# INFORMATION FOR DISASTER MANAGEMENT: BACK TO BASICS

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## ABSTRACT

*To be prepared to manage a disaster implies to a great extent the availability of the necessary information. The managing of information and information technology is an important component of a disaster management plan. Information management therefore entails the creation of an information infrastructure with the data and information required for dealing with various phases of different kinds of disasters successfully. The growth in online information, and the ease with which everyone can add information to the WWW, creates the false idea that information will always be available and easily accessible. The correct information will, however, only be available if a disaster is anticipated, and the information that may be needed is collected and processed beforehand, so that it is available at the time it may be needed. The focus of this article is to discuss the creation and maintenance of a database with basic information for disaster management in the context of the various types of disasters that could occur in southern Africa; and also to explain the processes of collation, processing and distribution of disaster information. The specific types of information that should be available in different disaster situations, and for different areas, will also be explained.*

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## INTRODUCTION
The lives of millions of people across the world are affected annually by disasters of immeasurable proportions. During the past two decades, the governments of many countries have begun focusing on the management of disasters in order to limit their overall impact.

Although the South African government has been aware of the importance of managing disasters for some time, it is only since 1994 that the prevention of disasters and disaster management *per se* has been the subject of intensive study (Wylie 1998: 15). The National Disaster Management Committee was formed in 1995 with the purpose of drafting a policy document for disaster management in South Africa. The White Paper on Disaster Management was subsequently released on 19 January 2000, while the Act on Disaster Management (Act no. 57 of 2002), was approved on 6 May 2002. Cabinet also established the Centre for Disaster Management in 2002, with the directive to monitor all aspects pertaining to disasters, and to collate information relating to disasters, potential disasters and disaster management (*Business Day, 7 May 2002: 2*).

In accordance with the above directive, local and provincial governments in South Africa have, in the course of the past few years, appointed disaster managers in most regions of the country, with the objective of compiling plans for dealing with, or managing, potential disasters.

Stair and Reynolds (2003: 565) define disaster planning as "...the process of anticipating and providing for disasters", and disaster recovery as "...the implementation of the disaster plan". This implies that disaster managers must, at all times, be prepared for any possible disaster that could take place. Preparedness in this regard implies especially the availability of the right information to manage any disaster situation. Stair and Reynolds (2003: 565) also emphasise that the planning phase of disaster management should be centred on information, and the maintenance of an information system. The managing of information and information technology is therefore an important component of a disaster management plan. It entails the creation of an information infrastructure, with the data and information required for successfully handling the various phases of a disaster. In this regard, Granger (1999a: vii) writes, "It is simply not possible to reduce the impact of disasters without appropriate information". Granger (1999b: 20) also emphasises that once a disaster starts to unfold, it is too late to start looking for the information to manage it.

The growth in online information, the ease with which everyone can add information to the WWW, and the easy access to this information, create the idea that information will be available whenever and wherever one may need it. The contrary is true; hundreds of agencies, in almost every country in the world, many disaster managers and many private organisations have created databases accessible through the Internet, with information pertaining to disasters or risk situations. The problem is to find reliable, current and applicable information from the abundance of sources when it is needed. Information delivery systems and communication technologies may become overloaded during crises; during a disaster everyone wants information, including

disaster managers trying to access the data necessary to manage the response plan, with the result that the overloaded systems are not able to handle the traffic.

This article is written against the backdrop of a comprehensive literature review that was undertaken to determine the present status pertaining to disaster information at national and international level. The opinion of disaster managers with regard to existing information systems and the available information for disaster management, was retrieved by means of telephonic and face-to-face interviews. The interviews also sought to determine:

- the understanding of disaster managers regarding information systems

- the categories of information disaster managers regard as important

- to what extent disaster managers rely on online information, and

- the extent to which disaster managers collect, organise and use information.

