PREPAREDNESS REQUIRED FOR ENSURING BEST COORDINATED USE OF INTERNATIONAL URBAN SEARCH AND RESCUE ASSISTANCE BY EARTHQUAKE AFFECTED COUNTRIES

by:

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FOREWORD

For the last decades, the development of efficient international Urban Search and Rescue (USAR) response and international disaster coordination concepts has been an important issue for the United Nations and disaster managers worldwide.

In the international disaster response community there appears to be consensus that disaster response becomes ever-more complex with more international actors arriving on the scene of the disaster within a very short timeframe, thereby adding pressure on disaster managers in the affected country. In addition, the media adds stress on decision makers, challenging them to make best use of available resources.

The international disaster response community, in particular the International Search and Rescue Advisory Group (INSARAG) under the United Nations umbrella, have set the issue of improving international disaster response at highest priority on their agendas. Numerous workshops and lessons learned meetings have been held in recent years to analyse response operations after major disasters and to identify ways to improve the quality of international assistance and the coordination of international actors on the ground. The process was driven and shaped by experts in a vast variety of fields ranging from search-dog handlers, communication experts, rescuers, and logisticians to administrators, managers, diplomats and politicians.

It must be said that significant progress has been made in defining, introducing and applying USAR response standards and international disaster coordination procedures, including the development of tools and concepts that support these activities.

However, most of these findings were derived from expert opinion lacking systematic analysis on a scientific basis, resulting in development of new concepts on a trial-error basis with the inevitable consequence of revision and amendment of introduced procedures.

We feel that this dissertation provides the long-pending systematic scientific research and analysis of international USAR response. Furthermore, the paper presents in a clear and illustrative manner the characteristics and challenges of international USAR and disaster response and describes well the dilemma of countries overwhelmed by major disasters and subsequently confronted with international assistance in great variety and quantity for which they had not been prepared. In its conclusions, the paper confirms assumptions that had been made earlier but also identifies new aspects that have, so far, not been adequately considered.

We see the paper as an important contribution to the ongoing effort in the development of international USAR and disaster response coordination. The paper has the potential to serve as orientation for the international disaster response community to better understand the complexity of international disaster response coordination and to determine priority areas for further improvement in this field.

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ABSTRACT

Strong earthquakes are frequent catastrophic disasters occurring worldwide and often lead to structural collapse of buildings. Urban Search and Rescue (USAR) is the specialised process of locating, extricating and providing immediate medical treatment to victims trapped in collapsed structures. This research project aimed to identify the key preparedness efforts necessary by an earthquake affected country to ensure best coordinated use of international USAR assistance.

There is significant knowledge and experience resident within the international USAR community, some members of which have been involved in the field for many years. This qualitative research made use of a range of data collection tools including interviews and documentary analysis, to elicit data from people and organisations that span the globe. The result was a conceptual model of the cyclic relationship between *time*, *communication* and *understanding* in USAR preparedness.

The research concludes with a series of recommendations for improving both preparedness for and the operational delivery of international USAR assistance, and suggestions for further study.

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COMMONLY USED ABBREVIATIONS

ESB (Emergency Services Branch)

A United Nations (UN) branch within the Office for the Coordination of Humanitarian Affairs (OCHA) responsible for the provision of international humanitarian assistance.

FCSS (Field Coordination Support Section)

UN section within the ESB of the OCHA who's main purpose is to develop, prepare and maintain stand-by capacity for rapid deployment to sudden-onset emergencies.

GA (General Assembly)

The main deliberative organ of the UN composed of representatives of all member states.

INSARAG (International Search and Rescue Advisory Group)

A group of functional USAR specialists formed for the purpose of advising the UN on the development of standards and guidelines that should be adopted and used by all international USAR Teams.

LEMA (Local Emergency Management Authority)

Term used to describe emergency managers, decision makers and other official representatives in an affected country. LEMA is applied to all levels of government: national, provincial and local.

OCHA (Office for the Coordination of Humanitarian Affairs)

Is the focal point in the UN system for disaster relief coordination.

OSOCC (On-Site Operations Coordination Centre)

Coordinating group set up near a disaster and composed of staff from affected country, local officials, personnel from assisting country, and OCHA. It provides coordination of international resources in cooperation with the LEMA of the affected country.

Reception/Departure Centre (RDC)

Point of arrival/departure (normally an airport) established by the OSOCC (or 1st arriving USAR team). It is used to register all incoming international USAR teams.

UN (United Nations)

International organisation formed to promote international peace, security and cooperation under the terms of the UN Charter.

UNDAC (United Nations Disaster Assessment and Coordination Team)

An OCHA team designed for rapid assessment and onsite coordination missions following a sudden onset disaster.

Urban Search and Rescue (USAR)

The specialised process of locating, extricating and providing immediate medical treatment to victims entrapped in such collapsed structures.

Virtual OSOCC

Web based tool for disaster information management that is used for alert and notification after disasters that facilitates real-time exchange of information between stakeholders.

PART 1 - BACKGROUND AND STUDY DESCRIPTION

CHAPTER 1 - INTRODUCTION TO THE STUDY

1. INTRODUCTION

The intention of this introductory chapter is to provide the reader with a brief overview of the study. As such, it begins with a summarised explanation of the background of international Urban Search and Rescue (USAR) assistance. This background provides the setting for the research questions that follow. This is followed by an explanation of the rationale for the study. The chapter is concluded with an explanation of the assumptions and delimitations of the study.

2. BACKGROUND TO THE STUDY

A violent shaking of the earth's crust, otherwise referred to as an earthquake, is the result of volcanic activity or the sudden release of tectonic stress along fault lines (Reed, 1997). Earthquakes, as such, are potentially catastrophic disasters occurring worldwide and regularly result in the structural collapse of buildings (Cone, 2000). These collapses may result in entrapment of the occupants of these buildings. USAR is the specialised process of locating, extricating and providing immediate medical treatment to victims entrapped in such collapsed structures (Cone, 2000; Hogan and Burstein, 2002).

2.1. Preparedness and prevention

Despite some work in the area of earthquake prediction (CNN, 2005; USGS, 2005), earthquakes, unlike many other natural disasters, are considered unpredictable in nature. This makes planning for such events incredibly challenging (UNDP, 2002). It is often difficult for a country or region to justify the costs for the creation and upkeep of specialised USAR teams, especially considering that such a team is likely to be used very rarely (Barbera and Cadoux, 1991). USAR teams are more difficult to justify if a country has more pressing everyday public health disasters with which they have to deal (WHO, 2006).

There are steps that can be taken to mitigate or minimise the consequences of earthquakes. For instance, the use of advanced building codes can greatly minimise the effects of earthquakes (Valery, 1995). Japan has demonstrated the positive effects of advanced building codes since the great Hanshin-Awaji earthquake of 1995, with far less damage to buildings in subsequent earthquakes (Marino, Nakashima and Mosalam, 2005). However, there is still the possibility that such measures will be inadequate, resulting in incidents of structural collapse with persons trapped. In these circumstances the need for USAR is clear.

2.2. USAR response

To perform USAR effectively, there is a need for specially trained personnel as well as technical and often expensive equipment (Morris, 2002a). These teams can be very easily overwhelmed. For instance, a team of approximately sixty rescuers using a cache of equipment costing hundreds of thousands of US Dollars, could easily be exhausted on the USAR activities required in one multiple story collapsed concrete structure (Berthlin, 2005).

2.2.1. International USAR response need

USAR activities often need to be performed simultaneously at multiple sites, over large geographical areas. This considered, it becomes clear that there is likely to be a need for multiple USAR teams to tackle the rescue requirements of a major earthquake.

While the potential need for large USAR activities is clear, the costs of specialised USAR teams and the fact that they are rarely required, limits the number routinely available in an affected region at the time of an earthquake. It is for this reason that requests for international USAR assistance have become commonplace following such events.

2.2.2. The need for coordination

For many years, teams from various countries have routinely provided USAR assistance in the event of major structural collapse (OCHA, 2005). Together with the use of international USAR assistance, so too comes the need for effective coordination of such efforts. Effective coordination aims to ensure that the most appropriate USAR aid is used in the most appropriate location at the most appropriate time (INSARAG, 2006). The International Search and Rescue Advisory Group (INSARAG) was established in 1991 (OCHA-FCSS-INSARAG, Real time), as a result of initiatives started by some of the international USAR teams who operated at the 1988 Armenian earthquake that killed twenty five thousand people (Armenian, Melkonian, Noji et al., 1997). The USAR activities in the wake of the Armenian earthquake had been poorly coordinated (Redmond, 1990) and the establishment of an

advisory group was aimed at improving the response to future earthquakes (INSARAG, 2006).

2.3. The role of the affected nation

Under the coordination of the United Nations (UN) Office for the Coordination of Humanitarian Affairs (OCHA), the INSARAG has achieved much in ensuring that arriving international USAR teams are adequately prepared so as not to become a burden to the affected country they are assisting (INSARAG, 2006; OCHA-FCSS-INSARAG, Real time). It has however, become clear that there is a need to better prepare the potential receiving countries of USAR assistance to make more efficient use of this aid. Aid of any sort is only useful if it is effectively used (SCHR, 2004). Providing aid in itself is challenging. However, the provision of *appropriate* and *effectively coordinated* aid is more challenging still.

The overriding principle of sovereignty of states as found in the UN Charter (UN, 1964) is that each country is ultimately responsible for the management of any disaster within its borders. For this reason, it is essential that overall command and control of any rescue efforts in a country will ultimately be the responsibility of that state. Understanding this, there is obviously a need to ensure that officials in these affected countries have the skills and knowledge to coordinate USAR assistance they may request and receive from the international community.

2.4. Role of assisting nations

The extent to which countries that provide international USAR assistance should have a role in developing USAR capacity within the affected country for future events can be debated. It could be argued that international USAR assistance should not extend beyond reacting to a request for assistance following a single earthquake. It could equally be argued that USAR teams responding to requests for assistance from affected countries, and the sponsors they represent, have a moral obligation to add value in the longer

term. To date the development of the systems for international USAR deployment has focused on operational deployment in response to structural collapse; the official literature does not explore the broader responsibilities of the international USAR community beyond the immediate response.

2.5. Formulation of the research question

The research project focuses on optimising the donor-recipient dynamic to ensure effective use of international USAR assistance by an affected county. The goal is to answer the specific question of what preparedness should be in place to ensure that earthquake affected countries are able to make effective use of any international USAR assistance they have requested (Figure 1-1).

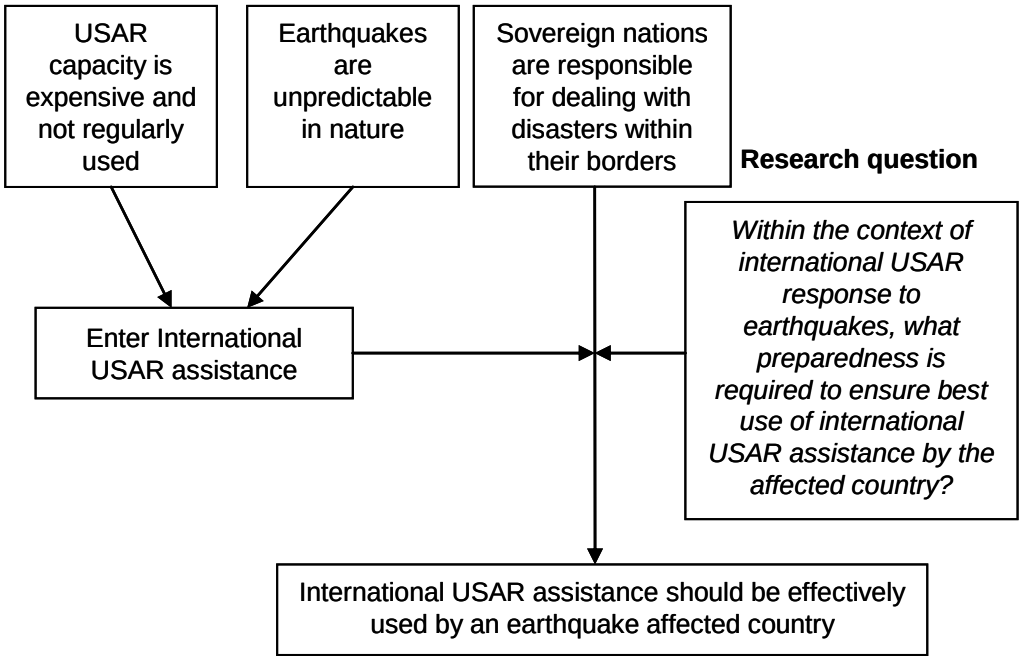

Figure 1-1 The donor-recipient dynamic in terms of international USAR assistance

3. STUDY PURPOSE

The purpose of this study is to contribute to improved coordination of future international USAR activities by identifying the key preparedness required of an affected country, which in turn will be used to inform guideline development and preparedness programs. To this end, the specific research questions have been defined below.

3.1. Main research question

The main research question for this study is:

Within the context of international USAR response to earthquakes, what preparedness is required to ensure best use of international USAR assistance by the affected country?

3.2. Sub-questions

International USAR assistance involves a dynamic between donors and recipients, and as such the sub-questions relate to each of these:

- What should a recipient country have in place to ensure it is best prepared for coordinated use of international USAR assistance?
- How should the donor USAR community contribute to a recipient country's preparedness for coordination of international USAR activities?

4. RATIONALE FOR THE STUDY

4.1. The need for investigation

Taking into consideration the fact that earthquakes lead to the overwhelming of local USAR resources, the need for some form of international USAR aid cannot be disputed. An increasing number of USAR teams are becoming involved in international USAR response (Erdogan, 2006; OCHA-FCSS-INSARAG, Real time).

Much has been achieved in the area of preparedness of responding teams to ensure they will be able to provide USAR assistance effectively without becoming a burden on the affected state (INSARAG, 2006). Over and above this there has also been some work in the area of developing local USAR capacity in previously affected and earthquake prone countries (OCHA-FCSS, Real time).

In comparison however, less has been achieved to ensure at-risk countries are well prepared to request, receive and coordinate such USAR assistance. The goal of this study is to provide insight into this aspect of the coordinated use of international USAR assistance by the affected country.

4.2. Lack of previous study

Until now evaluation of international USAR response and coordination efforts have been based primarily on the opinion of individuals within the international USAR community. This study represents the first comprehensive, systematic evaluation of this experience necessary for the progress of this developing field of international USAR response.

Disaster preparedness and disaster management is an exceptionally wide area of expertise. Even within the more focused area of international USAR assistance there is much to be researched. This study will not detail many of these areas. It has instead been designed to focus specifically on identifying the main components of preparedness for the coordinated use of

international USAR resources. This study will not concentrate on the operational preparedness of the international USAR teams, but on what should be in place in a potentially affected country in order to ensure they can make best coordinated use of the international resources that will arrive.

4.3. Use of results

The results of this research will be the basis for the development of guidelines on what efforts need to be made in a recipient country to ensure best coordinated use of future USAR aid initiatives. This information can be used in awareness and preparedness programs targeted at countries with high seismic risk, ensuring more effective and efficient use of the international USAR in the future.

5. ASSUMPTIONS AND DELIMITATIONS

5.1. Assumptions

The answering of these research questions has been performed with the following assumptions made:

- Firstly, this research is based on the assumption that all human life is equal in value and that the ultimate goal of all rescuers responding is to do the greatest good for the greatest number of people.
- Secondly, it is assumed that preparedness is ultimately the best philosophy for dealing with such major earthquakes. That is to say, we are better off having some sort of plan in place before an event occurs, rather than just leaving the response to the influences at hand at that time and place.

5.2. Delimitations

Further to the assumptions above it should be mentioned that the research questions and study design have been created in such a way so as to extract data specific to the response to collapsed structures as a result of earthquakes only. Other confounding factors that may contribute to the dynamic of international USAR response have been specifically excluded. Examples include geopolitical issues, conflict, and simultaneous complicating non-earthquake disasters.

6. OVERVIEW OF DISSERTATION

This dissertation has been split into two parts. The first of these is dedicated to the description of the study environment to provide a background to the research project. A review of the literature available on the topic is also covered in this part, and is followed finally by a detailed explanation of the study design.

Part two of the dissertation includes the results of the analysis and continues with an explanation of the theoretical integration of the major categories and concepts uncovered in the study. This second and final part of the dissertation concludes with a chapter dedicated to the findings of the study drawn on the basis of the theoretical integration and provides recommendations on how these may be used in the future.

CHAPTER 2 - ENVIRONMENT OF THE STUDY

1. INTRODUCTION

In order to appreciate the basis of this study it is necessary for the reader to have an understanding of the context in which it was conducted. This chapter has been written with the goal of providing the reader with a well rounded knowledge and understanding of the environment of international Urban Search and Rescue assistance (USAR).

In order to achieve this, the chapter begins by explaining what USAR is (Plate 2-1) and why it is necessary, followed by how it has become so widely used as a form of international humanitarian assistance. The chapter also provides some background on how this USAR assistance operates within the global environment of international humanitarian aid in response to sudden onset disasters. Following this, an overview of the operational tools already in place is provided.

Plate 2-1 Rescuers working in the rubble of a collapsed building (OCHA-FCSS, Real time)

2. WHAT IS USAR?

Incidents of collapsed structures are on the increase around the world (Cone, 2000; Thorvald, 2002; Turnbull, 2002). There are many different reasons why buildings and other such structures collapse. The causes can vary from natural disasters, such as earthquakes, through to human activities such as bad workmanship or intentional destructive acts such as bombings (Thorvald, 1995). Over and above these are other causes such as gas explosions or other technological disasters that may lead to the unexpected collapse of a building.

Regardless of the cause of collapse it is the presence of trapped persons requiring rescue that is of interest in this study. The numbers of those trapped and the manner of their entrapment depends on the type of structure (Sundnes and Birnbaum, 2003) as well as the occupancy of the structure at the time of collapse.

The way a building collapses contributes to the survivability of entrapped occupants. In some cases, buildings will collapse in a way that creates survivable voids in amongst the rubble (Thorvald, 1995; Collins, 2003). If survivors find themselves in these voids after the initial collapse (Sever, Erek, Vanholder et al., 2002), it may be possible for them to survive for some time depending on various factors including void size, physical injuries and weather conditions (Macintyre, Barbera and Smith, 2006). These survivable voids vary in size from just enough space for a small pocket of air around the head of a survivor, to openings large enough to hold several survivors who may even be able to move around freely inside them.

It is these survivors that need rescuing, which in turn necessitates teams with the appropriate expertise to free those that are trapped deeply below the rubble. This requires specialised ability to find and access these survivable voids, through the use of specialised search and technical rescue techniques. The aim of these techniques is to rescue the persons trapped in these voids without causing further collapse of the structure, which could kill survivors

before extrication can occur (Thorvald, 2002; Collins, 2003). These specialised teams are commonly referred to as Urban Search and Rescue or USAR teams.

2.1 The USAR team

While no formal definition of USAR exists (as in fact internationally there is not even consensus on whether the acronym should be US&R or USAR), it has been described as the location, physical reaching, medical treatment and safe extrication of casualties entrapped by a collapsed structure (Cone, 2000; Chiu, Arnold, Huang et al., 2001; Hogan and Burstein, 2002). A USAR team usually consists of several tens of persons all with specific roles. The need for such a large team is due in part to the labour intensive nature of USAR work as well as the requirement for many different technical specialities within the team. Most USAR teams, irrespective of their capacity, comprise the following four components as defined by the International Urban Search and Rescue Advisory Group (INSARAG) (INSARAG, 2006), discussed later in this chapter. These components are:

- Management;
- Logistics;
- Search;
- Rescue; and
- Medical.

These will be discussed in turn.

2.1.1. Management

A comprehensive, structured, team approach is required due to the complexity associated with ensuring the safe extrication of trapped persons from collapsed structures. The collapsed structure environment is fraught with risks that have to be considered (Castle and Owen, 2003). The management component (also referred to as planning in some national systems (FEMA, 1989; FEMA, 1994)) of the team is primarily responsible for bringing a structured method to the work that the team will do to ensure a safe approach.

The management component also acts as the focal point of that team in terms of liaison with other teams or organisations working at the event (INSARAG, 2003). A management component of an international USAR team is essential to their successful integration and use within the overall response in an earthquake affected country. It is also paramount that this management component is capable and understands the complexity of such work and the need for flexibility in approach (Williams, 2001; Collins, 2002b; Collins, 2005).

In cases where the international coordination infrastructure is not already established, the management section of the first international USAR team to arrive will be responsible for the creation and initial running of such structures (INSARAG, 2006; OCHA-FCSS, 2006). Where these coordination bodies have been set up, it will be the management team's responsibility to ensure that they work effectively with them. This may even require their providing a liaison office to the OSOCC (INSARAG, 2006; OCHA-FCSS, 2006).

2.1.2. Logistics

The logistics section of an international USAR team is an important component. USAR is an equipment and supplies intensive endeavour (Morris, 2002a), the management of which is complex and further complicated by the need to transport large volumes of bulky equipment between countries. For example customs and excise issues that may be attached to its import into the disaster affected country add complexity to the response. It is clear that international USAR response is heavily reliant on effective logistics management.

2.1.3. Search, rescue and medical

Finally the search, rescue and medical capacity in a USAR team are those components that work side by side in order to do the actual work of searching for rescuing of and caring for trapped persons. The work of these components is best described by using a detailed explanation of the scenario of a typical USAR team's sequential approach to the site of a collapsed building.

This sequence, usually follows the steps of a safety assessment (Oliver, 2005), search, victim access, medical stabilisation and extrication followed finally by victim removal (Collins, 2004). A detailed discussion of each of these steps will provide an insight into the actual work done by these rescue and medical components of the typical specialised USAR team.

2.2. USAR work

The work of a USAR team at the site of a collapsed structure ideally follows a systematic execution of defined steps toward the final goal of safe removal of the trapped survivor.

2.2.1. Safety assessment

On arrival at the site of operations, the first role of the team will be to ensure the safety of the working environment (Oliver, 2005). This will normally be achieved by the monitoring of the atmosphere around the working site as well as visually inspecting the site for any immediate dangers. This in itself is a continuous process and is not just performed at the beginning of the rescue effort. It is in fact not uncommon for a specific section of the team to be assigned to this role of safety monitoring throughout the time the team is working in the area.

2.2.2. Search

After ensuring it is safe to approach the site, the next priority for the team is to search the site for survivors. This can be performed in a number of ways. The simplest search techniques are standard surface search systems whereby the rubble pile is systematically and thoroughly searched by visual inspection. This type of very basic search is however, normally preformed by other survivors or the local rescue capacity long before the arrival of a specialised team (de Bruycker, Greco, Annino et al., 1983; Barbera and Macintyre, 1996; Chiu, Arnold, Shih et al., 2002). Generally these specialised USAR techniques, including canine and electronic searches (Collins, 2003), are employed when these basic approaches have exhausted their utility.

2.2.2.1. Canine search

This type of search technique using search dogs has been successfully used in many USAR operations (Chiu et al., 2002; Berthlin, 2005). The search-dog teams, consist of the search-dogs and their human handlers. These teams play an integral role in USAR due to their ability to rapidly detect victims buried deeply beneath the rubble following a structural collapse by following scent trails (INSARAG, 2006).

One of the major benefits of search-dogs is their capability to search large areas in a relatively short period of time and in this way improve the efficiency of the search process. Search-dogs do also, however, introduce extra complexities when they are used in the international USAR arena. The movements of dogs across national borders will often require special considerations to be taken, such as requirement for vaccinations and therefore present further complexity that has to be managed by the USAR team (INSARAG, 2006).

Plate 2-2 USAR team using sophisticated electronic search equipment (OCHA-FCSS, Real time)

2.2.2.2. Electronic search

Electronic search is normally used after the initial results of canine search have indicated possible live victims. The first type of electronic search equipment routinely used is specialised acoustic listening devices. These are highly sensitive machines that assess the structure for any sounds of life. By making use of different sensors that are progressively moved closer together,

a form of triangulation is used to pinpoint where the sounds are coming from. The second type of electronic search equipment is specialised cameras that that can be positioned into voids through narrow openings (Plate 2-2 on previous page) in order to be able to see if there are survivors inside.

2.2.3. Access

After the survivors have been located, the next phase of the rescue begins. This is the creation of an access route to the victims that are trapped. Depending on how deeply the victims are located, the process of accessing them may be relatively straight forward, involving little more than breaching or breaking through a wall or floor. If the victims are deeply entombed, other more time consuming access techniques may have to be used.

One of two approaches, or a combination, is generally used for this part of the rescue. These are the delayering or tunnelling techniques. Delayering is the process of progressively removing layers of building that have collapsed onto one another. This is usually achieved with heavy machinery such as cranes, in an effort to uncover those that are trapped beneath the collapsed parts of the structure. This approach is quite often quicker than tunnelling but holds a greater risk of causing secondary collapse into survivable voids within the building. This approach of delayering is quite often the approach that affected countries, without specialised USAR capacity, resort to by default.

Specialised USAR teams on the other hand, generally favour a combination of delayering and tunnelling, or in some cases tunnelling alone. Tunnelling, as the word describes, involves finding a route to the void space through the rubble by tunnelling through it. This approach does not come without complications and difficulties. Limited space and light are obvious issues, but there are others as seen in Plate 2-3. As tunnelling occurs, it is often necessary to stabilise the tunnel to ensure that it will not collapse onto the rescuers. Rescuers also have to pass various obstacles that may have to be removed or cut through in order to progress. This is further complicated by the likelihood of hazardous atmospheric environments that can occur in

tunnels and that have to be monitored continuously (Barbera and Cadoux, 1991).

Plate 2-3 USAR work in a confined space inside a collapsed structure (OCHA-FCSS, Real time)

2.2.4. Medical stabilisation and extrication

Once a victim is finally reached, the process of immediate medical treatment and stabilisation as well as extrication will have to take place (Ashkenazi, Isakovich, Kluger et al., 2005). Here again this may occur in an extremely confined space with the limitations this presents. Once this has been successfully achieved, the victim or victims can be removed, normally via the same tunnel route used to access them. In order to provide a greater appreciation of how it works in reality, the following actual account is included. Reproduced verbatim with permission from the publisher, this account tells of the rescue efforts of an international non-governmental organisation (NGO) USAR team (RAPID-UK) operating in the Pakistan earthquake of December 2005 and provides an excellent appreciation of the many realities faced in this sort of work.

2.3. An actual account

Quake lays waste to South Asia

…Monday October 10 (Day 3):

FOCUS Operations Officer requested RAPID-UK to send a team to the north to carry out an assessment around Muzaffarabad. Three members were scheduled to leave that afternoon while the remainder of the second team would leave the following morning. Team one would carry on with the search of the Margala Towers.

It was agreed with the military that around midday all machines would stop and personnel leave the site to allow another intensive sound location search for the missing woman. Unfortunately, no contact could be made – a low point for the team. Again, the Team Leader was under pressure to leave this area to the diggers; again he had to explain the principles of specialised equipment and that heavy equipment is a last resort.

Voice contact

During late afternoon a RAPID-UK search team made contact with the missing woman. Her voice could be heard faintly beneath the rubble six floors below and about five metres to the right of the first contact location. Rubble was removed while contact was maintained for a direction; a small void was created, allowing one member lying flat to slide in.

A large supporting concrete beam ran down to the right hand side, deep into the rubble; this would be used as a guide when progressively breaking and clearing rubble, re-bar and furniture between what was left of the floor and ceiling. The void was no more than 18 inches at its highest point (near the beam) to the right. To the left, the ceiling came down to meet the floor, crushing everything in its path. So a triangular void approximately one metre wide had been created, giving just enough room for one person to remove and pass things back. As the team progressed the voice was becoming a little clearer and it was assumed at that stage she was further down into this void.

During questioning the woman indicated she had her young two-year-old-son with her, but she could not find him, he was asleep, he could not breath… This gave cause for concern and indicated we were too late for him. She was asked to call to her son and try to wake him up so the member in the tunnel could get a location on him. To our amazement the child answered, although it was very hard to get a direct location.

As items were found, such as a wedding photo, carpet and a crushed armchair, they were described to the casualty and she confirmed that these were hers and that she had been in that room (the lounge) when the building collapsed. She repeatedly said: “He pushed me through the door, come through the door, I am near the door.”
Of course, there was no door or any remnants of a door, just a large supporting beam and two slabs of concrete with crushed items between. Approximately four metres into the void, a crushed settee blocked the way.
Next to this was a man’s body with a child entangled in his arms; both dead and trapped under the large concrete beam. The team was unable to move the bodies or cut away the settee. A member tried to crawl over the body to get further into the void but this was impossible.

After a re-assessment had taken place with the rescuer in the tunnel talking to the casualty and carrying out directional tapping with a chisel; the team realised she was the other side of the concrete beam.

The beam was too thick to cut through and this may have destabilised the voids so the team removed rubble the other side of the beam to work a way in with a parallel tunnel. A hole was drilled through the beam to allow a fresh flow of air and better contact. A light was shone through the hole and, using a small right angle mirror, the casualty was able to indicate that she could see the light and from which direction. It was now fairly clear where she was. The problem now was getting into her and her son.

Difficult egress

Slow progress was made down the opposite side of the beam, tunnelling between two slabs of concrete. Rescuers took turns to work in the confined space, lying on their stomachs or backs to remove crushed furniture, re-bar and rubble piece by piece.

This operation and egress into the void was made difficult by a high tensile bar running across the void about two metres in. Every effort was made to cut the bar but all failed; acetylene was not an option due to the confined space, the combustible materials inside and the dangers to the casualties. The only way past this obstacle was to lay on one's back, remove one's helmet, turn one's head to the side and slide underneath.

As rescuers progressed further they were able to make visual contact with the woman. She was approximately eight metres down in the building at the bottom of a sloping void. A crushed metal frame bed further restricted the access. The head and shoulders of the woman's husband were protruding into the void from under the beam, he was covered so that she would not see him and so rescuers did not have direct contact as they crawled through.

Medical attention

With two members now down in the bottom of the void giving medical attention to the woman they managed to locate the little boy who appeared uninjured. He was encouraged to crawl up the void towards the light of a third rescuer who was half way down the tunnel ready to take the child back. The boy crawled up the tunnel but kept toppling over, weak and confused by the light. The third rescuer rolled the child over into the crook of his arms and inched backwards flat to the floor protecting him from the hazards.

Outside members were ready to receive the first of the two casualties, a RAPID-UK medic was ready with a foil and wool blanket. A taped cordon was put around the area to prevent TV cameras and the public getting too close. A medical tent was set up in case treatment needed to be given prior to removal to hospital.

RAPID-UK members, together with military personnel, local engineers and firefighters lined the route to the medical tent to ensure stretchers could be passed down the line and over the rubble safely.

Once the child was out the team concentrated on the mother; she was loaded onto a drag sheet as it was impossible to get a stretcher in or out of the void. Hydraulic rams were used to bend the bar that was across the void and gain a few more inches to enable the casualty to be slid underneath with a little more clearance. Because of the tightness of this void it was impossible to carry out any propping and shoring. Once the woman was freed she was loaded onto a stretcher, stabilised and then passed down the line to the medical tent where a local doctor checked her over before she was removed to hospital.

The void was checked for any further signs of life while the remainder of the team returned to base camp to eat, drink and rest. Four members stayed on site to monitor the removal of loose rubble by machinery.

