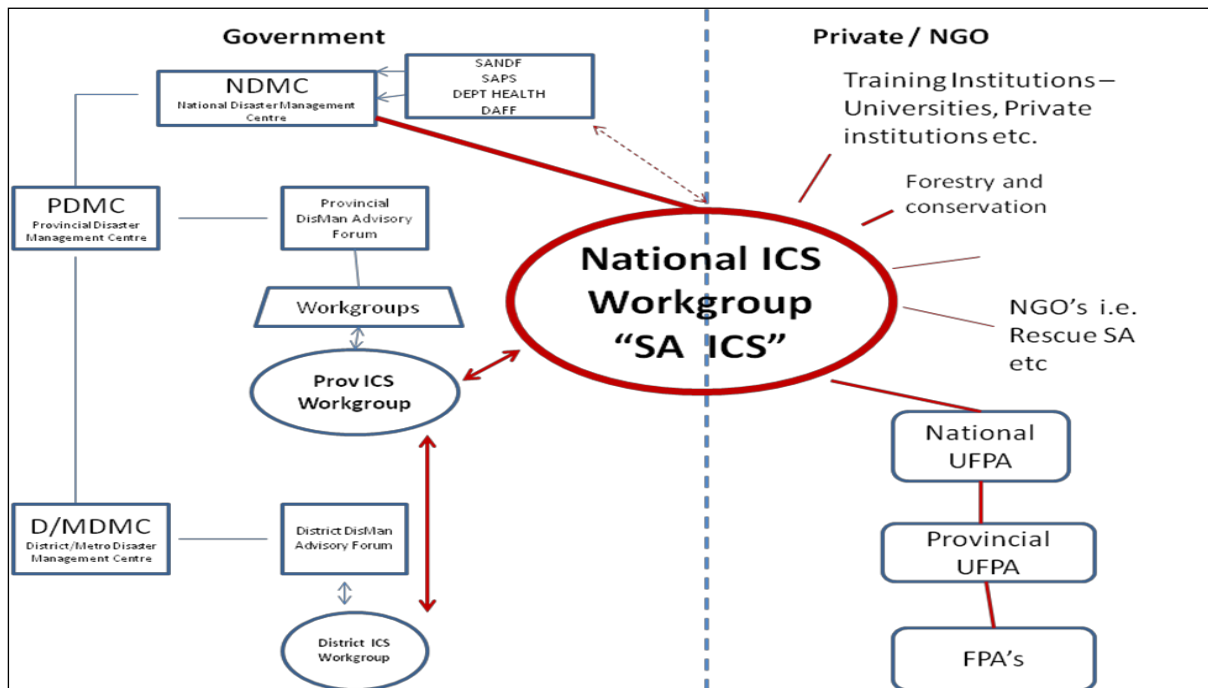


Figure 3-8: National ICS Workgroup

Source: Adapted from Fire and Rescue International (2014)

3.4.8 The different multi-agency stakeholders involved in the National ICS Workgroup for South Africa

The National ICS Workgroup is made up of the fire protection associations, the forestry industry, national parks, CapeNature, Working on Fire, Structural Fire, and disaster management. The purpose of the ICS Workgroup is to expand operational cooperation and coordination of veld, forest and prescribed fire operations with the utilization of an ICS. The National ICS Workgroup SA agreed to develop an ICS for South African veld and forest fire organizations.

The Veld, Forest, and Prescribed Fire Qualification System Guide, developed under the sponsorship of the National ICS Workgroup SA, was designed to establish minimum requirements for training, experience, physical fitness levels, and currency

standards for veld, forest, and prescribed fire positions that all participating companies and agencies have agreed to meet for national and international mobilization (Raat-Brownie, 2014). Although the ICS originated as part of the US Fire Services, the workgroup expanded the scope to other stakeholders to form part of all-hazard training (Western Cape Government, 2015).

3.4.9 Progress made by stakeholders involved in National ICS Workgroup South Africa

The Western Cape government's disaster management, Fire, and Rescue Services sub-directorate as one of the leading organization in implementing the ideals of the National ICS Workgroup, collaborated with a number of organizations during the process of developing a toolkit for ICS for South Africa, including several experienced ICS experts from the United States (Western Cape Government, 2015). Guidelines were designed to provide for the various components to seamlessly integrate and work together in one organization to develop and implement an incident response in accordance with agreed upon objectives (Western Cape Government, 2015). However, these guidelines and training interventions did not, and have not yet considered the local government application of ICS. In its current form, it is well suited for rural wildland fires. Building on the successes of the National ICS Workgroup, this thesis bridges the gap to local government.

3.5 CONCLUSION

Despite its implications for government, organizations and stakeholders, crisis and disaster management remain fragmented. History shows that if there is no defined ICS structure, a number of problems can be experienced when multi-agency stakeholders

respond to an incident, emergency or disaster, especially at local government level. In this chapter, different EMSs have been investigated to highlight some of differences and similarities. From the discussions above it is clear that the US ICS had a significant impact on the general and foundational developments of ICS in South Africa. To a varied degree, a number of role-players and response agencies have adopted those portions or elements of the US ICS that best suit their particular environment. It would therefore be fair to conclude that using the US ICS as a foundation for the formulation of a new ICS for the South African local government environment is justified. In the chapter to follow, the research methods of this study are discussed.

CHAPTER 4: RESEARCH METHOD AND PRESENTATION OF RESEARCH RESULTS

4.1 INTRODUCTION

This chapter presents first-hand information shared by emergency managers in a developing country who are themselves struggling to develop an EMS. Emergency managers work on the front lines every day in either government or emergency organizations, dealing with incidents that can include different kinds of emergencies, disasters, or otherwise adverse events. As such, their insights are of paramount importance in the construction of a framework to improve emergency management.

The management of an incident, emergency or disaster can bring different stakeholders together because of the magnitude of such an event. These different stakeholders possess different skills and they all have an interest at the affected area at the same time. This makes it imperative that each stakeholder be guided by pre-determined objectives to achieve certain goals. It is important to understand the thought processes and needs of the different stakeholders and to listen to their insights before constructing a framework for emergency management (see Section 2.1 and 3.2).

In pursuit of the above, the empirical part of this study probed the real-life experiences of emergency managers. The term “empirical” refers to knowledge derived by a process of practical and scientific experience, experiments and inquiry (Skager & Weinberg, 1971:4). An empirical investigation involves a planned process of collecting and analysing data in a way that is systematic, purposeful and accountable (Isaac & Michael, 1997:2). The purpose of this empirical investigation was therefore to obtain reliable and valid data to address the research problem. The data were gathered by

means of semi-structured personal interviews as part of a qualitative research design. The research and derived findings informed the framework presented later in the study.

The first part of this chapter details the research methodology and describes the process followed to gather the data, to organize and analyse it, and to identify the emerging themes that informed the development of the framework. The discussion of the research process includes an evaluation of the validity, reliability and trustworthiness of the research. The second part of the chapter presents the findings of the empirical research as it has emanated from the analysis.

4.2 RESEARCH METHODOLOGY

Information was obtained from respondents who work at different levels in organizations involved in the management of incidents and disasters. This information were used to develop an ICS for local government (see Section 6.2). In this regard, Yiannakis (2000:119) and Thomas *et al.* (2011:3,11,17) state that researchers should be prepared to put their research to the test outside the academic world. This would enable the researcher to determine a possible gap in the management of an incident, emergency or disaster (Yiannakis, 2000).

4.2.1 The nature of social research

Disaster practitioners possess a wealth of knowledge regarding their environment that can contribute to the current body of knowledge and that can help to solve specific real-life problems (see Section 4.7). However, this kind of information is not easily quantifiable and subject to interpretation, as it is made up of the experiences, interpretations, insights and views of human beings. In other words, it is social

research as opposed to research that involves cold facts. This implies that different methods and techniques would be suitable for harvesting this information as compared to the pure sciences. Various social research methods have been developed, modified and used over the course of the history of social science (Sarantakos, 2005). Social research entails a purposive and rigorous investigation that aims to generate new knowledge. It is the intellectual tool of the social scientist and it allows the researcher to enter the context within which a real-life problem occurs to search for answers (Sarantakos, 2005). The research problem as formulated in Chapter 1 can be regarded a real-life problem (Leedy & Ormrod, 2010; Scott & Morrison, 2007).

4.2.2 Selecting a research design

The research process has been a topic of interest within the field of research methodology. According to Sarantakos (2005:104), the manner in which the research is conducted is determined by the methodology that underlines the research.

The research design is of interest because it is a plan or strategy that moves from the underlying philosophical assumptions (such as those discussed in Chapters 1-3) to specifying the selection of respondents, the data gathering techniques to be used, and data analysis to be done (Maree, 2007). It refers to the overall strategy that the researcher choose to integrate the different components of the study in a coherent and logical way (De Vaus, 2006). Generally, the research problem determines the methods and procedures, the types of measurement, the sampling, the data collection and the data analysis to be employed for the proposed research (Zikmund *et al.*, 2010:66).

EMSs play an important role in coordinating responses and managing an incident, emergency or disaster (see Section 3.2.1.1, 3.2.1.5, 3.2.1.6, 3.2.1.7 and 3.2.1.8). The

scale of an emergency may require the involvement of numerous role-players (see Section 3.2.1.4). It was therefore important that the research design allows for the inclusion of a wide variety of stakeholders to determine their views on an ICS for local government. A flexible qualitative design provided the researcher with the opportunity to adjust the research procedures as demanded by the research outcomes.

4.3 QUALITATIVE RESEARCH

A qualitative research design best suited this study because it allowed the researcher to study the phenomenon within its real-life context and to apply the research techniques that best served the purposes of the investigation. The participants' experiences and views about what is actually happening in practice helped the researcher determine if the government and other organizations are achieving their goals when it comes to emergency management. It facilitated the practical application of the theory on IMSs by providing insight into the feasibility and the possible structure of such a framework.

The qualitative research was conducted by means of observations and semi-structured key informant interviews to gain insight into the typical experiences of the participants. As such, the study serves as a phenomenological study.

Leedy and Ormrod (2010:141) reveal that a phenomenological study attempts to understand people's perceptions, perspectives and views of a particular situation. By looking at multiple perspectives on the same situation, the researcher can make a generalization on what something is like from an insider's point of view. The phenomenological approach aims to understand and interpret the meaning that participants give to their everyday life. Creswell (2007:57) regards a phenomenological

study as a study that describes the meanings that the lived experiences of a phenomenon, topic or concept have for various individuals.