From the interviews, it was determined that disaster managers in South Africa are not always aware of the essential role of information in managing a disaster. Most of the disaster managers who were part of the study, rely on the Internet for information, and are of the opinion that they will find all the information they need to manage a disaster, online. This article is not about the role information technology plays in disaster management, but about the information that must be managed with, or without, information technology. The focus of this article therefore, is to discuss the creation and maintenance of a database with information for disaster management in the context of the various types of disasters that could occur in Southern Africa; and also to explain the processes of collation, processing and distribution of disaster information. The specific types of information that should be available in different disaster situations and for different areas, will also be explained.

## AN INFORMATION INFRASTRUCTURE FOR DISASTER MANAGEMENT
An information infrastructure consists of the computer hardware, general purpose software, networks, communication facilities (including the Internet and intranets), databases and information management personnel (Turban, McLean & Wetherbe 1997: 58). An information infrastructure tells us how the computers, networks, databases and people work together, how they are arranged and how they are connected. An information system, on the other hand, refers only to those components that work together to process data and to produce information (Oz 2004: 13).

For a disaster manager, an information system refers to the computer hardware, the specific computer software, the data necessary to manage a disaster or crisis, and the people managing the data into useful information that can contribute to saving lives and successfully manage any disaster. Data refers to the facts that should be collected and organised, stored in a database and made accessible before it can become information. Information is, in other words, data with meaning in a certain context; in this regard, data with meaning and importance to the disaster manager.

One of the basic prerequisites for handling a disaster is accurate information that is immediately available. In order to achieve this objective, a disaster information system must be planned and managed effectively. Klenk (1997: 7) defines information management as: "... (the) concerted planning, organising, controlling, and influencing of human, material, and information resources to ensure that information is disseminated to the right decision-makers at the right time to satisfy those needs."

Joyce (1999: 2) points out that the first requirement following a disaster is information; information which will ensure that the disaster is managed successfully in order to limit loss of life and damage to property. Pitroda (2001: 2) emphasises that during the Gujarat earthquake disaster of 2001, what was needed was access and databases; databases with detailed information that are instantly accessible at the time of the crises. Pitroda is of the opinion that due to the chaotic state of the databases, the effectiveness of relief efforts was greatly reduced in the management of this specific disaster.

The *Australian National Emergency Management Competency Standards* requires that all disaster managers are skilled in the use of information. Units 10 and 11 of these standards, describe information management and processing skills as being imperative for disaster managers (Granger 1999b: 23). The South African Act on Disaster Management, Act No. 57 of 2002 (South Africa: 2002) also emphasises the importance of disaster information. In both Articles 17 and 18 of this Act it is stated that the Centre for National Disaster Management is responsible for the collection, conservation and dissemination of information in South Africa. The nature and content of such information, as well as the manner in which the information is collected, is clearly stipulated. Articles 30(1)(c) and 44(1)(1) state that it is the responsibility of provincial and municipal disaster managers to collect and disseminate information pertaining to disasters, pending disasters and disaster management. The responsibility of disaster managers with regard to information management is, however, not emphasised enough.

The creation of a database to form part of an information system for disaster management entails four main steps: the collection of data, data processing, the distribution of information and the continuous evaluation of the information in the system.

**Gathering of data**
The first priority of information management is the collection of data. To identify and gather the correct data is a crucial step in the creation of a successful information system. An effective information system for the management of disasters will provide selective information, relevant to specific situations, to the correct people at the right time, while simultaneously addressing specific problems and possible solutions, which will result in the disaster manager making the correct decisions (Roeder 1999: 25).

The collection of data and the maintenance of a database is a never-ending task: "Data gathering is a continuous emergency management function. It is conducted before (warning), during (assessment and monitoring), and after (evaluation) the emergency operation to ensure that decision makers can stay abreast of changing conditions"

(Klenk 1997: 19). A study done by Comfort (2003: 9) shows that the surveys done during the Gujarat earthquake of 26 January 2001 to establish the needs of the people in the different villages were of little help, because they were done too late. During the disaster there was no communication system to the villages, and relief was not distributed to the people in time. If the survey had been done before the earthquake occurred, the correct information would have been available and people's lives would have been saved. Under no circumstances must data be incorrect, out of date or unavailable. As a result of differing information requirements with regard to disasters in various regions of the world, there are no standard guidelines for the gathering of information. Information that is suitable for one type of disaster can be totally unsuitable for another, or inappropriate for a similar disaster in another region.