(Holland, 2005)

3. THE HISTORY OF USAR AND USAR ASSISTANCE

The history of USAR and international USAR assistance, are strongly linked to each other. It would appear that the concept of a team travelling abroad to assist a country in need of USAR capacity after a major earthquake is linked to the development of the concept of USAR as a whole (Cone, 2000). The earliest recorded major earthquakes, leading to significant human loss, can be dated back hundreds of years (Elnashai, 2002). The specific concept of USAR however can not be dated back further than the 1980s (Hogan and Burstein, 2002).

3.1. Where it began

While certain medical aspects of USAR, such as crush syndrome (Shimazu, Yoshioka, Nakata et al., 1997) are described in literature as early as World War I (Cone, 2000), the concept of USAR did not seem to gain specific recognition until some time later (Hogan and Burstein, 2002).

The first formal understanding of USAR as a specific rescue discipline seems to have evolved alongside the use of such teams to assist counties in need of specialised rescue expertise after major earthquakes. In this regard the earthquake affecting Mexico in 1985 and the Armenian earthquake of 1988 seem to be the first earthquakes that heralded significant international USAR assistance (de Bruycker et al., 1983; Armenian et al., 1997).

3.2. Further growth

From this time on there has been a steady use of international USAR aid in earthquake affected countries with the longest single break between such major deployments being only three calendar years. Why this phenomenon of USAR aid seems to have begun to grow at this point can most likely be attributed to the concurrent advances in communications technology at this time. As well as allowing for an emergence of a strengthened international mass media’s coverage of such events live, this technology has also made it possible for information to be received out of the affected area more rapidly.

The continued increase in use of USAR in the years that followed this initial development in the 90's, most likely has a lot less to do with communication technology and the mass media, and a lot more to do with an increasingly credible terrorist threat on society (IJOCC, 2004).

3.3. The role of the terrorist threat

The actual need for USAR capacity can vary depending on the amount of risk that exists. Until some years ago, the most significant risk for building collapse was earthquakes. This is evident from the observation of a leading USAR rescue equipment manufacturer. They noted that with the exception of a handful of developed countries who either had a significant seismic risk of their own or were already actively involved in the deployment of USAR teams to other countries, most other countries had little or no USAR capacity a few years ago (Reefman, 2004). Since the September 11th 2001 terrorist attacks on the USA (Cook, 2001) with the ever looming threat of terrorist activities that followed, there has been increased interest and activity to develop USAR capacity in the developed world, including areas that do not have significant earthquake risk of their own (Reefman, 2004).

It can be concluded that prior to the increase in the threat of terrorist activities leading to building collapse, much of the developed world did not consider specialised USAR capacity as a major priority, unless they had their own seismic risk for which they had to be prepared. One example of this is the New Dimension Project launched by the United Kingdom Government in the aftermath of the September 11th terrorist attacks. This project, which included massive funding from central government, was specifically focused on developing and strengthening emergency rescue response, in the event of terrorist activity on UK soil in the future (ODPM, 2005).

3.4. Increased USAR capacity available internationally

Many more countries now have specialised USAR capacity that previously did not exist (Erdogan, 2006). This has in turn, led to more countries finding

themselves in the position of being able to provide international USAR aid in the event of a major earthquake in another country. Some even theorise that such countries see these events as an opportunity to practice their USAR capacity in a real situation in preparation for any response they may need to perform within their own borders. The net result is that more USAR teams are active with the subsequent requirement that there activities are coordinated.

Plate 2-4 INSARAG logo (OCHA-FCSS, Real time)

3.5. The establishment of the INSARAG

Another significant development in the history of USAR and more importantly international USAR assistance, was the development of the INSARAG. As a result of the need for better coordination of the international assistance provided at earthquakes, INSARAG was established in 1991. The establishment of this group followed initiatives of the international USAR teams who operated together in the Armenian earthquake and other such events of that time. So as not to duplicate existing structures, the group was created within the framework of existing humanitarian coordinating within the United Nations. To this end the group's secretariat falls within the Field Coordination Support Section (FCSS) of the Emergency Services Branch (ESB) of the OCHA (INSARAG, 2006; OCHA-FCSS-INSARAG, Real time).

3.6. INSARAG's historical achievements

Under this umbrella of the UN, INSARAG went on to successfully pursue the creation of a UN General Assembly (GA) Resolution on Strengthening the Effectiveness and Coordination of International USAR Assistance (UN, 2002). This resolution is widely considered to have underpinned much of the progress achieved by the group over the last fifteen years.

Other work that the INSARAG has achieved over the years includes:

- The establishment of a world-wide network of disaster relief organisations in three INSARAG Regional Groups in Africa/Europe, Asia/Pacific and the Americas.
- The development of international guidelines for USAR operations to ensure standardised training and structures of international USAR teams.
- The development of internationally accepted markings for use on buildings in USAR operations to improve communication of USAR teams on site.
- The development of the methodology for the establishment of a reception/departure centre at the entry points into the affected country to better coordinate team assignment and logistics support on site.
- The development of a concept for rapid disaster assessment and coordination (the United Nations Disaster Assessment and Coordination (UNDAC) concept).
- The provision of resources for the establishment (i.e. personnel, training and equipment) and mobilisation of these UNDAC teams.
- The development of the concept of On-Site Operations Coordination Centre (OSOCC) in sudden-onset disasters in general not only earthquakes.
- The establishment of a 'Virtual OSOCC' on the Internet for real-time information exchange during ongoing emergencies among involved disaster managers.
- The development of an international USAR team assessment and classification program. (OCHA-FCSS-INSARAG, Real time)

The use of specialised USAR teams even within ones own borders has various logistical and political complications attached. When this USAR assistance is offered and received across borders many more complications arise. The world of international USAR aid is a global environment with all the complexity of donors, recipients, foreign affairs and international law included (Katoch, 2006). Missing from the list of achievements above is the

exploration of concepts for increasing local capacity for coordination of international assistance provided to earthquake affected countries.

4. THE GLOBAL ENVIRONMENT OF INTERNATIONAL USAR ASSISTANCE

Taking into consideration the fact that major earthquakes routinely lead to local USAR resources being overwhelmed, (FEMA, 1989; FEMA, 1994; Johnson, 1998; Hsu, Ma, Lin et al., 2002; AP, 2006; Castle and Owen, 2003; IFRC, 2004; Erdogan, 2006) the need for international USAR assistance in the form of specialised USAR teams cannot be disputed. For this reason, the mission created by the INSARAG was to develop effective international relationships in order to save lives and render humanitarian services following natural or man-made disasters. To this end, the activities of the INSARAG include the improvement of emergency preparedness and cooperation between international USAR teams as well as the promotion of information exchange on operational procedures and lessons learned (INSARAG, 2006). It is for this reason that this group has been so central to the study, as it represents the only international group with this specific role.

As a result of the efforts of participating countries that collectively make up the INSARAG, these INSARAG participants have developed a common understanding of the functions and operations of USAR teams resulting in the development of an international USAR response system. Under the coordination of the OCHA, this group has achieved much in ensuring that arriving international USAR teams are adequately prepared so as not to become a burden to the affected country (INSARAG, 2006).

Despite clear progress, much still needs to be achieved in terms of those receiving this international USAR assistance. The Local Emergency Management Authority (LEMA) of the affected area ultimately has to be able to receive and use this assistance effectively if it is going to be effective at saving lives. This is the topic of this study.

4.1. Complexities and challenges

Within the UN system, the responsibility for coordination of an international UN natural disaster response, as well as UN complex emergency response,

ultimately rests with the UN Emergency Relief Coordinator (ERC) who is also the Under Secretary General for Humanitarian Affairs and head of the OCHA (OCHA-FCSS, 2006). As will be discussed at length in the review of related literature in Chapter Three of this dissertation, disaster response is an issue in which the UN GA has been engaged for over forty years and as such has passed many resolutions on the topic. Response of international USAR teams into an earthquake affected country occurs under the umbrella of this organisation, but at the same time is not governed by it (OCHA-FCSS, 2006). Indeed the provision of and receiving of aid of any sort, including USAR assistance, is finally always a product of an agreement between two countries or a country and a non-governmental organisation (NGO). These agreements are referred to as a bilateral arrangements (OCHA-FCSS, 2006).

It is the role of the INSARAG, as well as other disaster management tools, to coordinate these bilateral arrangements into the unified, organised and effective response they should be (OCHA-FCSS, 2006). International USAR assistance is fraught with complexity and challenge and some of these are highlighted in the following sections.

4.1.1. Overwhelmed local mechanisms

The very nature of the event is likely to lead to the recipient county's local and national disaster management systems that are normally in place being overwhelmed (FEMA, 1989; FEMA, 1994; Johnson, 1998; Hsu et al., 2002; Castle and Owen, 2003; IFRC, 2004; AP, 2006; Erdogan, 2006). As a result, those individuals normally responsible for coordination of such situations, are suddenly required to take on board extra resources from abroad that they may not understand in addition to their existing responsibilities.

4.1.2. Information management challenge

There is often a lack of accurate information or in some cases even the dispersal of inaccurate or confusing data on the actual state of affairs (Boodram, Torian, Thomas et al., 2002). In many cases, the sheer magnitude of the event only becomes apparent after some time (Bateman, 2001). This leads to decisions being made on the basis of inadequate or incorrect

information. The consequences of these decisions are normally the creation of a frustrating circle of confusion resulting in ineffective use of resources. The language divide adds complexity (Morris, 2002b).

4.1.3. Emotionally charged environment

Despite the need for a rapid deployment the actual state of affairs is often only fully understood some days after the impact. This emotionally charged environment where substantial loss of life has occurred, in some cases also the loss of key decision makers of the LEMA, can lead to significant stress for those who have survived and are now expected to be dealing with this massive event (Bateman, 2001; Ishikawa, 2004).

4.1.4. Fear of appearing out of control

On many occasions countries are reticent to make use of international disaster response assistance. This can be attributed to a mistaken perception that to request international assistance will be seen as a sign of weakness. The potential exists for national pride leading to delays in requests for assistance.

4.1.5. Media pressure

The ever increasing presence of the national and international media at such events adds complexity. The opportunity for scrutiny that the press provides adds a new dimension to the decision making process and the requirement for press liaison has resource implications. The pressure from the media adds to the already emotionally charged event (Barbera and Cadoux, 1991; Dufresne, 1997; Erdogan, 2006). A further significant influence of the media is the fact that increased numbers of responders with little experience and the wrong motives are now responding due to this media interest (Katoch, 2006).

In some cases, through circumstance, an overwhelmed sovereign nation is not necessarily in control. The arrival of highly skilled professional teams who are capable of leading could potentially lead to tension in the donor-recipient relationship.

4.2. Lack of understanding

While many in the international humanitarian aid community question the cost effectiveness of international USAR teams, there is often little understanding of the fact that they are focused on the rescue of deeply entombed victims. These teams operate on the basis that the remaining numbers of patients are usually small in relation to those who will have initially been rescued by local professional rescue resources or other survivors. Yet, these small numbers of deeply entombed victims still need to be rescued and this is where these teams can make a difference (Morris, 2004). In some instances the cost versus benefit calculations may not appear to support the efforts (Aoki, Nishimura, Pretto et al., 2004) but as pointed out by Barbera and Macintyre (1996) in their review of such team's work from the medical perspective, motivation for rescuing those deeply entombed include:

- That in most societies each life is equally valued. While budgeting occurs, in practice, when it comes down to the actual event, every possible effort is taken to save life.
- Moving from response to recovery is often delayed until these rescues have been completed. Until this has occurred much attention and resources are given to search and rescue.
- It is in most cases difficult, if not impossible, to move families and friends away from the dangerous areas until rescues or even body recoveries have taken place.
- Survival of the victims is important not only to the victims but also to the family. In many cases, especially where the overall impact is large, successful rescue of victims also contributes to the national or local psyche.

(Barbera and Macintyre, 1996)

4.3. The initial sequence of events in ideal circumstances

When international teams finally arrive in the country the effective integration of these resources into the national response can be challenging for all

involved. It is important however to consider how much has to happen before such teams arrive in the affected nation. In order to help the reader to understand this, the following narrative of the chain of events that would most likely be followed has been written.

In the narrative one will also begin to see how different tools such as the Virtual On-Site Operations Coordination Centre (Virtual OSOCC) are used in this process. The Virtual OSOCC is an on-line information exchange and coordination tool for disaster managers and international response organisations. The Virtual OSOCC is used by responders during major disasters to exchange information in order to facilitate their decision-making for international assistance (OCHA-FCSS, Real time).

4.3.1. The chain of events (a narrative)

It all starts with an event, in our case a violent shaking of the earth. An earthquake has occurred. This will usually not last longer than a few seconds but the destruction may be enormous. With the exception of those who actually felt the shaking, and have survived to tell the story, there are few others that know what has happened. Earthquakes are continuously being detected and recorded by a global network of seismic detectors. These detectors are maintained by different organisations around the world. Within minutes of an earthquake, such as this one, these organisations will automatically share their information of the event to allow for rapid automatic determination of the earthquake's characteristics by computation centres (UN-GDACS, Real time).

The Global Disaster Alert and Coordination System (GDACS) is one such centre. Located at the European Union's Joint Research Centre in Ispra, Italy, GDACS provides near real-time alerts about natural disasters as well as providing tools to help facilitate response coordination, including news and maps to the virtual OSOCC. The GDACS earthquake impact model is built on the seismological infrastructure that allows it to obtain rapid estimations of location, magnitude and depth of earthquakes. In order to ensure robust information gathering, GDACS collects information from various sources. To

this end GDACS collects information every five minutes from the following sources:

- United States Geological Survey National Earthquake Information Center (NEIC): http://neic.usgs.gov/.
- European-Mediterranean Seismological Centre (EMSC): http://www.emsc-csem.org/.
- GEOFON Programme of the GeoForschungsZentrum (GFZ) Potsdam: http://www.gfz-potsdam.de/geofon/.

(UN-GDACS, Real time)

Once the information about the earthquake has been collected by GDACS a disaster alert would be triggered automatically by the automatic computerised monitoring and impact estimation tool, called Asgard. This would be a primary alert and would immediately be sent to all those that have subscribed to receive such alerts. Depending on the initial data, such as magnitude, depth and populated area affected, this alert will be classified as a red, orange or green status event. Red, orange and green represent levels of severity, with green being the least serious, through to red, the most serious. Based on this a schedule of notification alerts are implemented. These alerts, as well as the initial information out of the affected area, will start a cascade of involvement if the event is large enough to possibly require international assistance.

At the sight of our earthquake, the response will be two-fold. Firstly, there will be a local response from those emergency services on the ground in the affected area, the LEMA. In some cases of course this response may not even happen or may be greatly diminished if, for instance, the event has overwhelmed this response capacity. Secondly, news will also likely have reached the national level of the affected country where this will trigger a national response and may lead to overall command and control moving from a local to a national level. In some cases, time is lost in this phase as the national bodies may not have all the information about the magnitude of the event. It is not uncommon for this interval in the timeline to take days.

Simultaneously, activities will continue within the traditional USAR donor community. Subscribers to the first level of alert notification will have accessed the Virtual OSOCC to read the full details of the information feeds from Asgard. Based on this information, as well as other sources, entries will be made on the breaking emergencies section of the Virtual OSOCC. These entries can be made by any of the over four thousand disaster managers, from around the globe, that have access to the Virtual OSOCC. It may even be decided at this point, by any one of these users, to create a secondary alert which is more widely distributed. This is a critical point in the process as this step usually results in many higher level decision makers taking notice of the unfolding disaster.

As more of the donor community become aware of the event they will start the process of deciding whether to send a response to the situation and in what form this response should be. The actual response can however not occur without some sort of official request from the affected country. While it can be very frustrating for the donor community to wait for this request and other information, it must be well understood that the affected country will be occupied with assessment of the affected area. This assessment is crucial as it allows the national decision makers in the affected country to understand the extent of the situation and will provide the necessary information to inform the highest level of government. This is necessary to facilitate the decision to request for international assistance or not, and how this request should be formulated.

By this point the extent of the event will have caused a Virtual OSOCC moderator to create a dedicated topic for the event on the Virtual OSOCC. On this newly created section of the Virtual OSOCC many international donors will be asking for, as well as providing, information about the event and whether or not international USAR teams or other aid will be required. Once the affected country has made the decision to request assistance, the coordination of international USAR assistance will commence.

While the information collection stage continues, the international USAR teams will be rapidly preparing for deployment. A critical part of this preparation includes the posting of their team information on the Virtual OSOCC. This information should help in the coordination of the arriving assets in the affected country. They also provide the starting point for analysis of how much assistance is being provided and how much is likely to be needed. On the basis of final details from the affected country on where best the international teams should fly into, the teams will leave their home countries en-route to this arrival point.

5. COORDINATION TOOLS ALREADY DEVELOPED

The requirement for coordination of international USAR assistance adds a third dimension to the donor-recipient dynamic – the coordinators. The donors are the international USAR teams themselves. Their involvement is the product of the bilateral arrangement between the affected country and the sponsor of the team whether that is a government or a non-governmental organisation. The affected country is the recipient. They are the group receiving and using the donated USAR assistance. The third party involved are the coordinators. This is a relatively complex role to fill as they have the responsibility of providing the link between the donors and recipients, without necessarily being party to all communication between them (Figure 2-2). Within the context of international USAR assistance, this role consists of translating the needs of the donors and recipients to each other while at the same time helping the recipients to make best use of the various resources the different USAR teams made available to them (OCHA-FCSS, 2006).

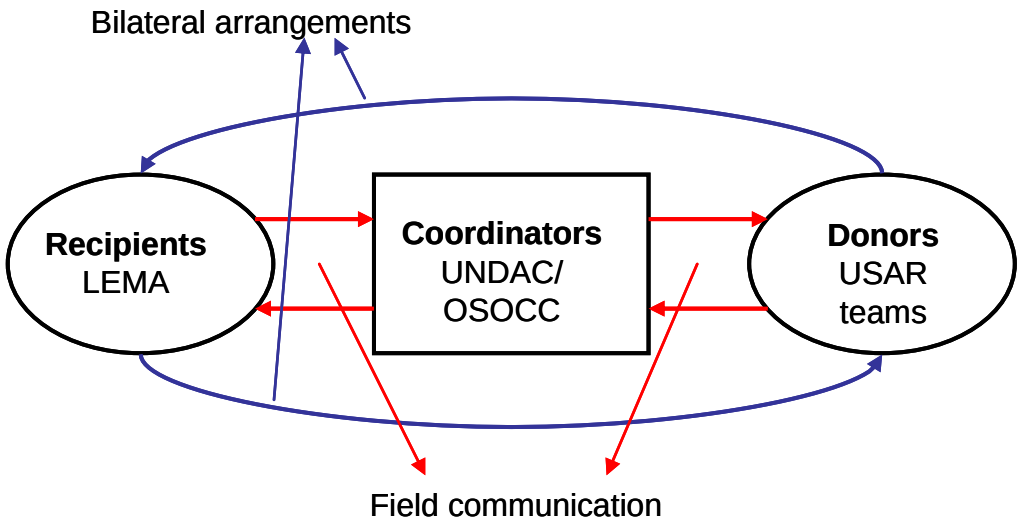

Figure 2-2 Lines of communication in response to earthquake showing OSOCC as central communication link

In order to facilitate the coordination of specialised USAR teams, a number of operational tools have been developed and are being used by the international USAR assistance community.

Four primary tools are used to assist with coordination. These are supplemented with a range of standardised procedures and guidelines. The primary tools are the Virtual OSOCC already described above in the initial sequence of events, the Reception/Departure Centre (RDC) and the On-Site Operations Coordination Centre (OSOCC). The OSOCC and the RDC are normally staffed and run by an UNDAC team (OCHA-FCSS, 2006). Other tools used by the international USAR aid community and developed out of the work of the INSARAG, include the USAR team classification concept, the worksite triage system and finally the standardised USAR team marking and signalling systems (INSARAG, 2006).

5.1. Virtual On-Site Operations Coordination Centre (Virtual OSOCC)

The Virtual OSOCC not only plays a vital role in the initial events of deployment as discussed above but is equally as valuable a tool in the operational phase of an international USAR deployment mission. Earthquakes may render maps inaccurate (ESA, 2004). With this in mind the ability to download satellite images and other maps certainly helps in operational planning. Through the Virtual OSOCC such maps and satellite imagery can be requested from the appropriate bodies (UN-GDACS, Real time). The Virtual OSOCC also provides a platform for regular information updates on the activities of all major players involved in the disaster (OCHA-FCSS, Real time).

5.2. The UNDAC system

The UNDAC team system is designed to assist the UN in meeting international needs for early and reliable information during the first phase of a sudden-onset emergency and in the coordination of incoming international relief at national level and or at the site of the emergency (OCHA-FCSS, 2006). It is designed to deploy staff and experts at very short notice, (between twelve to twenty four hours) anywhere in the world (OCHA-FCSS, 2006). It also aims to advise national and regional disaster response capacity (OCHA-FCSS, 2006).

In order to be able to achieve this role the UNDAC system consists of four components:

- Staff - Professional and experienced emergency managers made available for UNDAC missions by their respective governments or organisations together with Office for the Coordination of Humanitarian Affairs (OCHA) staff. UNDAC team members are specially trained and equipped for their task.
- Methodology - Predefined methods for coordination including the collection and management of information, assessment as well as structures for coordination support during the first phase of a sudden-onset disaster or emergency. UNDAC methodology is designed to fit any disaster anywhere around the world.
- Mobilisation procedures - Proven systems to mobilise and deploy an UNDAC team so that it can arrive within 24 hours at any disaster or emergency site anywhere in the world.
- Equipment - Adequate personal and mission equipment for the UNDAC teams to be self-sufficient in the field when deployed.

(OCHA-FCSS, 2006)

5.3. On-Site Operations Coordination Centre (OSOCC)

An OSOCC is designed to facilitate the coordination of the international relief community in a disaster or emergency. The OSOCC concept was originally developed by the INSARAG and the then United Nations Department of Humanitarian Affairs (DHA), later OCHA, to assist affected countries in coordinating international search and rescue teams in the aftermath of a catastrophic earthquake (OCHA-FCSS, 2006). However, the emergency management principles behind the OSOCC's scope, structure and procedures make the OSOCC an effective tool in any sudden-onset disaster involving international relief resources.

An OSOCC has three main objectives:

- To provide a system for coordinating and directing the activities of an international relief effort at the site of a disaster/emergency such as to coordinate the activities of international USAR teams.
- To provide a framework or platform for cooperation and coordination among the international humanitarian entities at a disaster or emergency site.
- To act as a link between such entities and the affected country's authorities.

Over and above this the following actions are expected to be taken by the OSOCC in a USAR-operation:

- Identification of a suitable location for the OSOCC, ensuring visibility for incoming resources, e.g., flags, directional signs, etc.
- Identification of potential locations for the Base of Operations (BoO) of USAR teams.
- Coordination activities with LEMA and agreement of the role of OSOCC regarding the coordination of international assistance and aid and establishing information exchange process between LEMA and OSOCC.
- Identification of locations and establishing of procedures for access to resources such as the following:
    - cranes;
    - loaders;
    - forklifts and lorries;
    - petroleum products;
    - timber;
    - compressed gases;
    - interpreters; and
    - guides.
- The recording of USAR team fact sheet information of incoming resources.
- Establishing survivor medical handover process.

- Capture and analysis of information supplied by USAR teams and other actors.
- Determining gaps in the operation and recommending appropriate changes.
- Considering long-term plans with regard to additional resources and reassignment of USAR teams.
- Displaying information on incident maps.
- Preparing for and facilitating a daily USAR operations meeting.

(OCHA-FCSS, 2006)

5.4. The RDC

The RDC is an adjunct of the OSOCC at the point of entry into a country (normally an airport). It works in close cooperation with Customs, Immigration and other local authorities (OCHA-FCSS, 2006). If the UNDAC team has not yet arrived, the INSARAG Guidelines specify that this creation and running of the RDC should be temporarily performed by the first international USAR teams to arrive (INSARAG, 2006). Due to the high level of preparedness of most first arriving teams it is possible that they could arrive before the UNDAC team.

The RDC's main goal is to assist the LEMA and airport authorities to ensure incoming USAR teams have a speedy and smooth entry into the country. USAR teams are large entities arriving with some forty to sixty staff and dogs and in many cases over thirty tons of equipment. The airport may be damaged (Plate 2-5) requiring extraordinary logistics arrangement to deal with incoming people and freight (Morris, 2004).

Plate 2-5 Rescue teams arriving at an earthquake damaged airport (Morris, 2004)

The expectation of a RDC is to:

- Facilitate rapid customs and immigration clearance
- Assist with provision of transportation for the team from the airport to the emergency site
- Provide a briefing of the current situation
- Provide locations of OSOCC, LEMA, other USAR teams and points of contact
- Assist in obtaining maps of the area
- Assist in finding interpreters, if needed
- Providing a cultural briefing
- Provide security, weather and medical/health updates

(OCHA-FCSS, 2006; (INSARAG, 2006)

5.5. USAR Team classification concept

The chance of a trapped victim surviving decreases rapidly over time (Sever et al., 2002; Macintyre et al., 2006) and it is therefore of the utmost importance that the appropriate resources are assigned to the appropriate sites as soon as possible. Humanitarian response is one of the few fields where there are no predetermined requirements or a standard one requires to participate in it (Katoch, 2006). The same is true more specifically of international USAR assistance response.

While deployment of international USAR teams has been of great benefit to trapped victims and the affected country, lessons learned by the INSARAG have revealed the need for responding USAR teams to be integrated within a well coordinated system to ensure the most appropriate use of available USAR resources (INSARAG, 2006). In order to help facilitate this, they have identified a need to classify international USAR teams according to their operational capabilities so as to ensure that the best qualified and most appropriate USAR resources are deployed to any emergency (INSARAG, 2006).

While the creation and use of this system is still very much in its infancy, the concept seems, up to now, to have been well received by all involved. The INSARAG USAR Team Classification System seeks to ensure that in the future USAR teams will have a common understanding of the different capabilities attached to the different categories of the classification system (INSARAG, 2006). This should help teams in the future to integrate effectively having the same basic structure and standardised qualifications for the primary aspects of an USAR team's response. To this end, the system makes use of three levels of classification. These are Light, Medium and Heavy USAR teams (INSARAG, 2006).

According to the classification guidelines Light USAR Teams should have the operational capability to assist with surface search and rescue in the immediate aftermath of the disaster. The intention is that these Light USAR teams would usually come from the affected country and perhaps

neighbouring countries. It is not the intention that Light USAR teams would deploy to emergencies internationally. Medium USAR Teams should have the operational capability for technical search and rescue operations in structural collapse incidents. Medium USAR teams should be capable of breaking, breaching and cutting concrete, typically found in suburban areas. Medium USAR Teams are not expected to have an ability to cut, break and breach concrete reinforced with structural steel. If a Medium USAR Team wanted to travel to an affected country the classification guidelines would require it to be operational in the affected country within thirty two hours of the disaster being posted on the Virtual OSOCC.

The highest classification level is the Heavy USAR Team. These teams should have the operational capability for difficult technical search and rescue operations particularly those in structural collapse incidents involving structures reinforced with steel. This classification of the team is envisaged for international assistance in disasters resulting in collapses of multiple reinforced concrete structures, typically found in urban settings, such as in earthquakes affecting cities. International Heavy USAR Teams travelling to an affected country would be expected to be operational in the affected country within forty eight hours of the disaster being posted on the Virtual OSOCC. (INSARAG, 2006)

Initiatives are underway to evaluate all USAR teams within the INSARAG USAR Directory (OCHA-FCSS-INSARAG, Real time) against the requirement of the USAR Teams Classification System (INSARAG, 2006), to facilitate better coordination of deployed teams in the future. Such classification systems are at risk of not being used at all if the recipient country is not in a position to understand and use them.

5.6. Worksite triage system

When an USAR team is working in an area, where there may be more than one potential site for live rescues, the order in which these sites are targeted needs to be prioritised. To facilitate this, the concept of worksite triage and structural evaluation is used. Originally the brain child of a seismic engineer

actively involved in the international USAR aid world (Thorvald, 2002), this system prioritises the work sites in order to save as many lives as possible. This tool is a systematic procedure adopted by teams to evaluate and compare key factors in order to clarify and expedite the prioritising of the work sites. Such a system of Worksite Triage is just another example of something that should be well understood by all the teams and the locally affected officials operating in the area in order for it to work effectively.
(INSARAG, 2006)

5.7. USAR team marking and signalling systems

The aim of the standardised marking and signalling systems is to provide specific information regarding assessment and operational results to ensure optimal coordination on a work site. To this end the INSARAG guidelines have defined the following marking and signalling systems:

- *Team function identification:* Used so that all teams can easily identify their counterparts in other teams.
- *General area marking:* A standardised system of marking buildings according to their location.
- *Structure orientation:* The use of standard terminology in regard to the explanation of locations in buildings. For instance, all teams using the same concept of ground floor and first floor.
- *Cordon markings:* Used so that all teams understand the same things, by areas, that have been marked off by other teams.
- *Structure marking:* Markings made on buildings summarising the work that has been done and the findings of teams that have worked there.
- *Signalling procedures:* A number of predefined standardised sound signals used to warn rescue workers of any dangers during rescue efforts.
- *Mapping symbols:* Standardised symbols used when creating operational maps.

(INSARAG, 2006)

In the ideal world these signalling systems are used by all the responding teams ensuring optimal communication among them.

6. CONCLUSION

The world of international USAR assistance is complicated by both the technical nature of the work as well as the geopolitical environment in which it operates. In recent history much has been achieved in ensuring those providing international USAR aid are doing so within the framework of the guidelines developed. This has been facilitated further by many well organised coordination and operational tools already commonly used in the field.

The role of the recipient country has, however, been focused on less during this time. While some activity in the realm of rescue capacity development has occurred, there is still much work to be done in the area of ensuring those ultimately responsible for coordinated use of the assistance are in a position to be able to understand how to do this.

CHAPTER 3 - LITERATURE REVIEW

1. INTRODUCTION

This chapter presents the background literature related to this in-depth study of the use of international USAR assistance by earthquake affected countries. Much of the literature alluded to in this chapter is further discussed in other chapters of this dissertation. As common in the qualitative research paradigm, this literature review does not represent a detailed account of every publication considered for this study (Holloway and Wheeler, 1996). In this vein, additional literature that has not been discussed here will be presented in other chapters of this dissertation in order to facilitate understanding of the research findings. In short, the goal of this literature review is to provide the reader with an overview of topics related to this study and provide some background on what has been studied and commented on in these areas in the past.

1.1. Literature sources

The nature of international USAR assistance means that it does not enjoy one specific detailed literature source. Rather, the international USAR assistance discipline is considered by a host of different fields, each focusing on how international USAR aid is viewed from their particular point of interest. While this has made the process of the literature review for this study more challenging, it has also provided an opportunity to explore different perspectives on the discipline. These different sources of literature traditionally come from the following realms:

- fire and emergency services;
- general disaster management;
- foreign and humanitarian affairs;
- United Nations documentations;
- medicine; and
- seismology and engineering.

These literature sources make varying use of academic research principles. The fire and emergency service world for instance does not commonly make

use of academic research principles such as peer review. In fact most of the literature considered in this review from this realm, consists of opinion pieces authored by experienced practitioners and published in trade publications. In contrast, the literature generated by the medical and engineering world normally comes from peer reviewed scientific publications.