The research took the shape of an exploratory and descriptive study with a view to delve into the complexities, relationships, and processes to identify important variables that are necessary for the effective development and integration of an ICS for local government.

Maree (2007:51) explains that qualitative research focuses on describing and understanding phenomena within their natural contexts with the intention of developing an understanding of the meanings imparted by the participants. Qualitative research has the following characteristics:

- It makes extensive use of descriptive data.
- Qualitative researchers are likely to describe a phenomenon with words, rather than with numbers.
- The emphasis is on the process rather than on the product.
- It is often based on inductive logic: going from the specific to the general.
- The search for meaning is often evident.
- The search for meaning focuses on how people try to make sense of their lives.
- How it is, is not nearly as important in a qualitative study as how the participants think it is.

The literature on qualitative research has highlighted several aspects that are important. According to Holloway and Wheeler (1996), qualitative research as a

research methodology is concerned with understanding the process and the social and cultural context that underlies various behaviour patterns. It is mostly concerned with the “why” questions of research.

Qualitative research is often interdisciplinary, multi-paradigmatic, and multi-methodical (Denzin & Lincoln, 1994). The qualitative design chosen for this research guided the researcher first to an intensive literature study, which formed the foundation for the triangulation of data. This enhanced the validity and reliability of the study. By utilizing this design, the researcher could examine the different perspectives of practitioners relating to the research problem (Van Schalkwyk, 2000).

The trustworthiness and reliability of this study relied heavily on the identification of the correct population group and sampling method. The next Section explains the data gathering process, including the identification of the population and the sampling process.

4.4 THE PROCESS OF DATA GATHERING

Qualitative data collection methods can vary from unstructured or semi-structured individual interviews, focus groups (group discussions), participation or observations. The sample size is typically small, and respondents are often selected purposively for what they can contribute to the study. This study made use of semi-structured key informant interviews as a data gathering technique.

4.4.1 Sampling

The target population identified for this study included disaster practitioners active in various spheres and at different levels of society who are involved in the management

and response to incidents, emergencies or disasters. The population included disaster practitioners from different backgrounds (international and national, at the provincial level, from local departments, academics, researchers and persons affiliated with professional disaster and emergency management bodies).

Strydom and Delport (2011:390) and Durrheim (2002:44) define sampling as the means of taking any portion of a population as representative of that population. Sampling is a process of selecting a subset of persons or things from a larger population (Scott & Morrison, 2007:219) with the intention of representing the particular population (Gall *et al.*, 2007; Neuman, 2011).

The size of the sample is an important aspect to consider in qualitative research. A non-probability sampling procedure (Cozby, 2009:139-140) was used for the selection of knowledgeable and experienced participants as a purposive sample. Purposive sampling (also known as judgemental, selective or subjective sampling) is a sampling technique in which the researcher relies on his or her own judgement when choosing members of the population to participate in the study. This enabled the researcher to rely on his expert judgement in selecting units that are representative or typical of the population (De Vos *et al.*, 2005; Marshall, 1996; Welman *et al.*, 2005). Preference was given to key informants who have adequate information about the response to and management of incidents, emergencies or disasters on account of their experience and position.

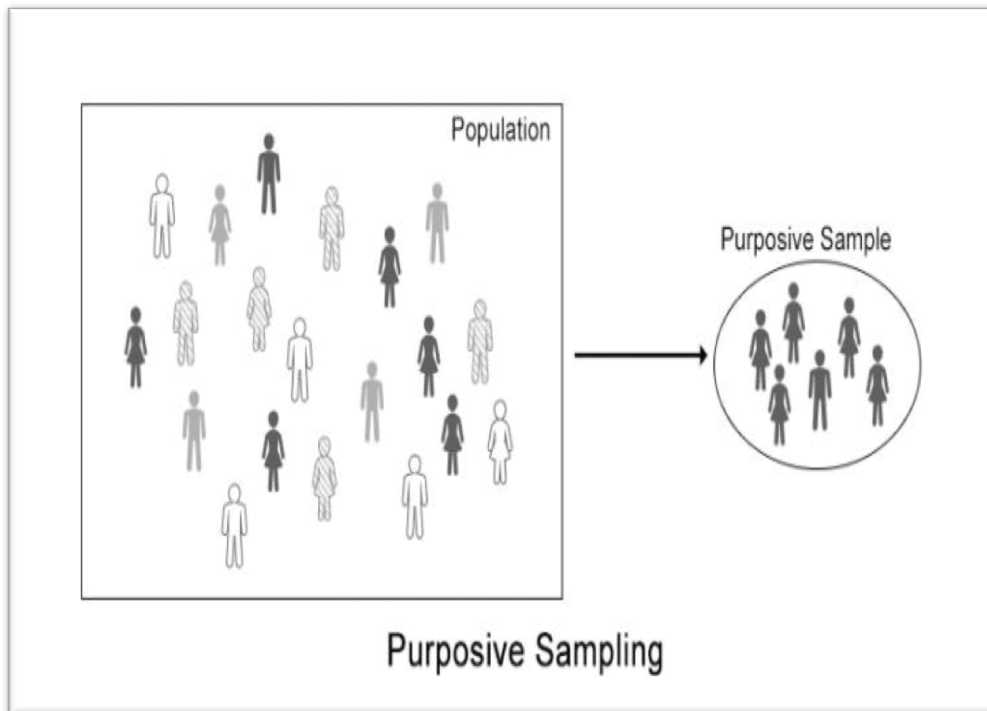


Figure 4-1: Purposive sampling

Source: Dudovskiy (2013)

The use of purposive sampling resonates with arguments advanced by Lunenburg and Irby (2008:176-177), who argue that qualitative research utilizes sampling techniques that produce samples that are predominantly small and non-random, in keeping with its emphasis on the in-depth description of participants' perspectives and context.

Lunenburg and Irby (2008:176-177) maintain that when one conducts qualitative research, it is important to purposively select respondents who meet criteria that will provide a sample that is likely to yield the type of information you need to achieve your purpose.

In this case, 30 officials involved in response and management of incidents, emergencies or disasters at an international and national level were selected and approached to participate, of which 20 responded (n=20). The sample included 12 international officials from different countries who attended a US Forestry international seminar. The officials represented their countries at different levels of government or at international organizations such as US Forestry, US Aid, and US emergency services.

Nationally, participants included officials from the NDMC and provincial, district and local governments. The number of participants was determined by data saturation, which refers to the assumption that each additional participant would supply less new information than the preceding one until no new information appears (Thiétart, 2007). In this study, the saturation principle held true.

Disaster practitioners from different developing countries were identified and selected because they are on the frontline of incident, emergency or disaster management activities every day, and can give the best account of the progress made by their countries in terms of disaster risk management, in particular ICS.

The sample group ultimately included 12 international and 8 local disaster practitioners involved in the management of incidents, emergencies and disasters.

All the participants have a long history within this field and are involved with their communities. The disaster managers were all knowledgeable about the shortcomings of the EMS because of their experience. The respondents had adequate knowledge of disaster management in their respected countries and made a meaningful contribution to the study.

4.4.2 Data gathering techniques

The most common method used to gather data in qualitative research is interviews, which may be structured, semi-structured or unstructured. Other ways to generate data include group discussions or focus groups, observations, reflective field notes, or the analysis of texts, pictures, and other materials (Cooper & Schindler, 2011; Savin-Baden & Major, 2013; Thomas *et al.*, 2011). For this qualitative research, different measuring instruments were employed, which served as a means of triangulation.

4.4.3 Literature study

The literature study (see Chapters 1-3) focused on the theoretical principles of organization in and between stakeholders, management and response of multi-agency stakeholders to incidents, emergencies or disasters. The purpose of the literature study was to probe the different aspects related to the EMS in use in different parts of the world. Documents, minutes of meetings, reports, correspondence (original source documents), and books and articles (secondary sources documents) were reviewed.

4.4.4 Observation

The purpose of observational data is to describe the setting that was observed, the activities that took place in that setting, the people who participated in the activities, and the meanings of what was observed from the perspective of those observed (Patton, 1990:202). Observations should also include descriptions of the participants, descriptions of the physical settings, and accounts of particular events and activities (Bogdan & Biklen, 1998). Observations should also include self-observations. It is important for researchers to be aware of their own biases that they bring to any

new situation and their personal reactions to these situations. De Vos *et al.* (2011:8) suggest the use of participant observation and field research techniques in cases where many hours and days are spent in direct contact with the participants.

The researcher had the opportunity to observe an EMS in the US while attending an international conference hosted by the US Fire Service. This was supplemented by a period of three weeks in California visiting different stakeholders actively involved in the ICS (see Section 3.3.2). Seven component heads involved in the ICS were identified (incident commander; public information officer; safety officer, liaison officer, operations; planning; logistics and finance) and observed in their real-life environment (see Section 3.2.2.2). The purpose was to gain first-hand experience of the phenomenon within its real-life context. The researcher engaged in active collaboration with the participants to address real-life problems in a specific context.

The data collected by means of observation generated a number of questions that the researcher discussed with participants and with component heads during observation.

4.4.5 Semi-structured personal interviews

The aim of the semi-structured key informant interviews was to obtain comparative information pertaining to the environment in which each participant functions on a daily basis. Semi-structured interviews were conducted because this part of the research was concerned with participants' subjective assessment of the EMS emergency of different countries and environments. According to Faber (2001), semi-structured interviews generally comply fully with the standards and principles of qualitative research. The use of semi-structured interviews enabled the researcher to obtain data from a wide range of different and multiple sources, which in turn served as a method of triangulation (Arksey & Knight, 1999; Lamnek, 1993; Pannas, 1996).

While Arksey and Knight (1999:25) recognize the disadvantages of triangulation, such as the time it consumes and resource implications, they outline the following advantages:

- It increases confidence in the results;
- It strengthens the completeness of a study;
- It enhances interpretability: one set of data gives a handle to understanding another set;
- The researcher is closer to the research situation, contributing to a more nuanced understanding of the focus of the study; and
- Divergence can uncover new issues or processes that can result in the development of new theories or modification of existing ones.