Data must be gathered with a specific purpose in mind, namely to facilitate the decision-making process and to ensure effective planning (Stephenson 1994: 15). According to Cuny (1995: 2), the quality of any decision depends on the quality of the information in the information system: "The better the information, the better the resulting decision." It is therefore important that the correct data is gathered; it must be obtained from a reliable source and it must be correct. The disaster manager should create scenarios and anticipate specific disasters, in order to determine what information is required to manage a specific disaster most efficiently. During this phase, it should also be ascertained at what level of necessity the information is directed towards. Critical information, for example, is information that must be available immediately following the disaster in order to save people's lives and bring the situation under control, while general information about disasters and disaster organisations is necessary, but not critical.

Various technological aids are available that are indispensable in the gathering of disaster information. A Geographical Information System (GIS) and a Global Positioning System (GPS) are probably the two most important aids in this regard. Geographic and spatial information can be gathered, stored, manipulated, compared, adapted and presented in many different ways. GIS represents a real world situation in layers of maps that can be combined to identify the impacts of a natural hazard, through the introduction of a hazard dimension, and can also produce a precise model of a disaster scenario with spatial information as input data. Both GPS and GIS can be used to determine precisely where assistance should be provided during disasters.

**Data processing**
Processing is the phase in which gathered data are converted into a useful format. It also entails the process whereby information is made accessible by indexing and organising it in such a way as to make it more manageable, and easy to retrieve out of the system. The data should be correct and should be evaluated for accuracy and applicability before it is added to the information system. Granger (1999a: 2) emphasises the importance of accurate information: "Accurate, appropriate and timely information is clearly a key ingredient in effective disaster management – it can have life-or-death significance." The purpose of the information system is to provide support to the

disaster manager and assist in problem-solving and decision-making; the wrong information can negatively influence these.

Stephenson (1994: 23) points out that over-generalised information, too much data concerning one aspect or one disaster, and information that is not relevant to disaster management, should not be included in the information system. According to Rego (2001: 3) the objectives of the information system for disaster management should be stated clearly, in order to prevent the system from having more information than is required. Unnecessary information can make the system difficult to control, and out-of-date data difficult to discern from data that are really required. Unnecessary information also increases the costs of maintaining the system. Guha-Sapir and Below (s.a.: 4) found that although more disaster information has become available during the past few years and despite more technologically advanced information systems, systematic, standardised data pertaining to disasters are more difficult than ever to access.

The processing of information for disaster management cannot be handled by a single person. Experts in specific areas should preferably process certain types of specialised information before it is passed on to the disaster manager. This will ensure that the information is accurate and of high quality. Equally important is the continuous verification of the information in the system. Most information is dynamic in nature and should therefore be updated regularly. Dated or inaccurate information can have catastrophic consequences in disaster situations.

Although it may be unwise to rely totally on technology for access to information in disaster situations, modern technology can be used with great success to manage information and make it easy accessible. Various software packages are available that are specifically designed for the management and retrieval of information. Hard copies of the packaged information should preferably be printed and electronic back-up copies should be safely stored in order to ensure that the required information is available at all times.

## Dissemination of information

The most important aspect of information management is the distribution of the right information at the right time to the right people. Disaster managers should, with regard to the distribution of information, continually focus on possible scenarios in order to ensure that the acquired information will be correctly employed for a specific type of disaster. Information must be packaged in such a manner that it can be accessed immediately and without any delays be supplied to the correct people. Klenk (1997: 33) emphasises that disaster managers should never assume that information will reach the people who are most in need of it. After the Tsunami disaster in December 2004, many questions were asked regarding the reason(s) why the information about the coming disaster did not reach the right people in time to prevent the loss of so many lives. Even though data regarding the earthquake were registered by seismic stations, satellites and various other systems, by the time the first tsunami bulletin had been issued, many people had already been killed (Chossudovsky 2005: 1).