Despite the stark contrast between the different sources of the literature and the professions they represent, it is interesting to note that when we focus specifically on what these sources have to offer in regard to this study topic, we notice that some common topics begin to emerge. It is these different topics that will be considered separately, in more detail.

1.2. Literature search strategy

The lack of one detailed literature source made for an arduous literature search process. Many of the literature sources used do not have advanced search engine type databases as found in other disciplines. For the disciplines where such electronic search tools do exist they were used extensively. For the others a mix of the limited search tools available along with a detailed review of the researcher own archive of documents was used.

1.3. Literature topics

The world of international USAR assistance is not well versed in the science of evidence based practice. In this regard the paucity of research in this field is evident (Aoki et al., 2004). Much of the current knowledge and practice is based on consensus opinion drawn from the practical experience of a handful of personalities routinely involved in such initiatives (INSARAG, 2006).

While it is understood that there is a profound lack of research available specifically on international USAR aid provision and use, there is work that has been carried out more specifically on the topics investigated from the

perspectives of other non-rescue disciplines. In this regard this literature review will consider the following topics:

- *disaster management,* which is specifically related to the principles that apply to international deployment of aid, operational issues and local development considerations;
- *USAR* as a discipline, concerning either technical or organisational issues, including rescue as a topic of discussion;
- *seismic engineering,* which considers the way to build structures that are less likely to collapse during or after an earthquake; and
- *medicine,* as a science related to the care of those that are rescued and the study of the pathophysiology and instance of such injury.

While these topics will be considered separately under their own headings within this chapter, it is fair to say that there is a certain amount of synergy between them.

2. DISASTER MANAGEMENT

Disaster management is an exceptionally wide area of study. Within this topic much has been written on the issues related to the coordinated use of international disaster response aid. Most of this comes in the form of UN policy documents and guidelines. Within the development of disaster management theory and knowledge, there is also much work that has been done in the area of humanitarian aid as the larger umbrella that incorporates international USAR assistance. Additionally, there is literature to be found on the ever present considerations of the economics of such aid and the politics and foreign affairs environment that international aid of any sort operates within. Also considered under this topic are issues more specifically related to local initiatives, in terms of both development of own capacity, and risk mitigation.

2.1. United Nations publications

Much of the significant literature on disaster management is generated by the UN and can be spilt into two categories. The first category is the official resolution documents published by the UN GA highlighting policy and recommendations. The second category encompasses documents published by the INSARAG and other such UN agencies and organisations. The documents from this category include consensus guidelines, reports on meetings and other data from UN run electronic databases outlining activities of international USAR response.

2.1.1. General Assembly Resolutions

A closer look at the documents falling into the first category shows a historical progression of commitment from the UN GA towards better coordination in major natural disasters. As pointed out by Katoch (2003) in his detailed analysis of existing UN GA resolutions on the topic there are clearly four areas where specific evolution of trends has occurred since the first resolution in 1965 (UN, 1965) These trends are:

- The responsibility for natural disaster response in a disaster affected country rests with the country itself. All assistance provided by the

international community is in support of the government and on request from it.

- The Emergency Relief Coordinator of the UN (earlier known as the UN Disaster Relief Coordinator) is mandated to coordinate and facilitate all international response to a disaster.
- A clear recognition of the need for the UN system to work closely in disaster response with what is now called the International Federation of Red Cross and Red Crescent Societies (IFRC).
- A consistent effort to improve the capabilities of the international system, especially the UN, for disaster response.

(Katoch, 2003)

While it is interesting to note the clear patterns of evolution on all of these points, the first issue of sovereignty is of most interest to this study on the effective use of USAR aid by an affected country (Figure 1-1). The concept of sovereignty has been enshrined in the UN concept since its inception with the signing of the Charter of the United Nations (UN, 1964).

Although the first GA resolution on the topic of 'Assistance in case of natural disaster' was published in 1965 (UN, 1965), it is interesting to notice that this major category of sovereignty in response to natural disasters did not appear until as late as 1981. In fact the first time this discussion of sovereignty appears, is in the GA Resolution on 'Strengthening the capacity of the United Nations to respond to natural disasters' of 17 December 1981 (UN, 1981) in which paragraph two clearly states:

'Reaffirms the sovereignty of individual Member States, recognizes the primary role of each State in caring for the victims of disasters occurring in its territory and stresses that all relief operations should be carried out and coordinated in a manner consistent with the priorities and needs of the countries concerned.'

(UN, 1981)

In 2002, the language became even more explicit in this regard, even referring back to the UN Charter mentioned earlier. The GA Resolution of

December 2002 on strengthening the effectiveness and coordination of international urban search and rescue assistance (UN, 2002) states:

> ‘Reaffirming that the sovereignty, territorial integrity and national unity of States must be fully respected in accordance with the Charter of the United Nations. In this context humanitarian assistance should be provided with the consent of the affected country and in principle on the basis of an appeal by the affected country.’
>
> (UN, 2002)

It is key to note that this first UN GA resolution relating to USAR very clearly affirms the issue of sovereignty of recipient nations. ‘GA Resolution 57/150 of 16 December 2002 on ‘Strengthening the effectiveness and coordination of international urban search and rescue assistance’ (UN, 2002) is in fact the product of the work of the INSARAG, who pursued its creation (INSARAG, 2006; INSARAG-OCHA-FCSS, Real time). As such this resolution makes pertinent recommendations that are central to this investigation.

The first recommendation highlights the responsive nature of international assistance which follows a request from an affected country. (UN, 2002). It goes on to explain that each state has the responsibility first and foremost to take care of the victims of natural disasters occurring within its borders and that this affected state has primacy, ‘in the initiation, organisation, coordination and implementation of humanitarian assistance’ (UN, 2002). The resolution is clear that international USAR should supplement existing in-country capacity such as local rescuers, and the importance of timely coordination of these resources.

When an incident becomes too large for one country to handle the next part of the resolution comes into play. In this case the resolution highlights the need for technically sound international assistance particularly in the field of USAR following earthquakes and other events resulting in structural collapse (UN, 2002). Much work has already been directed towards ensuring that the responding donors are adhering to all of the points highlighted in this

resolution (INSARAG, 2006; INSARAG-OCHA-FCSS, Real time). There is however a gap in knowledge surrounding the understanding of what needs to be in place in these affected countries to ensure that they are able to manage this international USAR aid. It is this knowledge that this study has pursued.

2.1.2. United Nations guidelines and reports

2.1.2.1. INSARAG Guidelines

Within the area of study one of the most significant statements in the GA resolution discussed above is its official recognition of the Guidelines developed by INSARAG, as 'a flexible and helpful reference tool, for disaster preparedness and response efforts' (UN, 2002).

These guidelines represent a document that falls into the second category of UN literature as described earlier. The International Search and Rescue Response Guidelines first published in 2002 (INSARAG, 2002) have undergone review, with the second edition now in circulation entitled *INSARAG Guidelines and Methodology* (INSARAG, 2006). The guidelines have been extensively used as a source of data for this study. These guidelines represent the current consensus-derived recommendations for teams wanting to operate in the international USAR aid arena. The guidelines also map out the mandate of INSARAG and explain how this group should work towards realisation of such goals.

This INSARAG document provides a history of the development of coordinated international USAR assistance (INSARAG, 2006). As discussed in detail in Chapter 2, the environment of the study, this history of international USAR aid can be traced alongside the development of INSARAG.

2.1.2.2. Synthesis Report

One document that cannot go unmentioned in the review of the relevant UN reports is the joint evaluation of the international response to the Indian Ocean tsunami titled the *Synthesis Report*. Only published in July 2006, this document was consequently considered very late in this study.

This Synthesis Report has been the outcome of an international collaborative process involving over 40 humanitarian and development cooperation agencies. Individuals involved came primarily from the evaluation departments of UN agencies, multi- and bilateral donors, as well as non-governmental organisations, the Red Cross Movement and a number of research groups.

As such this document represents an especially detailed investigation into various international aid issues attached to the massive international aid response launched in response to the Indian Ocean tsunami in December 2004. With regard to its relevance to this study, some common issues have been found. These issues include: inappropriate aid, lack of coordinating in general and a so called “media fuelled response” leading to the US$13.5bn donated in international aid that was not very well distributed.

While the studies did have similar foci it is important to note that they were in no way linked and do also clearly represent studies of different types of humanitarian assistance. In this regard it is fair to say that this report did in no way directly affect the findings of this study.

Tsunami Evaluation Coalition Synthesis Report
Summarised recommendations:

1. The international humanitarian community needs a fundamental reorientation from supplying aid to supporting and facilitating communities’ own relief and recovery priorities.
2. All actors should strive to increase their disaster response capacities and to improve the linkages and coherence between themselves and other actors in the international disaster response system, including those from the affected countries themselves.
3. The international relief system should establish an accreditation and certification system to distinguish agencies that work to a professional standard in a particular sector.

4. All actors need to make the current funding system impartial, and more efficient, flexible, transparent and better aligned with principles of good donorship.

(TEC, 2006)

2.2 Disaster management knowledge

As mentioned previously disaster management, in general, is an exceptionally wide area of study. Much has been written on the subject, but little or no reference has been made to USAR or USAR preparedness (Bremer, 2003). Much of the literature dedicated to the topic of disaster management is primarily focused on general disaster planning and theory (UNDP, 1992; EMA, 1997), with issues such as risk management (UNDP, 2002) at the forefront. It is well understood that prevention is better than cure (Chiu et al., 2002). This is echoed in so far as the so-called 'trendy' issues such as prevention, mitigation and risk reduction being mistakenly seen by many in the field of disaster management as the panacea to all disasters (Katoch, 2006). In this vein the increased importance attached to effective vulnerability and risk assessments (Coburn, Spence and Pomonis, 1994) have also been noticed as a trend in this literature.

While these are all important issues, their direct relevance to this study is limited. Issues more directly related to this investigation include matters of economics, preparedness, operations, issues of coordination and the politics of foreign affairs (already alluded to in the review of UN documentation see Section 2.1.2) surrounding the use of international aid.

2.2.1 Economics

The age old adage that "money makes the world go round" is certainly apt to this environment of international disaster response. Economics is considered by many different reports and has been for many years (Bull, 1994). What is interesting to note (as discussed in Chapter 2 Section 4.2) is that when considering rescue specifically, cost versus benefit calculations are often made but rarely considered when it comes to the need to save life (Aoki et al.,

2004). This economic issue is further extenuated by the latest trend of massive public funding of response initiatives first noted in the Indian Ocean tsunami of 2004 (TEC, 2006).

While this increase in funding may at first appear to be a positive development it should be noted that in many cases the public are not fully aware of what they are funding. This results in an increase in un-professional responses funded by the general public (Katoch, 2006), which in turn leads to more resources needing to be properly coordinated on the ground by the affected country. In terms of USAR resources, this is the topic of this study.

A crucial economic factor is the funding available for response and preparedness initiatives. The economic consequences of such disasters is another key consideration, particularly when it is considered that developing countries may not have adequately developed disaster response plans (Katoch, 2006). This increased vulnerability can compound the destructive effects on the economy following an event. As outlined in a case study on the economic impact of the 1985 Mexico City earthquake by Stephenson and DuFrane (2005), there are many economic implications to such a disaster that should be considered.

Economics case study - The 1985 Earthquake in Mexico City

An earthquake of extraordinary magnitude, 8.1 on the Richter scale, caused extensive damage in a densely populated sector in the center of Mexico City in September 1985. The earthquake and its aftershocks caused the deaths of more than 10,000 persons; another 30,000 suffered injuries or psychological effects, and about 150,000 were left homeless. Approximately 33,600 dwellings were destroyed and 65,000 more suffered considerable damage. The health sector facilities were especially hard hit, with many hospitals and clinics destroyed. Nearly one-fifth of the schools in the city were destroyed or seriously damaged. Also seriously damaged or destroyed were the water, electrical, and telecommunications systems in the central city.

The direct losses were estimated at [US] $3.8 billion. These losses included the urban infrastructure, public service facilities and their equipment, housing, health and educational facilities, communications, small industry, and businesses. The indirect losses were estimated at [US] $544 million, and included the decrease of income and the increase in the costs to small industry and businesses, communications, tourism, and the personal services sector. The total losses caused by the earthquake amounted to [US] $4.4 billion, making this disaster the most damaging in recent years in the region.

More serious than the absolute losses was the effect that the rehabilitation and reconstruction had on the macroeconomics of Mexico. The effects are especially significant considering that the total losses represented only 2.7% of the Gross Domestic Product of Mexico. However, the disaster occurred at a time when the government was applying a policy of austerity in public expenditures, the banks had limited assets to meet the increased demand for credit, and when more external restrictions were foreseen.

It was estimated that during the five years following the earthquake, the negative effect in the balance of payments reached $8.6 billion in spite of considerable income from insurance and foreign donations. It also was estimated that the fiscal deficit increased approximately $1.9 billion due to the expenses of rehabilitation and reconstruction.

The demands for reconstruction required the Mexican authorities to revise their economic policy in order to accommodate greater needs for public funding, credits, and imports. The priorities for public expenditures were reoriented to reconstruction projects leaving many of the predisaster problems of the city unattended.

Summary

The damage resulting from an event may disrupt many aspects of a society in addition to the loss of the life of many of the inhabitants of the affected area. Often, such damage is not accounted when assessments of the costs

of the disaster are assessed. Development projects can increase and/or decrease the vulnerability of a society. Therefore, the risks and benefits accrued by every development project must be assessed prior to its implementation.

(Stephenson and DuFrane, 2005)

2.2.2. Preparedness

The concept of preparedness is central to this research project, (the word preparedness is found in the research title and research question) and is not a new concept in disaster management (Kent, 1994). The nature of earthquakes makes preparedness an essential component to any disaster management plan (Emerson, Pesigan, Sarana et al., 2005).

To this end, much has been written about the need for training of local capacity (de Bruycker et al., 1983; Barbera and Cadoux, 1991) and that strengthening the capacity of the local community is the best way to be effective at responding to the rescue needs after a major earthquake (Roces, White, Dayrit et al., 1992; Guha-Sapir and Carballo, 2000).

It is, however, impossible to ignore the fact that equally as much has been documented on the overwhelming nature of such events. Whether this is overwhelming in medical capacities (AP, 2006; Hsu et al., 2002), or USAR capacities, or the fact that rescue capacities are so easily overwhelmed by the likes of numbers of victims, amount of damage or the 110 fires and 60 aftershocks in the first day after an earthquake in Japan as described by Tanaka (1996).

Preparedness projects, are focused on how countries should be prepared to help themselves (IOM, 2001; Morris, 2002b; ICET, 2005). While there is certainly nothing wrong with this approach, it is interesting to note that there are very few reported projects focused on preparing counties to make effective use of aid from outside of their own country. To this end, this study is unique in its direct focus on this matter, if not in disaster management projects in general, then certainly in the realm of international USAR aid.

2.2.3. Operational issues

The INSARAG's operational achievements are little known within the humanitarian aid world. This is due primarily to much of this humanitarian response community being involved with response to complex emergencies. Responding to sudden onset disasters such as earthquakes is completely deferent to responding to conflict-related emergencies (Spiegel, 2005) and this is often not well understood by those routinely responding to complex emergencies.

The response phase for natural disasters in the early stages of an event is critical to saving lives. Complex emergency response on the other hand requires dealing with and solving structural problems that can take years to solve (Katoch, 2006). Much has been written about inappropriate use of international response (de Ville de Goyet, del Cid, Romero et al., 1976; Redmond, 1990). Most speculate that the reasons for this are a lack of standards for humanitarian response and in cases where such standards do exist, a lack of authority to enforce them (SCHR, 2004).

Three phases that exist during the response to an earthquake are:

- search and rescue;
- relief; and
- rehabilitation and reconstruction.

(Katoch, 2006)

When it is considered how these phases overlap one another in the response to such a major earthquake, it becomes clear why coordination also needs to be critically evaluated by this study.

On the question of whether or not coordination is a common problem in the field of major earthquakes the following literature is considered. Over and above the various reports outlining coordination problems in general there is one particular study by Altntas and Delooz (2004) that takes a closer look at this issue.

In their quantitative investigation of the problems faced by the personnel who participated in the 1999 Marmara earthquake, they found that coordination was the greatest organisation/system problem experienced (Altntas and Delooz, 2004). This reinforces the need for more in-depth study on what efforts need to be in place to ensure better coordination of the massive amount of resources required after an earthquake. Perhaps, in some cases, there may already be a situation of excess resources that in themselves require management (Romundstad, Sundnes, Pillgram-Larsen et al., 2004).

One of the latest coordination tools discussed is the new cluster approach first used in Pakistan during the major earthquake in the region in 2005. This approach, approved by the UN Inter Agency Standing Committee (IASC), splits the different areas into logical sectors of humanitarian activity and organises the relief organisations in clusters accordingly (Table 3-1) (OCHA-FCSS, 2006).

This is not the only coordination tool discussed in literature. Others such as civil military coordination exist and are regularly used (UN, 1994; Gunnarsson, Hyer, Hufstader et al., 2005). There are also many more closely related to international USAR aid as discussed in Chapter 2. There is however one commonality they all share. They are predominately used by those responding to help rather than by the affected country itself. What has not been found in the literature to date are tools that have been specifically developed to ensure preparedness for better coordination by the affected countries.

Cluster	Lead agency
Nutrition	UNICEF*
Water and sanitation	UNICEF
Health	WHO†
Camp coordination and management	UNHCR‡ – complex emergencies. IOM§ – natural disasters.
Emergency shelter	UNHCR – complex emergencies IFRC** – natural disasters (taking into account the IFRC's obligations and independence, IFRC will act as convener).
Protection	UNHCR – complex emergencies. UNHCR/UNICEF/OHCHR†† - natural disasters.
Logistics	WFP‡‡
Telecommunications	OCHA for emergency telecommunication and as overall process owner. UNICEF for common data services. WFP for common security and telecommunications services.
Early recovery	UNDP§§

Table 3-1 Nine clusters as defined by the Inter Agency Standing Committee (IASC) with their respective lead agencies

* United Nations Children's Fund

† World Health Organization

‡ United Nations High Commissioner for Refugees

§ International Organization for Migration

** International Federation of Red Cross and Red Crescent Societies

†† Office of the High Commissioner for Human Rights

‡‡ World Food Program

§§ United Nations Development Program

3. URBAN SEARCH AND RESCUE

Along with the topic of disaster management, USAR is one of the most closely related topics to this study. This study is mainly interested in the coordinated use of international USAR resources. While this is hardly ever the main focus of any piece of literature, even in specific USAR literature, it is often alluded to in some form. In this regard the primary focus of most of the literature considered here is on issues such as the equipment and operational organisation. A much more in-depth discussion into what USAR involves can be found in Chapter 2. The source of most of the literature for this topic is a contrast of both non-academic trade publications and scientific medical journals.

3.1. USAR equipment

As outlined in Chapter 2, the nature of USAR operation means that it is an equipment intensive endeavour. It is for this reason, that the topic of USAR equipment is so often discussed in literature. Over and above issues such as the need for large quantities (Collins, 2002a) of very specialised equipment (Barbera and Cadoux, 1991; Morris, 2002a) a great emphasis is also placed on the importance of personal protective equipment, essential to protect rescuers from injury (Barbera and Cadoux, 1991; Boodram et al., 2002).

There has also been some interesting work done on the issues of modernisation of equipment and the effect of this on its price (Backstrom and Christoffersson, 2006). This is very often the main reason for local at-risk communities not being able to invest in the required capacity of their own (Castle and Owen, 2003). This issue of cost is central to this study as it relates directly to the issues of developing local capacity as well as the likelihood of local capacity becoming overwhelmed as outlined in Chapter 1.

Another very apt issue discussed, is the fact that equipment alone will not provide for local capability, and that the need for training on how to use such equipment safely and effectively is just as important as having the equipment (Collins, 2001). Further to this, some study has been performed on better

understanding what equipment is most useful. Most agreeing that the use of sniffer dogs or Canine search and heavy duty lifting and breaking equipment is the most useful (Chiu et al., 2002). Of course knowing what equipment is the most useful is not enough and this is highlighted by the call for better standards for equipment (Erdogan, 2006) as well as response standards for international USAR team (INSARAG, 2006; Katoch, 2006).

3.2. USAR Operational issues

The need for more research and training in the field of USAR is well noted (Chiu et al., 2002). It is also well understood that there is a certain amount of organisation required to ensure effective USAR operations (Collins, 2004) as the risky environment of USAR requires it (Martinez and Gonzalez, 2001; Castle and Owen, 2003). This has been considered in some detail in Chapter 2. While much has been reviewed in relation to practical operational issues such as medical management (Shimazu et al., 1997; Crippen, 2001; Sever et al., 2002; Ashkenazi et al., 2005) and the fact that rescue efforts should be in place as early as possible (de Bruycker, Greco, Lechat et al., 1985; Tanaka, 1996), no significant literature has been found on the more specific issue of use of USAR resources by affected countries who have little or no understanding of them.

4. SEISMIC ENGINEERING

The world of seismic engineering is linked to this research topic in two ways. The first of these is the involvement of the profession of seismic engineering in technical USAR teams. The second is the involvement of seismic engineering in the prevention of building collapse through design. Almost all literature considered here comes from peer reviewed journals out of the profession and represents studies and commentary with a stable academic foundation.

Building collapse is not uncommon (Thorvald, 1995), but single building events are generally more unexpected (Castle and Owen, 2003). They do however occur in instances such as the case of isolated buildings collapsing in Cairo in 2002 (Turnbull, 2002). Use of traditional building styles has led to variable susceptibility to collapse. For instance, in India (Roy, Shah, Patel et al., 2002) traditional building styles seemed to do well, compared to China (Tanaka, 1996) where the heavy roofed structure of traditional buildings increased their susceptibility to collapse.

No matter what the cause, it is clear from the literature, that poor construction increases vulnerability in earthquakes and high winds. A good example of this is a comparison between the earthquakes in Armenia in 1988 with a magnitude of 6.9 that killed twenty five thousand people as opposed to the earthquake in Seattle in 1999 with a magnitude of 6.8 that killed none (Sundnes and Birnbaum, 2003). With this understanding in place it is also not surprising to note that there is no lack of study on how buildings should be built (Valery, 1995; Elnashai, 2002; Marino et al., 2005).

When considering this profession’s influence on this particular study, what is most interesting to note is its involvement within the operational capacity of specialised USAR teams as discussed in Chapter 2. Here we see that the engineer brings a valuable input into the safe working in and around a collapsed building (Thorvald, 1995; Thorvald, 2002) . In terms of this study though, this only highlights another issue that needs to be understood by an

affected country. This is that they need to have an appreciation of the decisions being made on the basis of such expertise.

5. MEDICINE

The medical profession is a source of literature related to the field of earthquake response. Little of this specifically focuses on USAR but rather on epidemiology of injury (Chatterjee, 2002; Hogan and Burstein, 2002; WHO, 2005), or special reports on specific medical teams establishing field hospitals in earthquake affected regions(Schnitzer and Briggs, 2004).

The few USAR slanted writings are mostly focused on the treatment of those entrapped, (mentioned under heading 3.2. USAR Operational issues of this Chapter) with few considering the wide scale coordination required to ensure timely provision for such efforts (Cone, 2000).

In contrast, more focused studies into the coordination of health initiatives in disasters has been performed by the Task Force on Quality Control of Disaster Medicine. This group has clearly illustrated that much aid provided in the past has been based on intuition and anticipation, and has not necessarily been rooted in knowledge.

They have also exposed the fact that in disaster management the impact of interventions are mostly assessed by quantifying the output, or what efforts are preformed rather than the outcome, or what the effect of the outputs are. They explain that some interventions are not only inappropriate or useless but actually lead to negative costs for the affected county. The findings are summarised as follows:

- Certain elements used in the past have proven to be helpful and contribute to more efficient and effective coordination.
- Certain elements used in the past have proven to be unhelpful and perhaps even detrimental to the overall goal of efficient and effective coordination.
- Certain elements have not been used but would likely allow for more efficient and effective coordination.

(Sundnes and Birnbaum, 2003)

6. CONCLUSION

Various literature sources and topics have shown some slight relation to the area of interest for this study. It is however clear that there is a distinct lack of previous research done in the specific area of international USAR assistance and even less on the more specific area of effective use of such assistance by the affected country.

In this regard, this study is unique in its focus on this specific matter of coordinated use of such assistance by the affected country. These projects that are more focused on how countries should be prepared to help themselves (IOM, 2001; Morris, 2002b; ICET, 2005) can certainly not be seen as irrelevant as this is a very important issue. However in the face of an earthquake leading to significant structural collapse, the reality is that helping yourself may well include using needed assistance provided effectively and efficiently.

CHAPTER 4 - STUDY DESIGN AND RESEARCH METHODS

1. INTRODUCTION

The purpose of this study is to outline the research design developed and tradition and approach followed. To this end details on the construction of the research design are provided along with details on the sample and setting as well as data collection and analysis used. Finally details on the principles used for the enhancement of rigor are also covered.

2. STUDY DESIGN

2.1. Research paradigm of the study

This inquiry has been conducted within the naturalistic paradigm, through the use of qualitative research methods. The reason for the choice of this paradigm is that the philosophical questions and assumptions, as described by Polit and Beck (2006), and upon which it is based, are suited to the main research question for this study. This was:

Within the context of international USAR response to earthquakes, what preparedness is required to ensure best use of international USAR assistance by the affected country?

The answer to the question was based on the perceptions, opinions and experience of people within the International Search and Rescue Advisory Group (INSARAG) aid community. The first philosophical question concerns the nature of reality (ontologic). It is believed that the reality of what preparedness is required is subjective and as such is constructed by the individuals involved. From an epistemologic perspective, which considers how the enquirer is related to those being researched, the researcher is part of the INSARAG aid community and interacted closely with the informants. The findings are the result of this interaction. The role of values in the enquiry (axiologic) were that the subjectivity of the results was both inevitable and desirable. Finally, the manner in which the knowledge was to be obtained in order to answer the research question (methodologic) was most suited to the interpretive paradigm. Specifically, the methods that were used were inductive reasoning processes; an emphasis on understanding the phenomenon as a whole; the interpreting of the phenomenon based on participants experience; the need for a flexible design that was context bound; and seeking patterns within the narrative data analysed (Polit and Beck, 2006). The use of constant comparison also ensured there was an emphasis on the whole throughout the inquiry (Strauss and Corbin, 1998).

Strauss and Corbin (Strauss and Corbin, 1998) note that qualitative research is particularly useful when little is known about the problem. This is especially appropriate for this study given the lack of research on the topic, as explained in Chapter 1.

2.2. Approach used in the study

The study has used Strauss and Corbin's Grounded Theory approach, which has its origins in Symbolic Interactionism from sociology (Holloway and Wheeler, 1996; Polit and Beck, 2006). This is because the purpose of the research was to explain what preparedness was needed to ensure best coordinated use of USAR aid. The intended outcome of the research was at least the generation of a conceptual framework , if not substantive theory from the data (Strauss and Corbin, 1998). These can then be used by INSARAG to generate guidelines. Theory in this approach is regarded as 'identifying the relationship between concepts, and presenting a systematic view of the phenomenon being examined, in order to explain what is going on' (Wiener and Wysmans, 1990: 12 in Holloway and Wheeler, 1996). To this end, data collection, analysis and sampling have occurred simultaneously with constant comparison being used to focus on emerging theoretical concerns and core processes. In accordance with Strauss and Corbin's approach (1998 in Polit and Beck, 2006) the research problem was developed from the literature, the researcher's own professional experience within INSARAG and the data. Therefore, a literature review is presented before the data. This is in contrast to the original approach to Grounded theory, in which Glaser stated that the basic problem must emerge from the data (Strauss and Corbin, 1998; Strauss, 1978 in Polit and Beck, 2006). However, both the researcher and INSARAG had identified the problem, prior to the inception of the research. The initially proposed design has proven flexible enough to accommodate changes as the research progressed (Polit and Beck, 2006).

In addition to using a Grounded Theory approach, the research can be regarded as a case study of events (Yin, 2003), in that the experiences from

a series of different earthquakes, where USAR assistance was provided, have been examined through the interviews and secondary data that was analysed, in order to determine what preparedness is needed to ensure best coordinated use of such assistance (Babbie, Mouton, Voster et al., 2005).

3. UNIT OF ANALYSIS AND UNITS OF OBSERVATION

3.1. Overview

Disaster preparedness and disaster management is an exceptionally wide area of expertise. This study has been designed to focus specifically on identifying what the main components of preparedness for the coordinated use of international USAR resources are. Therefore, the unit of analysis for this study is the preparedness for best coordination of international USAR assistance after an earthquake.

In order to effectively study this unit of analysis the following two main units of observation were investigated:

- experience and opinions of key informants from the different areas of the international emergency response community and those that have used such assistance in the past or may have to in the future; and
- consensus documents reporting on events of major earthquakes where such assistance had been used.

In order to obtain the data for the first unit of observation, a series of formal and informal semi-structured interviews were conducted. For the second unit of observation, three specifically detailed consensus documents reporting on major events where international USAR aid had been used were considered.

A third possible unit of observation was originally planned but was eventually not used. This was the possible opportunity for direct observation of an actual event that may have occurred during the research study period. As it turned out, there was a major earthquake during the research period that made extensive use of international USAR assistance. The devastating earthquake in South Asia on October 8th 2005 led to a situation in which several international USAR teams deployed to the affected area. This event would certainly have fallen into the category of being an event where direct observation would have been suited. Unfortunately, however, it was not practically possible for the researcher to travel to this event due to other travel commitments at the same time.

The rationale for using the units of observation (with the data being gathered by multiple methods) alongside one another was to confirm the understanding of the phenomenon by comparing these different, yet complementary, data sources against each other (Holloway and Wheeler, 1996). This form of method and data triangulation would enable checks to be conducted (Terre Blanche and Durrheim, 1999).

Despite not using the third unit of observation it is felt that the two main units of observation provided sufficient data to answer the research question. A more detailed discussion of these two units of observation, identifying more precisely what they represent, will follow. Figure 4-3 summarises the methodology of the study.

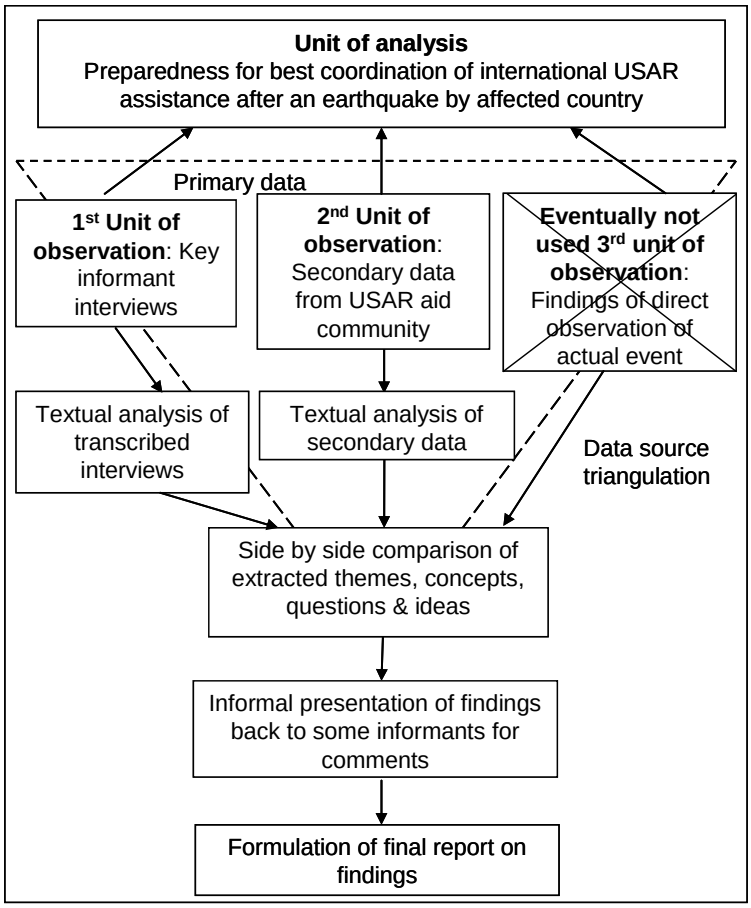

Figure 4-3 Summary of the study methodology indicating the unit of analysis, units of observation and data analysis

3.2. Political and logistic considerations

As mentioned in the overview above, various dynamics had to be considered when the study was being planned. These included:

- the political nature of the study environment; and
- the logistical considerations owing to the international nature of the study.