All the semi-structure interviews were recorded (with the consent of all involved) for transcription purposes. Some ground rules were explained to the respondents before the semi-structured interview commenced. The introduction to each interview ensured that respondents were made aware of their voluntary participation and that no participant would be prevented from discontinuing their participation in the interview at any given time. The anonymity of each respondent and the confidentiality of the information were guaranteed. The semi-structured interviews were conducted in a safe environment.

The semi-structured interviews commenced with a brief introduction of the participant and their functions within the management and response to an incident, emergency or disaster within their respective environments.

According to Behr (1998:152), in a semi-structure interview, the series of questions to be asked are prepared beforehand, but the interviewer is permitted to use his/her own discretion and to adapt or depart from the set questions and their order of presentation as the situation demands. Pre-determined questions were posed to each participant in a systematic and consistent manner, but participants were also given the opportunity to discuss issues beyond the confines of the questions (Berg, 1995). The aim of the open-ended questions was to determine the level of knowledge of the participant surrounding the emergency management and ICS environment in their respective contexts (see Section 3.3.2.2). Specific questions were asked to stimulate ideas and to test the participants' knowledge of their respective emergency management/IC systems in use. Questions were carefully structured based on key elements derived from the literature review and observational research conducted. Open-ended questions were also used as not to restrict each respondent's answers because of the complexity of different EMSs/ ICS in use. The discussion was facilitated by the researcher to gain a better knowledge of certain aspects or to obtain more data that would ultimately address the research question and problem as identified. The semi-structured interviews were used as a method to obtain information and viewpoints necessary to develop an ICS model for local governments in South Africa (see Section 6.2).

The semi-structured interviews consisted of 12 opened-ended questions and were circulated among the twenty (20) respondents (12 international and 8 national) via e-mail. The international respondents were divided into two sub-categories namely developed (3) and developing countries. The reason for this sub-dividing is that response and management of incidents, emergencies or disaster is a process that continuously changes, therefore ICS model for South Africa need to incorporate best

practices of developed countries in line with developing countries problems. Although, a number of international countries participated in this study are not on the same level. Some countries have a national management system while other international countries do not even have anything in place.

4.5 ENSURING VALIDITY, RELIABILITY AND TRUSTWORTHINESS

Several lines of evidence suggest that some qualitative researchers have begun to question the relevance of the term validity in qualitative research. Some suggest that terminology such as credibility, dependability, confirmability, trustworthiness, verification and transferability be used instead of validity. Scholars like and Tobin and Begley (2004:388-389) are of the opinion that it is inappropriate to transfer terminology across paradigms. Inevitably, the authors suggest alternative ways to demonstrate reliability and validity outside the linguistic confines of a quantitative paradigm.

For the purpose of this study, rigour was used to ensure reliability and validity (Onwuegbuzie & Leech, 2007; Tobin & Begley, 2004:389-390; Twycross & Shields, 2005). Rigour refers to the demonstration of integrity and competence in qualitative research by providing detail and focusing on accuracy to ensure the authenticity and trustworthiness of the research process.

The trustworthiness of this research phase was ensured by applying the following criteria: credibility, dependability, authenticity and confirmation. Detailed description of the qualitative research process and adherence to the identified criteria for qualitative research ensured the authenticity and trustworthiness of this research phase.

One of the most challenging aspects when undertaking qualitative research is for the researcher to remain unbiased and not to precede the findings with any preconceived

ideas. This can cause the researcher to be biased in his findings. This can have a negative influence on the outcomes of the research. On the other hand, it can have a positive effect because the researcher has intricate knowledge of disaster risk management and the EMS in use. The dangers of bias were addressed by means of interpretative validity. Participants were asked to comment on the interpretation of the researcher after the interviews had been completed. Triangulation was furthermore employed to verify findings by using independent measures. A comparison of documents (as per Chapter 2 and 3) and the interview data assisted in determining whether perspectives revealed by various disaster practitioners, academic and professional bodies are being contradicted or not.

4.6 THE DATA ANALYSIS PROCESS

The main characteristic of qualitative analysis is that it deals with data presented in words and it contains few quantitative measures, standardization and statistical techniques (Coffey & Atkinson, 1996:3; Engel & Wuggenig, 1991). According to Faber (2001), the process of qualitative analysis is deeper, more focused and more detailed than in quantitative research.

A combination of data analysis methods was used as data were analysed both during and after the data-gathering phase. According to Sarantakos (2005:345), such a combination of methods is not only possible, but also frequently used. It is common for researchers to conduct a basic analysis during data gathering, to record the data and then to intensify their analysis when the data gathering has been completed by focusing on more specific aspects of the research question as evident from the transcripts.

A thematic analysis was conducted by reading the interviews and identifying important topics, which then became the potential categories. The data were analysed according to the eight steps outlined by Tesch (1990:142-145). These eight steps are:

- Thoroughly read through and make notes of all transcribed material;
- Consider the substance of interviews conducted, looking for the underlying meaning;
- Compile a list of all topics that came to the fore in the research;
- Cluster these topics;
- Using a clustered list, once again consider the data, code the topics and correlate coding with data;
- Elaborate on the topics with the aim of turning them into certain categories and determining interrelationships;
- Make a final decision on the coding of the categories and alphabetize the list; and
- If necessary, record existing data.

The researcher made use of 12 questions to tap into the participants' wealth of knowledge. The questions were developed from the viewpoint of organizational theory and the strategic goals that the government has to achieve in emergency and disaster management.

Steps 1 to 3 (Tesch, 1990) of the data analysis process were used to capture the data of the twenty (20) respondents. The transcribed interviews were thoroughly read, and

the notes were made. The substance of interviews was considered, looking for the underlying meaning. All data were listed and group together under different topics (Steigenberger, 2016).

The topics were clustered according to the functionality of the findings. The topics were coded and clustered into different categories as indicated in Step 4 and 5 of (Tesch, 1990). The data were once again considered and the coding of the topics was correlated with the data collected from the interviews. Elaboration according to Tesch's steps 6 and 7 produced categories. The topics identified by the researcher were related to the different internal and external functions of an EMS/ ICS. Table 4.1 indicates the data analysis process. The different colours represent the emerging topics and its correspondence with the themes. Categories of clusters were identified and linked to a theme.

4.7 FINDINGS OF THE EMPIRICAL RESEARCH

The data analysis revealed seven themes than can be addressed in South Africa by means of a framework to improve the efficiency and effectiveness of the management and response to incidents, emergencies or disasters. Each of these themes is explained in detail to indicate how it evolved from the data and why it is important and relevant to the research problem under investigation. The themes identified from the data were prioritized from most important to least important.

Table 4-1: Data analysis and findings of interviews

Topics 	Clusters 	Categories 	Themes
• EMS is largely centralized • All hazard response • Integrated disaster management approach • Preparedness • Public awareness and information • Command and control • Contingency plans • Uniform concepts • Manmade and natural disasters (multi-hazard response) • Collaborative incident management • Different terminology • Early warning system • Effective response and recovery • Emergency management and response • Legislation (poor implementation;	• All-hazard response • Command and control • Uniform concepts • Collaborative incident management • Different terminology • Early warning system • Effective response and recovery • EMS is largely centralized • Emergency management and response • Fast and slow onset events/emergencies/disasters • Inadequate preparedness • Multi-agency coordination system • National ICS Working Group • Multi-agency stakeholders with different goals	• Response • Standards • Laws • Policies • Unified system • Multi-agency collaboration, coordination and partnerships • Fundamentals of ICS • Communication • Knowledge, education and training • Technical skills • Event, emergencies and disasters • Preparedness • Resources • Levels of response/action	Theme 1: Laws, policies and standards Theme 2: Institutionalized and uniform ICS Theme 3: Fundamentals of ICS Theme 4: Multi-agency collaboration Theme 5: Communication and information management

- statutory and regulatory); applicable to all stakeholders - Fast and slow onset events/emergencies/ disasters - Inadequate preparedness - National ICS Working Group - Multi-agency coordination system - Multi-agency stakeholders with different goals - Contingency plans - Uniform concepts - Manmade and natural disasters (multi-hazard response) - Collaborative incident management - Number of incidents indicate a need for EMS - Flexible and standardization - Compatible structure for the qualification and certification of	- Manmade and natural disasters (multi-hazard response) - Number of incidents indicate a need for EMS - Flexible and standardization	- Spheres of governance - Roles and responsibilities - Information management - Simulations and exercises	Theme 6: Preparedness and simulations Theme 7: Resources management
	- Acquisition of equipment - Equipment certification - Equipment capacity - Equipment to perform to certain standards		
	- Absence of EMS - Boundaries national, provincial and local - Community-based disaster preparation (volunteers) - Partnership - Comprehensive national approach - Different systems - Experience - Government levels (national, provincial and local) - Cross cutting - Geographic location - ICS not part of the NIMS		

emergency management / response personnel • Different stakeholders involved • Absence of EMS • Procedures and protocols • Policies • Low level of technical skills • Acquisition of equipment • Equipment certification • Equipment capacity • Equipment to perform to certain standards • Hyogo Framework for Action • Boundaries national, provincial and local • Community-based disaster preparation (volunteers), partnership • Communication and coordination • Goal-orientated	• Minimum knowledge • Organization and institutional principles • Situational awareness • Standardization on-scene all-hazard management and uniformity • Distribute the workload • ICS to improve capacity • Institutional capacity • Key organizations • Lack of institutionalization capacity • Low level of technical skills • Public and private sector involvement • Response capacity • Roles and responsibilities • Resource management; allocation • Standardized training • Span of control; different stakeholders • Technical skill • Key organizations		
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• Information management • Comprehensive national approach • Different systems • Experience • Government levels (national, provincial and local) • ICS not fully implemented because no legislation exists • Cross cutting • Geographic location • ICS not part of the NIMS • Minimum knowledge • Organization and institutional principles • Situational awareness • Disaster risk assessment • Leadership • Standardization on-scene all-hazard management and uniformity • Education and training • Distribute the workload	• Compatible structure for the qualification and certification of emergency management / response personnel • Different stakeholders involved • Communication and coordination • Goal-orientated • Information management • Knowledge • Education and training • Leadership • Mitigation • Planning • Personal qualification • Preparedness • Public awareness and information • Project management • Unified public information when working in multi-agency • DRR • Disaster risk assessment		
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• ICS to improve capacity • Lack of institutionalization capacity • Public and private sector involvement • Response capacity • Roles and responsibilities • Standardized training • Technical skill • Key organizations • Planning • Knowledge • Mitigation • Institutional capacity • Key organizations • Overlapping of responsibilities • Personal qualification • Project management • Unified public information when working in multi-agency • Sendai Framework for DRR • Disaster risk reduction • Doctrine	• Integrated disaster management approach • Contingency plans • Doctrine • Hyogo Framework for Action • Sendai Framework for DRR • ICS not covered by legislation • ICS not fully implemented because no legislation exists • Legislation (poor implementation; statutory and regulatory); applicable to all stakeholders • Procedures and protocols • Policies • Principles • Strategy for disaster management • Strategic goals / direction / management control • Standing operation procedures		
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• ICS not covered by legislation • Resource management; allocation • Principles • Strategy for disaster management • Strategic goals / direction / management control • Standing operation procedures • Simulated roles • No planning with other organizations • Span of control; different stakeholders	• Simulated roles • No planning with other organizations • Overlapping of responsibilities		
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4.7.1 Theme 1: Laws policies or standards

The literature study reported in Chapter 1 showed that an event can become larger than any one organization can manage. Therefore, the importance of integrated and independent collaboration is important to allow public and private organizations to work together (see Section 3.2.1.4). The demand for mobilization of resources are critical in an incident, emergency or disaster and a disaster response system should be in place. This should be able to cope with such events regardless of their size, scale or type.