Information on and about possible disasters should be distributed to the community, the media and any other role players before, during and after a disaster. It is especially the information given to the media that is of crucial importance, since it is this information which will determine the reaction of the community when a disaster does happen. Specific information should be available to politicians and community leaders, since they will play an important role in the managing of, and eventual recovery from the disaster.

The distribution of information is greatly facilitated by modern information technology. Various technological communication devices enable a disaster manager to distribute information quickly and efficiently to those who are in need of it. By means of cell phones, e-mail, video conferencing, online communication services and databases, large amounts of information can be transmitted in seconds. Wireless communication devices, cell-phones and laptop computers especially, can be very effectively used in the distribution and transmission of information during disasters. During the Tsunami disaster in December 2004, highly sophisticated communication devices such as Myriad satellite links, Wi-Fi and WiMax networks, cell phone text messaging, and instant messaging application software were used, while Lightweight Multi-band Terminals gave access to different military and commercial networks and the Internet, using laptop computers with wireless capabilities (Brewin 2005: 2).

Disaster managers should however, be careful not to become too dependent on technology and should therefore always have access to alternative means of communication, should technological support become unavailable during a disaster. In this regard, careful attention should be given to the following aspects:

- information hard- and software can be incompatible, some devices may need specific drivers or programmes, and the available hardware may not contain the software necessary to access the information. After the 2004 Tsunami disaster, Commander Eric Rasmussen recommended that officials prepare for "every reasonable eventuality for data sharing" when planning future collaborative humanitarian efforts (Brewin 2005: 4). During the disaster, Rasmussen was unable to access important information due to incompatible USB memory sticks

- access to a computer or information system may be hampered by access control. In a disaster situation it may be necessary to allow general access to the information

- having the most advanced communication technologies available during a disaster situation, will not mean anything if people are not able to use and manage it

- power outages can hinder access to electronic data. Contingency plans should ensure that critical disaster information is also available in other formats (e.g. in printed format), and

- computers can fail, networks can become overloaded or unavailable, and theft or hacking can inactivate the entire system. Serious veld fires in the Free State during September 1998 were ascribed to the Free State Provincial Government's inability to provide aid because of the theft of a computer. This computer, which was acquired for "combating the consequences of disasters" (Volksblad, 14 September 1998: 6) was stolen without a backup of the disaster information it contained having been made. The result was a total failure of the disaster management system.

## Evaluation of the information system

Evaluation of the information system is an ongoing process. Every piece of information in the system should be evaluated for relevance, correctness and applicability. Especially after every disaster, the information system should be evaluated in order to determine whether the information was correct, correctly supplied, and whether it had had the desired effect. Any gaps in the information, or any other shortcomings that are identified during the disaster should be addressed immediately in order to ensure that service of the highest quality is delivered at all times.

## ESSENTIAL INFORMATION FOR MANAGING A DISASTER

Without the correct information in the information system, a disaster manager cannot successfully manage a disaster. Attempting to locate contact details or emergency units once the disaster has occurred can result in an unnecessary waste of time and the loss of human life. Correctly organised and easily accessible information applicable to the area under the control of the disaster manager, can make a significant contribution to the management of a disaster, should be readily available. That is the reason Granger (1999b: 24) describes a disaster as "an information-hungry activity". Thorough planning should be performed regularly in order to ensure that all necessary and appropriate information is available in the system. By subdividing the information in the system into categories, access to, and control over it can be greatly facilitated. These categories can include general disaster information, information concerning disasters, information about possible crises during disasters, information about the managing of disasters, as well as the contact details of other disaster organisations.

## General disaster information

General disaster information includes the information that should continually feature in the information system and which can contribute to the planning of emergency actions and the successful management of any disaster. This information should comprise the major portion of information in the system and should also be accessible to other organisations and institutions, if needed. Information pertaining to the community, the infrastructure, geographic and spatial information and information concerning other role players during disasters may be categorised under general disaster information.