The consideration of these dynamics together with the flexibility associated with the emergent design, prevented the associated concerns from adversely affecting the project. The concerns and the manner in which they were addressed are explained hereafter.

3.2.1. Political considerations

Any study involving the opinions of nationals from over twenty different countries is bound to raise some politically sensitive issues. Nowhere is this more obvious than in the analysis of the primary and secondary data from which emerged a major category eventually named “sensitivities” in which political sensitivities are discussed in some detail. (Chapter 5 Section 8.2)

As discussed later in this dissertation, it is clear that people operating within this international environment select their words very cautiously. In this regard, perhaps the greatest of the political issues that had to be considered was how to encourage informants to express any negative opinions. There was a specific concern that informants may believe that an opinion on the failure of a disaster management system might be considered as a negative opinion on the country to which that disaster management system belongs, rather than just a constructive criticism of a system.

Further to that there was some concern that the personal opinions asked of the informants might be misconstrued by the researcher as an official opinion of the organisation to which the informant belongs.

These issues were not seen as a threat to informants being willing to participate, but rather that they might have resulted in them providing guarded answers. Both of these issues were resolved by a detailed briefing of each informant before their interview began, as well as this information being provided in the letter of information received from the researcher before being interviewed (Annexure A). Over and above this, due regard has been given to the politically sensitive nature of the opinion of a national of one country, on how a second country dealt with a specific disaster. Consequently, the results have been portrayed in such a way as to be sure that they are academically sound and a true reflection of the finding of the analysis while at the same time being presented factually to ensure that it would be understood as the constructive opinion that it is.

In addition, an undertaking that information imparted during the interviews would be kept confidential in terms of the identity of the informant, also reassured them about providing their honest opinions without concern for repercussions. Confidentiality was also required from the perspective of creating an ethically appropriate study environment. (This is discussed in more detail under the Ethical considerations Section 7 of this Chapter)

A further observation worth mentioning is the effect of the official support of the project by the OCHA (Annexure B). This gave the project credibility among the informants which was important for finding willing participants. In one case, a certain government even went so far as to invite the researcher to conduct the interview in their home country so as to ensure that they could provide the appropriate informants. Such voluntary participation would have been very unlikely were it not for the official support of this organisation. This type of consideration was practical in nature yet at the same time highlights the political considerations that had to be taken.

3.2.2. Logistical considerations

The nature of international USAR aid is such that those involved are geographically spread over the globe. This presented a logistical challenge that had to be carefully considered in the planning phase of the study.

However, in the end it was not as much of a challenge as expected, due mostly to the generous support of the corporate sponsorship of the researcher's employer as well as the INSARAG and the OCHA.

A perfect example was the way that the researcher was supported to perform many of the informant interviews in November 2005 at the annual INSARAG team leader's meeting held in Tallinn, Estonia. Over and above being given the permission to conduct the interviews at this event, the organisers went so far as making a separate room available for the interviews as well as creating time within the program to allow individuals to be interviewed. As a result, many of the key informants were interviewed without the researcher having to travel extensively.

All in all it is the flexible design of the original planning of the study design that has led to the success of the research approach that has been followed. Taking into consideration all the logistical and political barriers that could have challenged the study, the forward thinking approach has surely been the central factor that has facilitated the implementation of the study.

3.3. Sampling strategy

3.3.1. Sampling strategy in respect of key informants

In keeping with the confidential nature of the interview process it would be inappropriate to provide details on the sample of informants used. With special consideration for the political and diplomatic sensitivities (Chapter 4 Section 3.2.1 and Chapter 5 section 8.2) surrounding the use of this data source, as well as the creation of an ethical appropriate study environment (Chapter 4 Section 7) it is not possible to provide much information on the informants. What can, however, be shared are the following details.

The formal and informal interviews of informants have proven to be a valuable data source and have provided in-depth insight into the various perspectives on the topic of this study. These informants were sampled in such a way as to provide as wide a perspective on the topic as was possible.

In this regard the informants that participated in the interviews could be broadly categorised as having one or more of the following backgrounds:

- Experienced earthquake affected countries
- Experienced international USAR aid providers and coordinators
- Inexperienced international USAR aid providers
- Inexperienced earthquake affected countries

3.3.1.1. Type of sampling

Purposeful sampling was used for the selection of the informants, with a maximum variation sampling strategy employed (Polit and Beck, 2006). The resulting sample was homogenous, in some aspects, yet at the same time greatly diverse in others. Homogenous aspects were the consistent experience in some form of the use of or provision of international USAR aid. All the informants had developed some opinion on the effective use of international USAR aid through their experience.

In contrast to this homogeneity, the purposeful sampling also ensured that a varying amount of experience levels existed among the informants. The least experienced of the informants were three informants, each from different countries who had not personally ever been physically on the ground at an earthquake disaster site during a major earthquake where international assistance had been used. They had however all been involved, to some extent, with the use of, or provision of, international USAR aid in the past. On the other end of the scale there were some informants with extensive experience dating back as far as the early 1980s. The most common number of events experienced by all the informants was three. All in all it was felt that the varied level of experience of the informants made for a good balance between fresh ideas and experienced realism.

3.3.1.2. Selection strategy

A large proportion of the informants were senior members of the international USAR community. This was in part due to the fact that the majority of the interviews were conducted at the international INSARAG team leaders' meeting held in November 2005, in Tallinn, Estonia. As outlined in Chapter

Two (Environment of the study), a USAR team usually consists of approximately thirty to sixty practitioners with various technical rescue skills. This team is traditionally led by the team leader who is responsible for ensuring that rescue operations are achieved safely. The team leader is also the focal point of contact for this team.

The researcher's position as a member of INSARAG meant that he was a participant in this meeting. Since so many of the informants were to be together in one place, this assembly was chosen in the research plan, so as to provide for effective data collection without significant expense. The different types of bodies represented in this group of informants included:

- international governmental aid agencies;
- non-government aid agencies;
- governmental international USAR teams;
- non-governmental international USAR teams;
- local and national emergency services;
- local and national level disaster managers; and
- different UN agencies.

A further source of informants was those from outside of the INSARAG network who were especially selected to provide additional perspectives and therefore varied opinions. This was achieved by sampling informants that had different perspectives on the use of international USAR aid. In most cases these could be categorised into one of the following:

- those that had used international USAR aid within their own borders;
- those that traditionally provided this USAR aid to others;
- those that have provided and also used such USAR aid in the past; and
- those that usually provide coordination assistance to the affected country.

As indicated in the section dealing with political considerations (Section 3.2.1) it was made clear to all the informants that they were expected to provide

answers based on their own experience and opinion and they would not be considered to be speaking on behalf of these bodies.

The sampling strategy for selection of the informants can be regarded as having been successful as it resulted in a good spread of informants with various levels of experience and contrasting perspectives. The diversity of the participants was necessary in order to achieve a well balanced collection of thoughts, feelings, opinions and ideas.

3.3.1.3 Sample size

Altogether thirty different informants were interviewed from twenty three different nations. Of these nations, eight countries had experience in using international USAR aid in their country due to a major earthquake. Of these eight, three were approached from outside of the INSARAG network. The informants held positions in, or worked for, a wide variety of bodies that were or may in the future become involved in earthquake response. This again provided for an excellent variation in experience and perspective of the informants.

As argued by Patton in Polit and Beck (2006) purposive sample sizes should be judged on the basis of the purpose and rationale of the study. In this regard it was strongly felt by the researcher that theoretical data saturation for this unit of observation had been reached by the end of the assigned data collection period. This data saturation was gauged based on the fact that category development appeared to be dense and rich and relations between categories were well established (Terre Blanche and Durrheim, 1999).

3.3.2. Sampling strategy in respect of Earthquake Lessons Learnt reports

The second unit of observation consisted of existing secondary data on international USAR response.

3.3.2.1. Selection strategy

The initial planning of the research allowed for the collection of this data from various sources such as:

- reports on deployments of various kinds including those from teams involved, and recipient countries;
- news and media reports from various news agencies;
- reports from coordinating authorities such as UN-OCHA;
- Lessons Learnt reports on incidents compiled by the INSARAG; and
- data from the electronic database of UN-OCHA known as The Virtual Operations On-Site Coordination Center.

Extensive collection of such data took place. This was greatly facilitated by the support of the OCHA as seen in the letter of support outlining their commitment to making such data available as well at their encouragement to the rest of the international USAR community to participate (Annexure B). However, on the basis of the initial analysis of this data it was decided to rather make use of a few detailed reports. Some of the other collected data has been used in Chapter 2 and 3 the 'Environment of the study' and the 'Literature review'.

Probably the most important reason for abandoning the bulk of this secondary data in the analysis of the second unit of observation was the fact that while they were sources from different locations, they mostly represented the perspective of the international aid community with little or no input from the affected countries. In contrast to this, the three Lessons Learnt Meetings were hosted in an environment where a more balanced opinion could be shared and captured in the minutes that were analysed later.

3.3.2.2 Sample size

Since the inception of INSARAG, the group has facilitated three Lessons Learnt Meetings following major earthquakes involving international USAR assistance. It is the documented results of these meetings that have been included as secondary data for analysis. Although there were only three meetings, in reality four different earthquake events were considered, as one of the meetings covered two events closely timed to one another.

The first of these meetings was the INSARAG Lessons Learnt Meeting, following the Algerian earthquake of 21 May 2003, that was held in Geneva on 9 and 10 September 2003. This was in fact the first meeting of its kind to be organised by the INSARAG since its inception. This meeting was attended by ninety two participants (including the researcher) from thirty three different countries and organisations. It was co-sponsored by Germany, Sweden and Switzerland and co-organised by Switzerland and the INSARAG Secretariat (FCSS) in the OCHA Geneva.

At this meeting, all phases of USAR response operations in the Algerian earthquake were analysed and discussed. Further to this, particular focus was placed on coordination issues and the INSARAG Guidelines. Similar to all the other meetings considered, this meeting was structured in short presentations about each phase of the USAR response operation and provided opportunity for participants to discuss lessons learned and make recommendations for improvement in each of the phases.

Due to the presence of so many of the countries and organisations that were involved in the response as well as local officials from Algeria itself, this event provided great insight into the experiences of both the international response contingency as well as the local affected emergency services. As such, this proved to be an invaluable event where all sides of the response could be effectively analysed. As a source of secondary data it was also immensely valuable as it represented a consensus document against which to test the validity of the finding of the primary data from the individual informant interviews.

The second document considered as a secondary data source was the documented findings of the second ever INSARAG Lessons Learned Meeting. On this occasion the event was planned after the earthquake of Bam, Iran in December 2003. As it turned out, a further major earthquake in Morocco occurred in February of 2004 before the meeting was held and so was also considered during the discussions. This meeting was hosted by the Government of Tunisia and was held in Hammamet, Tunisia, on the 27 April

2004 with ninety one participants from thirty four counties and organisations that participated in the response and again, included the researcher. This meeting began with a review of the results of the first INSARAG Lessons Learned Meeting following the Algerian earthquake of May 2003 discussed above. The purpose of this revision of previous lessons learned was to provide the context for the meeting to build on previous experience and complement recommendations for improvement where necessary.

Here again, the presence of so many of the countries and organisations that were involved in the response, as well as local officials from the affected countries themselves, made for a powerful opportunity to ensure all sides of the response were well considered and analysed. Again this forum made it possible to understand how both the international response community and the local affected country viewed the response. The fact that this event was structured to ensure it complemented the previous event also helped considerably in allowing these two secondary data sources to be effectively analysed as secondary data sources alongside one another. The consideration of the findings of the previous meeting also provided a powerful opportunity to discover exactly which of the lessons had in fact been learnt and not repeated, and what problems had re-emerged despite being uncovered by the previous lessons learnt event.

The third and final document considered as secondary data for analysis of the second unit of observation was an extract of the report on the annual meeting of INSARAG USAR team leaders that was held in Tallinn, Estonia, on 24 and 25 November 2005. The extract was that of the portion of this meeting devoted to Lessons Learnt in the USAR operations in Pakistan following the South Asia earthquake of October 2005. While this was not a dedicated event, for the evaluation of lessons learnt as with the previous two events, it was not in any way less usable. The meeting was attended by eighty one participants from thirty three countries and organisations, and provided for a host of opinions and considerations to be aired by those who had been actively involved in the response. The results again represented a

consensus documentation of the key lessons learnt surrounding the response to this event.

The results of this document dovetailed into the results of the previous two secondary data sources but also provided for a close link to most of the data from the first unit of observation, namely the key informant interviews. While this document cannot be considered anything less than a consensus of the many different participants who attended, the majority of the individual key informant interviews were occurring directly alongside this event. In fact, some of the key informants who were interviewed during this team leaders meeting would have been excused from this very section of the discussion in the main meeting room to come to the private interview room where the interviews were being conducted.

This provided for an excellent opportunity of serendipitous contrast of consensus discussion in the main meeting rooms and the concurrent individual personal and confidential opinions of some of the same participants of this meeting. It must be mentioned that the interviews running alongside the meeting did not draw from its consensus. This was due to all consensus statements made being agreed upon at the end when all participates were present. By using this format it was ensured that no consensus was lost due to any participants being out of the meeting in the individual interviews.

3.3.3. Review of sampling strategies used

The sampling strategies used for investigation of both the primary and secondary units of observation, appear to have adequately provided all the necessary data required for a detailed study. Both in terms of adequacy and appropriateness it is felt that the data extracted is fitting and sufficient (Polit and Beck, 2006).

4. DATA COLLECTION STRATEGY

4.1. Overview

As stated earlier, data was collected for the first and second unit of observation, whilst no data was collected for the originally planned possible third unit of analysis as the opportunity for this did not arise during the research period. In the case of the first unit of observation, namely the opinion of key informants, a series of formal and informal semi structured interviews were used. For the second unit of analysis data was collected from reports on Lessons Learnt Meetings of past earthquakes that had involved the use of international USAR aid since the inception of UN GA Resolution 57/150 (UN, 2002).

4.1.1. Primary data sources

As discussed above, these key informant interviews were used for the collection of data on the first unit of observation. INSARAG consists of many individuals with a wealth of experience in international USAR response. Many of these INSARAG personalities have been involved in the group since its inception and have personal experience in responding to almost every major event of international USAR response known. This was a previously untapped source of knowledge and experience that has until now never been definitively studied.

The researcher's position within INSARAG provided him with the ideal opportunity to make use of informant interviews at meetings where many such informants are assembled in one place. This allowed for effective data collection without significant expense. The use of these interviews was strengthened by the interest that the informants have in the results of the study. This increased their willingness to be involved and to contribute fully. There was also a feeling of ownership amongst the informants which ensured their full cooperation and detailed contribution to the interviews. This in turn has allowed for significantly detailed data to be extracted from these interviews.

A further source of informants was the Emergency Service world in general. The researcher's position as an international emergency services consultant (Annexure C Researcher's Professional Portfolio) ensures that he is able to interact with emergency service managers from many different countries and systems. It was some of these interactions during the research period that were used to further investigate this primary data source. In this case it was informants who had an opinion on the coordinated use of international USAR aid but did not necessarily find themselves actively involved within INSARAG.

4.1.1.1. Formal semi-structured interviews

The interviews were all conducted by the researcher who has an in-depth knowledge of the world of international USAR assistance and as such was accepted as an interviewer by all the informants. All the formal interviews were recorded using Microsoft Windows voice recording software. This led to the creation of electronic sound files of each of the interviews that were labelled and played back on a computer at a later point. Over and above this, an analogue recording of all the formal interviews was also made on a standard tape cassette recorder as a backup. The recordings of the interviews were used to make transcriptions of all the interviews. These transcripts represent the data from the first unit of observation, that is, the documented opinions of informants on their personal experience in major earthquakes and the international USAR aid used in these events.

4.1.1.2. Informal interviews

While most of the interviews were conducted in a formal setting, some were conducted in a less formal setting on occasions where it suddenly became possible to interview a prime informant candidate. It must be made clear that all informants approached in this vein were approached due to their value as an informant rather than due to any statements they made outside of the confidence of the interview process. An unfortunate consequence of this serendipitous approach to these informal interviews was that most of them were not recorded as the formal interviews were, but rather only captured in detailed field notes. It is possible that some details were missed in this approach.

4.1.1.3. Interview strategy

An interview guide (Annexure D) was used in both formal and informal interviews. It was developed through a process of pre-testing the questions on three informants who were similar to those who would be used for the study. Thereafter, slight adjustments were made and the guide was piloted as indicated on the Gannt chart (Annexure E). None of the informants used in this pre-testing phase were interviewed during the study. Expert opinion on the questioning strategy was also obtained, so as to ensure that maximum useable data could be extracted.

The following key areas of questioning were covered in the interviews.

- What does an affected country need to do/have in place to ensure it is well prepared for the most efficient, effective and coordinated use of international USAR assistance?
- What responsibilities should lie with the international USAR community to contribute to this preparedness for coordination?

These lines of questioning were answered within the context of the informants' personal experience as donors and/or their experience as receiving states in past events. In this way, as much detail as possible was gained on the two key constructs of the study namely, coordination and international USAR intervention. Therefore, contextual detail and in-depth description was central as indicated in case study research (Yin, 2003). In a process of asking questions on and around the key constructs of the study, two objectives were achieved. Firstly, the informants were put at ease as they were able to speak freely on issues they felt most comfortable with. Secondly, it provided an opportunity for other contextual variables that influence the unit of analysis to be exposed and described (Babbie et al., 2005).

While the interview guide was useful, it was also well appreciated that it should not become restrictive by tying the researcher down in too much structure. To this end the interviews were seen as an interaction between the

interviewer and the informant in which the interviewer has a general plan of inquiry but not a specific set of questions that had to be answered. The interviews in both the formal and informal setting as outlined above were in essence more of a conversation in which the interviewer established a general direction in order to pursue specific topics. This process also evolved as the interviews progressed with some informants needing more direction to the area of inquiry than others (Babbie et al., 2005).

4.1.1.4. Why individual key informant interviews?

The reasoning behind the choice of individual rather than focus group discussions was two fold. Firstly, it was felt that sensitivities that might exist within a group of informants for this study might hinder some informants from giving their true or detailed feelings. Issues discussed under political considerations are good examples of this (Section 3.2.1). This concern turned out to be justified, as indicated by the comments of two separate informants who were interviewed during the INSARAG team leaders meeting show.

Both informants explained to the researcher outside of the interview, after having returned to the meeting and reflecting on their interview experience, that they had greatly enjoyed the opportunity to speak their minds on certain matters within the individual, confidential environment of the interview. The reasons they gave for this were the fact that they felt they could get their opinion across without feeling they were being judged by other colleagues for either their opinions or their ability to articulate these opinions in English as a second language.

This issue of non-mother tongue English was the second reason for using individual interviews. A review of the transcribed interviews clearly indicates how the researcher often rephrased or paraphrased questions in different ways, taking into consideration the English language ability of the informants. This was expected as the researcher's experience in working with different nations has taught him the importance of asking questions in a way that they

can be understood. Focus group discussions would not have allowed this, and would likely have limited the input of some informants.

4.1.2. Secondary data sources

The initial plan was to use existing data from the USAR aid community. However, only specifically selected documents, namely the three Earthquake Lessons Learnt Meeting reports, were actually used. This data was very easily collected as the reports are available for download from the Virtual OSOCC. Permission to make use of these documents came in the form of blanket permission (Annexure B) give by INSARAG in the planning phase of the research project.

5. DATA ANALYSIS

5.1. Overview

The secondary data, along with the transcripts of the informant interviews making up the primary data, have been subjected to textual analysis through the use of descriptive coding to highlight major categories, categories and concepts. This detailed account of the process used for the treatment of the data has been written with extensive reference to the researcher's personal research notes, which were made during the research process. They were in fact started at the time of deciding on the research topic even before the research proposal was drafted and have provided an opportunity for reflection throughout the study.

The data analysis was both inductive and deductive, which is essential for grounded theory (Strauss and Corbin, 1998). Therefore, relationships and provisional hypotheses were identified by inductive reasoning. These were then verified by checking against further data and literature. These continued in a cyclical manner until the researcher was satisfied that the phenomenon was understood. The literature thus stimulated theoretical sensitivity (Holloway and Wheeler, 1996).

5.2. During and after the interviews

Strictly speaking the process of analysis of the primary data had already begun at the time of the researcher hearing the first answer of the first informant who was interviewed. This rapid analysis was used to decide on the best follow-up questions during the interview. It also provided the opportunity to develop an understanding of the research answers. The results of such analysis were recorded as field notes made after each interview. These notes were later used as an aid during the formal textual analysis of the interviews.

After conducting the interviews, the process of immersion in the data began by the researcher regularly reflecting on the field notes, listening to the electronic recordings, and by this further editing the field notes. This period in

the research can be seen on the Gannt chart (Annexure E) which indicates when the initial set of interviews were conducted at the team leaders' meeting, the completion of additional interviews and the simultaneous further review of relevant literature.

5.3. Transcription

After all the formal recorded semi-structured interviews had been conducted the transcription of the interviews began. As a test of the credibility of the transcribing process and at the same time to become further immersed in the data, the researcher actively participated in the transcribing process. This was done in so far as watching the transcription of the text and simultaneously listening to the playback of the electronic recordings while aiding the typist by controlling the speed of this playback. This involvement in the transcription process had two main benefits.

The first benefit was that it allowed the researcher to immediately correct any misunderstanding by the typist due to pronunciation and or foreign language accent of the informants. This greatly sped up the process of validating the transcribed interviews but secondly also provided an excellent opportunity for the researcher to further immerse himself in the data before beginning the textual analysis.

5.4. Data analysis and interpretation

5.4.1. Researcher's comprehension

While many researchers may have to spend much time and energy in the initial period of analysis in grappling with at least a basic understanding of the environment of the study, (Morse and Field, 1995) this was not the case in this research project. The researcher's day to day involvement within the international USAR aid community meant that he was already in a position to comprehend much of the environment behind the study. After some initial immersion in the data at the beginning of the analysis process, the researcher very quickly felt comfortable with moving on to the initial process

of synthesis. While this may first raise concerns of bias, it should be noted that the research supervisors carried out checks throughout the whole data analysis process in order to guard against this. One of the supervisors is himself familiar with the field from outside of the study, which was especially useful.

5.4.2. Synthesis

The process of synthesis started by ensuring an organised approach to the analysis process (Polit and Beck, 2006). This was necessary to ensure an effective analysis process but was also required due to the coding systems that had to be created to ensure confidentiality of the informants used for the interviews that made up the primary data source. This organised approach greatly facilitated the intellectual process of the qualitative analysis that had to follow.

5.4.2.1. Open and axial coding

The analysis of the text from both the primary and secondary data sources was performed along the lines of the Strauss and Corbin's Grounded Theory Methodology (1998). In general an editing analysis style was used as commonly found with researchers following the grounded theory tradition (Polit and Beck, 2006). This was starting with the reading through of the data to begin to see what the broad categories were. During this immersion process, a type of open coding, as described in Grounded Theory, using constant comparison across all data sources, uncovered common broad categories along with their properties and dimensions that emerged (Strauss and Corbin, 1998).

The sections of text relevant to these initial broad categories were captured using a colour coding system in the transcribed interview documents. This proved to be a lengthy process as any new major category that emerged later in the analysis of the interviews had to be retrospectively considered in all the interviews that had already been analysed.

After completing this process for all the transcriptions of the formally conducted interviews, the same process was followed with the field notes of the informal interviews as well as the secondary data reports on Lessons Learnt. Together these results were then shared with the research supervisors for comment. On reflection of these comments the next step began. This was the manual creation of files for each of the major categories.

This was performed by electronically cutting and pasting all the sections of text colour coded as a specific category into a separate document, to create a file for that major category. Here it was possible to subject the text to a form of axial coding into categories for each of the main categories that were again reanalysed to ensure nothing significant had been missed. The supervisors also checked the main categories.

5.4.2.2. Selective coding

From this stage it became possible to begin the selective coding process in an attempt to integrate and refine the findings. To this end, the central category of *timing* was chosen along with the two primary categories of *understanding* and its relation to the *communication*. This point marked the end of the synthesis process with the next step becoming the theorising and discussion of the results of the coding process (Chapter 6). It is expected that in fact the final process of re-contextualising as described by Morse and Field (1995) will come in the use of the findings of this project by the USAR aid community to develop guidelines to ensure better coordinated use of international USAR aid in the future.

6. TRUSTWORTHINESS

6.1. Introduction

As suggested by Lincoln and Guba (1985) in Polit and Beck (2006) there are four criteria for the establishment of trustworthiness of qualitative data:

- credibility;
- dependability;
- confirmability; and
- transferability.

The manner in which these have been addressed is explained hereafter.

6.2. Credibility

6.2.1. Prolonged involvement and persistent observation

The concepts of prolonged involvement and persistent observation (Polit and Beck, 2006) have both been seen in this research project and as such have greatly helped in ensuring credible data was extracted.

The researcher's involvement in the environment of the study, as well as his day to day interactions with many of the informants in his capacity as an international emergency service consultant, (Annexure C) has enabled the researcher to achieve an in-depth understanding of the culture, language and views of the group. It has also provided an ideal test for misinformation. While this may raise concerns regarding researcher bias it should be mentioned that this has be addressed through peer debriefing (Section 6.2.3. Peer debriefing and member checks).

Credibility has been further strengthened by the persistent observation by the researcher who has had a particularly detailed focus on the topic of study within this community of international USAR aid for the two year period of the study.

6.2.2. Data source triangulation

Credibility has been further enhanced through the use of triangulation, widely considered to be one of the best ways to enhance validity (Babbie et al., 2005). As such, data source triangulation has been centrally used within the research design as discussed earlier in this Chapter. (Figure 4-3) The use of both primary and secondary data from informants as individuals as well as consensus documents respectively, have certainly complemented each other and speak to the credibility of the study.

6.2.3. Peer debriefing and member checks

Finally, credibility has been further established though the processes of peer debriefing and member checks (Polit and Beck, 2006).

Peer debriefing has been extensively and formally used throughout the research process. This has been conducted within the context of the involvement of both research supervisors to check for bias. The supervisors are both experienced in qualitative research with one also being experienced with the phenomenon under investigation.

The original plan for the collective presentation of the initial results to the informants at an INSARAG meeting for comment, before formulation of final report has been adapted to the use of individual member checks. To this end the working results of the data analysis have been shared with some, but not all, of the informants for comments. These comments have been taken into consideration in the analysis process as well as being considered in the final report.

The main reason for this change in the research plan was due to the limitations of time and practical logistics. It has been impossible to practically collate all the results and collectively report them back to all the key informants (who are rarely together in one place) for comments before presenting them in this dissertation. It is however, the intension to perform this final step outside of the submission of this dissertation for examination. Indeed, the results of this study are in fact already well sought after by the

INSARAG community, as a whole, who are very eager to consider them for more detailed discussion in the future.

6.3. Dependability and confirmability

In relation to the dependability and confirmability of the data, a process of inquiry audit has been embraced. All raw data, data reduction and analysis products, process notes, materials relating to intentions and depositions, instrument development information and data reconstruction products have been shared with the research supervisors as the research project has evolved. The audit trail has been further strengthened by the keeping of reflective notes on the decision making processes taken by the researcher.

6.4. Transferability

Ultimately the judgment of transferability lies with the reader. This said, the following steps have been taken to ensure this judgment can be made in the presence of all the necessary information and in accordance with the recommendations of Smaling (1992) in Terre Blanche and Durrheim (1999). Firstly a detailed *thick description* of the research situation and context (Chapter 2 and Chapter 6). This should provide sufficient detail and precision, to allow judgment. Secondly, an accurate account of the research process including an argument for the choice of methods is provided. Thirdly, a detailed description of the purposeful sampling of informants is given in order to give the reader a better understanding of the divergent populations' opinions considered (Babbie et al., 2005).

7. ETHICAL CONSIDERATIONS

The ethical principles for the conduct of research, namely beneficence, respect of human dignity and justice as outlined in the Belmont Report (1979) were observed during the planning and implementation of the study.

7.1. Confidentiality

The maintenance of confidentiality was essential to protect informants from harm as a result of them sharing their opinions (principle of beneficence) and respecting their privacy (principle of justice). Two important means of methods for ensuring confidentiality were as follows.

7.1.1. Use of codes

Participants were assigned reference numbers which were used instead of their names when collecting the data and producing the final results. This strict protocol of codes for referencing the interviews has been used throughout collection and analysis of the primary data. This has ensured that no informant will be named or known to anyone except the researcher.

7.1.2. Quotation tests

Further to this, care has been taken in the selection of direct quotes from the transcribed interviews. A test was devised to ensure that it would not be possible for informants to be recognised by their quoted comments. This test consists of a checklist of considerations that needed to be completed before a direct quote from the transcribed interviews was included in the final report.

The test is as follows:

In order for a section of text from the transcribed interviews to be eligible for inclusion none of the following should elicit an affirmative response.

- It there any reference to persons by name or function that may be identifiable of a certain informant?
- Is there any reference to time and or place that may be identifiable of a certain informant?

- It there use of language (expressions or English language ability) that may be identifiable as typical from a certain informant?

If the quote did not satisfy these criteria it was modified (by the removal of any identifying details) or rejected.

7.2. Approach to informants

Over and above this, as outlined in the letter of information, informed consent form, and the interview guide (Annexures A, F and D respectively), the informants were approached in such a way as to ensure that they would feel completely free to provide their unreserved personal opinions without concern for any implication as a result of them expressing their true feeling.

A full explanation of the study was included so that they could give informed consent. They were also not compelled in any way to participate in the study and were given every opportunity to choose not to take part. Further to this, it was explained in detail that no reason had to be given for not wanting to participate in the interviews.

The effectiveness of this approach was evident in that one of the participants chose not to take part in the initial set of interviews. These measures were adopted in order to address the principle of respect for human dignity (they had the right to decide if they wanted to participate or not and the right to full disclosure about the study).

8. CONCLUSION

All considered, the initial research design was fairly closely followed and only slightly adapted in places where flexibility for such deviations were planned for in the originally design. Of the possible three units of analysis provided for in the initial research plan eventually only two were used.

The first of these was the experience and opinions of key informants from the different areas of the international emergency response community, and those that have used such assistance in the past or may have cause to in the future. The second unit of observation was consensus documents reporting on events of major earthquakes. As it turned out, these two units of observation provided ample high quality data for analysis alongside one another.