The aim of the question related to Theme 1 was to determine if the respondent could identified any link between existing international policies and their own country or organization’s laws, policies or standards that relate to an ICS (see Section 1.2, 4.7, 5.1.1, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6,6.2.7,6.2.9,6.2.12 and 6.2.15).

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 1: Laws, policies and standards	<i>“United Nations DRR strategy is implemented in my country, therefore laws, policies and standards are in place (intergovernmental, interorganizational) to manage incidents, emergencies or disasters.”</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I10; I11; I12. No: I8; I9.	Yes: N1; N2; N3; N4; N5; N6; N7; N8 No: None.
	<i>“Incident command system is working in my country.”</i>	Yes: I1;I2;I3. No: None.	Yes: None. No: I4; I5; I6; I7;I8; I9;I10; I11; I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>“Our government do not have a structure available for DM, DRR.”</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>“I don’t think that we adhere to any international polices or standard.”</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>“I did not know that there is legislation applicable on disasters.”</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>“International policies not applicable on my country, the defence force responsible for any incident, emergency or disaster.”</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.

4.7.2 Theme 2: Institutionalized and uniform ICS

Institutionalized and uniform working processes in the response and management of incidents, emergencies or disasters are fundamental to any incident, emergency or disasters. The US NIMS (preparedness, resources; ongoing management and maintenance, command and management, communication and information) established a national standard for the US emergency stakeholders. Hence, ICS forms

part of the NIMS and ICS strategic intent is to institutionalize integrated a uniform response and management of to an incident, emergency or disaster (see Section 3.3.1, 3.3.2, 3.3.2.11).

The purpose of this question was to determine if the respondents have such institutionalized integrated and uniform response and management plans for incidents, emergencies or disasters (see Section 4.7; 5.1.2).

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 2: Institutionalised and uniform ICS	<i>"I don't think my organization will be in a position to manage a disaster situation because of no institutionalised and uniform ICS."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I10; I11; I12;I8; I9. No: None.	Yes: N3; N4; N5; N6; N7; N8. No: N1; N2.
	<i>"Incidents, emergencies or disaster occurs in my country but we do not have a standard working procedure."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9; I10;I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"The NIMS and ICS is not perfect but it assist us to report to and who are responsible."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9; I10;I11; I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; No: N8.
	<i>"Not every multiagency stakeholders believe in the NIMS and feel that there are better ways to manage all stakeholders."</i>	Yes: I3. No: I1;I2.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: N7; N8. No: N1; N2; N3; N4; N5; N6.
	<i>"I don't know what structure I must follow what responding to an incident, emergency or disaster."</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11; I4; I5; I6; I7;I8; I9. No: I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>"We rush to the incident, emergency or disaster and adhere to our protocols."</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11; I4; I5; I6; I7;I8; I9. No: I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>"We respond to an incident and do not report to anyone, no objectives identified to achieve a goal."</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11; I4; I5; I6; I7;I8; I9. No: I12.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.

4.7.3 Theme 3: Fundamentals of ICS

The different government departments have different roles and responsibilities during an incident, emergency or disaster. All stakeholders involved in the management and response to any incident, emergency or disaster should be prepared for any situation. Incidents, emergencies or disasters can occur at any time. Therefore, the local government and the relevant emergency services must develop strategies and train together to manage such occurrences efficiently and effectively. ICS standardizes and gives structure to the management or response to any incident (see Section 1.2.4, 1.2.5, 2.2, 2.3, 3.3.1, 3.3.2, 3.3.2.10, 3.3.2.11, 3.4.2, 4.7; and 5.1.3).

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 3 Fundamentals of ICS	<i>"I want to do my work better but I do not know what our role and responsibility pertain in a disaster situation."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I10; I11; I12. No: I8; I9.	Yes: N1; N2; N3; N4; N5; N6; N7; N8 No: None.
	<i>"No working procedure exists between different emergency stakeholders".</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"I do not know what the capabilities are of other stakeholders are, because we do not train together."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9; I10; I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"No prior planning for incident."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8;I10;I11. No: I9;I12.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.

4.7.4 Theme 4: Multi-agency collaboration

The management of an incident, emergency or disaster begins locally. The magnitude of the incident, emergency or disaster will determine the multi-agency stakeholder involvement. Therefore, multi-agency collaboration and coordination are an important aspects.

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 4: Multiagency collaboration	<i>"There is no incident command system in use in my country."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I10; I11; I12. No: I8; I9.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"In an incident, emergency or disaster all stakeholders respond to the situation not beeing coordinated."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I10; I11; I12. No: None.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>"If I know my role and responsibility I can be of more assistance in a disaster."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I10; I11; I12, No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"No working procedure exists between different emergency stakeholders".</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"I do not know what the capabilities are of other stakeholders are, because we do not train together."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9; I10; I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.

Coordination is an important aspect of organizational theory. All aspects of an incident, emergency or disaster should be managed to prevent additional problems from occurring (see Section 4.7 and 5.1.4).

4.7.5 Theme 5: Communication and information management

Effective incident, emergency or disaster management and response relies on flexible communication and information systems that provide a common operating picture of all multi-agency stakeholders. Organizations always experience problems with communication internally and externally. Properly planned, established and utilized communication enables the dissemination of information among and between command and support elements and appropriate cooperation agencies and organizations.

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 5: Communication and information management	<i>"Communication and information in my environment is not sufficient."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I10; I11; I12. No: I8; I9.	Yes: N1; N2; N3; N4; N5; N6; N7; N8, No: None.
	<i>"I do not know of any correspondence or instructions pertaining communication and information management."</i>	Yes: None. No: I1;I2;I3.	Yes: I5; I6; I7;I8; I9;I10; I11; I12. No: I4.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"The lack of good communication and information in an incident, emergency or disaster lead to the death of a number of personal."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: N7; N8. No: N1; N2; N3; N4; N5; N6.
	<i>"I could have done more if I had the correct information regarding the situation."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10;I11. No: I12.	Yes: N2; N3; N4; N5; N6; N7; N8. No: N1;
	<i>"I respond to the wrong area because of communication breakdown."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10;I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"In a blink of an eye I lost a number of personal, resources because of poor radio communication."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10;I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"There is no communication between the different multi-agencies stakeholders in an incident, emergency or disaster."</i>	Yes: I1;I2, No: I3.	Yes: I4; I5; I6; I7;I8; I9;I10;I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"The local government communication and information systems are more advance than the other multi-agency stakeholders."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10;I11;I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"I could see multi-agency stakeholders but could not communicate with them."</i>	Yes: I1;I2;I3. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"The multi-agency stakeholders who came to assist us did not make use of the same terminology as us". Radio frequencies are not the same."</i>	Yes: I1;I2;I3. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"Every stakeholder involved in the management of incident, emergency or disaster consults directly with the public."</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: N1; N2; N3; N4; N5 No: N6; N7; N8.

Communication and information problems occur because there is no standard procedure for communication or information sharing when responding to an incident, emergency or disaster. Although different legislation indicates that such a standard must be in place, government sectors or organizations do not adhere to this.

4.7.6 Theme 6: Preparedness and simulations

A number of disaster management legislation pieces highlight research. Incidents, emergencies or disasters can have a slow or sudden onset. Therefore, it is important for any government to research and develop plans for such situations. The management of incidents, emergencies or disasters is a never-ending process. Any multi-agency stakeholder should be prepared for the next incident, emergency or disaster maintenance at any time, and the necessary resources should be available.

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 6: Preparedness and simulations	<i>"The legislation promulgated is not uphold by relevant stakeholders."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I10; I11; I12. No: I8; I9.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"Disaster management structures is no more in place."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10. No: I11; I12.	Yes: N1; N2. No: N3; N4; N5; N6; N7; N8.
	<i>"New technology and techniques is available but my organization cannot afford it."</i>	Yes: I1. No: I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: : N1; N2; N3; N4; N5; N6;. No: N7; N8.
	<i>"Legislation prescribe that research be done, there is no person trained to do it."</i>	Yes: None. No: I1;I2;I3.	Yes: I10;I11. No: I4; I5; I6; I7;I8; I9;I12.	Yes: N1; N2; N3. No: N4; N5; N6; N7; N8.

New technology and techniques are available and should be incorporated into existing structures to improve the emergency stakeholder's life in a dangerous situation. The main aim of ongoing maintenance is to leverage science and technology to improve

capabilities and lower cost. Preparedness begins long before an incident, emergency or disaster occurs. Therefore, an ICS must be a standard operating procedure for all organizations involved in incident, emergency or disaster management or response (see Section 4.7 and 5.1.6).

4.7.7 Theme 7: Resource management

Resource management is an important aspect in the response and management of incident, emergency or disaster. Therefore, careful planning is essential in the allocation of resources. Resource management should be flexible and scalable to adapt to any situation (see Section 4.7 and 5.1.7).