### *Community information*

Knowledge concerning the inhabitants in every part of a community and the circumstances in which they live, represents some of the most important information

that should be included in the information system. Morrow (1999: 1) recommends that the disaster management plan be developed according to the needs of the community. Community information can be obtained from various sources, especially local and municipal governments, clinics, schools, churches and community leaders. Aspects that are important include:

- Population statistics: Information regarding the number of inhabitants in a specific area can be obtained from the census and municipal offices. This information should however be analysed in order to indicate the number of pensioners, schoolchildren, children under six years of age, handicapped people, poverty-stricken people and all other groups that may need special care or attention.

- Socio-economic information: Groups in the community having different economic backgrounds also have different requirements during a disaster. Disadvantaged groups, for example, may have greater financial needs following a disaster than more affluent groups.

- Educational level: The level of education has an influence on a community's economic circumstances and will determine the manner of communication that can be used to reach and communicate with them. According to Young (1998: 15) individuals having a better education and a higher income recover sooner from disasters than those having limited education. Education will also influence the level of literacy which is crucial in the distribution of printed information before and during a disaster.

- Housing and accommodation: This would include information about the type and quality of housing in the community, the ability of existing housing to withstand disasters, the location of housing units and the number of inhabitants per housing unit. In certain communities, the number of people per housing unit will be considerably more than in others which, according to Morrow (1999: 5), is the result of weak economic conditions, greater reproductive ability, longevity, and the availability of houses. Inhabitants of informal settlements are, for example, more exposed to disasters such as fires, floods, wind damage and unrest than inhabitants of more established areas. High population density in informal settlements is also a factor that exacerbates the impact of a disaster.

- Language and culture: The size of families, their socio-economic status, the availability of housing and level of education is often determined by culture. Young (1998: 14) points out that language and culture can cause communication problems that can lead to difficult situations during disasters.

- Ethnic and racial groups: Racial differences are especially pertinent in southern Africa and should be dealt with, with great circumspection. Certain ethnic groups are in a state of permanent conflict with one another, or are not acceptable to one

another, owing to these differences. Such differences should be accommodated when housing or relocation following a disaster is required.

- Religion: Religious beliefs, etiquette, rituals and behaviour should be taken into consideration when making arrangements for temporary accommodation, funerals, and the care of women and children.

- Political beliefs: In certain areas of southern Africa, different political beliefs have been the cause of many deaths and wars. It is therefore important to determine the major political convictions of the people in a certain area.

- Minority groups: Morrow (1999: 8) indicates that the mortality rate and damage to property following a disaster are higher among minority groups than among the rest of the community. The disaster manager should know exactly where minority groups are located, and what their cultural, religious and socio-economic situations are.

- Other groups: Tourists, holidaymakers, sports lovers, or other large groups of people are sometimes gathered in a city or place. The disaster manager should be aware of every event occurring in the community and also of how many people may be involved therein.

*Information concerning role players*

A disaster manager or disaster management team may require help to manage a disaster:

- Experts in various fields can supply the disaster manager with crucial advice should a disaster occur. These experts include *inter alia*, engineers, medical experts, psychologists, forensic specialists, entomologists, geologists, botanists and meteorologists. Contact details of experts, as well as their level of expertise should always be available to the disaster management team.

- Community leaders or prominent role players in the community should be contacted in the event of a disaster. In this context, Morrow (1999: 11) states: "Planners and managers who make full use of citizen expertise and energy will more effectively improve the safety and survival chances of their communities". These role-players may include: politicians, mayors, police chiefs, army officers, government officials at local and national level, headmasters, religious leaders, hospital superintendents, businessmen and women, leaders in the farming community, welfare organisations and traditional leaders.

- Voluntary groups are essential in the managing of disasters. Affected groups should, for example, be relocated and supplied with food and basic necessities; children should be kept occupied and injured people should be taken care of. It is usually in this regard that voluntary helpers can play a valuable role.