A further small deviation from the original research design can be seen in the use of member checks in the final stages of the design. Member checks have predominately been performed on an individual basis. Interim results of the data analysis process have been shared with selected informants in an effort to establish whether they felt them to be a reasonable reflection of the content covered in their interviews. Further to this the results will also be shared to the INSARAG as a form of report back on the findings of the study.

PART 2 – RESULTS

CHAPTER 5 - RESULTING MAJOR CATEGORIES AND THEIR CATEGORIES

1. INTRODUCTION

Many interesting major categories have emerged from the analysis of the data. A closer look at the detailed categories of these major categories makes for interesting linkages between them. More detail on these linkages will be covered in the following Chapter. The findings for the primary and secondary data sources have been presented together, since all the major categories and most of the categories were present in both. However, the few important differences are noted where relevant.

1.1. Intention of the chapter

The intention of this chapter is to provide a detailed description of the findings of the study. In keeping with the grounded theory approach, these include the interpretations of the data and the validation through the use of constant comparison of the data (Strauss and Corbin, 1998).

1.2. Chapter layout

The chapter begins with a brief overview of the seven major categories. This is then followed by a more detailed description of each of the major categories along with an explanation of their categories.

1.3. Consideration of research sub-questions

As indicated by the sub-questions of the study, two sub-sets of the study community i.e. donors and recipients are identified. The results of the analysis have however shown that all the major categories and categories relate to both donor and recipient (in itself an interesting finding of the study). For this reason, they are not discussed separately but are rather considered side by side throughout the results.

2. OVERVIEW OF RESULTING MAJOR CATEGORIES

The following seven major categories resulted from the analysis of both primary and secondary data.

- Understanding
- Communication
- Strategies for success and failure
- Variations
- Need for working together
- Sensitivities
- Lack of discipline

Of these major categories, *understanding* and *communication* have been identified as the primary categories. More detail on this is provided in the explanations of the major categories which follow, as well as in the next chapter which addresses the integration of the major categories.

3. UNDERSTANDING

One of the major categories that emerged from the data is that of understanding. Noticeably common to both primary and secondary data, it is clear from the analysis that most of the problems and inversely strengths, in the use of international USAR assistance as it currently stands, are strongly linked to the issues of experience, awareness and ultimately the understanding that these bring.

Both positives (such as a strong ability to use concepts and tools for coordination) and negatives (such as conflicts or miscommunication getting in the way of effective use of USAR assistance) can be attributed to a lack of understanding by those involved in this field. It is for this reason that this major category has been chosen as a primary category that will be used throughout the discussion of the findings of the data analysis.

'Stop propagating disaster myths' is the title of a very enlightening paper on the common fallacies surrounding disaster response, including recipient nation dependence and operational issues such as the handling of dead bodies. The conclusion of this article is that many of the reasons for these myths being so widely believed is due to their strong plausibility. The solution proposed by the authors is that one needs to educate the donor community about the reality of such fallacies (de Ville de Goyet, 2000). This act of education is in fact the same as saying that we will help them develop an understanding. It would appear that a lack of understanding is central to many of the problems associated with humanitarian assistance in general. This major category's categories clearly highlight this as being the case within humanitarian assistance in the form of international USAR assistance.

3.1. Understanding defined

Within the context of this study, understanding is regarded as a process. It is a psychological process, whereby one is able to know, comprehend, think about and use concepts to deal effectively with a given situation. These concepts relate to the USAR aid context, as discussed above.

3.2. Commonalities and differences between data sources

This major category recurred throughout the primary and secondary data. The major category as a whole was only missing in three of the interviews and was discussed in all of the secondary data sources. For this reason, it was clear that it was a major category that is central to the preparedness needed to ensure coordinated use of USAR assistance.

In the following chapter on the integration of these major categories it will become clear how *understanding* is central to the successful pursuit of better coordinated use of international USAR assistance by the affected country. In order to be able to do that, this understanding needs to be achieved at two points; that is in the donor communities as proposed by de Ville de Goyet, (2000) but equally as important, with the recipient country. A closer look at each of the categories of this primary category will provide a better appreciation of what kind of understanding is actually required, and how this understanding might be achieved.

3.3. The categories

3.3.1. Understanding the greater system of USAR assistance and one's role within it

This category specifically speaks to the need for all involved to understand how the overall system of international USAR aid response works. This broader perspective is in fact the overall concept of an affected country needing help, asking for it, receiving it from the donors and then using it effectively, as depicted in Figure 5-4.

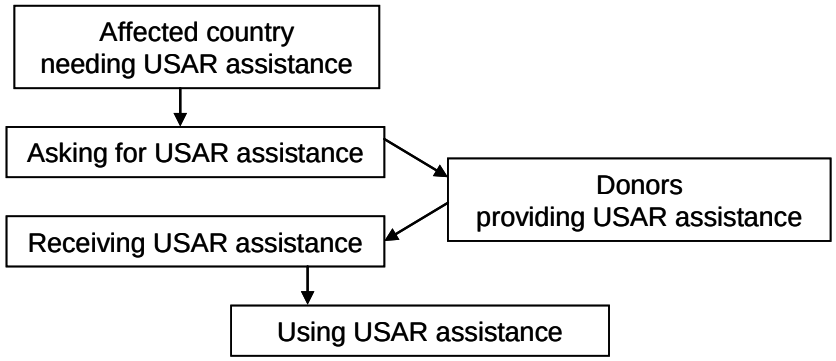

Figure 5-4 The broader perspective of USAR assistance in a major earthquake

Realising their responsibility in this system as a whole, (be this as recipients of aid or as donors of it) will help them contribute what is needed to ensure the process works. Here too, the issue of working towards this common goal is part of working with the greater system rather than against it.

"…you have to understand how the big machinery works, in order to be one functional part and not to slow things down or sabotage things, even if you have the best intentions."

"…and also that they fully understand what role they play within this international approach…"

"The other thing is that we are just a small part…"

"For me the coordination problem, the challenges rather in finding procedures and accepting procedures and if determining the common mindset so that everybody has an understanding of his contribution to the whole process"

3.3.2. Understanding the INSARAG and what benefits it provides through USAR assistance

The activities of the INSARAG play a central role in ensuring the effective use of international USAR assistance. However, a lack of understanding of what the INSARAG is and provides can hinder its effectiveness.

"Don't think they really understood INSARAG at all or what to expect when an international team arrives…"

Many informants felt that some persons wasted time feeling threatened by the unknown of the INSARAG and the USAR capabilities it represents. Time is lost when the INSARAG teams have to demonstrate their capabilities before being allowed to proceed with USAR activities. This was experienced at different levels but most often at the "on the ground" operational level.

"Not understanding our capacity. Why should we be able to do anything better than they've been doing for the last day? And they had probably a thousand people crawling over this building. Which we asked them to give us an hour. Clear everybody off and give us an hour and see if we can show them, and we were just going to go through what our equipment can do. Wasn't expected to actually find anybody but just show them we need everybody off, we need quiet to actually do it. Soon as we got everyone off put the vibra-phone (an electronic search device - researcher) over, picked someone up within 10 minutes of that. From then on coordination on site was a lot easier…"

It is also interesting to note that this frustration is also referred to in the literature. Published narratives of activities in affected countries also speak of this frustration of international USAR assistance teams having to prove they could contribute something to the rescue effort (Holland, 2005).

3.3.3. Having a common understanding of roles and responsibilities

In ensuring the understanding of the INSARAG and the USAR benefits they provide, it becomes important that everyone has the same understanding of what this is, and more importantly a common understanding of what should be in place ahead of the event - preparedness. In this regard, de Boer (1997) proposes that the criteria for assessment of disaster preparedness should consider:

- the medical rescue capacity;
- medical transport capacity; and
- medical treatment capacity.

While these are clearly assessments of medical capacity in a disaster plan, they clearly outline the considerations for ensuring the same things are assessed. In other words, having a common understanding of what is important, and therefore should be in place.

The following participants' quotes highlight the need for this understanding:

"..and prior knowledge of documentation that will be required. Pre-filled out documentation so that when you arrive at the reception centre you've already got a lot of that. That will speed up teams actually being deployed into the field. Prior knowledge of how the reception centres will work and what they will require of you as an international team coming in.."

"..Number one is awareness and even if my country is disaster prone and it's not able to develop a USAR resource at least I know how to call for one. So that is the first step and the resources come along and it takes a while to develop but particularly for a disaster prone country to realise that they're not in this thing alone there is a community there that's willing to help them that is coming cost-free.."

The following extract is taken from the secondary data source of the report on the response to the Bam, Iran earthquake.

"Integration of International Response Teams
Good disaster planning by the Iranian Government prior to the disaster enabled the integration of the numerous international response teams into the disaster management plan. To follow this example, INSARAG member countries should be encouraged to include INSARAG and UN disaster response methodology into their national disaster management plans."

The inclusion of "INSARAG and UN disaster response methodology into their national disaster management plans" requires a common understanding of what these plans entail. If everyone were to make plans that did not allow interoperability between them, this would only make things more complicated and less effective. A common understanding of what is required from such plans is essential to ensure compatibility and integration of, and synergy between systems. Operationally speaking, this common understanding will also facilitate the relationship between the LEMA and any international assistance that may be on the ground.

3.3.4. The link between experience and understanding

Understanding is clearly linked to experience. The more experience one has, the more understanding one has. It would appear from the informants that experience and understanding are directly related to each other. Many of the informants attached a very high value to understanding gained through experience. Conversely, it was noted that countries with less experience have less understanding.

"Prior experience is probably the biggest thing. The countries that have at any time experienced an international response they act very differently at the next one."

It was further noted that ongoing experience leads to greater understanding. In other words, experience needs to be ongoing with the best experience being seen as regular or frequent experience.

"I think this deviation from the original plan, was very much supported by the fact that there were no major earthquakes for a while…"

It is however worth mentioning at this point, that it is well understood that no single country will ever generate all the real USAR experience required to ensure this ongoing experience exists. The literature speaks of a lack of experience within bodies with daily responsibility for the coordination of response to major disasters (Katoch, 2006). This raises the issue of the need to provide assistance in other disasters in order to be properly experienced (prepared) for your own disasters. Of course the ethical appropriateness of this is a separate discussion worthy of future study, and as such is considered in the conclusion as an area for further research.

3.3.5. Creating and using opportunities to gain experience and understanding

Because it is understood that major earthquakes requiring international USAR assistance do not happen every day, the question of what other opportunities exist for gaining experience for understanding was covered by

some of the informants. It was also a point of action in the Lessons Learnt meetings.

“Recommendation: In order to make more clear the relationship between international USAR Teams, the LEMA and the OSOCC, more international USAR exercises should be organised involving all partners. The INSARAG concept paper for USAR/OSOCC liaison should be distributed (Action: INSARAG Secretariat, INSARAG Regional Groups)”

Over and above the exercises (that is scenario-based field type exercises) as mentioned in the extract above, other opportunities in the form of INSARAG meetings and combined training were also recommended by some informants as a means of gaining experience.

“They pick up on that, they gain skills that they can then put back into their own teams.”

"So now most of the region knows what INSARAG is about. We’ve done presentations on the tools of coordination. They know what the OSOCC is. They know how the OSOCC fits on site and how the OSOCC fits in the capital of the affected country."

"Now those 4 events proved that the international community was in disarray, disjointed and dis-structured and it was a free for all. It was a disaster derby and anybody that had a horse could ride and go in. Since then the INSARAG family through meetings and exercises has produced some quality work"

The Lessons Learnt Meetings, also provide such opportunities for gaining experience and thus understanding. As pointed out in the flow diagram below (Figure 5-5) these would represent ‘Indirect experiences’ as opposed to ‘Direct experiences’ gained through being involved in a real international responses to major earthquake events.

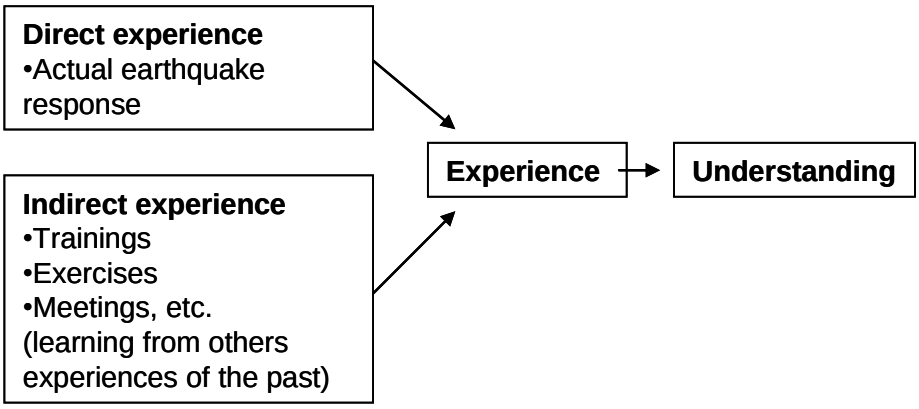

Figure 5-5 Direct and/or indirect experience leading to understanding

A further consideration in this area, is the classification of experience not only as direct and indirect but also according to its worth. For instance it could be understood that some experiences are far less useful than others. In some cases experiences may even create less understanding or even confusion. This issue did not come out in this study but would certainly represent an area for further investigation.

3.3.6. The right people, at the right level, acquiring the right knowledge and understanding

The informants pointed out that these opportunities for gaining experience and understanding need to target the right people, that is to say the right people at the correct level. This discussion of what is the correct level is also found in literature where varying opinions exist. The general feeling is that on the ground level, local people are the level that should be targeted, as they are always the first to arrive (Barbera and Cadoux, 1991). On the other hand some feel that the need for experience among decision makers is as important (Katoch, 2006). Most of the informants agreed with both of these approaches, as they spoke of the need for what they call a 'cascading down of information'. In this way they felt that the need was for all levels to be targeted.

"Cause there may be some people in countries that do know about the INSARAG system but they are probably not going to be the ones responding to the airport first and they haven't cascaded the information down."

"It's got to be done at a very basic level, not in some big ivory tower at government level enjoying a very nice coffee somewhere, on the ground getting your hands dirty, speaking to the people who are actually going to do the work. It's got to be done at all levels I guess but not just at the top."

3.3.7 Having understanding before it is needed

The issue of the time or when understanding should be gained is simply summarised by this quote.

"They should know all that before hand…"

The data consistently refers to the period before an event more than the period after an event (preparedness). Understanding developed before an event is essential, with the only way to achieve this being contact with potentially affected countries before an event occurs. This argument is further strengthened by many feeling that things improve after time.

"All the times things going better."

If one believes that the reason things improve with the passing of time is due to the development of understanding over that time, then one could further conclude that if understanding were in place before the event (preparedness), then things would have been even better from the start.

"…this is the only way by working with together and creating awareness in countries…"

4. COMMUNICATION

Communication is essential to success in solving difficult problems that span individuals, organisations, systems and countries. In this regard, it was not surprising that the major category of communication emerged so strongly from both data sources. This category, as with *understanding*, is considered a primary category as it is the link between *understanding* and the other major categories identified in this study.

4.1. Communication defined

Within the context of this study, communication should be seen as the means of propagating understanding. That is to say we communicate with each other so as to develop understanding amongst and between each other. If we appreciate that there is a process behind this communication, such as: Who (says) what (to) whom (in) what manner and (with) what effect (Lasswell, 1971), than we begin to understand where opportunities and threats to its effective use may exist.

4.2. Commonalities and differences between data sources

The major category of communication was present in all the secondary data sources and in all but two of the interviews. This strong presence in the data is to be expected due to the fact that the issue is so closely related to the research questions.

4.3. The categories

In considering the categories of this major category it is noticed that communication is discussed at two levels, these are: preparatory communication and operational communication (Table 5-2). In other words, communication is needed to develop understanding in *preparatory* activities such as training. Additionally, communication is used *operationally* to send and receive information in the context of delivery of USAR in the field. This may be the technical ability to speak to a field control centre from a remote

location, or the ability of teams from different countries to talk to each other at the site of a collapsed building.

Operational Communication	Preparatory communication
Practical communication means between those involved in the actual response to an earthquake allowing them to be understood	The use of communication to achieve understanding during opportunities such as meeting, training etc.

Table 5-2 Operational versus preparatory communication

At both levels the important consideration is the fact that communication is essential for information exchange and understanding.

4.3.1 Language barriers and the use of interpreters

At the very basis of being able to work together is the need for effective communication. Communication requires that the communicators are able to understand what is being said. This is essential for all aspects of USAR, but especially for operational issues. It should be understood that USAR assistance is drawn from a variety of countries that do not all necessarily share a common language. This often creates a language barrier between those involved. The two important aspects of this consideration became apparent from the data and are discussed below.

"Sometimes it was a problem with the communication, of trying to get over the language barrier."

4.3.1.1. Language

Not understanding each other because of language differences can be a major problem at both levels of communication (Table 5-2). In the field (operational level) this can lead to incorrect decisions based on misunderstandings. In meetings, training and other such events (conceptual level) a lack of understanding due to limited language ability can mean that the content of the training is not understood and key messages are lost. Even in the informant interviews, such as in the extract that follows, there were

occasions where a lack of language ability made for some misunderstandings.

Interviewer: Why these things?
Informant: My things?
Interviewer: No, why do you say contact?
Informant: Contact?
Interviewer: Yes, why contact?
Informant: Mail and phone.
Interviewer: But why?
Informant: Who?
Interviewer: No, not who, why? For what reason contact?
Informant: Ah, reason contact. Reason contact is better coordination and what kind of coordination, what questions coordination. (Pause - researcher) I don't understand the question.

"We're dealing with different languages, different religions, different cultures generally so just one inappropriate word can destroy a weeks worth of work..."

"I've got to say it was hit and miss. Sometimes it was a problem with the communication, of trying to get over the language barrier."

4.3.1.2. Interpreters

The language divide can be very wide without the ability to translate from one language to the other. The issue of not being able to adequately communicate because of a lack of accurate interpreters was an issue covered in some detail by many of the informants.

"Yeh, the local people they're also important but that depends on the language. That's sometimes a little problem. I have not all times the idea that the translator work very well work in the same direction that we want..."

"We have to have interpreters."

It was also seen in points raised (see extract below, interpreter referred to as a translator) at the Lessons Learnt meetings considered as a secondary data source.

> "Translators: When using local translators, it was suggested that USAR teams use translators that are provided by local authorities and not recruit their own. It has been observed that unqualified interpreters often gave their personal evaluation to the USAR team or the media which was not always accurate."

Of course this issue does not only relate to communication during an event. The use of interpreters in training (Morris, 2002b), meetings or other such events is also paramount to the successful impartation of knowledge and understanding. The use of unqualified interpreters or interpreters with personal motives may not easily be controlled but, again, represent a limitation that should be well understood by those involved to help in preparedness for this.

4.3.2. Limitations of the extensive use of terminology

As shown in the commonly used abbreviations section at the beginning of this dissertation, there are many terms and abbreviations that are commonly used in international USAR assistance. Consider for instance On Site Operations Coordination Centre (OSOCC), affected country, Base of Operations (BoO), United Nations Disaster Assessment and Coordination (UNDAC), or delayering. These are all examples of the terminology and abbreviations often used in the field or at other gatherings of those routinely involved. Without an understanding of such terminology there is a great potential for miscommunication.

Terminology was referred to by only a few informants but was heavily used by many of the informants in the interviews. In this regard, the issue of terminology per se was raised by only some of the informants, and was not

directly referred to in the secondary data sources at all. It was however noticed by the researcher that without some understanding of terminology that newly involved persons could quite easily be unable to fully understand and participate in discussions.

"Of course we have a system, let's say, and we just have to improve it to get it better and to get the understanding to reach each teams. So they are talking the same language, let's say, in that way..."

"Terminology. It is correctly this word terminology? And strategy and tactical terminologies…"

4.3.3. Communication between players

There are three *players* involved in the environment of international USAR aid. They are the donors, the recipients and the coordinators. Figure 5-6 shows where these groups' responsibilities lie in relation to the overall international USAR assistance concept initially discussed in Section 3.3.1 and shown in Figure 5-4 of this chapter.

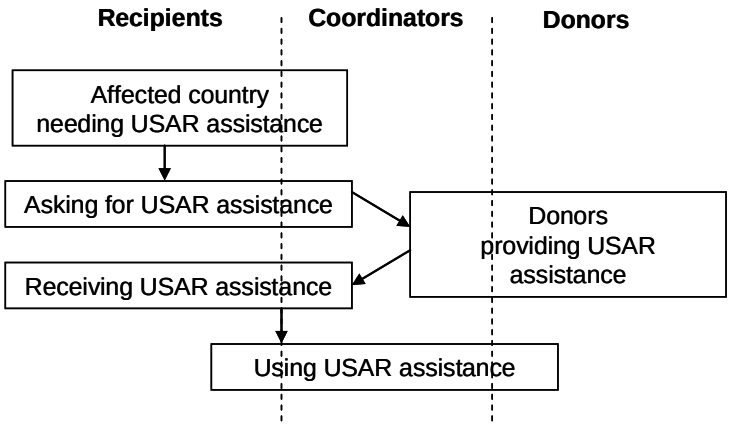

Figure 5-6 Outline areas of responsibility of three groups involved in USAR aid

The ability of these groups and the individuals within them to communicate with one another appeared as a major issue within the data. Effective intra- as well as inter-communication within and between these groups is essential to the successful pursuit of a common understanding among all involved. Within this category, operational communication issues (referred to in Table

5-2), such as having the correct technical communication equipment to facilitate communication between players was discussed. This issue of telecommunication for information pathways is also found in literature (Garshnek and Burkle, 1999).

With regard to the conceptual level of communication (Table 5-2) providing opportunities for communication to occur outside of actual earthquake events, was also discussed. The use of such opportunities for gaining understanding in different forms to target different levels is considered an important consideration for the future.

"So again it comes back to training, events like this, creating more open communication channels and being able to respond to changing issues quicker than maybe getting together once a year type of thing."

"But there once again there's no discussion between the donor community about whose doing what. Who they're doing it with. So I think that, and this is something we have discussed within the INSARAG family," (Referring to the needs for creating opportunities for communication.)

"And I think now that a lot of the countries not only hear that message but believe that message where before they didn't believe it. So I think that has helped as well of getting rid of the mystic of, if you will, or the leaders or whatever word you want to use. When we go into a meeting room we are all the same group of people regardless of what country we come from."

4.3.4. Communication with the affected country

Opening lines of communication with affected or potentially affected countries is a very common issue found in the primary and secondary data sources. It appears to be well understood by most that the way forward is to communicate with potential recipient countries ahead of time, to optimise their opportunities to make use of international USAR assistance in the future.

There was also some discussion on the operational benefits of having open communication channels with a country ahead of an event.

"The affected country is an issue that comes up more and more in the INSARAG after we have spent the first few 15 years now to get our act together from the response community I think the understanding is it gets more developed than actually the disaster prone or affected countries, those who are actually receiving all the international teams should actually be better prepared…"

The data would suggest that two considerations need to be made. Firstly there is a need for having communication with countries ahead of an event. This should ensure the use of preparatory communication to develop understanding so as to allow for preparedness. Secondly the fact was raised that such communication will ensure open channels for operational communication when needed later during an actual earthquake event.

4.3.5. Communication between the LEMA and the OSOCC

The sound operational communication link between the LEMA and OSOCC is paramount to successful coordination of international USAR assistance. Communication between the OSOCC or UNDAC team and the LEMA of the affected country is a critical issue in the effective use of international USAR assistance. This is ultimately where the three groups discussed above come together. That is; the donor meets the recipients with the coordinators in the middle (Figure 5-6).

"So basically what we did was trying to put up a sub-OSSOC to establish contact with the other teams and with the local authorities as well."

At the same time there are issues raised in the literature that point towards challenges to this relationship between donors and recipients. Issues such as the need for donors not to appear threatening to receiving countries but being there to help (Barbera and Cadoux, 1991) as well as the importance of assisting with coordination while at the same time not duplicating local

coordination (Erdogan, 2006) are discussed. Over and above the various reports outlining coordination problems in general there is one particular study by Altntas and Delooz (2004) that takes a closer look at this issue. In their investigation into the problems faced by the personnel who participated in the 1999 Marmara earthquake, they found that coordination was the greatest organisation/system problem experienced (Altntas and Delooz, 2004).

4.3.6. Timing of communication

It all has to begin with communication. From preparatory communication ahead of an event to ensure understanding, through to an early request for assistance being made, and stable operational communication being used in the field when the earthquake happens, all of these communications need to happen sooner rather than later.

"Official Request for Assistance: The chronology of events showed that the official request for international assistance came nearly 24 hours after the earthquake."

Early communication is highlighted in both the primary and secondary data as being an important element to any communication surrounding the use of international USAR assistance.

"We can't wait 24 hours to get a situation report. It's got to be within the 6-12 hour…"

"If we don't get. If the coordination and the communication, which is very important, doesn't occur, then the teams spend a lot of idle time waiting to be deployed or don't get deployed at all."

4.3.7. Communication of information

4.3.7.1. Access to and collection of information

Much can be found on the topic of information management in the literature. For instance a report on the humanitarian response to the Indian Ocean Tsunami of December 2004, called for information management to be

strengthened in future responses (Emerson et al., 2005). It is also clear from the literature that much information is lost in the chaos surrounding disasters in general (Guha-Sapir, 2000; Boodram et al., 2002). Most of the discussion found in the interviews related to operational communication for information sharing. Here the informants spoke of the importance of managing the various sources of different information in the field, such as reports on number rescued or assessment results of collapsed building and damaged infrastructure. They further spoke of the need for this information to be properly distributed among those needing it.

"…everything is based on information. You either have it, you don't have it…"

Similarly this was found in the secondary data surrounding practical operational information collection and distribution.

"This information was made available on the Virtual OSOCC, and individual teams were contacted directly by the INSARAG Secretariat."

The conclusions drawn were that effective communication to facilitate information exchange is an essential component to the operational dealings surrounding the response to and coordination of any international USAR assistance in the case of a major earthquake.

4.3.7.2. Communication with media

Considerations surrounding communication with the media were only found in the secondary data source. It was interesting to note that it appeared to be an issue related to some events more than to others. This may well be linked to some earthquakes events being more heavily covered by media.

"Interaction of international responders with media

A policy should be developed during the field operation on how to deal with media in order to ensure a synchronised provision of information to media by

all international USAR teams and other responders. Action: UNDAC Team, international USAR teams”

The literature clearly points to increased media interest and coverage of such disasters. (Barbera and Cadoux, 1991; Barbera and Macintyre, 1996) In this regard the international USAR community clearly needs to consider information exchange with the media in so far as how to ensure it is performed efficiently and effectively. As such, this appears to represent information that should be considered with all involved to ensure understanding and thus better preparedness as considered in the research question.

4.3.7.3. Information and communication standards

Again only represented in the secondary data, there would appear to be issues with the manner in which information is handled in the response environment. Here some operational solutions to common communication of information problems where discussed in the secondary data sources. These were mostly technical operational issues that did not have particular relevance for the study area.

5. STRATEGIES FOR SUCCESS AND FAILURE

This major category represents commonly referred to strategies found within the concept of international USAR assistance use. In both the primary and secondary data sources there were several similar examples of principles, which have proven over the years to provide either predictably favourable or unfavourable results in major earthquakes. Many of these represent concepts and tools developed and/or commonly used within the environment of international USAR assistance. These tools have been discussed in Chapter 2 (Section 5).

As with the other major categories, it is expected that a stronger understanding of these strategies and principles will likely provide opportunities for more effective use of international USAR aid in the future. In many cases, strategies for success also represent tools already in place that only need to be well understood as part of preparedness in order for them to work well.

5.1. Commonalities and differences between data sources

This major category arose from both the primary and secondary data. It was only absent in two of the informant interviews.

5.2. The categories

5.2.1. The need to plan for receiving assistance from outside

The issue of the need for countries to have a plan to receive assistance was found in the informant interviews but was surprisingly not covered in the secondary data source. In most instances this spoke to a frustration of the international teams regarding the ability of an affected country to be able to cater for the minimal needs of the teams. That the team's needs are so limited is due to the fact that many teams respond according to the INSARAG guidelines that require a very high level of self sufficiency.

"…preparedness plan, how to receive help. Almost everyone has the plan to give help but to receive help that's another question"

There was also a note of "…it can happen to any country no matter what your resources are…" in the data. This was very interesting as it spoke to the fact that ultimately all involved should see themselves as potential recipients. This is a point that is perhaps ignored by some over confident donors. This is also where we begin to see the importance of less separation between the proverbial split between traditional donors and traditional recipients.

5.2.2. Being prepared to ask for assistance

The issue of asking for assistance was discussed but not well spread throughout the data. Within this category the issue of the time of requests is not the central issue, but rather what preparation is required to ensure an effective and properly detailed request for assistance can be made.

Informants touched on the ability to be prepared for what such a request would entail from those recipients asking for the assistance. It is also very interesting to note that most comments, despite coming from countries with high risk, started by saying that it is unlikely they would ever need assistance.

"We can do this. But just in case if we need assistance from the international team then we are very organised."

This speaks to the misconception (also noted in Section 5.2.1) seen in some more developed countries that they do not consider themselves vulnerable despite the recent escalation of terrorist threats (Arnold, 2005) and the unpredictability of seismic activity (USGS, 2005). It was felt, among some of the informants, that many developed countries see themselves as traditional donors only and so have difficulty appreciating the need to be able to receive assistance if necessary.

5.2.3. Importance of starting all coordination at the point of entry of the assistance

Much of the success or failure with arriving international assistance in the first days of a major disaster is the direct result of the effectiveness of the exchange of information that occurs at the point of entry. The concept of working from the point of entry is a perfect example of a strategy already in place discussed here as a category of the major category “Strategies for success and failure”.

"In Pakistan we find the reception in the civilian airport where most of the incoming help is coming in from the military airport and there you have a mismatch. The OSOCC, one is in the hotel and the other is up ahead in Musaffrabad and all the other sub-hubs you see. So at least one of those coordination mechanisms can come in closer to where the teams arriving and to be the link between the team and the LEMA and I guess that would be even better. Because when we were in the airport we were dealing straight with the Pakistani officials by making calls to OSOCC and the information is in one big loop rather than face to face on site. So my thoughts is that if the coordination mechanism is on site where the LEMA is where the arriving teams are, as per theory always, it will work. So in that sense here we are moving from one place to another going to the mechanisms, coordinating mechanisms, like moving from Islamabad to Musaffrabad, getting to the OSOCC and getting ourselves present there and then doing the work."

"…the reception centre when we arrived something that is very good and you can talk to them and perhaps in Bam you can talk to the Swiss guys we want some transport or we need something to else and then we know that have somebody have heard and somebody can perhaps help us and then I think that’s a good thing."

"United Nations will set up reception centres in the devastated country that will enable enough information to come both into the country from teams coming in as well as information on the ground in the hot zones as to the best place and the number of teams and the types of teams that would be

required. The information that is needed is two-way information from both the teams coming in as well as the LEMA's within the country."

The use of RDC with all the considerations that surround them is well documented in existing literature (INSARAG, 2006; OCHA-FCSS, 2006). As such, the concept of working from the point of entry through the use of a RDC, is discussed at length in Chapter 2 (Section 5.4). The fact that it is raised here highlights that it is a critical methodology that should be well understood by potential affected countries.