The responses pertaining to the questions included:

Themes	Responses	International developed countries	International developing countries	National responders
Theme 7: Resource management	<i>"What entails DM resources?"</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6. No: I7;I8; I9;I10; I11; I12.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>"The resource allocated is not up to standard, outdated and break down."</i>	Yes: I1;I2;I3. No: None.	Yes: I4; I5; I6; I7;I8; I9;I10; I11; I12. No: None.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"In my area, I do not have resources to manage an incident, emergency or disaster. In my area there is no disaster management capacity or resources."</i>	Yes: I1. No: I2;I3.	Yes: I4; I5; I6; I7;I8; I9;I12. No: I10;I11.	Yes: None. No: N1; N2; N3; N4; N5; N6; N7; N8.
	<i>"Local government do not have any infrastructure or resources for a disaster are available."</i>	Yes: None. No: I1;I2;I3.	Yes: I4; I5; I6; I7;I8;I9;I10;I11. No: I12.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"The supplier cannot cope with the demand."</i>	Yes: I1. No: I2;I3.	Yes: I4; I5; I6; I7;I8;I9;I10;I11. No: I12.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.
	<i>"Resources do not perform well under certain circumstances."</i>	Yes: I1. No: I2;I3.	Yes: I4; I5; I6; I7;I8;I9;I10;I11. No: I12.	Yes: N1; N2; N3; N4; N5; N6; N7; N8. No: None.

Resource management focuses on human resources, the use of standardized equipment, identification of suppliers, and inventory. Resource management entails

the deployment of resources before, during and after an incident, emergency or disaster (see Section 2.4; 4.7 and 5.1.7).

4.8 CONCLUSION

This chapter set out the research design and methodology. A specific, related research design was identified to ensure the accomplishment of the set aims for this study, namely to determine the needs and competencies required by multi-agency stakeholders responding to an incident, emergency or disaster.

In conclusion, it may be stated that the research design and related methodologies were developed with the aim of obtaining reliable and valid data to develop an ICS model for local government multi-agency stakeholders. The results and findings contributed to the model presented in Chapter 6, and this model will help current emergency stakeholders to deal with the demands of managing responding to incidents, emergencies or disasters effectively and efficiently.

CHAPTER 5: DISCUSSION OF RESEARCH FINDINGS

5.1 INTRODUCTION

Chapter 4 presented the research results of the empirical data collected from international and local participants. The data were categorized into different themes. This chapter derives empirical findings in the shape of themes that emerged from the data presented in Chapter 4. The themes are subsequently discussed individually.

5.2 DISCUSSION OF THEMES

The themes gave an overview of what an ICS must consist out of, therefore these themes are subsequently discussed.

5.2.1 Laws, policies and standards

The UNDRR strategy (Hyogo and Sendai frameworks) focuses on aspects such as government or multi-agency coordination, research, collaboration and coordination. The first step for any government is to secure the safety of its citizens. This is normally done by developing laws, policies and standards. The laws and standards enforce a structure for multi-agency stakeholders within which to function. In the small number of countries that participated in this study, the UNDRRS has led to the development and of laws, policies and standards. The implementation of the UNDRRS should be reflected in a country's legislation, laws and policies. The principles of DRR and DRM are used internationally to save lives. Thousands of lives have been saved by DRR initiatives. For example, the evacuation of thousands of Japanese citizens before the tsunami struck in 2011 can be mentioned as a success story of DRR. However, in the

case of Japan, DRR and DRM initiatives have been ingrained in Japanese society over decades.

A number of respondents indicated that they have been involved in a number of incidents, emergencies or disasters. However, not all of the respondents could clearly the UNDRRS to their laws, policies and standards. Some participants mentioned international policies (Hyogo and Sendai frameworks), but not all could explain the essence of these documents and make the connection that governments have to take responsibility for the response and management to incidents, emergencies or disasters (see Section 1.2 and 1.2.1). It is notable from the responses that the UNDRRS is reflected in the legislation, laws and policies of developed countries and some developing countries.

Although developed countries implemented legislation, laws, policies or standards for responses to and the management of incidents, emergencies or disasters, this process was not without problems. The majority of respondents indicated that their governments do not acknowledge the UNDRRS. Some of governments acknowledge the strategy, but do not have the capacity to implement the guidelines as prescribed (see Section 1.2 and 3.3.2).

The UNDRRS greatly influenced the development of the Disaster Management Act (57 of 2002) and the NDMF in South Africa. It is clear that DRR as originally stated in the Hyogo and Sendai frameworks is not applied fully in every country and therefore a number of the participants did not grasp the concept of an ICS. Local participants indicated that the time is right for an ICS for South Africa and that government should take the lead in developing an ICS for local governments in South Africa. Such an ICS

should be used on a daily basis to respond to and manage events, incidents, emergencies or disasters (see Section 1.2.2, 4.7.1, 5.1.2 and 6.2.1).

5.2.2 Institutionalized and uniform ICS

The second theme relates to institutionalized and uniform multi-agency stakeholder system such as the US NIMS. NIMS institutionalized multi-agency stakeholders' response to and management of incidents, emergencies or disasters nationally. Any response to and management of any incident, emergency or disaster should begin with a structure, a standard working procedure that is applicable to all multi-agency stakeholders that should be coordinated by government.

Developing countries struggle because no national standard exists for the management of incidents, emergencies or disasters. The responses above indicate the negative influence of the fact that there is no standard or structure when responding to an incident, emergency or disaster.

The results show that the majority of participants come from countries that do not have a NIMS in place (see Section 4.7.2). The rest of the participants indicated that they have a NIMS, but not all multi-agency stakeholders accepted it. A few participants indicated that their country's NIMS is fully implemented and that all emergency stakeholders participate in it. The reason for this is that such NIMSs are taken up in legislation and are binding to all multi-agency stakeholders in the management of and response to an event, incident or emergency (see Section 5.1.1).

In South Africa, the Disaster Management Act (57 of 2002) and the NDMF are in line with aspects mentioned in the US NIMS, except for an ICS. Such a response draws

together different multi-agency stakeholders into a temporary organization. Therefore, the principles of organizational theory are applicable (see Section 2.2, 2.3 and 2.4).

In the South African context, the Disaster Management Act (57 of 2002) and the NDMF are available, but no official structures, guidelines, or policies are in place. This has a negative effect on the response to and management of an event, incident, emergency or disaster. An ICS would standardize and give structure to the management of or response to any event, incident, emergency or disaster in South Africa (see Section 1.2.2, 1.2.4, 1.2.5, 1.2.6, 4.7.2 and 6.2).

5.2.3 Fundamentals of ICS

The third theme relates to the fundamentals of ICS in a multi-agency response and management of incidents, emergencies or disasters. The different government departments have different roles and responsibilities during an incident, emergency or disaster. An important aspect that came to the forefront during the discussion on this point is that many of the participants indicated that their teams are in most of these situations the first governmental department to respond to an incident, emergency or disaster situation. In most of the situations, stakeholders are not prepared for what they must do, although other stakeholders do have the capacity. There is no coordination between the different stakeholders (see Section 3.2.1.5, 3.2.1.6, 3.2.1.7, 3.2.1.8 and 3.3.2). The multi-agency stakeholders responding to a situation focus only on what they are trained for and allowed by legislation (see Section 3.2.1.3 and 3.2.1.4). The interviews made it clear that there is a need for a coordination function such as an IMS when responding to incidents, emergencies or disasters.

Multi-agency stakeholders involved in the management of and response to any incident, emergency or disaster should be prepared for any situation. Incidents,

emergencies or disasters can occur at any time. Therefore, the local government and the relevant emergency services must develop strategies and train together to manage such occurrences efficiently and effectively (see Section 4.7.3).

5.2.4 Multi-agency and collaboration

The fourth theme relates to multi-agency and collaboration between multi-agency stakeholders. Collaboration in the response and management of any incident, emergency or disaster can be described as a temporary structure. Multi-agency stakeholders (intergovernmental, interorganizational) act within this temporary structure to collaborate (hierarchy or network). In such cases, legislation, laws, policies and standards form the basis that keeps all stakeholders together (see Section 4.7 and 4.7.4).

These three aspects are very important in the management of incidents, emergencies or disasters. The management of an incident, emergency or disaster normally begins at a local government level. The magnitude of the incident, emergency or disaster will determine the multi-agency stakeholder involvement. Therefore, coordination is an important aspect. Multi-agency coordination is a process that allows all levels of government and stakeholders to work together more effectively and efficiently. Public information is a day-to-day function relating to multi-agency stakeholders' operational progress. The public information should be coordinated across all stakeholders involved to get the correct message out.

The participants in the study indicated that they experience problems with command and information management when responding to an event. This situation is experience at local level because of a shortage of capacity. Therefore, command and information management should be coordinated, and information should be

disseminated to the multi-agency stakeholders (see Section 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.1.4, 3.2.1.5, 3.2.1.6, 3.2.1.7, 3.2.1.8, 4.7 and 4.7.5).

5.2.5 Communication and information management

The fifth theme relates to communication and information management. Communication and information management relates to the internal multi-agency communication and information.

All the participants indicated that the communication of information was a problem and that this happens because there is no standard procedure for communication or information sharing when responding to an incident, emergency or disaster. Although different legislation indicates that such a standard must be in place, government sectors or organizations do not adhere to this. Effective incident, emergency or disaster management and response relies on flexible communication and information systems that provide a holistic and shared picture of all the operations to all multi-agency stakeholders. Organizations often experience problems with communication internally and externally. Properly planned, established and utilized communication enables the dissemination of information among and between command and support elements and supports appropriate cooperation between agencies and organizations (see Section 4.7.5). Public information systems are important day-to-day functions when multi-agency stakeholders are operational. Such systems consist of processes, procedures and systems to communicate timely, accurate and accessible information on the incident, emergency or disaster. Public information should be coordinated across all stakeholders involved (see Section 3.2.1.3 and 4.7.5).

5.2.6 Preparedness and simulations

The sixth theme relates to preparedness and simulations. Preparedness can only be achieved and maintained by means of a continuous cycle of planning, organizing, and training, equipment, exercising, evaluating and taking corrective action.

The majority of respondents mentioned that the biggest challenge is that there are no funds for scientific research or for implementing new technology or methods. New technology, methods and techniques are available and should be incorporated into existing structures to improve the functioning in a dangerous situation. The main aim of ongoing maintenance is to leverage science and technology to improve capabilities and lower cost (see Sections 3.3.2.10, 3.3.2.11, 4.7 and 4.7.6).

5.2.7 Resource management

The seventh theme relates to resource management in an incident, emergency or disaster. All the participants in the study indicated that they experience problems with resources. Therefore, careful planning is essential in the sourcing and allocation of resources. The correct allocation of resources in an event, incident, emergency or disaster is vital to the success of the operation. Resources include different stakeholders, equipment or organizations with special skills. In the deployment of human resources, the span of control should be implemented for safety purposes. The availability of equipment for the event, incident, emergency or disaster must be managed carefully (see Section 3.2.1.3, 3.2.1.5, 3.3.2.2, 3.3.2.11, 4.7 and 4.7.7).

5.3 CONCLUSION

The themes identified during this process provide the foundation for the development of an ICS model for local government. The above themes contribute to the information needed to draw up an ICS model for local government that considers both the South African context and international standards. Chapter 6 continues by presenting such a model.

CHAPTER 6: A COMPREHENSIVE MODEL FOR A MULTI-AGENCY ICS FOR LOCAL GOVERNMENTS IN SOUTH AFRICA

6.1 INTRODUCTION

This chapter presents the model that is the culmination of the evaluation of theory and the empirical research. The empirical research data were categorized, and out of this, categorization themes emerged. These themes laid the foundation for the multi-agency ICS model for local government.

The model presented in this chapter can serve as a point of departure for local governments. The model is comprehensive in that it covers all aspect of DRR, yet it is flexible enough to be adapted for specific applications.

6.2 A MODEL FOR A MULTI-AGENCY ICS AT LOCAL GOVERNMENT LEVEL

An ICS model for a multi-agency at local government level can be derived from Chapters 2 to 5. The model works in a logistical sequence and a specific line of activities, in other words, an outline of processes. The ICS model for local government is flexible and can expand according to incidents, emergencies or disasters.

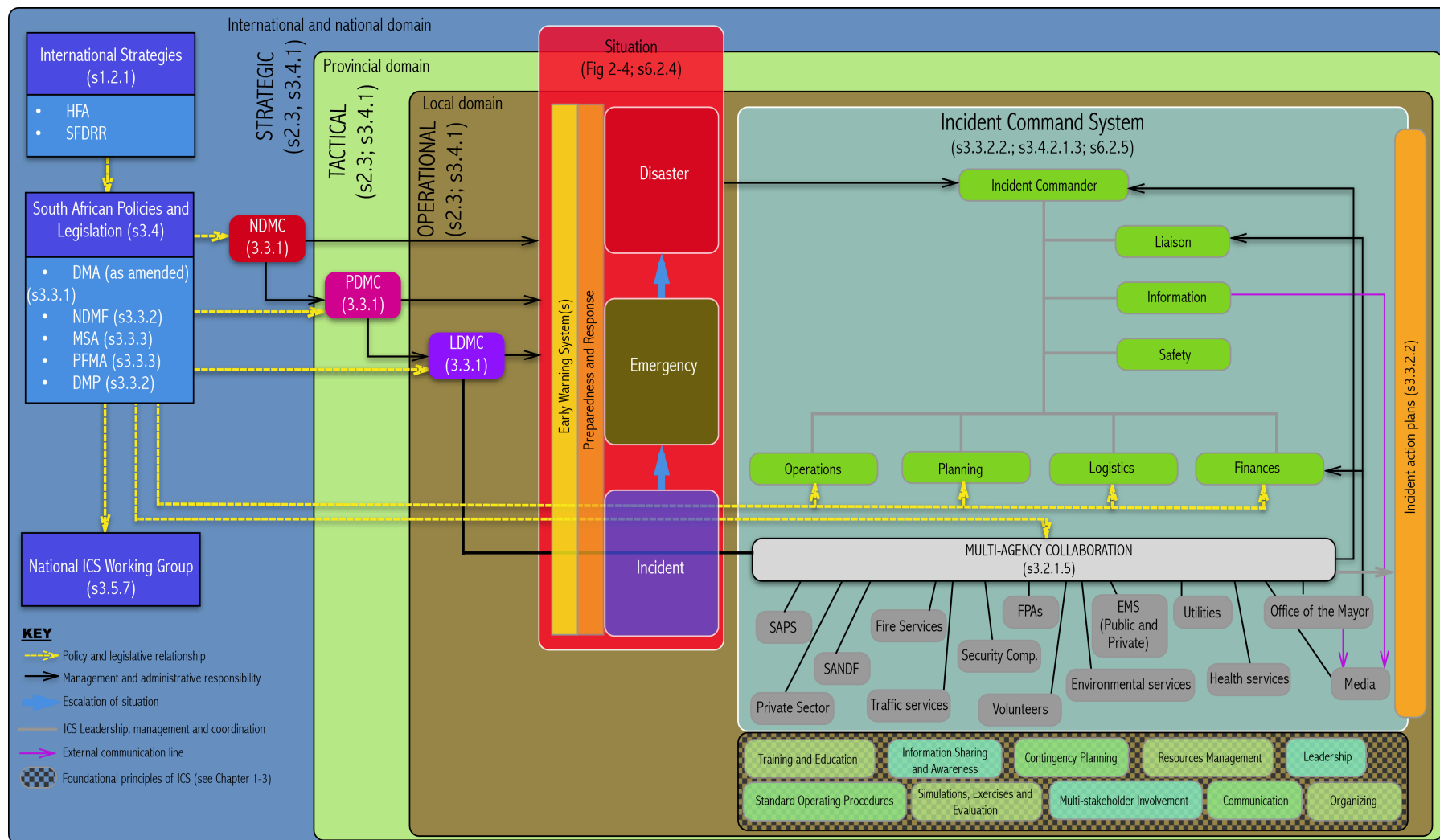


Figure 6-1: Multi-Agency ICS Model for the Local Government Level in South Africa

6.2.1 International strategies

The UNDRRS, the Yokohama Strategy and Plan of Action for a Safer World, the HFO and the SFDRR all influenced South African legislation. There is a direct link between the UNDRRS and South African legislation. For this reason, international policies are mentioned as the point of departure. Figure 6.1 contains a process map of how international policies influenced South African legislation to become more proactive by involving all the stakeholders (South Africa, 2015) (see Sections 1.2.1; 2.2.1, 4.7.1; 5.1.1 and 6.2.2).

6.2.2 South African policies and legislation

The Constitution of the Republic of South Africa indicates that government is responsible for incidents, emergencies or disasters. The Department of Governance and Traditional Affairs (CoGTA) is the custodian of the DMA, NDMF (South Africa, 2015). This entails that the South African legislation focuses more on the preparedness of an emergency. Preparedness is the state of readiness of the organs of state and other institutions involved in disaster management, the private sector communities and individuals to mobilize, organize, and provide relief measures to deal with an impending or current disaster or the effects of a disaster (see Section 6.2) (Pelling & Holloway, 2006).

6.2.3 Disaster Management (Act 57 of 2002)

The Disaster Management Act (57 of 2002) (DMA) came into effect on 15 January 2003. The main aim of the DMA is a sustained, committed and concerted effort with regard to disaster risk management reform by the government and a wide range of stakeholders were reflected in the DMA. The DMA provides for an integrated and

coordinated disaster risk management policy that focuses on preventing or reducing the risk of disasters; mitigating the severity of disasters; preparedness; rapid and effective response to disasters; and post-disaster recovery by establishing national, provincial and municipal DMCs and the management of disaster risk management volunteers, or matters relating to these issues. Therefore, the importance of the DMCs at different levels of government (national – NDMC, provincial – PDMC, local government – LGDMC) are important for an ICS model for local government. The prevalence of events, incidents, emergencies or disasters at local level is very high and therefore government should focus most of its efforts on the local level. The purpose of DMCs is to coordinate all multi-agency stakeholders' actions before and after an incident, emergency or disaster. The disaster centre should execute different functions relating to the coordination of events, incidents, emergencies or disasters. This includes coordination in the preparation phase (development of contingency plans, plans, training). During the second phase, the DMC coordinates the response and management of the event, incident, emergency or disaster. During the last phase, the DMC has to coordinate the finalization of all aspects (recovery, rehabilitation) (see Section 2.4, 6.2.2).

6.2.4 National Disaster management framework of 2005

The NDMF of 2005 is a policy framework for disaster risk management in South Africa. Subsequently, the NDMF is the legal instrument specified by the Act to address such needs for consistency across multiple interest groups by providing a coherent, transparent and inclusive policy on disaster management appropriate for the Republic as a whole (Section 7.1). Therefore, the NDMF recognizes a diversity of risks and disasters that occur in southern Africa and gives priority to developmental measures that reduce the vulnerability of disaster-prone areas, communities and households.

Firstly, the NDMF is in line with international best practice and it places explicit emphasis on the DRR concepts of disaster prevention and mitigation as the core principles to guide disaster risk management in South Africa. Secondly, the NDMF also informs the subsequent development of provincial and municipal disaster management frameworks and plans, which are required to guide action in all spheres of government that is important for the ICS model for local government (see Section 6.2.2) (South Africa, 2015).

6.2.5 The role and responsibility of the Public Financial Management Act (1 of 1999) and the Municipal Financial Management Act (56 of 2003)

There is a financial effect with (before, during and after) any incident, emergency or disaster. In any of the phases mentioned above, finance plays a key role. Therefore, finances are management and regulated by the Public Financial Management Act (1 of 1999) as amended by Act 29 of 1999 (PFMA), and the Municipal Finance Management Act (56 of 2003) (MFMA) (National Treasury Republic of South Africa, 2000).

6.2.6 The role and responsibility of the Public Financial Management Act (1 of 1999) as amended by Act 29 of 1999

The financial impact is prevalent (before, during and after) in any incident, emergencies or disaster. In any of the phases as mention above finance plays key role. Therefore, finances are management and regulated by the Public Financial Management Act, Act No.1 of 1999 as amended by Act 29 of 1999 (PFMA), Municipal Finance Management Act, Act 56 of 2003 (MFMA) in South Africa (National Treasury Republic of South Africa, 2000).

6.2.7 The role and responsibility of Public Financial Management Act (1 of 1999) as amended by Act 29 of 1999

The Act promotes the objective of good financial management to maximize service delivery through the effective and efficient use of the limited resources.

6.2.8 The role and responsibility of Municipal Financial Management Act (56 of 2003)

Municipal Financial Management Act (56 of 2003) secures sound and sustainable management of the financial affairs of municipalities and other institutions in the local sphere of government; establishes treasury norms and standards for the local sphere of government; provides for matters connected therewith.

6.2.9 South African ICS working group

The purpose of the training policies of the SA ICS Training Committee of the SA ICS Work Team is to provide guidance and standards for assessment policies to regulate SA ICS accredited training providers and centres with registered programmes.

6.2.10 Coordination function of the national, provincial and DMCs

Incident, emergency or disaster response and management are regulated by the Disaster Management Act and NDMF. Therefore, DMCs at different levels of government (national – NDMC, provincial – PDMC, local – LGDMC) are established at the different levels of government to coordinate. The Disaster Management Act (57 of 2004) Chapter 5 Section 44 (1) indicates powers and duties of the local government disaster management centres. Chapter 5 Section 30 (1) indicates the powers and duties of the Provincial Disaster Management Centre and Chapter 3 Section 15 (1) indicates the powers and duties of the National Disaster Management Centre (see

Section 3.3.1.1 and 6.2.2) (South Africa, 1993a; South Africa, 2000; South Africa, 2002b; South Africa, 2005; South Africa, 2010b; South Africa, 2010c; South Africa, 2015).

6.2.11 Situation response and management of incident, emergency or disaster

The ICS model for local government can assist the disaster management centre by improving response and management of an incident, emergency or disaster (see Section 6.2.2). The probability of an incident, emergency or disaster at local level is high. Therefore, disaster management centres in conjunction with other multi-agency stakeholders should develop an early warning system that can expand with the threat or to the next level (local government, provincial or national). The situation can begin as a local incident that can spill over into a disaster. The Disaster Management Act (57 of 2005) in Chapter 1 indicates that a disaster is progressive or sudden, widespread or localized, natural or human-caused occurrence that causes death, damage and disruption to any community and exceeds the ability of those affected by the disaster to cope with its effects using only their own resources (see Section 6.2, 6.2.2, 6.2.4) (South Africa, 2015).

6.2.12 ICS for local government

The proposed ICS model for local government consists of an organizational hierarchy and procedures for the management of incidents and planned events. The ICS model for local government provides a flexible and effective mechanism for the management of personnel, facilities, equipment, and communications during incidents. Stakeholders can work together to rapidly integrate into one common management

structure to meet specific set objectives. This is achieved by adhering the two key philosophies of management: setting objectives and unity of command.

The ICS model for local government makes use of common terminology for organization by integrating all communications. The unified command structure makes it possible to consolidate action plans for better response and management of an incident, emergency or disaster. Command and control should be improved because the span of control involved. More resource should be available for the management of incidents, emergencies or disasters (see Section 2.4, 3.4.7 and 6.2).

6.2.13 Multi-agency collaboration

A response to and management of an incident, emergency or disaster brings together a number of different multi-agency stakeholders. The multi-agency stakeholders each bring different skills, resources, methods and equipment to the operation. If multi-agency stakeholders not coordinated, the goal of the operation will not be achieved. Response and management of any incident, emergency or disaster a number of different stakeholders (South African Police Service, private sector, Fire Services, fire protection associations, local and provincial traffic, South African Defence Force, social media, local government) are active. The proposed ICS model provides for local government to assist the local disaster management system (LDMC) to set a structure for all multi-agency stakeholders to work in. The model also helps the LDMC to coordinate the incident, emergency or disaster better (see Section 6.2.2) (Reid & Van Niekerk, 2008; Reid, 2008; South Africa, 1973; South Africa, 1993b; South Africa, 1998b; South Africa, 1998c; South Africa, 2015; Vermaak & Van Niekerk, 2004; Vogel, 1988).

6.2.13.1 *The South African Defence Force*

The primary role of the defence force is to defend the Republic of South Africa's sovereignty. However, in the case of emergencies the Defence Act (22 of 2010) does provide for the President or the Minister to authorize the use of the services of the defence force in cases where life, health or property is in danger to assist with the provision of emergency and humanitarian aid and with maintaining lifeline services. The Defence Act requires the Chief of Defence to compile contingency plans for circumstances in which the services of the defence force may be required (South Africa, 2010a).

6.2.13.2 *The South African Police Service*

According to the provisions of the South African Police Service Act (68 of 1995), the functions of the police service in South Africa include ensuring the safety and security of all persons and property and protecting the rights of individuals in terms of the Constitution (South Africa, 1995).

6.2.13.3 *The Municipal Police Service*

In terms of the South African Police Service, which provides a framework for the establishment of municipal police services, the function of such a service is traffic law enforcement and the prevention of crime (South Africa, 1995).

6.2.13.4 *Fire Brigade Services*

The Fire Brigade Service Act (99 of 1987) (South Africa. 1987:!) provides for "the establishment, maintenance, employment, coordination and standardization of fire brigade services; and for matters connected therewith". The functions of the fire

service in terms of the Act can be summarized as the prevention and suppression of fires to protect life and property. These functions include provisions for rescue services, emergency medical care and any other associated actions (South Africa, 1987).

6.2.13.5 *Emergency Medical Services*

The National Health Act (61 of 2003) gives the national Department of Health the responsibility to “coordinate health and medical services during national disasters” (Section 21(2) (e)). Similarly, in terms of Section 25(2) (g) of the Health Act, provincial health departments must “coordinate health and medical services in the event of provincial disasters”. In terms of the National Health Act (South Africa, 2003:34), emergency medical services are competencies of provincial health departments (South Africa, 2003).

6.2.13.6 *Road Traffic Services*

The powers and duties of local and provincial traffic officers are prescribed in the National Road Traffic Amendment Act 21 of 1999 that focus on all national, provincial and local roads (South Africa, 1999a).

6.2.13.7 *Local government domain (Operational)*

The Disaster Management Act, Act 57 of 2004 Chapter 5 explain the roles and responsibilities Local government. The Disaster Management Act, Act 57 of 2004 Chapter 5 44 (1) explain the tactical responsibilities of Provincial government (see Section 6.2.2) (South Africa, 2015).

6.2.13.8 Provincial domain (Tactical)

The Disaster Management Act (57 of 2004) Chapter 4 explains the roles and responsibilities of the provincial government. The Disaster Management Act (57 of 2004) Chapter 4 S 30 (1) explains the tactical responsibilities of provincial government (see Section 6.2.2) (South Africa, 2015).

6.2.13.9 International and national domain (Strategic)

The Disaster Management Act (57 of 2004) Chapter 3 explains the objective of the national centre. The national centre's role and responsibilities are to promote an integrated and coordinated system of disaster management, with special emphasis on prevention and mitigation. All stakeholders should be involved, including national, provincial and local government organs of the state, statutory functionaries, other stakeholders in disaster and management communities. The Disaster Management Act (57 of 2004) Chapter 3 (15) gives the strategic overview of powers and duties of the national centre (see Section 6.2.2) (South Africa, 2015).

6.3 CONCLUSION

The literature study in Chapter 1, 2 and 3 lay the foundation of this study. Chapter 4 focus on the research, methods and findings of the empirical research by dividing all data into topics. The topics were cluster into certain categories. Certain themes emerge from the different categories. These themes were discuss in-depth in Chapter 5. The information gather from literature study and information from the research were dissected serves as the basis of Chapter 6. One of the aims of the DMA is not to develop a new structure, but rather make use of existing structure by incorporating

them into disaster management structures such DMCs. The proposed Multi-Agency ICS Model for the Local Government Level in South Africa address this problem.

CHAPTER 7: RECOMMENDATIONS AND CONCLUSIONS

7.1 INTRODUCTION

Given the research presented in the preceding chapters, this chapter explains the contribution of the theory and empirical findings to the integration of DRR with national multi-sectoral planning. This is achieved through the evaluation of the study's objectives. Each chapter of the research was structured to achieve a particular objective. The purpose of this chapter is therefore to provide evidence that the objectives of the study have been achieved in full. The chapter further presents conclusions and recommendations on mechanisms to integrate ICS into existing structures. It also stipulates how the study contributes to the body of knowledge in the field of ICS.

7.2 OVERVIEW OF CHAPTERS

Chapter 1 of the study provided an overview and acknowledged that DRR is a long-term national investment that should be prioritized by a country's ministries. It should be revised regularly to keep up with progress and environmental and social demands. The chapter further revealed that responding to and managing incidents, emergencies or disasters take a multi-disciplinary and multi-sectoral effort.

The chapter subsequently identified the need for a multi-agency ICS for local government. In an effort to address the problem comprehensively, the study identified six research questions and objectives with the understanding that addressing these

questions and objectives would achieve the goal of attending to the problem statement.

Chapter 2 positioned the theoretical foundation of the study with an investigation of organizational theory that begins with the Industrial Revolution. The discussion presented the philosophical constructs and major schools of thought that evolved over time and reflected on the contributions of specific identified scholars, researchers or practitioners. The chapter furthermore identified organizational theory as a theoretical foundation that could aid the objective of the study, as the insights on the performance of organizations and the behaviour of groups and individuals offer an understanding of what is needed to reduce disaster risk. This chapter identified the important role that organizations have in society by revealing that organizations contribute by delivering a service or a product.

This provided knowledge and insight into the way organizations operate in the response to or in the management of an incident, emergency or disaster. The effective implementation of a model for a multi-agency ICS for local government requires a number of diverse organizations to be successful. While the chapter examined the contribution of eminent scholars and practitioners to organizational theory throughout its development, it also presented the various components of organizational theory.

Chapter 3 focused on how organizational theory influences different ICSs. In essence, this chapter examined and explored existing ICSs. The chapter also presented a discussion on the origin of the concept of an ICS and its importance in the management and response to an incident, emergency or disaster. The state plays a primary role in the implementation of an ICS and in view of this, a discussion of the South African state system was provided. This was followed by a discussion of the

origin and evolution of government departments within the South African environment. Chapter 3 further presented an in-depth discussion of the progress made in the South African environment to develop a multi-agency ICS for local government. The last part of Chapter 3 looked at international ICSs in use.