- The assistance of emergency personnel from other organisations than the disaster management team (for example, divers or specially trained firemen) may be needed to perform, or assist with, specific rescue actions.

*Information concerning the infrastructure*

Information about the infrastructure of the entire geographic area can be compiled using GIS technologies. The information that can be included is, *inter alia*:

- Road systems, road conditions, the location and number of bridges, airfields, landing strips, dangerous areas in respect of traffic flow, escape routes, alternative entrance routes and railways lines.

- The location of businesses, industries, petroleum depots, power stations, shops, malls, markets and informal trading areas.

- Telecommunication and postal services, cell phone and radio reception areas, and broadcast and telecommunication towers.

- The location and number of schools, nursery schools, old-age homes, clinics, hospitals, libraries, community centres and other potential gathering places in the area.

*Spatial information*

All other environmental and community related information may be categorised as spatial information. This includes:

- The location of rivers, lakes, dams, hills and valleys; information about flood lines, natural waterways, water reservoirs and high lying areas.

- Vegetation types, crop types (according to season), plantations, pastures, and the influence of droughts, floods and fires on agricultural crops.

- Meteorological and climatic conditions as determined by statistics and predictions, the influence of climate on possible disasters, as well as on food production.

- Substrate utilisation, farming methods, landownership and the number of livestock in an area.

- Subsistence of communities, available and potential food supplies, and the preferred food of specific groups.

**Information concerning previous disasters**

Disasters that have occurred in the past have created a need for information as to why they occurred and what their consequences were. Various online databases are available in this regard and contain valuable information and statistics about previous disaster situations, their specific effect, the way they were managed and the reconstruction

strategies that were followed. According to Guha-Sapir and Below (*s.a.*: 8) historical data should be gathered for the purpose of studying disasters and the consequences thereof. Historical information should form the basis of a disaster manager's planning for a specific area, but should never be the only information available in the system. In fact, many online databases on previous disasters are available via the Internet, both on national and international disasters, and therefore, it would be unnecessary for disaster management with online access to duplicate the information in their own systems.

## Information concerning crises during disasters

A disaster can be greatly exacerbated when it occurs simultaneously with other life threatening situations:

- During the evacuation phase following a disaster, a shortage of drinking water could arise; human waste and other waste matter could accumulate because the normal sanitation services are interrupted; a shortage of medical and food supplies could occur; or sudden temperature fluctuations could occur which would hamper rescue attempts (Stephenson 1994: 14). In this regard, Swann (2002: 5) reports that water pollution; inefficient sanitation systems and the outbreak of infectious diseases exacerbated the disaster situation during the recent Iran war.

- Inaccessible roads could result in disaster-stricken people not being reached on time in order to deliver emergency assistance. The disaster manager should therefore be aware of alternative routes, or must be prepared to reach affected people by using other means of transport such as aeroplanes, boats or helicopters.

- Telecommunications systems could fail due to overloading, power failures, or other problems caused by a disaster. According to Pitroda (2001: 1), many people died during the Gujarat earthquake of 2001 because the telecommunication links were destroyed and people were not trained to use the wireless phones. Disaster managers should anticipate that telecommunications can fail and have information about alternative communication systems available (Reid 1996: 2; Durham & Williams 2002: 67).

- Technology is not always usable. According to Creighton and Jamotte (1992: 35) most people are of the opinion that technological disasters cannot take place and that technological systems are infallible. Wall (s.a.: 2) regards the dependence on technology for the assimilation of information as a disaster: ",,,disaster means anything that prevents you from getting at your data when you need to". Comfort (2003: 10) is also of the opinion that an electrical power network can hamper the effectiveness of a technical information infrastructure during a disaster.