5.2.4. The need for coordination and an organised structure in the field

The issue of coordination and the existence of an organised structure are certainly closely related. There was some discussion on how to help this occur in the affected country. It was however clear from the review of these discussions that no simple solution to the problem of coordination and structure exists. The reason for this is primarily due to the overwhelmed state of the affected country. These limitations are not newly discovered as they are also discussed in the literature (Emerson et al., 2005). What is of interest is that it again represents issues clearly not well enough understood by those involved, especially those in the affected country.

"Standard USAR field reports
There is a need to introduce a procedure by which a standard report format by USAR teams should be provided on a daily basis…"

Having an organised structure in place may not provide all the solutions. It is however pointed out that such a structure represents the basis on which to fall back, when all else is overwhelmed.

"…is not something that international responders can just turn up and do on their own without any form of coordination…"

Lack of coordination is seen by many as a major problem in such earthquake events (Altntas and Delooz, 2004). It is also well understood that a lack of

coordination often equals duplication of efforts (Erdogan, 2006). These considerations further strengthen the argument for embracing a structured, coordinated approach.

5.2.5. The right people understanding the right things

Does the knowledge and understanding reside with the right people? The issue of targeting the right levels with the right message is discussed in some detail in the following chapter as it is an issue that crosses many categories from different major categories.

"I would say they've done as much as they can already. We've all the tools that we have, the guidelines, our workshops and in fact most of these affected countries have already participated in many of our team leader meetings. They have had some personal trainers, some UNDAC people, it's just that they need to translate these down to the people who are actually managing incidents…"

From an operational stand point, much of the discussion here was focused on a lack of understanding but also some novel ideas on how to spread the understanding were given. For instance, the use of a rotation system for staff members to attend training and meetings to ensure better knowledge saturation was suggested.

5.2.6. Use of and understanding of guidelines and tools already in place

Guidelines referred to here are the International Search and Rescue Response Guidelines (INSARAG, 2002). These guidelines are discussed in Chapter 3 (Section 2.1.2.) of this dissertation.

"…they asked for the guidelines and they asked for the marking system. They asked for a website, like the virtual OSOCC eventually, and these other tools. And these were developed then. And henceforth we have them. And I think, thanks to all these phases the INSARAG process went through it is now what I consider a very powerful network."

It is interesting that some of the commentary coming from certain team leaders interviewed as informants, showed a lack of understanding of the content of the guidelines. It is also of note that these were team leaders with little experience. No comments were made regarding the use of the guidelines by the affected countries. With hindsight this makes sense as there is not a lot of content of particular interest to them in this document, as the document refers primarily to operational response (INSARAG, 2002).

5.2.7. Proper use of UNDAC system and OSOCCs

The UNDAC team system (Chapter 2, Section 5.2) is not without its limitations. Many informants spoke of a frustration at the lack of understanding among some UNDAC teams. These were teams that have been involved in earthquake response without fully understanding the dynamics of coordination of USAR assistance.

"It is not yet mature in the international community that's why in the future in the future we have to to to strengthen the role of OSOCC."

"…beginning there was a lack of coordination between teams. So basically what we did was trying to put up a sub-OSSOC to establish contact with the other teams and with the local authorities as well."

At the same time however, much was mentioned on the strength of the UNDAC system and concept as a whole and the importance of its link to an On-site Operations Coordination Centres (OSOCC) in being essential for good coordination with the LEMA.

"Role of the UNDAC team: The Algerian authorities stressed the positive and critical contribution made by the UNDAC Team in assisting the coordination of international USAR teams."

5.2.8. The LEMA should always be in charge

It's all about the LEMA being in charge. Many informants highlighted the fact that this is essentially the only viable way to ensure a stable platform for

coordination during the rest of the disaster. The responsibility for dealing with the disaster will always ultimately lie with the affected country (UN, 1981; UN, 2002). It is also important to point out however that it makes sense that the LEMA resists challenges to its authority.

"…the major incentive to do international Urban Search and Rescue is actually to start or create the platform for further relief operations to the affected people. And to strengthen their own willingness or ability to take care of themselves because we, the international USAR teams, will yes provide specific assistance to very small part of the affected population."

USAR assistance is only there for a limited time and is only initiating the response to the quake as a whole. If the LEMA does not remain in charge it becomes very difficult for them to take on this role after initial USAR assistance has left.

"They're supposed to be helping the country so they have to coordinate with the country…"

5.2.9. Early use of strategies and tools

"Timely" "quick" "before", "proactive", are all used in describing the timing aspect of use of the various strategies discussed above. As mentioned earlier in this chapter the issue of *timing* represents a critical point of consideration in the overall theoretical integration of the major categories. It is also noticed that time does not go unmentioned in the literature. Some authors go so far as stipulating specific times, such as significant rescue activity needing to start in the first six hours (Fawcett and Oliveira, 2000).

"I think the UN and everybody always preaches you've got to get there quick. It was very fortunate that there were some UNDAC members still in Turkey who were able to start a lot of stuff. But I think it was more from the affected countries perspective that they were able to bring everything together a lot faster."

"…there is no use of them if we can't coordinate them and if we can't deploy them in a very early stage after an earthquake…"

5.2.10. Classification of USAR teams according to capacity

This concept of all international teams being classified into light, medium or heavy, is briefly discussed in the Environment of the study (Chapter 2, Section 5.5). It is interesting to note that it was raised in the interviews of two informants as well as appearing in one of the secondary data sources.

"Yes and the classification for Urban Search and Rescue team is very useful, very good."

The only common message that can be taken from these instances is that it is clearly seen as an ideal way to help increase efficient use of USAR assistance in the future.

"Quality of international USAR teams

The quality of international USAR teams was still variable. There is a need to ensure a timely arrival of appropriately equipped and trained USAR teams. The INSARAG USAR classification system should be finalised quickly."

Having a stronger idea of which teams have what ability should assist coordinators in ensuring the right teams are used in the right place at the right time. It is thought that this will greatly assist the coordination process in the future.

5.3. Links between categories and tools already developed

As mentioned in the introduction to this major category many of the strategies discussed in these categories reflect a knowledge of existing coordination tools already developed as outlined in Chapter 2 (Section 5). As an illustration of these similarities the following figure is provided (Figure 5-7). This figure lists the concepts and tools discussed in Chapter 2 alongside the

categories making up this major category. Common ones are indicated by means of the arrows linking them.

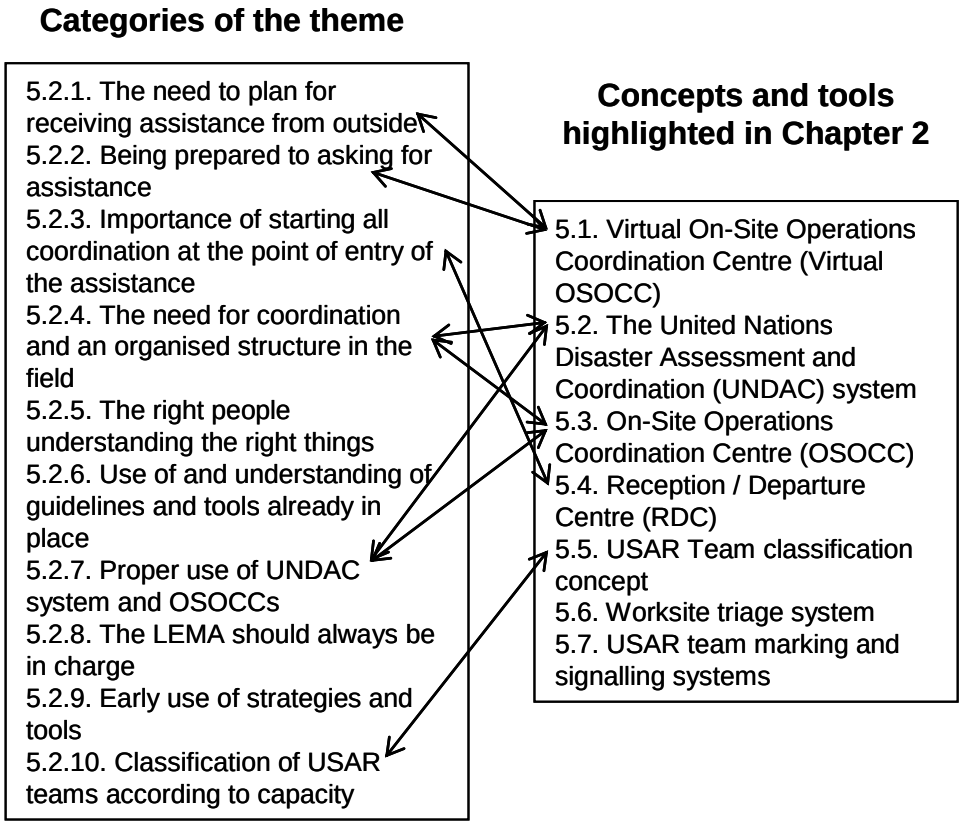

Figure 5-7 Linkages between categories and concepts and tools already used

6. VARIATIONS

Every earthquake is different. These variations are multifaceted involving almost every area imaginable. For instance:

- the amount of destruction spread as a result of the event;
- how many of the local emergency management authorities have personally been affected or killed; and
- the amount of previous experience in dealing with such disasters.

The list of variables can be very long. Most informants considered an understanding of the large variation to be paramount to the effective handling of a disaster of this type. Variations in events based on differing levels of vulnerability are also well documented in the literature (Stephenson and DuFrane, 2002) with the resulting need for flexibility in approach also discussed (FEMA, 1989). If *variations* are the problem, then it could also be concluded that *flexibility* is the solution. There cannot be a 'one size fits all' approach to dealing with the vast multi-faceted variations that exist in this environment.

"It can't be a procedure that is set in stone and the people who are running it need to know how flexible that can be."

This major category emerged as an issue of high importance for the informants who considered an understanding of the wide variations to be vitally important. Due to the wide variations found in this type of disaster response environment, it is impossible to be prepared for every eventuality. In terms of the research question, this major category seems to point to experience and understanding of variation as a way to ensure better preparation.

6.1. Commonalities and differences between data sources

This major category was regarded as very important by those informants who mentioned it. However, it was not found as frequently in the primary data

source despite being mentioned in all secondary data sources. In fact it did not appear in six of the interviews.

6.2. The categories

6.2.1. The overwhelming nature of major earthquakes

The concept of the local authorities being overwhelmed is a common concept also found in the literature that speaks of being practically and emotionally overwhelmed by such events (Kuwagata, Oda, Tanaka et al., 1997; AP, 2006).

"There were no local rescuers because the fire stations they had collapsed. The local hospitals they had collapsed. The Major was standing outside and the city hall he had been standing there for 2 days and he had also relatives and friends that had been killed in this earthquake."

The important point raised by the informants was the issue of a need for international coordination to help the overwhelmed state. This was however, qualified by adding that any help had to be performed within the boundaries of ensuring the affected country was still left in charge.

"So if we have an earthquake or floods or any other natural disaster you have the government who should be in charge, most of the time they are overwhelmed. They cannot do it, but still they call the shots at the end of the day. And they have all these international teams coming in which are sent bilaterally by their organizations."

Natural disasters occur suddenly and require a rapid response (Katoch, 2006). The practical limitations to this were well highlighted by the informants but equally so was the emotional overwhelming of those in charge. This was seen as a limitation of local authorities, perhaps with their own particular interests, being in charge of assigning resources. It is understood from this that a certain amount of conflict of interests could occur in this environment. An informant provided an example of where a local coordinator was

suspected of diverting USAR resources to the collapsed home of his family rather than to a collapsed public building where more potential survivors could be trapped. As such this represented a further piece of understanding that needs to be in place to help be better prepared to create systems to avoid it.

6.2.2. Differences in the geographical spread of earthquakes effects

Mostly a practical issue, the main message raised by the informants here is that the more widely spread the effect of the earthquake is, the more difficult it is to coordinate.

"The wide spread effect of the earthquake in literally over hundreds of square kilometres. Density, the density of where the impact was felt obviously has a huge difference."

The more spread out an incident is, the more difficult effective communication between those involved in the response is. Again this was primarily an operational issue that only directly related to the study in that it represented knowledge that should be understood as part of the preparedness required.

6.2.3. Differences in nature of an earthquake response

This category follows on from the discussion above. The issues raised here again speak of practical considerations regarding the way that one event can differ so much from the next.

"…it's two different variables. One variable is the country itself and how organises and how coordinated and how ready it is to cope with the catastrophe. And the catastrophe itself, the magnitude of the catastrophe,…"

These variables are multifaceted, but basically fall into two areas of consideration. Firstly there is the difference in the preparedness of the affected state. Secondly is the variation in magnitude of the event and thus its effect.

6.2.3.1. Differences in preparedness of affected country to coordinate the response

As mentioned above, one of the major variations between events is the ability of the recipient country's preparedness to coordinate response.

"…a great difference from country to country in their abilities to cooperate and coordinate and respond…"

A specific point of interest to the study is the apparent link between their ability and previous experience. This speaks strongly to the idea that with experience so too comes a better prepared LEMA. In other words, those LEMAs that have had earthquakes of their own or have been in the position to learn from events in other countries are far better prepared to manage their next event.

"One variable is the country itself and how organised and how coordinated and how ready it is to cope with the catastrophe."

6.2.3.2. Difference in magnitude of the event

Even the most well prepared country may still be overwhelmed due to the sheer enormity of the earthquake event. This is the second major variable affecting the response to such an earthquake.

"I think it's pretty much driven by the incident itself. And what I mean by that is the area where it's taken place and of course the, what's the word, um, the area that is affected. Bam was a good example. Very easy, straight forward, one place that's affected nothing else around it you come in. It's very easy to organize the international response into the area. Pakistan, India was another different totally different story."

Interviewer: "How, how was it different?"

Informant: "The wide spread effect of the earthquake in literally over hundreds of square kilometres. Density, the density of where the impact was felt obviously has a huge difference."

6.2.4. Variation in amount of assistance required and supplied

In review of USAR assistance provided, it is noted by some that the assistance required does not always meet assistance received. In some cases there are not enough teams available and in others it appears there are too many. Another aspect is that in some cases the teams capabilities and the requirements of the earthquake are mismatched.

"Those international assistance requests went out, everybody just about deployed and only a quarter of them, if that, were actually required."

Discussion on the importance of response being directed on the basis of specific needs is well documented (Gunnarsson et al., 2005). It would appear that any mismatch is due to a lack of appropriate information coming out of the affected areas (such as insufficiently detailed requests for assistance) or that the information is not being properly considered by the donors (sending what they have rather than what is actually required or requested).

6.2.5. Different types of LEMA respond differently

Most discussion on the local emergency management authority (LEMA) was restricted to the type of authority in place. For instance the LEMA in one instance was the military but in another it was the civil defence. These discussions obviously also attached certain values to certain types of LEMAs. For instance, a military-based LEMA may be more command orientated.

"In that situation, initially, I think it was the civil defence there. Different type of problems encountered…"

These conclusions drawn on the strengths and weakness of different types of LEMAs are in themselves not the most interesting points raised. It is rather the fact that so many different types of LEMA existed that is important for this study. The fact that different authorities are used in different countries points to a critical need for preparedness programs to target the most appropriate authorities. In other words, the importance of identifying who to deal with

before beginning to create opportunities for developing understanding with the wrong authority.

6.2.6. Earthquakes response is different to response to other emergencies

The USAR aid response to an earthquake is somewhat different from that of other major emergencies.

> "…earthquakes are still one of those things I see as one of the most challenging natural disasters because of various things, their nature, sudden onset, a lot of response in the 1st phase of the disaster. Therefore a big need to coordinate and also time pressure and media pressure which is not similar in other disasters."

As already noted in the other categories, earthquake response has many variables within itself. It is however also important to understand that response to major earthquakes is in itself also very different to the response surrounding other types of sudden onset disasters. As pointed out in the extract above there are various elements that make responses to earthquakes so different from other disasters. The message from the informants was that these need to be appreciated by those coming into earthquake response with experience in other disaster response environments.

7. NEED FOR WORKING TOGETHER

No single government, organisation or person can have every solution required to deal with a major earthquake. Involved organisations have to work together synergistically to effectively manage such disasters. This was a common consideration among the informants. This major category emerged as a central consideration for the successful use of international USAR assistance. Various facets of working together including, who works together, and how this occurs were discussed. Again, as with all the other major categories, there was an overriding consideration that an understanding of this major category and the synergies or conflicts it uncovered, would allow for more effective use of international USAR assistance in the future.

The need for working together was approached from two standpoints. That is the stand point of international USAR assistance teams working together and the standpoint of the recipient country and donors working together. In some instances, the line between these is difficult to define. However, the common conclusions were that working together is important.

"You should be part of a system and take part in the system and contribute what you can."

7.1. Commonalities and differences between data sources

In comparison to the two primary categories of the study, this major category was relatively less spread through the interviews. It was not referred to in seven interviews although it was found in all secondary data sources.

7.2. The categories

7.2.1. Working together towards a common goal

This category relates to all parties contributing towards a common goal. Both the recipient country and those responding need to work together in advance of an event to ensure that assistance can be best used in the event of an earthquake.

"Both disaster prone countries and donor countries and that's the key to be able to act together to start to meet each other to start to discuss and try to understand each others viewpoint because everybody wants to do their best."

7.2.2. Working together requires interaction, coordination and trust

The ability to work together yet maintain autonomy requires interaction, coordination and very importantly trust. This only comes from having worked together in the past. The more interaction that occurs before an event, the better it will all work when the event occurs.

"I see coordination as the main conveyer belt for gathering the international USAR response into a meaningful fashion without taking away the teams autonomy to operate"

This concept was not only expressed in the interviews but was also strongly identified in the secondary data.

"Strengthening the INSARAG network

Efforts to integrate all countries that have a stake in USAR in collapsed structures into the INSARAG network must be continued vigorously."

7.2.3. When should interaction occur?

Again, as with all other categories related to timing, the consistent message was that interaction should happen sooner rather than later; ideally before and event and certainly ahead of any deployment.

"All countries that have specific information of the disaster e.g. construction methods should share this through the VO (Virtual OSOCC – Researcher)"

7.2.4. Good and bad reasons for working together

Here the informants mostly spoke about why different international USAR teams might work together. In this regard the discussions raised were slightly

outside the focus of this study, which is more concerned with the affected country's preparedness, rather than donors working together. However as with all discussion of this type, an understanding of the results can only be beneficial as part of the preparedness process.

The reasons given by the informants, for teams working together, can be split into good and bad reasons as categorised by them. The positive reasons given were to be coordinated and to learn from each other.

"So I think we need to work together to try and learn from each"

The negative reason was that certain teams needed to work together due to lack of their own capacity. This was generally seen as a weakness that causes an unnecessary increase in coordination needs, such as making sure they are both sent to the same place to work. Any extra coordination requirement adds an extra stress on the coordination process as a whole (Green, 2001).

7.2.5. Understanding the common interest of rescuers

From the discussion it was interesting to note that above all else, international USAR teams, whether their motives were appropriate or inappropriate, just wanted to be able to do USAR. Understanding this can only help the coordinators in their task of facilitating this. A greater understanding of the desires of the USAR assistance teams will greatly help coordinators motivate the required actions from them.

"…coordination has to be seductive, attractive and we will only succeed if the USAR teams themselves feel that they are stakeholders."

7.2.6. Governmental political synergies providing for and creating opportunity

The governmental and political synergies that allowed for or resulted from the use of international USAR assistance are far reaching. It is apparent, from the data, that in some cases the motivation for involvement in USAR assistance may be more political than humanitarian, but this is a reality of

such response. It was further noted that in many instances the NGOs fell outside of such synergies leading in many instances to the frustration of these teams. While this is not a focus of the study the issue of NGO type USAR assistance teams has emerged from the data and as such cannot be ignored.

"…several USAR teams did not receive a bilateral request…"

8. SENSITIVITIES

The working environment of international USAR aid is an emotionally charged global setting. This environment makes for many interesting interactions. It is this human interaction that the major category speaks to. The extensive experience of most of the informants has given them the opportunity to critically reflect on their experiences in this environment and consider these interactions, the politics at play and the sensitivities. This experience provides a powerful opportunity to learn from these sensitivities and political issues so as to ensure they are carefully handled. Simply ignoring the existence of such sensitivities is not productive. It appears from the details of the categories that make up this major category that working through awareness and understanding of the sensitivities is a better approach to dealing with them.

8.1. Commonalities and differences between data sources

This was again a very strong category with only four informants not making reference to it. It was also covered in all secondary data.

8.2. The categories

8.2.1. Who is in charge and who is able to be in charge?

The simple answer to this is the recipient country. Discussed in some detail in the literature review and the environment of the study chapters, the issue of sovereignty will always stand, especially in a disaster (UN, 1964; UN, 2002).

> "Now I know that we say that the LEMA is responsible for making the assignments but that takes that means the LEMA is in charge of operations and with that understanding a lot of times they are so overwhelmed they have not idea how to put operations into a command structure and take that strong role that they need to take. And it would take a very robust entity to be able to do that during an emergency."

Of course being in charge, when you are perhaps not able to be, can be problematic. The ability to deal with this situation requires efforts from all involved in the donor-recipient dynamic. The recipient country needs to understand the possibility that exists for this situation to arise and to know how to work with this often delicate situation. Similarly donors and coordinators need to understand the delicate position the recipient country finds itself in. As a central issue of this study this needs to be understood as part of the preparedness effort.

8.2.2. Political barriers to opportunities for the development of understanding

The ability to get the message to the right people at the right level, working through the political hierarchical structures that are in place, is the main issue raised here. It is the issue of the right people getting to hear about what is already in place and to develop an understanding of the common challenges they are likely to be faced with as a LEMA. It would appear that certain management structures in some LEMAs are sensitive about a perceived loss of authority. They feel that they lose authority by sending lower level staff to training events rather than attending them themselves. Ordinarily this might not present a problem if the higher level persons attending would pass the information, knowledge and understanding down. However this seems not to occur, again perhaps due to sensitivities about loss of power or control.

"…it's just that they need to translate these down to the people who are actually managing incidents because most of the time from countries like this I find representatives that come higher level of management…"

8.2.3. Politics within INSARAG

Various geopolitical issues were covered by some of the informants. Many did not relate directly to the study but still represented a common category in the interviews and so are briefly discussed here.

8.2.3.1. NGO teams

There appeared to be a major issue with small non-governmental (NGO) teams. Rightly or wrongly they were considered to be substandard by some,

while having been considered to have their own strengths by others. The details of the discussions are not as important as the overall message they presented. That is, that there is a potential rift within the group that should be addressed before it becomes a major issue. This said it should be understood that this issue is not extensively discussed due to it falling outside of the study focus of preparedness of affected countries.

8.2.3.2. Lack of governmental support

A further point that emerged despite falling outside of the focus of the study was that of a lack of governmental support expressed by some countries. In other words, USAR assistance teams felt that they were not adequately supported by their own governments/sponsors. This meant for instance that they were not in the position to participate in opportunities for gaining understanding outside of actual earthquake response missions. While this is not a major consideration for this study it does highlight a limitation to certain opportunities for providing understanding.

8.2.3.3. INSARAG in the UN

There was also some discussion on the lack of understanding within the UN as a whole, on the role of INSARAG. It was felt by many that the bodies within the UN often did not know of or understand what the INSARAG is or does. Some felt that this led to inefficiencies within the global response to major disasters.

8.2.4. Cultural/political sensitivities as communication barriers

Cultural and political sensitivity is the only way to be able to work effectively in this environment. This is the message that came across in the interviews.

"We're dealing with different languages, different religions, different cultures generally so just one inappropriate word can destroy a weeks worth of work."

Reiterated in the reports, the need for those responding to be culturally sensitive to the environment they are entering into is paramount to success.

"The need for adequate training in cultural awareness was emphasized. This includes also the behaviour of international response staff vis-à-vis the affected population, irrespective of their cultural background (e.g. eating food in public places where affected population is suffering from food shortage)."

What was not considered is the effect such knowledge and understanding might have on the affected country. If both the recipient country and the donor countries were both approaching the situation with cultural sensitivity in mind, this may well make things even easier than just one party considering this.

8.2.5. Personal or political agendas in the way of the greater good

The importance of getting information from local sources is highlighted in the literature, but at the same time so is the bias attached to such information in many cases (Backstrom and Christoffersson, 2006; Katoch, 2006). Much commentary was given by the informants as to how they had been given misinformation in the field in the past. In some cases informants' perceived that this misinformation was intentionally provided so as to get them to work according to biased priorities of individuals. This seems by all accounts to be a reality of the environment. Those affected by the earthquake, perhaps with loved ones trapped beneath the rubble, are emotionally pulled between knowing what is best for everyone and knowing what is best for them personally and their immediate family and friends. For example emotional locals may insist on areas that have already been searched, being re-searched and so waste resources that could be used more productively elsewhere.

"There was also priorities that seemed to differ, that the USAR teams opinions seemed to differ very much to the locals opinion because there seemed to be a very high input of personal input because we're dealing with local people they seem to want us to prioritise on their families and their friends first of all,…"

While the issue of personal agendas is one of the things that recipient countries should be aware of, political agendas are another consideration. These exist with donor teams as well as in some instances with recipient countries. These can be varied but in many cases rooted in national pride and the fear of appearing out of control. Consider for instance the statement below made from within a country that has a high risk of earthquakes and has asked for and used international USAR assistance in the past. Here they state that they are not sure that they will ever need to ask for assistance in the future.

"I don't know if my country asks the assistance from international team."

9. LACK OF DISCIPLINE

Guidelines and other agreements are only of use if those involved honour them. The data showed a high incidence of lack of discipline among the various groups involved in international USAR response. The major category identifies discipline issues and provided reasons for much of the lapses in discipline. This understanding is very likely to provide opportunities to counteract this phenomenon. Discipline is required in this environment primarily due to the fact that so many organisations and persons are working together. For this to work, certain assumptions need to be made between these groups. In order for these assumptions not to lead to confusion and misunderstanding all involved have to work according to the same assumptions in a disciplined way.

9.1. Commonalities and differences between data sources

This major category did not appear in six of the thirty individual interviews. Having said this, it was found in all secondary data sources.

9.2. The categories

9.2.1. The reality of the rules not being followed in this environment

Not every one sticks to the rules. This seems to be a frustrating reality of international USAR assistance, despite the acknowledgement that they are important for the effectiveness of USAR aid. Many feel that this is just a reality that cannot be changed.

"If I could switch a button and say ok we can establish discipline in the international community and responsibility to do what you are supposed to do then we would have solved all the problems I would say."

There does however seem to be an effort from within the INSARAG to solve the problem of discipline.

"USAR Teams that do not follow INSARAG Guidelines

Measures have to be developed to ensure that USAR teams, which do not comply with the INSARAG Guidelines, adopt the INSARAG Guidelines or refrain from deploying again. It was suggested that OCHA follow up with the INSARAG Focal Point in the dispatching country of such teams and inform the Government of the transgressions, remind it of the UN GA Resolution 57/150 of 16 December 2002 and request the dispatching country to encourage respective USAR teams to adopt the INSARAG Guidelines."

For the purpose of this study the reality of a lack of discipline should be seen as another piece of knowledge that should be understood and worked with until it can be further investigated and hopefully solved. Some of the possible reasons for not adhering to the rules are indicated in the following categories.

9.2.2. Timely exchange of information required

One of the key areas where discipline seems to be most lacking is in the timely exchange of information. From the affected country's perspective this can take the form of a lack of timely information being provided in terms of the likelihood of a request for international assistance. From the perspective of the international USAR assistance teams, it may be them not updating their team information on the virtual OSOCC ahead of a deployment to an affected country. The issue of not providing information or asking for information does not seem to be a weakness of one group but rather of all involved.

"Pre-filled out documentation so that when you arrive at the reception centre you've already got a lot of that. That will speed up teams actually being deployed into the field."

9.2.3. Disciplined use of agreed upon communication channels and reporting

Following on appropriately from the above issue, the matter of communication channels and the use of reporting have appeared very strongly, especially in the secondary data, as an area where discipline is lacking.

"INSARAG member countries have to assign INSARAG Focal Points and to communicate these to the INSARAG Secretariat."

The solution to develop more standardised reporting channels and forms is not seen by all as the best way to solve the discipline problem. It is however the only solution currently being discussed within the INSARAG.

"international discipline to follow this procedures. Whatever the procedures are the discipline is currently, for me, the big bottle-neck that countries and organisations are still driven by ego problems or by media pressure fund raising issues which are important for them to survive, I fully understand this but there is no discipline to report and share information systematically. There is even though in theory but when it comes to the place no discipline to really hook up and adapt to agreed procedures and it runs down to the fact that when you ask for registration from 2 weeks before the meeting they don't reply until the day before the meeting. So this is the discipline that is missing."

"The balance of information is a very difficult issue there. The idea of the OSOCC is to coordinate and to establish the balance. They are the ones that need to turn around and say we are not getting enough information from the LEMAs. We are not getting enough information from a team. They should be chasing up teams in the field and saying you are not giving us adequate information or the information you are giving us is not enough depth. So I honestly believe, and it's the wrong word, but they nearly have to be the policemen of communications in the field to say you know you are not sending a sitrep, you're not sending us enough information or you're sending us too much…"

9.2.4. A lack of policing and rules

Policing of the rules is seen by some as the solution to discipline problems within international USAR assistance response. The limitations of this solution are two fold. Firstly there is no possibility for policing as it is very

difficult to police within the geopolitical environment of international USAR aid. The whole system is based on trust, cooperation and respect between countries.

Secondly there is no enforceable legislation governing this sort of international response. This is a limitation that is further complicated by many having the mistaken idea that making such legislation is easy to do or already exists.

"The United Nations should come up with an international protocol of how the local authorities should cooperate with the USAR teams. That all countries would have to abide with."

The solution seen by some of the informants is that policing should come from within as a sort of peer pressure or a self generated process. This requires a deeper understanding of the limitation of the current policing mentality.

"…countries are doing this based on rules and a mind set that has been set up rather than because there is a powerful coordinator somewhere or someone who knows it all and can tell everything but rather a proactive approach…"

9.2.5. Emotions playing a role in discipline in the field

Emotions are seen in the data as one of the reasons those involved do not always stick to the rules. Whether this condones the action is not the focus of this study. What is an important conclusion is that the cause and effect relationship is understood.

"…local authorities who come under considerable pressure from families with information about buried victims."

A further interesting point is that emotions appear to affect both the receiving country as well as the donors.

"Rescue workers want to do one thing, they want to work. And if you are not going to put us in the best environment we're going to get shitty."

The USAR assistance teams seem to also be affected by emotions to varying degrees. Many informants spoke of frustrations at the ineffective use of the resources they provided to affected countries. This caused strong feelings when they felt that the affected population was not receiving the full benefit of the assistance they could provide due to coordination problems of the LEMAs.

9.2.6. Leaving the affected country in charge not trying to take over

Nobody wants to take over but the balance needs to be found in helping a country with the international assistance that has come, while at the same time ensuring that they stay in charge. A lack of discipline in this environment can lead to the coordination assistance from outside the country taking over as the easier approach. This occurs when those assisting in the coordination choose to take over in an effort to bring order to the chaos. This will however only lead to more difficulties further into the disaster, when the time comes that this assistance has to leave. This 'not taking over but still helping' balancing act seems to be complicated by affected countries wasting time seeing the international coordination assistance as a threat. This problem can only be removed by instilling a better understanding with potentially affected countries ahead of an event as part of their preparedness.