Whereas Chapter 3 focused on international and local ICSs, Chapter 4 focused on the empirical research method to yield data. The data recovered from international and local respondents were categorized according to Tesch's research method and seven themes were identified. Based on the empirical findings discussed in Chapter 5, the seven themes became the cornerstone of the model for multi-agency ICS in Chapter 6. These three chapters culminated in the conclusion and recommendations offered in this chapter.

7.3 ACHIEVEMENT OF THE OVERALL OBJECTIVE OF THE STUDY

This study developed a model for a multi-agency ICS for local governments in South Africa with a view to assist government and other multi-agency stakeholders in integrating their resources, skills and methods into one structure, thereby reducing disaster risk at the local government level. As such, the study successfully reached its overall objective.

7.4 ACHIEVEMENT OF INDIVIDUAL OBJECTIVES OF THE STUDY

The overall objective was divided into six secondary objectives. All of these objectives were formulated to complement one another to achieve the main objective of the study. The chapters were systematically sequenced and contextually aligned to ensure a link between the chapters, thereby contributing to the development of the

model. The achievement of each individual objective as stated in Chapter 1 of the study is outlined below.

7.4.1 Objective 1: Exploring, defining and analysing the theoretical approaches underlying multi-agency emergency response and ICSs

The definition, examination and analysis of organizational theories were successfully addressed in Chapter 2. As the focus of the study was on integrating ICS into local government, focus was placed on organizational theory and organizations. The purpose of this discussion was to address questions related to how to achieve organizational goals; how to achieve results by structuring activities; how organizations function and how they affect and are affected by their environment. Furthermore, organizational theory was studied since it makes an important and useful contribution to the study of government and public management. Organizational theories as they developed from the Industrial Revolution until now were explored, including the classical organizational theory, its antithesis, the neoclassical / human relations theory, and the synthesis of these, the modern organizational theory / open-system theory. This built a strong theoretical foundation for the study. This exposition included the basic tenets and assumptions of each school of thought and contributions made by major writers or scholars throughout the historical evolution of organizational theory.

Whereas Chapter 2 provided an overview of the organizational theory and its key components, Chapter 3 gave the reader an overview of EMSs and ICSs in use. This chapter examined and explored how organizations can use organizational theory to survive in a fast-changing environment such as response and management of incidents, emergencies or disasters.

7.4.2 Objectives 2 and 3: Describing the South African context in relation to the identified models for multi-agency emergency response and ICSs and explaining the statutory and regulatory requirements for multi-agency emergency response in South Africa

Chapters 1 and 3 provided an overview of the influence of the UN's DRR efforts on South Africa's disaster risk profile to provide the reader with a context to DRR practices and discourses in the country. The chapters also provided an overview of key legislation relevant to DRR and the national institutional and governance arrangements for this function in the country. The analysis of legislation revealed that the South African regulatory framework recognizes the multi-sectoral nature of DRR, which makes the adoption of an ICS into existing legislation easy.

7.4.3 Objective 4: Comparing the various ICSs in South Africa with international best practice

This objective was addressed in Chapter 3 by examination the existing models for EMSs such as the US NIMS and UK's integrated management system.

7.4.4 Objectives 5 and 6: Identifying and describing the different variables involved in a multi-agency ICS at local government level; and developing and elaborating on a common multi-agency ICS to be applied by the local government in South Africa

The development of the model in Chapter 6 is based on the theoretical foundations established in Chapters 2, 3, 4 and 5 and on the understanding of the South African context. This involved an analysis of existing legal instruments and frameworks

governing DRR in the country (Chapter 2 and 3). The model also drew from theoretical perspectives presented in Chapter 4 and 5, the international good practices explored in Chapter 3 and empirical findings discussed in Chapter 4 and 5. The ensuing discussion in this chapter focuses on the constructs that make up the model to provide an understanding that would aid the integration of DRR into national multi-sectoral planning in South Africa.

7.5 CONTRIBUTION OF THE STUDY TO THE BODY OF KNOWLEDGE ON DRR

The study contributed to the body of knowledge on DRR by firstly clarifying the theoretical basis for a multi-agency ICS for South Africa and secondly by exploring international ICSs in use. South Africa can learn from these insights and this can help the country to effectively develop and implement a multi-agency ICS for local government. Thirdly and most importantly, the study provides a model that can assist South Africa's government and the key stakeholders in their efforts to develop and implement a multi-agency ICS for local government.

7.6 AREAS FOR FURTHER RESEARCH

Some areas for further research have emerged during the theoretical and empirical investigations included in this study. These areas of further research are outlined below:

- Research should be done on a NIMS for South Africa. During the review of international good practices, it was striking that the US NIMS makes it mandatory for authorities to be prepared for any eventuality.

- The following aspects should be researched and clearly outlined as part of South Africa's policies: (1) measures to be taken for the prevention of disasters or the mitigation of their effects; (2) the integration of mitigation measures in development plans, United States DHS measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster; and (3) the roles and responsibilities of different ministries or departments of the government.

7.7 LIMITATIONS OF THE STUDY

A national ICS should become a function of all the different levels of government in South Africa, with all the different spheres contributing complementary roles, powers and duties. This means that an ICS can only be effective if taken up in legislation. In this regard, it is important to note that this study is limited by its focus on how to implement an ICS successfully at a local government level. More research should be done on the integration of ICS at the local government level. An ICS is only one part of a NIMS and provincial and national governments use the same planning.

7.8 RECOMMENDATIONS

The available literature and observations in the field of response to and management of events, incidents or emergencies indicate that there is a degree of uncertainty in this field. This study involved international and local multi-agency stakeholders in an effort to develop a model for a multi-agency ICS to managing and respond to events, incidents or emergencies. The different international and local multi-agency stakeholders were given the opportunity to express their views on a model for a multi-

agency ICS at a local government level. The following recommendations are based on the findings presented in Chapter 5.

7.8.1 Recommendation 1:

The Minister of Cooperative and Traditional Affairs and the NDMC should acknowledge the need for the standardization of an ICS at the local level in case of a multi-agency response to an event, emergency or disaster. Local government is the lowest levels where services are delivered to communities. Events, incidents, emergencies or disasters should be managed locally, so a standardized ICS should be developed for local governments to improve the networking between multi-agency stakeholders.

7.8.2 Recommendation 2:

The ICS should be used on a daily basis by the different multi-agency stakeholders as well as in any incident, emergency or disaster.

7.8.3 Recommendation 3:

The NDMF Enabler 2 (education, training, public awareness and research) place emphasis on research and training. Therefore, the ICS model can be used as a starting point by researchers to improve the model by continuous training and evaluation in a multi-agency environment.

7.8.4 Recommendation 4:

New technologies and techniques are available and should be incorporated into existing structures to protect the lives of emergency workers in dangerous situations (e.g. satellite remote sensing is the ideal tool for disaster management, since it offers information over large areas, and at short time intervals). The main aim of ongoing maintenance is to leverage science and technology to improve capabilities and to lower cost.

7.9 CONCLUSION

The UN DRR and other frameworks had a huge impact on South Africa legislation and revealed the importance of having sound legislation to manage disaster risk more efficiently. Given the fact that South Africa continues to incur losses as a result of incidents, emergencies or disasters, it is becoming increasingly urgent that the country integrates efforts to respond to and manage these situations. The study has provided detailed information to underline the importance of integration. Although the Disaster Management Act (57 of 2002 as amended) is in place, there is no national standard for multi-agency response to and management of incidents, emergencies or disasters at the local government level.

The study employed both theoretical inquiry and empirical research to examine the existing international and national legal instruments and institutional arrangements for emergency management.

The development and implementation of such a system will change the negative perception of different multi-agency stakeholders because they will know exactly where they fit in to the bigger picture. This could help the country to mitigate the consequences of adverse events.

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APPENDICES

APPENDIX 1: RESEARCH QUESTIONS

I am Peter J Brazer, and I am enrolled in the PhD programme at the North-West University in South Africa, Potchefstroom Campus in South Africa.

The purpose of the research is to investigate different EMSs such as ICS in use over the world and to develop an incident command system model for local government for South Africa.

Background Information

Name:

Contact details:

Institution:

Male/ Female:

Your position (e.g. disaster manager) and level you are functioning in incident, emergency or disaster management (e.g. national, provincial or local, volunteer, private or NGO):

The number of years involved in incident, emergency or disaster management:

The compiled document can be forwarded to my e-mail address: pjbrazier@gmail.com on 2015-09-18.

Please respond to the following questions. I value your feedback, and it will help me in my research as mentioned.

1. On what level are you operating in the management of incident, emergency or disaster in your country, organization, or institution?

Strategic, Operational, Tactical, Training, Volunteer, Private, Community, Volunteer or NGO.

2. According to your knowledge what is an ICS?
3. According to you, is an ICS currently in use by your country effective and efficient to the needs?

If yes explain why:

If no explain why and what would you see could be changed?

4. How did the need arise for implementation of an ICS in your country/ organization/ institution?
5. The ICS in use in your country, can you identify the different components?
6. If you could design an Incident Command System for your country, according to you what will you exclude or include in the exiting ICS?
7. ICSs regulated by legislation or policy?
8. The ICS in use by your country, organization, or institution, is it NGO/ private/ volunteer friendly?
9. Is ICS a component of your EMS?
10. Is your country making use of ICS?

If yes: please explain:

If no: please explain:

11. According to your knowledge regarding to ICS will it improve your capabilities to manage an incidents, emergencies or disasters positive or negative?

12. General comments:

Thank you for participating in this questionnaire.

PETER J BRAZER

APPENDIX 2: LANGUAGE DECLARATION



Director: CME Terblanche - BA (Pol Sc), BA Hons (Eng), MA (Eng), TEFL

22 Strydom Street
Baillie Park, 2531

Tel 082 821 3083
cumlaudelanguage@gmail.com

DECLARATION OF LANGUAGE EDITING

I, Christina Maria Etrecia Terblanche, hereby declare that I edited the
research study with the title:

**A MODEL FOR A MULTI-AGENCY INCIDENT COMMAND SYSTEM AT
LOCAL GOVERNMENT LEVEL IN SOUTH AFRICA**

for **PJ Brazer** for the purpose of submission as a research study for
examination. The changes were affected in track changes and comments,
and the consideration of the changes was left up to the author.

Regards,

CME Terblanche

Cum Laude Language Practitioners (CC)

SATI accreditation nr: 1001066

Full member of PEG