- A power outage can, in itself, be regarded as a disaster, but a power outage coinciding with a disaster can result in many additional crises. In this regard, Larkin (2000: 1) points out: (that) "The importance of electricity during and

following a disaster is not always appreciated until the power actually goes out."
This aspect is also emphasised by Granger (1999b: 27): "Power supply and
telecommunications are overwhelmingly the most important of all lifeline assets
in terms of what depends on them." The power outage that paralysed New York
on 16 August 2003 placed the spotlight on the dependence of modern society on
electricity. The outage which started in Ohio left approximately 50 million
people without power in a matter of minutes. People were trapped in lifts and
buildings, traffic lights did not work, water supplies were cut, airports were in
chaos, ATMs did not work etc. (Beeld, 18 August 2003: 1). A disconcerting
thought is that even cell-phone networks were dysfunctional due to the large
number of emergency calls being made. Had a separate disaster occurred
simultaneously, the consequences would have been catastrophic.

- Crucial disaster information can be unavailable due to the impact of a disaster.
  Wright (1999: 1) is of the opinion that disaster managers are too dependent on
  electricity for the transfer of disaster information. This viewpoint is supported by
  Joyce (2002: 16): "...communities are constrained by the availability of power,
  radio and television transmissions to remote areas, and by the reliability of the
  media in urban areas." The disaster manager cannot allow a power outage to lead
  to a loss of lives or other problems just because emergency information is only
  electronically available.

**Critical information required during a disaster**
In order to expedite the acquisition of information during emergencies, information
should be prioritised according to its urgency:

1. The critical information that must be available in the minutes following the disaster
should be packaged in such a way that it is always, and immediately, available. Critical
disaster information usually consists of the contact details of emergency services such
as the fire department, the police, medical services, air transport services, the army and
all other organisations and people who should be contacted immediately in order to
bring the situation under control and save as many lives as possible.

2. Information required within the first few hours after a disaster, include:
- information on available buildings and alternative housing that can be used to
  house groups of people or to provide temporary housing. Sites to establish
  refugee camps should also be identified

- information concerning suppliers of food, clothing, blankets, water, medication
  and other emergency supplies, in addition to the contact details of voluntary
  helpers and organisations that can assist with the distribution of these items

- the contact details of groups and organisations that can or should provide aid or
  assistance would include, *inter alia*: municipalities, the Red Cross/Crescent,
  local branches of various women's organisations, welfare organisations, the

traffic police, clinics, the police, hospitals, the media and telecommunication organisations

- information on emergency transport: the location and availability of planes, helicopters, trucks, boats or motorcycles, the whereabouts of fuel for these vehicles, passable roads, other feasible transportation routes and the location of landing strips or helipads, and

- the names and contact details of all role-players such as journalists, community and religious leaders, politicians and traditional leaders.

## SUMMARY

Disasters are a reality. No community and no country are exempt from the possibility that a disaster will hit them. Worldwide consciousness of the scale of past disasters has compelled the South African government to devote attention to the influence and impact of disaster management. By focusing on the prevention of disasters, instead of on recovery following disasters, the spotlight has fallen on the management skills of disaster managers and their ability to be prepared for disasters of any magnitude.

One of the most important aspects of disaster management is the management and maintenance of an information system that can be used by disaster managers to make decisions and initiate the necessary actions in the event of a disaster. In the preceding discussion the scope of a disaster information system was discussed, with special emphasis being placed on the nature and content of the information that comprises it. It was indicated that the most efficient and comprehensive information system can be paralysed by power outages or technological problems. Furthermore, the disaster manager's attention was focused on problems that could arise in the occurrence of additional crises during disasters.

Information is the heartbeat of disaster management and without it the disaster manager is totally ineffective in the performance of his/her job. In Southern Africa, considerably more attention should be given to gathering data and the establishment of a comprehensive information system for disaster management in every single community. It is therefore recommended that:

- disaster managers receive training in the management and maintenance of information systems for disaster management

- existing disaster information systems are examined in order to determine whether they comply with the requirements of every possible disaster situation

- the importance of information in the process of disaster management is emphasised in order to create an awareness among disaster managers of the crucial role of information

- The Centre for National Disaster Management establishes a database with general information applicable to every area in South Africa, and

- alternative information systems that do not require electricity or technology are investigated and implemented.

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