"They think that the foreigners are coming in to take over the show whereas we are putting in tools at the disposal of the affected country."

9.2.7. The discipline of NGOs

A feeling that some NGOs seem to be operating outside of the rules was expressed by many informants. This was reiterated by the secondary data.

"The Government of Iran felt that some international NGOs in Bam did not accept the leading coordination role of OCHA and participate in the

established coordination mechanisms for international responders. This problem needs to be resolved."

When contrasted in interviews with some NGOs it appeared that, in fact, it was not as much operating outside of the rules, but rather operating outside of an understanding of the rules. This study is more focused on the preparedness required in the affected country rather than the preparedness of the donors. While this issue lies outside of the study focus, it is still an interesting point that has emerged.

9.2.8. Teams being involved for the wrong reasons

The motivation of some assistance teams seems, from the data, to be questionable. Commonly referred to within the professional USAR assistance arena as "disaster tourists", these groups seem to be a major frustration to donors and receivers alike. These teams are normally groups of rescuers that respond to these earthquakes in order to be able to say they where there rather than because they are able to contribute significantly to the rescue effort.

"disaster response, because of the media and the wide coverage, has become a sexy business and everybody that has got a dog and a shovel wants to participate. Once upon a time these people were mercenaries, now they come under the INSARAG umbrella in some way or another."

"disaster tourist type of person." And that is an accepted term. When we talk about you know what I mean and everybody else knows when we talk about that. So for the first thing is that when a team gets registered according to those guidelines and those principles and the classification system it's important, I think, that when a team makes its intentions known of wanting to register and when the audit happens."

While it does not appear that much can be done to completely remove this problem, an understanding of the fact that it happens may well ensure that affected nations are better prepared to deal with it. For instance, affected countries could ensure that such teams are not provided valuable resources, such as transport, that should rather be assigned to the teams that are likely to use them more productively. These kinds of actions in the coordination process will not eradicate the deployment of such unprofessional teams but would minimise their negative affects on the overall response to the earthquake.

9.2.9. The need for response that is needs driven

"Too many not fully qualified USAR teams deployed: Grave concern was expressed for the fact that too many teams deployed to Algeria,…"

The concept that humanitarian assistance should be pulled in response to a specific need, rather than pushed onto the affected country is discussed in much detail in the literature (Gunnarsson et al., 2005). The concept of an affected country requesting specific assistance *pull* on the basis of its needs is central to the effective use of international disaster assistance. Likewise, avoiding donors that provide assistance based on what they have available to provide *push* rather than on what is actually needed by the affected country is important.

It would appear from the data that the need for this push rather than pull phenomenon, is not only seen in more traditional humanitarian aid, but is also a reality of international USAR assistance.

"Well, probably, the main challenge is, or how I see it is, that the international community and all participants in the process see their response as an international joint effort. That's the first important thing, so that they understand that if there's better co-ordination they get something out of it. And not THEY get something better out of it, but the victims, because very often, and we see this tendency that a request is made for international

assistance countries then will look at the portfolio and say we can do this, they deploy, they do whatever they have to do, of course they are attracted by media and other things, for which I called not a co-ordinated approach because they both just interested in their own thing…"

"The team does not see it as a stand alone thing but rather in the context of an international need or a task or activity. And also that they fully understand what role they play within this international approach. And are ready either to change their current objectives because they see that they are duplicating something that someone else has been doing before or that they stop doing something because they see there is no particular need for that or they change their agenda because what they've prepared for there's no need for that to do something else."

These statements illustrate how it is essential that receiving states are aware of this and so ensure that by making as detailed requests as possible, they decrease the likelihood of inappropriate assistance being sent. Arrival of masses of inappropriate aid and assistance only burdens the affected country with more resources they need to coordinate.

10. CONCLUSION

In-depth analysis of both the primary and secondary data has resulted in many categories being discovered. These detailed categories have been grouped into seven different major categories of which *understanding* and *communication* have been identified as primary categories. Discussion of each of the categories considered under the different major categories provides a holistic impression of the analysis of the data as a whole. The following chapter will integrate these finding into a conceptual description of the results of the study.

CHAPTER 6 - THEORETICAL INTEGRATION

1. INTRODUCTION

"I think that you must have now, before the next disaster and we don't know when it is going to be, in an ideal world communication would have begun for a year or two beforehand to try and get an infrastructure, a plan of action, an emergency plan in place for every country so that if a disaster befalls that country they can implement that plan and be prepared to receive international aid immediately. And that has to be flexible though. It can't be a procedure that is set in stone and the people who are running it need to know how flexible that can be."

1.1. Chapter purpose

The goal of this chapter it to illustrate the way in which the major categories and their detailed categories have been integrated into a conceptual description of the results of the study. In other words within the Grounded Theory methodology this chapter should be seen as the product of the selective coding process (Strauss and Corbin, 1998). This conceptual description will answer the research question on which the study is based.

1.2. Research questions revisited

In order to effectively discuss the findings of the study the research question should be revisited. The main research question is:

Within the context of international USAR response to earthquakes, what preparedness is required to ensure best use of international USAR assistance by the affected country?

1.2.1. Sub-questions

Understanding that there are two sub-sets of the study community involved in this process, namely the recipient country and the international USAR donor community, the sub-questions are:

- What should a recipient country have in place to ensure it is best prepared for coordinated use of international USAR assistance?
- How should the donor USAR community contribute to a recipient country's preparedness for coordination of international USAR activities?

Whilst a divide between donors and recipient was anticipated and therefore reflected by a division of the original research questions into sub-questions focusing on each group, the analysis has revealed that the derived concepts span the donor-recipient dynamic. The inductive nature of the qualitative paradigm followed in this study has allowed the researcher to move beyond artificially divergent research sub-questions. As a result, the theoretical integration will take a convergent approach on answering the research questions holistically, without being artificially constrained by the original sub-questions.

2. THE CENTRAL CATEGORY

2.1. Choosing the central category

The first step in the selective coding process is the identification of a central category, also referred to by some as a core category (Strauss and Corbin, 1998; Polit and Beck, 2006) . For this study *timing* has been chosen as the central category. According to Strauss and Corbin (1988) there are various criteria that should be considered for the selection of the central category. One of these is the frequency of the category in the data. In this regard this central category is truly interwoven throughout the data. Linkages to timing are present to varying degrees in categories in all seven of the study major categories (Table 6-3).

The categories of each major category strongly linked to central category of *timing*	***Chapter 5 Section ref.***
Understanding	
Having a common understanding of who needs to do what	*3.3.3.*
Creating and using opportunities to gain experience and understanding	*3.3.5.*
Having understanding before it is needed	*3.3.7*
Communication	
Communication with the affected country	*4.3.4.*
Timing of communication	*4.3.6.*
Strategies for success and failure	
The need to plan for receiving assistance from outside	*5.2.1.*
Importance of starting all coordination at the point of entry of the assistance	*5.2.3.*
Early use of strategies and tools	*5.2.9.*
Variations	
Differences in nature of an earthquake response	*6.2.3.*
Earthquakes response is different to response to other emergencies	*6.2.6.*
Need for working together	
Working together requires interaction, coordination and trust	*7.2.2.*
When should interaction occur?	*7.2.3.*
Sensitivities	
Political barriers to opportunities for the development of understanding	*8.2.2.*
Lack of discipline	
Timely exchange of information required	*9.2.2.*
Disciplined use of agreed upon communication channels and reporting	*9.2.3.*

Table 6-3 Categories linked to the central category

2.2. Timing explained

Most of the relationships between these categories are centred on timely interaction between all players in the donor-recipient dynamic (the donors, the recipients and the coordinators) in terms of preparation for the effective use of international USAR assistance. In this regard, three periods of time surrounding a major earthquake event exist (Figure 6-8). The first of these is the before earthquake period (blue arrow). The second period is the time during the response to an earthquake (red arrow), and the third period is that time after the response before the next earthquake (yellow arrow). From the figure below, one can see that in reality, this is cyclic time loop, where to a certain degree period 1 and 3 share a similar orientation on the continuum.

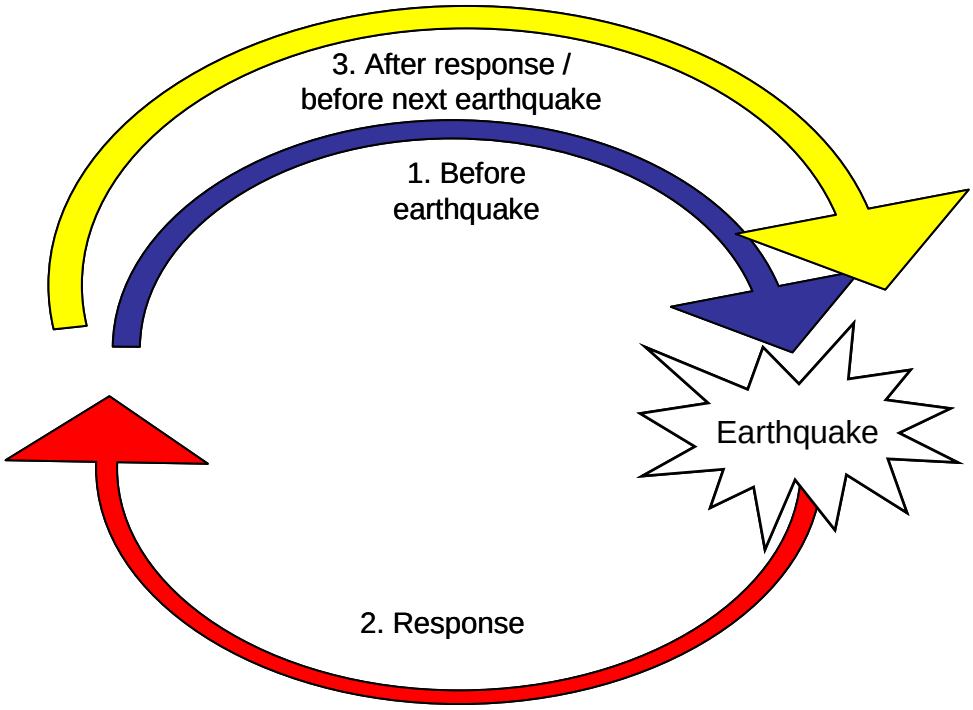

Figure 6-8 Periods of time surrounding a major earthquake

2.2.1. The sooner the better

It seems by all accounts that no matter what aspect of timing is being discussed, it is always clear that whatever is done, it should be done "timely", "quick"ly, "before" or "proactive"ly. Since the main area of study is the preparedness required to ensure effective use of international USAR assistance, this finding is not too surprising. After all preparedness by definition takes place before an event. It is clear from the evidence that

insufficient emphasis is placed on the preparatory phase of USAR coordination and consequently there is inadequate activity in this area. As such this is an area that should be targeted for improvement.

2.2.2. Timing of what?

2.2.2.1. Communication with or by the affected country

The need for timely communication between potential recipient countries and the donor community who have response experience is important. This communication for the development of understanding between those likely to need USAR assistance and those likely to be providing it should assist in optimising the donor-recipient dynamic.

"The affected country is an issue that comes up more and more in the INSARAG after we have spent the first few 15 years now to get our act together from the response community I think the understanding is it gets more developed that actually the disaster prone or affected countries, those who are actually receiving all the international teams should actually be better prepared…"

2.2.2.2. Requests from affected countries

By establishing communication channels ahead of an event it is more likely that the recipient countries will be able to operationalise their understanding of the need for early deployment of USAR assistance, by making early detailed requests. The statement below provides an example of the type of delay that can occur when a country does not understand the need to make an early request.

"Official Request for Assistance: The chronology of events showed that the official request for international assistance came nearly 24 hours after the earthquake."

2.2.2.3. Planning for receiving

The need for potential recipient nations to timeously develop plans for receiving aid ahead of a potential event is clear. The key to ensuring that

countries develop reception plans lies in the effectiveness with which the importance of this concept is communicated to them, and the degree to which they develop an understanding of their role in the broader USAR perspective.

"…preparedness plan, how to receive help. Almost everyone has the plan to give help but to receive help that's another question"

3. INTERRELATED CATEGORIES FROM DIFFERENT MAJOR CATEGORIES

3.1. Linkages between categories

It becomes clear that over and above the major categories already identified there are also crosscutting issues that act as linkages between certain categories across the major categories. These are:

- Opportunities for gaining understanding
- Who or what level should have what understanding?
- Interaction between those receiving and those donating
- NGO USAR assistance teams

Each of these topics is discussed in more detail below.

3.2. Opportunities for gaining understanding

In short, the ability of an affected country to make best coordinated use of international USAR aid is strongly linked to that country's prior understanding. That is an understanding of the strategies or plans and procedures that are already in place as well as the anticipated challenges likely to affect their performance. In order to achieve this understanding at all appropriate levels it is essential that effective communication for information exchange is in place ahead of an event. This is the responsibility of both, the recipient country, and the donor community.

3.2.1. Experience and understanding

In order to create opportunities for developing understanding, the enabling factors must be identified. The analysis suggests that there is a strong link between experience and understanding; this is clearly valued by many of the informants. Countries with less experience were perceived to have less understanding with the inverse also being true.

"Prior experience is probably the biggest thing. The countries that have at any time experienced an international response they act very differently at the next one."

It was also noted that experience needs to be ongoing with the best experience being seen as consistent experience.

"I think this deviation from the original plan, was very much supported by the fact that there were no major earthquakes for a while…"

Since major earthquakes are infrequent and unpredictable they cannot be relied upon as the primary means of developing experience. Opportunities must be sought to allow inexperienced members of the USAR community to learn from those with more experience.

3.2.2. Learning from others' experience

Opportunities that exist for gaining experience for understanding were mentioned by some of the informants as well as being raised as a point of action in one of the secondary data documents.

"Recommendation: In order to make more clear the relationship between international USAR Teams, the LEMA and the OSOCC, more international USAR exercises should be organised involving all partners. The INSARAG concept paper for USAR/OSOCC liaison should be distributed (Action: INSARAG Secretariat, INSARAG Regional Groups)"

Over and above the exercises mentioned in the extract above, other events such as meetings and training sessions were also proposed as other means of gaining experience and thus understanding. These have previously been referred to as indirect experience (Figure 5-5).

3.2.3. What gets in the way?

The analysis suggests that the following factors will influence the effectiveness of opportunities for gaining understanding through indirect experience.

3.2.3.1. Ensuring the right understanding for the right level

The effectiveness of opportunities for indirect experience would be optimised by targeting them at appropriate levels. For example practical exercises could be held in countries where more hands-on level personnel can benefit from them. Strategic level events could target decision makers.

3.2.3.2. Use of indirect experience

Events should be organised in such a way as to make maximum use of the experience of others. In this way, an atmosphere should be created where those participating are in fact developing experience for themselves. For instance, the use of exercises with realistic scenarios based on actual experience of the past could be used.

3.3. Who or what level should have what understanding?

In order for the understanding to be useful, the right people need to have it. The next important consideration is to identify who needs the understanding and at what level they operate.

3.3.1. Who or what level?

3.3.1.1. Who needs the understanding?

Ideally everyone involved in international USAR assistance requires understanding. The assumption that understanding is lacking only in the recipient countries is erroneous. Whilst this is very often the case, and the focus of this study, it is also clear from the analysis that some members of the donor community also have understanding deficits. This came up in many of the interviews either in the reported form or in some cases where it became clear that certain informants did not have the understanding that would be expected.

3.3.1.2. What level should be targeted?

Differing opinions exist on which level is the best level to target with opportunities for indirect experience and thus understanding. This lack of consensus was supported by the literature.

Some feel that knowledge and understating need to reside with those on the ground. "…it's just that they need to translate these down to the people who are actually managing incidents…" Others are of the strong opinion that this understanding needs to start at the top. "I think that the key lies in the decision makers, policy makers, the people who make decisions regarding money and projects."

It is likely that the solution will involve a range of opportunities for indirect experience designed for, and targeted at, all levels. It is also very important that intra-organisational communication is optimised to ensure dissemination of information.

3.3.2. What gets in the way?

The ability to get the message to the right people at the right level, working through the political hierarchical structures that are in place, appears to be the main hindrance. Some informants reflected that the wrong people are sent for training and other such indirect experience opportunities.

"…most of the time from countries like this I find representatives that come higher level of management…"

This issue will be covered in more detail in the next section.

3.3.3. Understanding what?

Finally what is it that needs to be understood? Two primary categories have been identified in the previous chapter. These are the categories of *understanding* and *communication*. *Understanding* is a major category of its own but also serves to link the other major categories together through the requirement that they are understood.

3.4. Interaction between those receiving and those donating

In order to ensure the development of understanding through communication, a healthy link between USAR donors and recipients should exist. The basis of this healthy link is interaction through which communication and understanding can be facilitated.

3.4.1. What interaction when?

Linked to the central category of timing are three periods of time. The first of these is the before event period. The second period is the time during the response to an event. For the purpose of this discussion, the third period, which is the time after the response and before the next event, will be considered alongside the first period.

3.4.1.1. Before and after an earthquake event

Before and after an event the interactions between donors and recipients are generally seen in the form of either bilateral arrangements between two countries or organisations, or alternatively through the INSARAG organised events, such as meetings, training or exercises.

3.4.1.2. During a response

In the period during a response to the major earthquake the link between the donors and recipients is normally centred on the interactions between the LEMA and UNDAC team and/or the OSOCC. This is a very different interaction to that mentioned above, as the relationship is operational.

3.4.2. The benefits and challenges of before and after event interactions

"Strengthening the INSARAG network
Efforts to integrate all countries that have a stake in USAR in collapsed structures into the INSARAG network must be continued vigorously."

3.4.2.1. Benefits

There is no doubt that the greatest advantage of pre-earthquake interactions between donors and recipients is a building of rapport, trust and

understanding. This is valuable in the context of deployment to potentially overwhelming events.

By ensuring that those who will need to communicate well with one another during an event have had the opportunity to communicate well ahead of an event, will increase effective integration of USAR assistance in the future. This will ensure a common understanding and eliminate the likelihood of time being wasted in building up such trust and rapport in the field.

3.4.2.2. Challenges - Them vs. Us

The main challenges to these pre-event interactions have been covered above in Section 3.2.3. There is however a further challenge to the interaction between donor and recipient that has emerged from the data.

There seems to be a strong *them vs. us* mentality prevailing within the donor community.

> "Now I know that we say that the LEMA is responsible for making the assignments but that takes that means the LEMA is in charge of operations and with that understanding a lot of times they are so overwhelmed they have not idea how to put operations into a command structure and take that strong role that they need to take. And it would take a very robust entity to be able to do that during an emergency."

While this *them vs. us* relationship does not manifest itself in one particular section of the data, it is a consistent thread running through out the data. It appears very strongly that those traditionally in the role of donors, often see themselves as the *us* group and very separate from the *them* group of recipients.

While it is very clear that this may not be a conscious, let alone malicious separation, the fact remains that polarisation does exist. As such, this is a potentially unrecognised challenge to effective communication, especially in the pre-earthquake period.

There is a further issue regarding the *them vs. us* mentality that should be considered. Given that self-categorisation into either the *them* or the *us* is dependent on a groups' perception of their status as either a recipient or donor, it follows that those in the *us* category may not consider the potential for role reversal in the future. It is possible that this may be a barrier to their understanding of the recipient position.

3.4.3. The benefits and challenges of during response interactions

As pointed out in various categories discussed in the previous chapter, the need for sound communication between the LEMA and the UNDAC or OSOCC is paramount to successful coordinated international USAR assistance. At the same time, there are many issues raised in both the literature and the data that point towards challenges in this relationship.

"They think that the foreigners are coming in to take over the show whereas we are putting in tools at the disposal of the affected country."

The UNDAC team plays a critical role in this communication exchange but has its limitations. In some cases, these teams have been found to be lacking the understanding of the dynamics of coordination in relation to USAR assistance. At the same time however, many believe that these teams play a critical role in the successful use of such assistance.

"Role of the UNDAC team: The Algerian authorities stressed the positive and critical contribution made by the UNDAC Team in assisting the coordination of international USAR teams."

In most cases, it is about the UNDAC team or the OSOCC playing the all-too-critical role of diplomatic translator or filter. This is the communication filter between the enthusiastic rescuers as donors and the overwhelmed and pressured LEMA as recipients.

"Rescue workers want to do one thing, they want to work. And if you are not going to put us in the best environment we're going to get shitty."

These enthusiastic USAR assistance teams can in some cases be a challenge to interaction with the affected nations. As discussed in detail in Chapter 2, the affected country is ultimately in charge but at the same time is trying to play this role while in many cases being seriously overwhelmed by the earthquake itself. By providing a filter of sorts between such teams and the affected country as discussed above, it is felt that a lot of unnecessary misunderstanding can be avoided.

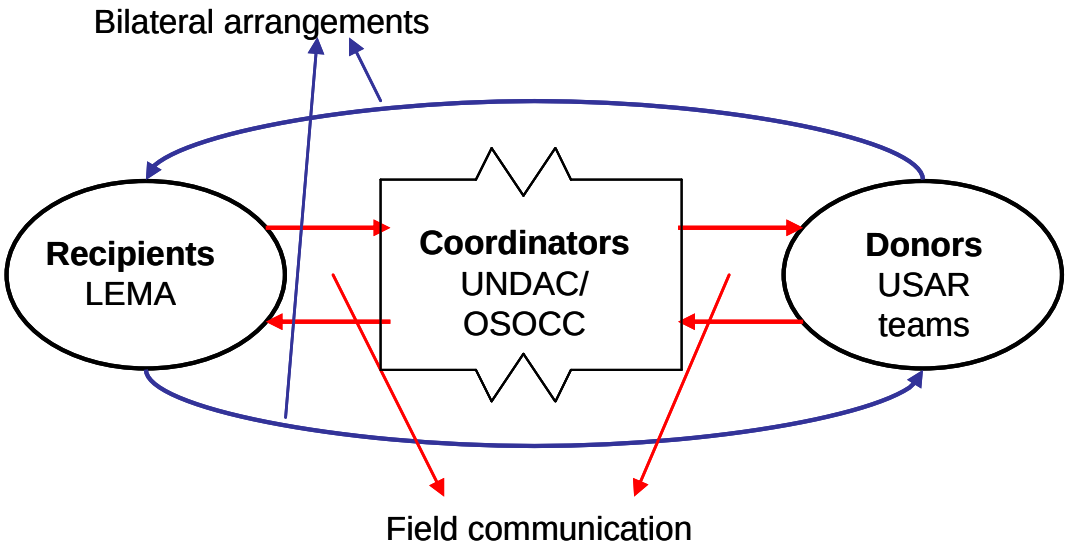

Figure 6-9 *Lines of communication in response to earthquake showing OSOCC as central communication filter*

The UNDAC/OSOCC in between the LEMA and the Donor assistance provides this filter. A good understanding of the need for and the use of this filter is critical to successful coordination on the ground. At the same time however, it should be well appreciated that this central coordination position can in many instances be a very challenging role to play. It is important to understand that a certain amount of communication takes place around the UNDAC/OSOCC, in the form of bilateral arrangements outside of the on-site coordination they are responsible for. These communications and agreements will, however, also impact on the overall coordination of the event (Figure 6-9).

3.5. NGO USAR assistance teams

A further detailed concept identified amongst the categories of the major categories is that of the opinions held by individuals within the INSARAG of small non-governmental NGO teams. While this discussion lies outside of the focus of this study, it has been included here due to its obvious presence in the data.

Within the data, there appears to be split opinions on the worth of such teams. Some consider these teams to be substandard, while others considered them to have unique strengths of their own. There is a potential rift within the group that should be addressed before it becomes a major issue.

> "…disaster response, because of the media and the wide coverage, has become a sexy business and everybody that has got a dog and a shovel wants to participate."

As such this issue represents an area for further investigation, where the finding should be used to address the potential disunity this topic presents.

4. INTEGRATED FINDINGS

4.1. The relationship between communication and understanding

The first step towards the complete integration of the findings into a conceptual description for this study is to consider the relationship between the two primary categories. These are the categories of *understanding* and *communication*. There is a strong interplay between these two major categories in that communication provides a conduit through which understanding is developed and understanding in turn should result in improved communication (Figure 6-10).

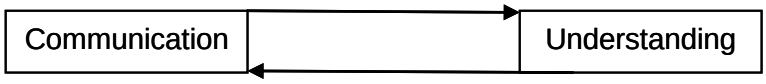

Figure 6-10 Cyclic relationship between communication and understanding

To develop this concept further mutual understanding requires interaction between parties which is achieved through communication. Thus communication is a prerequisite for understanding. The inverse of this relationship is that once understanding is in place it should ensure that communication retains it primacy as a tool for continued understanding. In this way, the relationship between the two is cyclic, continuing indefinitely (Figure 6-10). The next logical question then is what should be communicated and understood?

4.2. Understanding through communication *

In fact the findings of the study need to be understood. These findings are found in the detailed explanation of the categories making up the major categories (Chapter 5) as well as other detailed description in the cross-cutting categories discussed above (Section 2). Thus in summation, an understanding is required of: the strategies for success and failure, the variations and sensitivities that exist, the need for working together and the lack of discipline that is prevalent.

* Underlined texts in this section indicate research major categories or categories

It can be further concluded that this should be achieved through communication with who or what level should have what understanding in mind and by making use of interactions between those receiving and those donating in order to create opportunities for gaining understanding.

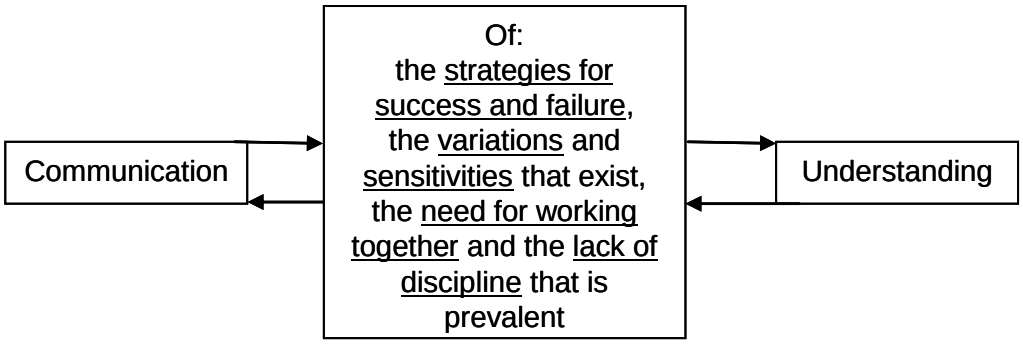

Figure 6-11 Cyclic relationship between communication and understanding including concepts to be communicated and understood

Here again, it should be mentioned that this continues to be a cyclic process whereby communication of these concepts (see central box Figure 6-11) creates understanding of these concepts which in turn then ensures communication.

4.3. Timing of the cyclic relationship

The final step, in the integration of the findings, is to insert the consideration of the central category of *timing*. By doing this, a structured sequence to the cyclic relationship between the data is provided. This is done by surrounding the cyclic relationship with the three periods of time identified by the central category.

As discussed in Section 2 of this Chapter, these three periods can be represented by the three different coloured arrows surrounding the use of international USAR assistance (Figure 6-12). The first of these periods is the before earthquake period (represented by the blue arrow). The second period is the time during the response to an earthquake (represented by the red arrow), and finally, the third period of time is the period after the response but before the next earthquake (represented by the yellow arrow).

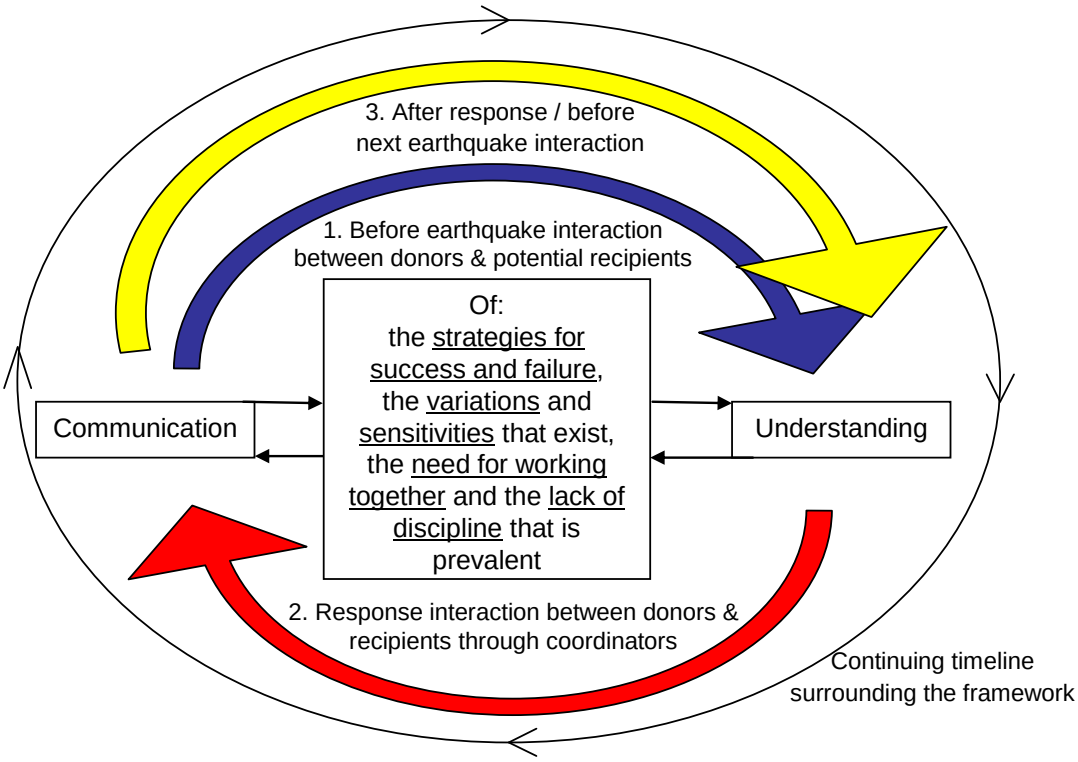

Figure 6-12 *Conceptually integrated continuum showing the relationships between the data within the time periods*

4.4. Conceptual integration explained

This conceptual integration (Figure 6-12) of the data is best explained by systematically discussing each of the 3 periods of time surrounding the concept of the use of international USAR assistance.

4.4.1. Before an event*

Beginning at the tail of the blue arrow (Figure 6-12) it can be seen that in the run up to a possible earthquake event, communication to arrive at understanding should begin. This should be communication of: the strategies for success and failure, the variations and sensitivities that exist, the need for working together and the lack of discipline that is prevalent. The result being that these concepts will be understood before an earthquake event and as such will become the foundation of preparedness. It is further evident from the data that this will be best achieved through the use of interaction between

* Underlined texts in this section indicate research major categories or categories

those receiving and those donating with due regard for who or what level should have what understanding, thereby facilitating opportunities for gaining understanding.

4.4.2. During an event*

As a result of the earthquake the red arrow is followed through the period of the response. In this period it is noticed that understanding, which is now in place due to activities in the before event period, ensuring communication during the event is maintained. This communication along with the understanding achieved during the before event period, will then create effective interaction between those receiving and those donating, thus ensuring effective working together. At the same time, the strategies for success should be used and the strategies for failure should be avoided. The variations, sensitivities, and lack of discipline that exist must be considered.

4.4.3. After the response before the next earthquake*

At the point when the response to an earthquake is over, the cycle then begins anew. In this way, the cycle continues with ever-improving communication acting again as a conduit towards ever-improving understanding and thus a higher level of preparedness. This improvement is further reinforced due to the fact that the recipient country now has direct experience.

4.4.4. Categories considered within time periods

As discussed earlier, there should be an understanding of all the concepts and issues highlighted by the study before an event as this improves preparedness. Focused review shows certain categories are more relevant to certain periods. The categories relate to either pre-event issues (periods 1 and 3), in response issues (period 2) or both (all three periods).

* Underlined texts in this section indicate research major categories or categories

Categories	Periods		
	1	2	3
Understanding (Chapter 5 Section 3)			
Understanding the greater system of USAR assistance and one's role within it		X	
Understanding the INSARAG and what benefits it provides through USAR assistance		X	
Having a common understanding of roles and responsibilities	X	X	X
The link between experience and understanding	X	X	X
Creating and using opportunities to gain experience and understanding	X	X	X
The right people, at the right level, acquiring the right knowledge and understanding	X		X
Having understanding before it is needed	X		X
Communication (Chapter 5 Section 4)			
Language barriers and the use of interpreters	X	X	X
Limitations of the extensive use of terminology	X	X	X
Communication between players	X	X	X
Communication with or by the affected country	X	X	X
Communication between the LEMA and the OSOCC		X	
Timing of communication	X	X	X
Communication of information	X	X	X
Strategies for success and failure (Chapter 5 Section 5)			
The need to plan for receiving assistance from outside	X		X
Being prepared to ask for assistance	X		X
Importance of starting all coordination at the point of entry of the assistance		X	
The need for coordination and an organised structure in the field		X	
The right people understanding the right things	X		X
Use of and understanding of guidelines and tools already in place		X	
Proper use of UNDAC system and OSOCCs		X	
The LEMA should always be in charge		X	
Early use of strategies and tools		X	
Classification of USAR teams according to capacity	X		X
Variations (Chapter 5 Section 6)			
The overwhelming nature of major earthquake		X	
Differences in the geographical spread of earthquakes effects		X	
Differences in nature of an earthquake response	X	X	X
Variation in amount of assistance required and supplied		X	
Different types of LEMA respond differently	X	X	X
Earthquakes response is different to response to other emergencies		X	
Need for working together (Chapter 5 Section 7)			
Working together towards a common goal	X		X
Working together requires interaction, coordination and trust	X	X	X
When should interaction occur?	X	X	X
Good and bad reasons for working together		X	
Understanding the common interest of rescuers		X	
Governmental political synergies providing for and creating opportunity	X	X	X
Sensitivities (Chapter 5 Section 8)			
Who is in charge and who is able to be in charge?		X	
Political barriers to opportunities for the development of understanding	X		X
Politics within INSARAG	X	X	X
Cultural / political sensitivities as communication barriers		X	
Personal or political agendas in the way of the greater good		X	
Lack of discipline (Chapter 5 Section 9)			
The reality of the rules not being followed in this environment	X	X	X
Timely exchange of information required	X	X	X
Disciplined use of agreed upon communication channels and reporting	X	X	X
A lack of policing and rules	X	X	X
Emotions playing a role in discipline in the field		X	
Leaving the affected country in charge not trying to take over		X	
The discipline of NGOs		X	
Teams being involved for the wrong reasons		X	
The need for response that is needs driven		X	
Interrelated categories from different major categories (Chapter 6 Section 3)			
Opportunities for gaining understanding	X		X
Who or what level should have what understanding	X		X
Interaction between those receiving and those donating	X	X	X

Table 6-4 Categories relation to time periods

5. CONCLUSION

The major categories and their detailed categories have been integrated into a conceptual description. The result is a conceptually integrated continuum where the relationships between the data are understood within the periods of time described by the central category of *timing*. As a whole the conceptual description can be seen as a cyclic process of the use of communication for understanding the concepts that emerged from the data.

CHAPTER 7 - CONCLUSIONS AND RECOMMENDATIONS

1. INTRODUCTION

The chapter will first briefly describe the research journey and summarise the key findings. It will then reflect on the research as a whole, highlighting its strengths and potential areas for improvement. This will be followed by a discussion of the recommendations derived from the findings and potential areas for future research. Finally the chapter will briefly discuss the researcher's personal journey from conception of the study to its conclusion.

2. THE RESEARCH JOURNEY

From a non-specific germinal idea that the researcher wanted to contribute evidence to the largely underdeveloped knowledge base of rescue as a discipline, the project has evolved considerably. Eventually the researcher funnelled these initial thoughts from rescue generally, to USAR in general and finally to very specific issues of the donor-recipient dynamic.

The research planted itself firmly within the qualitative paradigm, making use of a range of data collection tools including interviews and documentary analysis, to elicit data from people and organisations that span the globe. The analysis borrowed from the Grounded Theory approach of Strauss and Corbin (1998) which allowed the data to 'speak' to the researcher. The result was a conceptual model of the cyclic relationship between *time*, *communication* and *understanding* in USAR preparedness.

3. THE FINDINGS

The first level of analysis produced apparently disconnected major categories. However subsequent analyses made it clear that *timing* was the central category that bound the other major categories together as the foundation of an integrated conceptual model. The model was further developed by integration of *communication* and *understanding*, and supported by interrelation of cross-cutting categories from different major categories within specific time intervals within the USAR assistance cycle.

Essentially, the study finds that *timeous* use of *communication* is a conduit for development of *understanding*. The *understanding* in turn progressively reinforces the importance of *communication* in all time intervals within the USAR assistance cycle. Furthermore, the study identifies the utility of direct and indirect experience of international USAR assistance as opportunities for interaction, *communication* and the development of *understanding*.

4. REFLECTIONS ON THE STUDY

4.1. Research strengths

One of the main strengths of the study is its originality. A thorough review of the literature found no studies specifically addressing the defined research questions. Furthermore, the study has relevance because it addresses an existing area of concern surrounding the coordination of international USAR assistance.

The methodology is robust because the sample is heterogeneous, representing individuals from different organisations, systems and countries, and the qualitative paradigm enables the establishment of a relationship between researcher and informant to elicit personal perspectives and accounts of experience in a way that would be extremely difficult if not impossible using methodologies from a quantitative paradigm.

The validity of the results were assured by the breadth and density of the informant sample, the trust inherent between the informants and a gate keeper in the researcher role, the theoretical sensitivity of the researcher, the use of reflexive journaling to prevent bias, the official sanction of the OCHA allowing unrestricted access to data and methodological assurance of trustworthiness such as triangulation and data checking.

4.2. Areas for improvement

Given the research was subject to a number of constraints including Masters Degree submission deadlines, resource limitations and the clash of an earthquake with the researcher's existing commitments, there are areas where the research could have been improved.

The donors and the recipients have been identified as subsets of the informants. Whilst the study design made every effort to ensure that data was collected from both of these groups, in the end, a larger proportion of the informants were from the donor community. In retrospect this should have

been anticipated because recipients generally enter the USAR community on the basis of having had an earthquake and as such the research population is skewed in favour of the donor community. Despite this, it was the feeling of the researcher that at the point of data saturation the perspective of both sides was adequately represented.

A further limitation in this study was the logistical limitation of not being able to use collective feedback on the findings following the initial analysis of the data. Instead of collective data checking the researcher was limited to individual member checks of the data. While it is not believed that this has drawn from the validity of the findings in any way, it is identified as a limitation.

5. RECOMMENDATIONS AND OPPORTUNITIES FOR FURTHER RESEARCH

5.1. Recommendations

The recommendations have been divided into two categories: preparatory and operational.

Preparatory recommendations 1:

A purposeful non-technical and concise document should be prepared that explains USAR, the systems for accessing international assistance, and the responsibilities of both donors and recipient nations. This document should be translated and widely distributed to all levels of the USAR community and to key decision makers in both donor and recipient countries.

Preparatory recommendations 2:

Using existing data on seismic risk, specific countries should be identified as at risk of major earthquake requiring international USAR assistance. These countries should be targeted with initiatives focused on developing a critical mass of USAR understanding. This should be achieved by taking opportunities for indirect experience to them, such as scenario based exercises within their territory.

Preparatory recommendations 3:

Events (training, meetings and exercises) that are useful for gaining understanding though indirect experience, should be designed with this objective in mind, and targeted at specific levels within the USAR hierarchy.

Preparatory recommendations 4:

The current activity promoting cultural and sensitivity must be extended to encompass political sensitivity and must be extended to recipient or international USAR assistance.

Operational recommendations 1:

A standardised format for requesting international USAR assistance must be developed, and widely distributed.

Operational recommendations 2:

Protocols must be developed and agreed that facilitate even earlier mobilisation of appropriately qualified UNDAC teams to earthquakes, even in the absence of the results of detailed assessments.

Operational recommendations 3:

The RDC is an effective coordination tool. The use of this concept should be reinforced and developed further through the involvement of the recipient country.

Operational recommendations 4:

The feasibility of USAR teams providing translators should be explored.

5.2. Opportunities for further research

From within the findings of the study the following key research opportunities are highlighted.

- The use of indirect experience to gain understanding though training events should be further investigated. (Preparatory recommendation 1 and 2)
- Further study into political sensitivities surrounding the use of international USAR aid should be performed. (Preparatory recommendation 4)
- Research into the ideal standardised format for requesting international assistance should be performed. (Operational recommendation 1)
- The use of the RDC concept by recipient countries should be further investigated. (Operational recommendation 3)

6. THE PERSONAL JOURNEY

This study has provided me with a unique learning opportunity. I now have an expanded range of research tools at my disposal and a deeper appreciation for research from the qualitative paradigm. Not only have my information management skills improved, but I view what I read with far greater critical insight. I am more confident about my ability to identify research problems, deconstruct them into answerable research questions and develop and implement robust investigations.

On a personal level I have learnt the commitment and tenacity required to contribute knowledge. At the same time I have realised how much more there is to contribute. The data collection has greatly improved my communication skills and I have been enriched through the relationships I have developed with people from all over the world. The reflexive nature of the project has forced me to hold myself up to the findings, and in particular, my previously held assumptions about recipient nations have been challenged.

I am grateful to have had this opportunity.

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ANNEXURES

Annexure A

LETTER OF INFORMATION

Re: Research project to investigate preparedness required for ensuring best coordinated use of international urban search and rescue assistance by earthquake affected countries

Dear {*Name of each participant here}*

This letter serves to inform you about the above mentioned study. If you agree to participate you will be involved in a series of semi-structured interviews. The following points of information on the project and the interviews are provided so that you may make an informed decision on whether on not to participate in the research project.

- This study aims to identify the key efforts necessary to facilitate the best coordinated use of international USAR aid in earthquakes.

- This study has been authorised by the Field Coordination Support Section of the United Nations Office for the Co-ordination of Humanitarian Affairs (UN-OCHA) in their capacity as the secretariat of the International Search and Rescue Advisory Group (INSARAG).

- There will be not cost to you for participating in this research.

- This research project is being performed in compliance with a Master Degree postgraduate study by Mr. Brendon Morris.

- You have been chosen for this study because of your extensive experience in this field.

- There are no direct benefits or risks to you by participating in this research.

- Indirect benefits of participating would likely include the creation of results that can be used for more effect use of future USAR aid initiatives.

- The interviews will be used to gain a deeper understanding of various issues surrounding the use of international USAR aid in earthquakes.

- The interviews will be held in private and information revealed will be used confidentially. In this way no opinion or information given by yourself will be made known specifically as your opinion or information given by you.

- The results of the study will be made known to you after initial review of the data.

- You may withdraw from the research project at any time without having to give a reason.

- You may choose not to answer any questions posed in the interview without having to give a reason for this choice.

- The interview will last approximately 40 minutes, and will be recorded for later review.

- You will be able to have a copy of your recorded interview and are free to withdraw from the study event after later personal review of the recording.

- You are free to ask any questions about the research before agreeing to participate.

- You are free to make contact directly with the researcher or his supervisor if you so wish. (contact details below)

I trust that these points of information have adequately informed you to be able to make a decision on your involvement or non-involvement in this project. As mentioned in the last point, please feel free to ask any further questions you may have before making your choice.

Yours faithfully

Brendon Morris
Researcher - Durban Institute of Technology, Department of emergency medical care and rescue, South Africa

Contact details:

Researcher:
Brendon Morris
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Research supervisor:
Linda Grainger
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Annexure B

NATIONS UNIES

BUREAU DE LA COORDINATION
DES AFFAIRES HUMANITAIRES

UNITED NATIONS

OFFICE FOR THE COORDINATION
OF HUMANITARIAN AFFAIRS

Facsimile: ..... + (4122) 917-0023
Telephone: ..... + (4122) 917-1234

Palais des Nations
CH-1211 GENÈVE 10

30 September 2005

Re: Research project "An investigation into the use of international urban search and rescue teams in earthquake affected regions

To whom it may concern

After the review of the above mentioned project at two of the INSARAG meetings, namely the Europe-Africa meeting held in Geneva, Switzerland on 27-28 April 2005 and the Asia-Pacific meeting held in New Delhi, India on 12-13 September 2005, in the capacity as the secretariat of the International Search and Rescue Advisory Group (INSARAG), this letter serves as an official approval of the above mentioned research project.

We will thus provide as much support as possible for the project including access to all related literature as outlined in the proposal. We also encourage all international teams to participate in this research and to provide the researcher all support necessary to this end. Understanding that the research may also include direct observation of any actual events of international USAR aid occurring during the project duration, the international USAR aid community is requested to facilitate such observation where possible.

Research of this kind is well needed in the international USAR aid community. We are encouraged that such a project is being undertaken and look forward to being able to use the results in constructive pursuit of GA Resolution 57/150 of 16 December 2002 on "Strengthening the effectiveness and coordination of international urban search and rescue assistance".

Sincerely

Thomas Peter
Deputy Chief
Field Coordination Support Section
Emergency Services Branch
OCHA Geneva, Switzerland

Mr. Brendon Morris
Head, Consultation & Training Dept.
Holmatro Rescue
P.O. Box 33
4940 AA Raamsdonksveer
The Netherlands

Annexure C

PROFESSIONAL PORTFOLIO

Brendon Morris

Emergency Services Consultant

The Netherlands

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CONSULTATION AND EDUCATION EXPERIENCE

ORGANISATION: Various Emergency Medical & Rescue Services
POSITION: Invited external specialist Instructor & Consultant
DUTIES: Providing updated information on current developments in the medical rescue world to senior training officials.
COMMENT:
These events have given me ample opportunity to provide as well as gather information on the latest developments in various emergency medical and technical rescue areas. The following services are some of the many that I have had the privilege to be invited to.

- London Fire Brigade, United Kingdom
- Copenhagen Fire Services, Denmark
- Emergency Medical Rescue Services, South Africa
- National Fire Agency, Taiwan Peoples Republic of China
- Hong Kong Fire Brigade, Hong Kong
- European US Military Insulations Fire Services, Germany
- Seoul Fire Brigade, South Korea
- Queensland Fire & Rescue Services, Australia
- Staffordshire Ambulance Service, United Kingdom
- Oklahoma City Fire Department, United States of America
- Tehran Fire Brigade, Islamic Republic of Iran
- National Rail Rescue, India
- China Earthquake Administration Emergency Response Group, China

ORGANISATION: Holmatro Rescue Equipment (The Netherlands)
POSITION: Consultation & Training Manager
DUTIES: Training dealers and end users on latest emergency services developments. Consultation on product development.
COMMENT:
My position in this organization has allowed me to be actively involved in the development of the tools of the trade. This has been a new experience for me considering my previous operational and education background. This position has given me the opportunity to travel to various rescue and emergency medical services around the world allowing me ample opportunity to conduct research and gather the latest information on medical rescue trends.

ORGANISATION: International Urban Search & Rescue Advisory Group (INSARAG)
POSITION: Liaison Officer, Research Consultant
DUTIES: Coordination of rescue team functionality along side international organisation structures and other international teams.
COMMENT:
This is a very interesting position allowing me the opportunity to interact with rescuers from around the world as well as officials from the United Nations. International response to major incidents especially earthquakes, requires strong coordination. I enjoy the challenge of this work.

ORGANISATION: International Centre for Emergency Techniques (The Netherlands)
POSITION: International Emergency Services Instructor and Consultant
DUTIES: Providing training and consultation services to various international clients in the field of Emergency Medical Care & Rescue.
COMMENT:
Again a position that has provided me ample opportunity to promote and research the best practices in emergency care and rescue internationally.

ORGANISATION: Emergency Medical Rescue Services Kwa Zulu Natal (Durban, South Africa)
POSITION: Advanced Life Support – Rescue Paramedic
DUTIES: Operational duties on Advanced Life Support, Rescue Rapid Response Unit; Vice Chairman staff liaison committee; In-service training; Inter-service liaison and training
COMMENT:
Over and above my operational duties in this position I ran medical and rescue updates for the ambulance attendees and other emergency services.

ORGANISATION: Durban Institute of Technology, Dept. Emergency Medical Care & Rescue (Durban, South Africa)
POSITION: Lecturer
DUTIES: Lecturing and examining Rescue Paramedic Programs, Facilitation of and lecturing on Short Course Programs, Member of Quality Assurance Committee
COMMENT:
Most of my involvement in this department was predominately in the area of rescue. I ran the 1st year rope rescue program and also lectured the other years in this field. As well as lecturing in vehicle extrication, trench rescue, disaster/major incident management and IMS I was also involved in other subjects such as Emergency Medical Care and Emergency Service Communications.

Another area I was involved in, in this department, was the area of short course coordination and lecturing. The primary course I lectured here was the Emergency Trench Shoring and Rescue course. The other short course offered by the department is the Basic Fire Fighting course on which I lectured. I still on occasion have had the opportunity to teach and consult in this department as an external specialist.

ORGANISATION: John Rolfe / Hunter's Sea Rescue (Durban, South Africa)
POSITION: Rescue Helicopter Crewman, Emergency Medical Consultant
DUTIES: Aviation sea rescue, Emergency Medical Consultation & Training
COMMENT:
My position in this organization was two tiered. I operated as a member of the rescue squad and consultant in medical equipment requirements, and played a role in training squad members in current medical and rescue practice.

OPERATIONAL EXPERIENCE

ORGANISATION: Emergency Medical Rescue Services Kwa Zulu Natal (South Africa)
POSITION: Advanced Life Support - Rescue Paramedic
DUTIES: Operational duties on Advanced Life Support (ALS) Rescue Rapid Response Unit, Vice Chairman staff liaison committee, In-service training; Inter-service liaison and training
COMMENT:
Although I first started work in this organization back in 1995, my time in this position has equipped me with invaluable experience and learning opportunities.

Kwadakuza is a mid-sized town on the Northern Coast of Kwa Zulu Natal approximately 90kms from Durban. It is an industrial and farming town, which has a national road passing it along the coast to numerous tourist destinations as well as being the route to neighbouring Mozambique. This route, as well as other regional roads around the area, has a large traffic volume and is conducive to many high impact motor vehicle collisions, involving both light and heavy vehicles. This led me to gather extensive experience in the field of motor vehicle rescue extrication. Being a farming area I was also, on occasion, exposed to agricultural extrication rescue cases.

With the bulk of the Kwadakuza community being Asian, with a high predisposition to coronary disease, I also gathered a fair amount of experience in the field of emergency cardiovascular care. The other source of most of my patients was in the form of assaults among rural cane cutting labourers. My time in this position allowed me to hone my practical emergency medical as well as rescue skills.

ORGANISATION: John Rolfe / Hunter's Sea Rescue (South Africa)
POSITION: Rescue Helicopter Crewman & Emergency Medical Consultant
DUTIES: Aviation sea rescue, Emergency Medical training and consultation
COMMENT:
The involvement with this rescue squad allowed me to perform on average 200 rescue helicopter flying hours a year when actively involved. It gave me much insight into the running of such an operation as well as exposing me to numerous search and rescue cases. My position in this squad also included a medical consulting capacity and some training of the members in emergency medical care.

ORGANISATION: St. Augustines Hospital (Durban, South Africa)
POSITION: Trauma Assistant
DUTIES: Trauma unit Advanced Life Support patient care
COMMENT:
Working in this state of the art level one facility opened my eyes to all the aspects of cutting edge emergency medicine. My experience in this environment has also given me greater understanding of the continuum of patient care, increasing my knowledge of in-hospital management and the consequences of serious injury.

ORGANISATION: Durban Institute of Technology, Dept. Emergency Medical Care & Rescue
POSITION: Lecturer
DUTIES: Lecturing and examining Rescue Paramedic Program, Facilitation of and lecturing on Short Course Programs, Member of Quality Assurance Committee
COMMENT:
Although my position at this institution was as an academic and lecturer I gathered some operational experience through responding on the departments operational unit. I also found that my work in this department lead to me looking at things in a different light to what I experienced in my operational positions.

ORGANISATION: Ambulance & Emergency Medical Services Kwa Zulu Natal (Estcourt, South Africa)
POSITION: Volunteer
DUTIES: Voluntary Ambulance Duties
COMMENT:
My experience in this position is what led me to make the choice of career I did. The bulk of the work I did here involved motor vehicle rescue as well as a fair amount of agricultural rescue extrications. There was also mountain search and rescue as this town lies in the foothills of the notorious Drakensberg Mountain range. Although I was not a qualified Paramedic or rescuer at the time, this experience was invaluable to me, as with hindsight and reflection I learnt so much from my time here.

ORGANISATION: Various Emergency Medical & Rescue Services
POSITION: Invited external specialist Instructor & Consultant
DUTIES: Providing updated information on current developments in the medical rescue world to senior training officials.
COMMENT:
On certain occasions my involvement with some of these services has meant that I have had the opportunity to respond and work alongside them. This has given me great insight into the various differences between emergency services around the world. This allows one to far better understand what aspects of the services can work more effectively.

ORGANISATION: International Urban Search & Rescue Advisory Group (INSARAG)
POSITION: Liaison Officer, Research Consultant
DUTIES: Coordination of rescue team functionality along side international organisation structures and other international teams.
COMMENT:
The South African Urban Search and Rescue team have been active since the 1999 Turkey earthquake and have also resounded to the 2000 Floods of Mozambique, 2001 earthquake in India, 2003 earthquake in Algeria and the 2003-2004 earthquake in Iran.

FORMAL TERTIARY EDUCATION

ESTABLISHMENT: Durban Institute of Technology (South Africa)
QUALIFICATIONS: Bachelor of Technology Degree Emergency Medical Care; National Diploma Ambulance and Emergency Care

PUBLICATIONS

Selection of International medical rescue journal articles:
Airbag detonation hazards. Emergency Services 2004;25(3):31.

[Airbag-schutzsysteme]. UB Feuerwehr 2003:46.

[Austern-technik]. UB Feuerwehr 2003:45.

[Bergung von Unfallopfern]. UB Feuerwehr 2002:48.

Challenges of new car technology. Emergency Services 2004;25(1):27.

Cutting with care. Fire Int 2002:36.

[Dach nach vorn]. UB Feuerwehr 2003.

Dash push or dash lift. Fire Int 2002:38.

Going through the roof. Fire Int. 2002:33.

Hydraulic Rescue Equipment Away From The Vehicle Extrication Rescue Scene. Asia Pacific Fire 2002(5):49-53.

Is Remote Shoring Quicker than Standard Shoring? Technical Rescue 2003(37):33-34.

Protecting victims during extrication. Fire Int. 2002:35.

Rescue Tools At The Cutting Edge. Fire & Rescue 2003:37-45.

Rescue Training Teheran, Islamic Republic of Iran. Technical Rescue 2003(36):36.

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Selecting, using and maintaining hydraulic cutters. Asia Pacific Fire 2002:5-9.

Book:
Vehicle Extrication Techniques: Over 100 000 copies sold, First published in 2003 is now translated in French, Dutch, German, Romanian, Russian, and Spanish.

Annexure D

INTERVIEW GUIDE

Preparation

- ✓ Check informant has read and understood the “letter of information”

- ✓ Ensure “Informed Consent Form” is filled out and signed in duplicate by informant

- ✓ Explain again the issues regarding the informant’s involvement in the project.
  - The interviews will be held in private and information revealed will be used confidentially.
  - You may withdraw from the research project at any time without having to give a reason.
  - You are free to ask any questions about the research before agreeing to participate.

- ✓ Explain about the recording of the interview
  - The need to speak in the direction of the microphone
  - The fact that everything will be recorded for analysis later
  - That they are free to have a copy of any recording made in their interview and may choose to have their interviews withdrawn from the project later based on their own review of the recordings.

- ✓ Ensure that the informant is comfortable to begin.

- ✓ Explain interview intricacies
  - That as the interviewer I may ask questions they presume I already know the answer to.
  - That I may ask the same or similar questions more than once.
  - That the idea of the interview is to be a facilitated discussion rather than a question answer session.

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Study Questions

Opening question {Question used to start discussion and make informant comfortable with interview process}

What is your understanding of coordination of international USAR aid? {This question to develop a common understanding of the key concept of coordination between the interviewer and interviewee}

Tell me about your experiences of international USAR response.

- How did coordination work at this event
- Were all your resources used as effectively as possible
- What did you learn from this event

Key question {Used later when, informant is totally at ease, to extract key information relevant for the study}

What elements should an affected country have in place to ensure it is best prepared for coordinated use of international USAR assistance?

- What could your team do to help with this
- What could INSARAG do to help with this

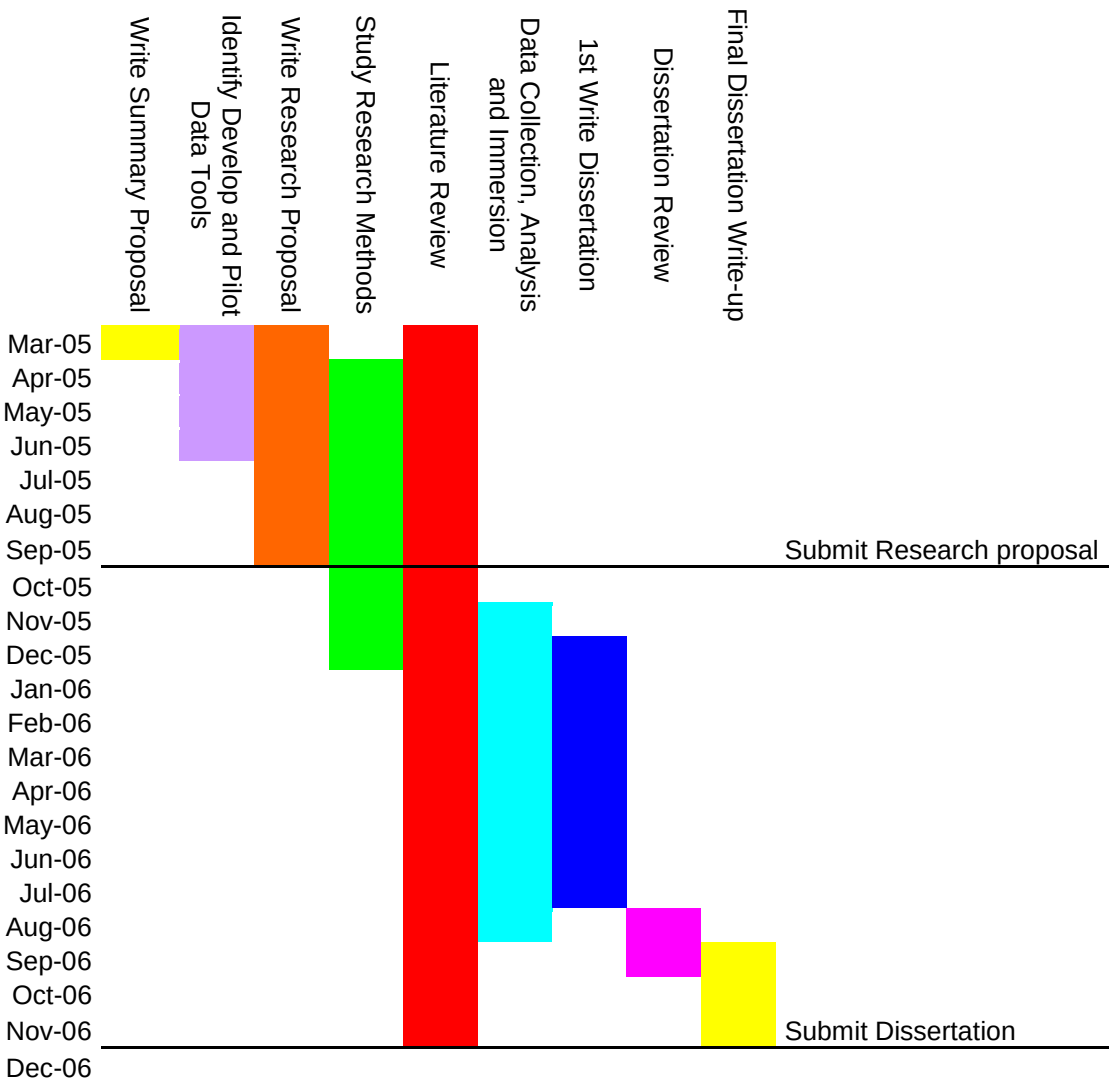
What could the international USAR aid community do to help with the development of adequate preparedness for use of international USAR aid in high-risk nations?

- What could your team do to help with this
- What could INSARAG do to help with this

Extra lines of questioning {to be used if required}

- What elements used in the past has proven to be helpful and contribute to more efficient and effective coordination.
- What elements used in the past has proven to be unhelpful and perhaps even detrimental to the overall goal of efficient and effective coordination.
- What elements have not been used but would likely allow for more efficient and effective coordination in the future.

Annexure E


Write Summary Proposal
Identify Develop and Pilot Data Tools
Write Research Proposal
Study Research Methods
Literature Review
Data Collection, Analysis and Immersion
1st Write Dissertation
Dissertation Review
Final Dissertation Write-up
Mar-05
Apr-05
May-05
Jun-05
Jul-05
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Nov-05
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Jan-06
Feb-06
Mar-06
Apr-06
May-06
Jun-06
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Dec-06
Submit Research proposal
Submit Dissertation

Annexure F

INFORMED CONSENT FORM

(To be completed in duplicate by the participant)

TITLE OF RESEARCH PROJECT: Preparedness required for ensuring best coordinated use of international urban search and rescue assistance by earthquake affected countries

NAME OF SUPERVISOR: ***Linda Grainger***
NAME OF CO-SUPERVISOR: ***Robert Owen***

Date:_____

PLEASE CIRCLE THE APPROPRIATE ANSWER

1. Have you read the "letter of information"?
YES/NO
2. Have you had the opportunity to ask questions regarding the study?
YES/NO
3. Have you received satisfactory answers to your questions?
YES/NO
4. Have you had the opportunity to discuss this study?
YES/NO
5. Have you received enough information about this study?
YES/NO
6. Who have you spoken to? _____
7. Do you understand the implications of your involvement in the study?
YES/NO
8. Do you understand that you are free to withdraw from this study?
YES/NO
   a) at any time, and
   b) without having to give reasons for withdrawing
9. Do you agree to voluntarily participate in this study?
YES/NO

If you have answered "NO" to any of the above questions please obtain the information before signing.

PARTICIPANTS NAME: SIGNATURE:

WITNESS NAME: SIGNATURE:

RESEARCH STUDENT: Brendon Morris SIGNATURE: