

UNIVERSITY OF CAPE TOWN

FACULTY OF EDUCATION

**AN EXPLORATION OF DISASTER MANAGEMENT IN LIBRARIES IN THE
GREATER CAPE METROPOLITAN AREA**

A dissertation presented in partial fulfillment
of the requirements for the Degree of

MASTER OF LIBRARIANSHIP

BY

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ABSTRACT

Disaster management and planning has traditionally been a neglected field in librarianship, and, thus this research study was undertaken to explore and evaluate the present situation regarding disaster planning amongst research/academic- and public libraries in the Greater Cape Metropolitan Area, which includes the Cape Metropolitan Area and the adjacent Stellenbosch region, and to make recommendations in this regard. A model disaster plan was developed, using the information gained from this study, to act as a guideline for libraries in the development of disaster plans.

This study consisted of two main approaches: the first was a conceptual overview of the literature in this field; and, the second was an empirical research study.

The purpose of the literature survey was threefold:- the first was to obtain a thorough broad overview of the literature in this field, in order to understand the theoretical concepts; the second purpose was to determine how thoroughly the theoretical concepts had been developed; and, the third aim was to determine the present situation regarding the existence of literature in this field in the South African context.

The second approach to this study, viz., the empirical research study endeavoured to explore and evaluate the present situation regarding disaster management and planning in the Greater Cape Metropolitan Area, and to provide a stimulus where such plans were found wanting. The empirical research study investigated twelve research/academic- and public libraries in the above region, which includes the Cape Metropolitan Area, and the adjacent Stellenbosch region.

Questionnaires were used as the primary data collection method. Interviewing was used, where necessary, as the secondary data collection method, to supplement and clarify information gained from the questionnaires.

The information obtained as a result of the above survey research, was evaluated, and conclusions were drawn. The results showed that the situation in the Greater Cape Metropolitan Area varied considerably from library to library. However, the majority of the libraries investigated in this study, were lacking in disaster plans and were underprepared for any potential disasters which may occur. Recommendations were made to facilitate the improvement of this situation, and a model disaster plan was proposed.

PREFACE

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Opinions expressed and conclusions arrived at, are those of the author, and are not necessarily to be attributed to the Centre for Science Development.

CHAPTER ONE: INTRODUCTION

Library resources are often very valuable, either for the information that they contain, or for their physical beauty. However, because of their nature, they are particularly susceptible to disasters such as fires or floods. As Parsons has aptly stated in his account of the destruction of the library at Alexandria some 2000 years ago: "The brittle and frail paper of Egypt and even tougher skins of Pergamon seem fragile media indeed on which to confide the precious knowledge and wisdom of the ages. Ready victim of the accidents of nature, fire, water and the other elemental forces...the book would appear to have small chance of survival" (Parsons, 1952:273).

The need to preserve and protect library materials has long been acknowledged and has a long history. The earliest known accounts of such preservation date from early Chinese history, when scrolls were protected from insect damage by the use of scented woods and herbs. One of the most devastating disasters in library history, occurred in the 3rd century AD, when a fire demolished the library at Alexandria. In more recent times, there have been other major library disasters. In 1966, the Arno River in Florence burst its banks and caused catastrophic flooding of the Biblioteca Nazionale Centrale, where one million volumes were damaged by the intrusion of the muddy river water. This flood caused the destruction of many of the city's cultural treasures (Fortson, 1992:vii). This disaster acted as a catalyst in precipitating an increase in disaster management research and paper restoration. Many experts in paper conservation from around the world offered their help and expertise in the restoration effort. The flood increased awareness in library preparedness and led to the development of techniques and procedures for the treatment of water damaged materials (Harvey, 1993b:20).

There have been many other disasters, however, particularly in the last few decades. Fires occurred at the Jewish Theological Seminary Library in 1966, the Klein Law Library at Temple University, Philadelphia in 1972 (Fortson, 1992:vii). In 1986 the Los Angeles Central Public Library was destroyed, with losses of 400 000 items in a fire started by arsonists, and in 1988 a fire at the USSR Academy of Sciences Library, caused by defective wiring, destroyed approximately 400 000 items and one quarter of a very valuable newspaper collection (Harvey, 1993a:221). Flooding occurred at the Corning Museum and Library in 1972 and flooding also caused construction-related water damage at Stanfords' Meyer Library in 1978. While fire and flood disasters are the most prevalent, other factors also cause destruction. A hurricane resulted in damage at the University of Corpus Christi in 1970 (Fortson, 1992:vii). In 1985, lightning caused a fire, which subsequently destroyed 60 000 items at the Dalhousie Law School in Nova Scotia. The San Francisco earthquakes in 1989 deposited books on the floor in various libraries, including Los Angeles Public Library and Stanford University Library.

Political unrest can also result in library disasters. The Rumanian State Central Library was destroyed in December 1989, during the overthrow of the Ceaucescu government. In more recent times, many libraries in Kuwait were completely destroyed during the Gulf War. However, not all library disasters are so all-encompassing and devastating. Many lesser disasters have also occurred (Harvey, 1993b:121).

The nature of library materials has also changed throughout history. In early times, books were made from paper and vellum and this continued until recent times. However, library materials are no longer made solely from paper-based materials. While books still constitute a large part of library resources, audio-visual and computerised materials are becoming increasingly prevalent and important as information media. Thus, library disaster planning has to take these media into consideration when devising disaster plans.

The numerous library disasters which have occurred since the Florence flood, have led to research and development in techniques and the promotion of the need for disaster plans. It was, however, not until the late 1970's that disaster planning began to be accepted as a part of library management (Harvey, 1993b:19-20,121). However, while it has been accepted, in theory, as a part of the preservation and conservation role, in practice it is often still neglected, partly as a result of severe budget cuts, which have led to enormous shortages of financial and staff resources. Many of our libraries house and protect valuable material and a disaster, such as a fire or a flood, could be calamitous and could cost millions of rand in damage. Thus, it is suggested that it should form an essential part of the management of a library; even though it is not always recognised as such.

1.1 CLARIFICATION OF DISASTER TERMINOLOGY

1.1.1. Definition of 'disaster'

A disaster can be defined as the following: "an adverse or unfortunate event, a great and sudden misfortune, calamity" (Chambers twentieth century dictionary, 1990).

Harrison (1979:7) gives the following very apt definition: "A disaster is what happens only if you are not prepared for it".

1.1.2. Disasters in the library context

Disasters in the library context can be either natural or man-made. Natural disasters include floods, fires, earthquakes, storm damage (a combination of wind and rain), cyclones and hurricanes. Man-made disasters include destruction during war-time, threats emanating from social or political unrest, such as bombings or rioting, and, malicious vandalism.

Anderson and McIntyre (1985:9) provide a very useful definition of disasters in the library context: "an unexpected event with destructive consequences to their holdings. It can be a small-scale incident or a full blown emergency, but in either case it requires prompt action to limit damage."

Their inclusion of small-scale incidents, indicates that library disasters can be frequent and need not necessarily only be large scale disasters. Each librarian will take part in at least one disaster during their professional career, and yet this possibility is very rarely recognised or acknowledged. Disasters are by no means limited to libraries. They occur every day, and, every building, simply because it is a building, is likely to experience a disaster at some stage (Harvey, 1993b:119).

1.1.3. Disaster management

While library disasters have been an all too common occurrence throughout history, disaster management and planning is a relatively new concept. Disaster management forms part of the library's preservation and conservation programme. Preservation and conservation of library materials is not a new field. Conservation

issues began to be discussed during the last century. One of the earliest conservation publications was that of William Blade's: The enemies of books, which was published in 1880.

Disaster management in the library context involves the development of a disaster plan, which can be described as a set of rehearsed actions, which will reduce the likelihood of a disaster occurring; and, secondly, will reduce the extent of the damage, should a disaster occur (Harvey, 1993a:221).

Disaster management and planning is also known by other terms, such as disaster control planning, disaster containment, contingency planning and risk management (Harvey, 1993b:119).

Disaster prevention is preferable to the costly and lengthy process of post-disaster recovery. It is, thus, preferable to minimise the likelihood of a disaster and the extent of the subsequent damage. This requires that buildings be properly constructed, well maintained and that staff are well trained in disaster preparedness (Harvey, 1993a:221).

However, while it is necessary to take all the necessary precautions to lessen the likelihood of a disaster occurring, it is important to realise that not all disasters can be prevented. McIntyre (1988:42) stresses that disaster plans have two essential aims: prevention and preparedness. It is important to do everything that is necessary to prevent a disaster from occurring, but, should one occur, it is just as important to handle it efficiently and swiftly in order to minimise the damage.

1.2. PURPOSE OF THE STUDY AND THE RESEARCH QUESTION

Disaster management has traditionally been a sorely neglected field in librarianship, and this has been exacerbated by severe budget cuts, which have led to enormous shortages of financial and staff resources. While there has been an increase in disaster management research in Britain and America during the 1980's and 1990's, it is still a sorely neglected field in South Africa.

Our libraries house and protect valuable material, and a disaster, such as a fire or a flood, could be calamitous, and, disaster recovery can be a long and very expensive process, during which service to the users can be negatively affected. It is, therefore, essential to be prepared for disasters and thereby minimise the consequences of a disaster, should one occur. The development of a comprehensive disaster plan is thus, essential as it eliminates panic and ensures logical, appropriate decisions in times of disaster. It is essential that library managers realise the importance of disaster management and planning in order that, in the event of a disaster, damage may be reduced.

The researcher has not been able to find any evidence of an investigation on South African library disaster management. Therefore, the aim of this research project is to explore and evaluate the present situation regarding disaster management and planning in the Greater Cape Metropolitan Area, which includes the Cape Metropolitan Area and the adjoining Stellenbosch region, and, to make recommendations in this regard. The researcher shall use the information gained through this research, to develop a model disaster plan, outlining the most important aspects to be included in such a plan, in order to assist libraries in the development of disaster plans, and to act as a guideline. It is hoped that, in the process,

an adequate stimulus will be provided, for the development of disaster plans in libraries, where such plans were found wanting.

1.3 PROPOSED METHOD OF INVESTIGATION

This research project will be based on the exploratory survey research method, which is characteristic of the qualitative research methodology generally used in library research, and more broadly in social sciences research. Quantitative research on the other hand, which is characteristic of the scientific field, is based on scientific hypotheses tested under controlled conditions, with statistical evaluation of the results. Exploratory research involves describing and evaluating the results of an investigation, not necessarily with reference to a scientific hypothesis. Exploratory research is thus used to clarify concepts, gather information, and, if possible, to identify new problems (Powell, 1985:60-61). This shall, therefore be an exploratory and descriptive investigation.

The research methodology that will be followed, can be broadly divided into two approaches:

- a) The first approach is conceptual and includes a review of the literature on library disaster management and planning. This section, (which comprises Chapters Two to Eight), will provide an overview of the types of disasters, disaster planning, insurance, disaster preparedness and prevention, techniques for restoration and recovery of materials, and disaster management of computerised material.

In the initial stages of the conceptual component of this study, the researcher undertook a comprehensive bibliographic search of the literature available on this subject, and the major indexing and abstracting sources, such as LISA (Library and Information Science Abstracts), were consulted for the purposes of this search. Although the sources used were not limited by country of origin or language, it became apparent that the majority of the literature published in this field is of British and American origin. The exceptions to this were (among others), the contributions made by Yujiro (1991), from Japan; Lenzuni (1987), from Italy; and Alegbeleye (1990, 1993), from Nigeria. It should be noted that, while the literature is well researched in Britain and the United States of America, this field is very neglected in the South African context.

b) The second approach is an empirical survey, (which comprises Chapters Nine to Eleven), in which the researcher will investigate disaster management and planning in research/academic and public libraries in the Cape Metropolitan Area and the adjoining Stellenbosch region, by means of questionnaires, and, if necessary, follow-up interviews.

The empirical survey shall cover twelve research/academic and public libraries in the Greater Cape Metropolitan Area. The results obtained from the returned questionnaires will be analysed, while the interviews, if necessary, will provide supplementary information. (cf. Chapter Ten and Eleven).

For the purposes of this study, the researcher will assume that the safety of people in libraries, that is the staff and users, is of paramount importance, and should thus be the first consideration in the event of an emergency. Thus, it will be assumed that the safety of people has been assured and that in the event of an emergency all

occupants would have been evacuated from the library buildings. This study will therefore concentrate on disaster management and planning issues that relate to the rescue of library materials only.

CHAPTER TWO: TYPES OF DISASTERS

As mentioned in 1.1.2, library disasters can be either natural or man-made. Natural disasters include fire, flooding, storm damage or earthquakes; man-made disasters include vandalism, arson or destruction due to rioting or unrest, and, bombings. These destructive and devastating events threaten the safety of the materials housed by the library, and disrupt the provision of library services. A disaster can be all-encompassing and catastrophic, such as the gutting of an entire building, due to fire. It may also be smaller and more localised, such as the damage caused to one section of a building by a leaking roof. Either of these, however, have serious repercussions for libraries.

2.1 TYPES OF DISASTERS

2.1.1 Natural disasters

2.1.1.1 Fire

Fire is probably the most feared of all library disasters, and it is one of the most common, flooding being the other. Fire results, not only in the charring of library materials, but also in flooding, as a result of the amount of water that has to be pumped into an area to extinguish a fire. Temperatures can become so severe that paper will crumble when touched, even though it may not appear to be burnt. Fire also has many sources. It can result from faulty electric wiring, lightning or earthquakes. Fires can also be the result of arson or political unrest or vandalism. The two fires at the Los Angeles Central Public Library in 1986 were the result of arson. Four hundred thousand books were lost. No other major event in the history of Los Angeles that did not result in loss of life, received as much news coverage (Fortson, 1992:1-3; Watson, 1989:34).

According to Morris (1986:29-31), arson has become the leading source of library fires in the United States. In recent years the incidence has risen from approximately 70% to 85%. Statistics in 1963 show that 18% of library fires were attributed to arson. During the 1960-1969 period, 47% of fires were listed as arson related. During the 1970-1979 period, 78% were attributed to arson and in the period 1980-1981, 85% were listed as arson related.

There are three types of fires that are likely to occur in libraries. They are Class A (cellulose materials, such as paper and wood), Class B (flammable liquids), and Class C (electrical fires). There are four progressive stages to fire: the incipient, smoldering, flame and heat (Fortson, 1992:1-3; Watson, 1989:34).

2.1.1.2 Flood and storm damage

These are the most common library disasters. Flooding, hurricanes and tornadoes cause the most damage. Hurricanes and tornadoes not only introduce an enormous amount of water, but also very strong winds. One of the major problems with flooding is that the water that intrudes into the library, is very often not clean. Water is often very contaminated by sewage, mud and oil, amongst others. This is what occurred during the Florence flood in 1966. The damaged materials in the Bibliotheca Nazionale Centrale included: 1 200 000 books, 300 rare oversized books, 20 000 newspapers, 10 000 periodicals, and many other rare items. The catalogue was also damaged, as was the building structure, furniture and equipment. The water which intruded was filthy, and was contaminated with sewage, oil, mud and a chemical called naphtha, which is almost impossible to remove. This factor complicated the reaction and recovery process a great deal (Fortson, 1992:23-25; Lenzuni, 1987:98-99; Morris,

1986:57;). Small scale flooding also occurs, by means of leaking roofs, seepage, faulty drains and faulty basement pumps (as has occurred many times at the South African Library). These disasters, however, can cause just as many problems as their large scale counterparts.

Storm damage can be particularly dangerous as the force of the wind can create structural damage to the building, which would allow for the entry of water. Cyclones occur over land, and consist of wind spirals which move over a large area. The tornado, which is a particularly intense cyclone, is the most violent of windstorms and can cause tremendous damage. They are confined to a much smaller area than cyclones and the force of the wind can drive shards of glass deep into books and other materials. Tropical cyclones occur over warm, tropical oceans. They consist of hurricanes, which occur in the West Indies or the eastern Pacific Ocean; and, typhoons, which occur in the western Pacific Ocean. Hurricanes are also very destructive, but they last longer and travel over a wider area. They also introduce heavy flooding (Fortson, 1992:23-25; Morris, 1986:57; World Book Encyclopedia, 1995, Vol. 4:510-511). Japan is susceptible to typhoons, which cause great flooding (Yujiro, 1991:43).

2.1.1.3 Earthquakes

Earthquakes can result in enormous damage, in the form of physical and structural damage to buildings, fires and flooding. Earthquakes also give no warning of their arrival, therefore libraries in earthquake prone areas have to be prepared for their onslaught. An earthquake occurs when stresses in the earth's crust cause fractures in the rock layers. When these broken layers move against each other, vibrations are caused, which spread to the earth's surface.

There are two major earthquake zones in the world. The first extends from South America, through North America to Japan and New Guinea. The second extends from Spain and North Africa, to Italy and then to the Middle East. Libraries in these areas should take into account the high earthquake risk when designing a disaster plan (Evans, 1992:347; Fortson, 1992:33-35).

The west coast of America is particularly susceptible to earthquakes, as is Japan. Japan is very densely populated. Geographically it is very prone to flooding for two reasons. Firstly, cities have developed on the estuaries of major rivers and secondly, it is a narrow island and is therefore prone to tidal waves, which can be a consequence of earthquakes. Japanese buildings are traditionally also wooden structures. These are particularly fragile in the event of earthquakes and flooding and are in great danger of damage from fire. While basic disaster prevention laws in Japan are very advanced, they are very much aimed at the saving of human lives in the event of a disaster. The disaster prevention policies for libraries and archives are not generally adequate (Yujiro, 1991:43).

2.1.2 Man-made Disasters

2.1.2.1 War, political and social unrest

During times of political and social unrest, and, war, libraries are susceptible to destruction in the form of bombings and rioting, amongst others. This type of threat is, to a certain extent, more prevalent in certain countries than in others, as some countries are more politically stable than others. Destruction can be caused by overturning shelves and destroying equipment and furniture. Bombings can cause widespread destruction and damage, as they can result in fires. A fire bomb exploded in a California University Library,

causing a fierce fire. The destruction of libraries during the First World War was relatively minor. The only library that was completely destroyed was that of Louvain. However, the Second World War saw widespread destruction of libraries, including the Preussische Staatsbibliothek in Berlin and the Bayerische Staatsbibliothek in Munich. During times of political instability, libraries are often viewed as supporting the official structures and therefore the oppressors (Alegbeleye, 1990:96; Morris, 1986:7).

2.1.2.2 Vandalism

Vandalism involves senseless and indiscriminate destruction of property. It ranges from the spraying of graffiti, to the physical mutilation of materials, and can also involve the deliberate setting of fires. In the United States libraries have experienced numerous problems with the deliberate setting of fires, by vandals inserting burning objects into book drops. There are two types of vandalism: ideological vandalism and conventional vandalism. Ideological vandalism involves destruction with a political motive, while conventional vandalism does not appear to have a motive (Alegbeleye, 1990:95; Morris, 1986:14,47).

2.1.2.3 Neglect

Man-made disasters are, however, not always deliberate. McIntyre (1988:42) also stresses the point that a disaster can be caused by neglect, carelessness and poor building maintenance. Faulty electric wiring can lead to the outbreak of an electric fire. A leaking roof can lead to flooding, as can a burst water pipe. Poor building maintenance accounts for a good deal of library disasters, especially the more minor disasters.

2.2 DISASTERS IN THE SOUTH AFRICAN CONTEXT

2.2.1 Natural disasters

The nature of potential disasters varies according to different geographical areas and regions of the world. The two most common disasters, fire and flood, are not necessarily limited to specific geographical areas. Even in areas that are particularly dry, flash floods do occur, which can lead to flooding. Flood and fire are two very important potential threats in South Africa. Some areas of our country, such as the Cape mountain slopes, the Drakensberg, and the Eastern Transvaal escarpment, have higher rainfall than others (South African Official Yearbook, 1992:4), but flooding is a possibility in many other areas as well.

Some areas of our country are particularly prone to electric storms. These are particularly dangerous as they are characterised by thunder, lightning and heavy rains. Lightning is very hazardous as it can start fires and libraries in these areas should be particularly aware of this danger. South Africa does experience some severe rain storms, along with their heavy rainfall and wind. The rains can lead to flooding and leaks developing in building structures. Heavy winds are very dangerous as buildings can be damaged. Tiles can be blown off roofs, and doors and windows can be forced open by the wind.

South Africa is not prone to earthquakes, as this country is not situated on any of the worlds' major earthquake belts, discussed above. Earth tremors occur, but they are minor and very rare. South Africa is also not prone to cyclones, hurricanes or tornadoes.

2.2.2 Man-made disasters

Any country which experiences periods of political or social unrest, is prone to destruction of buildings and property, because of rioting or bombings. Some countries are more susceptible to such forms of destruction than others. South Africa has a history of political instability, especially in more recent times; thus such threats have been a very real danger. Malicious vandalism, which is prevalent throughout the world, is also a threat.

CHAPTER THREE: DISASTER PLANNING

All too often the assumption is made that a disaster will never happen. Unfortunately one cannot count on this. Most people take the assumption that it will not happen, and, if it does, the insurance will pay out for the damages. These are dangerous assumptions. It is safe to say that many people are taken by surprise when a disaster does happen and are uncertain about what to do. It is also important to realise that when an alarm does sound, a large percentage of people do not believe that a disaster will really happen and ignore the warning (Wright, 1979:254).

It is for these reasons that disasters are often compounded by human error and neglect. The following are a few examples (Griffith, 1983:258):-

1. A caretaker, while dusting the floor of a library, did not notice that a lighted cigarette became entangled in the oily mop. The cigarette smoldered, the mop caught fire and developed into a serious fire.
2. At another library, the staff, upon discovering the beginnings of a fire, sounded the alarm and promptly evacuated the building and proceeded to wait for the fire brigade to arrive. This is a sensible thing to do. However, even though there were many fire extinguishers available, no one attempted to put out the fire, while it was still smoldering. The fire brigade arrived too late and the library was completely destroyed.
3. The third example is one of flooding. A study carrel window was left open in winter. The cold air froze the hot water radiator. However, the next morning it thawed and flooded the library. The damage was not noticed initially as frosted glass windows prevented

the staff from noticing the problem until it was too late. There are numerous accounts of library disasters, some of which are described in the following: (Buchanan, 1979; Burgess, 1989; DeCandido, 1988; Harrison, 1979; Olson, 1986; Schmelzer, 1968; Strong, 1987; Sung, Leonov and Waters, 1990; Watson, 1989). They range from fires to floods to pest infestation and there are two aspects that are a recurring feature of these accounts. Firstly, negligence and a lack of building maintenance often contribute to the occurrence of library disasters. Secondly, library disaster recovery is a time consuming and very expensive process that should be avoided if at all possible. The development of an efficient disaster plan is thus essential. It is vital that, in the event of an emergency, one can react swiftly and efficiently. McIntyre (1988:42; 1989:1) believes that to achieve this it is necessary to apply preventative measures, establish emergency procedures, have emergency equipment at hand, and to be in contact with emergency supply services.

3.1. DISASTER PLANS: THEIR NECESSITY AND OBJECTIVES

Watts (1993:5), is of the opinion that disaster plans are necessary for the following reasons:-

- Disasters are inevitable, so be prepared when they happen.
- Minimise the damage when they do occur.
- Ensure that reaction is swift.
- Security measures should be investigated as well, and in order to do this, a risk assessment must be done.
- It is essential to be in contact with emergency services.
- It is important to convince management of the necessity for such a plan.

Disaster planning has the following objectives:-

- To prevent a disaster from occurring.
- To protect the library materials should a disaster occur.
- To salvage damaged materials as quickly as possible after the event (McIntyre, 1988:43; McIntyre, 1989:2).

Harvey (1993b:122) makes the following very important distinction. Disaster planning is not concerned with the safety of people in libraries. These procedures are normally developed in conjunction with emergency services, such as the ambulance services or the fire brigade and these arrangements should be published in a separate document. Disaster planning follows on from these procedures, and assumes that the safety of people in libraries is of paramount importance and the first consideration in the event of an emergency. Disaster planning, therefore assumes that the safety of people has been assured and concentrates on the protection and rescue of library materials.

The objectives of a disaster plan, as enumerated by Harvey (1993b:122), are as follows:-

- To anticipate possible disasters and reduce their effects.
- To ensure that emergency services are familiar with the nature of the library's collection and disaster procedures.
- To re-establish normal conditions and library services as soon as possible after an emergency.
- To learn through experience and to prevent any further disasters from happening.
- To ensure that staff are trained in disaster procedures.
- To ensure frequent inspection of the building by trained professionals.

Anderson and McIntyre (1985:10) suggest that the value of a disaster plan is to ensure that reaction is fast and efficient. This can be achieved if staff are informed, procedures are well planned and disaster supplies and equipment are at hand and readily available. It is for this reason that planning is so important.

The procedure for developing a disaster plan depends on the size of the library, the number of staff and whether any additional funding is available, which would enable the library to hire a consultant to assist them in the planning process. A disaster plan should be developed co-operatively by the library staff, as this increases awareness of disaster planning. The essential elements of a disaster plan are a knowledge of the building, the collections, disaster prevention, recovery techniques, availability of outside help and the existence of a decision-making structure (Harvey, 1993b:123).

Buchanan (1988:105), has the following further suggestions to make concerning disaster planning:

- The library must accept responsibility for planning.
- The library must plan well in advance.
- Disaster reaction must be swift and must follow pre-planned disaster procedures.
- Disaster planning must be adapted to suit local conditions.
- Disaster education and training is essential.
- The use of common sense is essential.

Fortson (1992:77-82) discusses additional important aspects of disaster planning:-

- Staff responsibility: when developing a disaster plan, it is important to involve all the staff in its preparation. The process must, however, be well organised with clear lines of authority.

- Co-operation with other library services and information services: co-operative planning can be very useful, as ideas can be shared. Reciprocal assistance arrangements can also be made in the event of a disaster occurring.
- Education of staff: staff should be familiar with disaster reaction procedures, such as the handling of wet materials and the use of fire extinguishers.
- Survey of facilities: the library premises should be inspected regularly by professionals in order to maintain the building.
- Survey of staff practices: staff practices should be examined to determine whether there are any which constitute a risk. Smoking should be confined to one area, as should the use of coffee pots, and other electrical appliances.
- Evaluation of the collection: there are two aspects to this evaluation. The collection should be evaluated, firstly according to the type of media the library holds, such as paper, leather, microforms, among others, and, secondly according to priorities for evacuation and treatment.

Kahn (1994:22-24) discusses the following key aspects which are essential for effective disaster planning:-

- Authority: a staff member should be appointed to head the disaster response team. This person should be able to handle stress well and make decisions under pressure.
- Money and insurance: the conditions of the insurance policy must be understood. The disaster team leader should be given the authority to dispense cash during a disaster.
- Resources: this aspect is particularly relevant to computerised material. All software and data files must be backed up and stored in a separate location. Keep a list of hardware and communications needs and copies of the software communications

protocols. It is also essential to keep lists of phone numbers and passwords.

- Alternative locations: alternative premises must be arranged to house the service while salvage operations are being done.
- Testing: test all hardware and software at the alternative location to ensure that it is operational.

Davis, Fraser and Reed (1991:42-44), Nance (1993:64-66) and Rawsthorne (1990:20-22) discuss disaster planning from the point of view of the essential co-operative relationships which must be developed with other libraries and community services, some of which are the following:

- Library services: it is essential to co-operate and communicate with other library services, to share ideas and to obtain help in the event of a disaster.
- Community services: it is important to establish ongoing relationships with local community services, such as the fire brigade, emergency medical services, security companies, the Red Cross, and local and central governing bodies. Identify who they are and what their capabilities are.
- The media: the media are essential for the collection and dissemination of accurate relief response information.
- Community volunteer relief efforts: many volunteer and civic organisations provide relief and assistance in times of disaster. Communication with these organisations must be maintained.

Joseph and Couturier (1993) and Smith (1992) approach disaster planning from the point of view of management activities which should be undertaken.

Joseph and Couturier (1993:315-317) suggest the following:

- Management support: it is essential that disaster planning is supported by the management structure. Management should be committed to it and they should treat the process the same as other operational projects.
- Authority: disaster team leaders should be granted the proper authority in order to carry out their duties effectively.
- Analysis of threats: analyse the threats or hazards that apply to each organisation.
- Comprehensive plan: develop a detailed disaster plan, which covers each phase of an emergency.
- Distribute the disaster plan: all staff should be familiar with the plan and they should be trained in its execution.
- Contact with outside organisations: pre-arrange agreements with emergency services such as alternative operating locations, restoration services, and the fire brigade, among others.

Smith (1992:13) criticises the general tendency that reports of library disasters tend to concentrate on the actual disaster, how it was handled, the number of books lost, and the need to restore basic library services as soon as possible. He believes that there should be more emphasis on the indirect, rather than the direct, costs. Indirect costs can be described as the loss of that "which might have happened". Examples of this are: research that will never be done, library services not provided, unanswered research queries, unimproved economic conditions, less democratic forms of government and other losses in the quality of life that a lack of information brings. A better understanding of indirect costs is essential to facilitate effective disaster planning.

Another perspective on disaster planning is given by Alegbeleye (1993:7-11.) He discusses it in terms of risk management. He defines three related concepts with regard to disaster planning. The first is risk, which can be defined as the probability of an unwanted event occurring, which can result in injury or loss. The probability of such events occurring is uncertain and information about what might happen is incomplete. Risks are abstract. Hazards, on the other hand, refer to natural phenomena, such as fire or flood. In this way, a hazard is more defined, but its occurrence is still uncertain. The third concept, is disaster, which can be defined as the impact of a hazard on people, property or the environment.

Risk management can be defined as the attempt to reduce the consequences of an unwanted disastrous event. This process has three phases:

- 1) Identification and evaluation: the first phase is to identify the risks to which the library is susceptible and to evaluate their likelihood.
- 2) Management of risk: there are three methods which can be employed:
 - a) Avoidance: this involves avoiding situations which could be dangerous, such as building the library in a flood prone area.
 - b) Reduction, prevention and mitigation: this involves the reduction of risks by installing security devices, such as alarms or detection systems, introducing regular security patrols and training staff in disaster procedures and safe working habits.
 - c) Transfer: this involves legal methods such as insurance or leasing. When a property is leased to tenants, the risk is transferred to the tenants, who are responsible for any damage.
- 3) Retention: the third phase of risk management is to assume or accept the possibility of risk. Financial arrangements then have

to be made in order to be able to deal with a disaster should one occur. This is generally not a wise option for libraries (Alegbeleye, 1993:7-11).

3.2 THE FOUR PHASES OF DISASTER PLANNING

A number of authorities have suggested that disaster planning consists of the following four phases:-

1. Prevention
2. Preparedness
3. Reaction
4. Recovery

These four phases are discussed in detail by Anderson and McIntyre, (1985); Bohem, (1979); Buchanan, (1981b); Coates, (1987); Fortson, (1992); Harvey, (1993a,1993b); Griffith, (1983); McIntyre, (1988,1989,1990); Smith, (1992); Thorburn, (1993) and Watts, (1993).

3.2.1 Prevention

The prevention stage aims to identify the risks posed by the library building itself, equipment and fittings and to minimise the potential damage in the event of a disaster. The major risks to identify are unauthorised access, fire and flooding. Basic building security and design should be fail-safe. Leakages should be prevented and any underground water flow must be monitored and controlled by means of pumps. The roof must be well pitched to allow for water to drain off. Pipes and water mains should be led along passage ways, not through stacks. Electric wiring is a potential threat in that faulty wiring causes fires. Fire detection and suppression systems are essential in all libraries. Valuable materials should not be stored in basements or on top floors. In short, good building maintenance is crucial (Coates, 1987:52-55; Bohem, 1979).

3.2.2. Preparedness

This phase involves accepting that not all disasters can be prevented, and, planning and preparing to deal with disasters should they arise. It involves drawing up a disaster plan and forming a disaster reaction team, with a leader. A list of team members' home telephone numbers must be immediately available. Disaster plans should be circulated amongst the staff and workshops and disaster drills should be carried out. It is essential that backups are made of the shelflist or catalogue, as this is essential for insurance claims should a disaster occur. Another aspect of preparedness is the availability of disaster supplies and boxes, which should always be ready and available for use. These boxes should be placed in strategic places. The library should also be in contact and cooperation with emergency services such as the fire brigade and the police. Insurance contracts are a very important aspect of the preparedness phase (Buchanan, 1981b:245-246; Coates, 1987:56-60; Harvey, 1993a:230-231; Harvey, 1993b:127-129; McIntyre, 1989:3-4; Watts, 1993:5).

3.2.3. Reaction

The reaction phase involves the steps taken when disaster does strike. This involves contacting the disaster team and its leader. It also involves contacting the emergency services. The situation at the library must be assessed, and when the site is safe, it must be entered and the damage assessed. Evacuation of materials must also take place. The whole operation must be well organised and controlled, as it can easily be reduced to chaos.

Teams must be organised for the evacuation of materials. Evacuation must take place according to previously established priority lists. This reaction phase can be crucial, as the handling of materials must

be done with care. Materials can be further damaged at this stage by inexperienced helpers. Materials must be boxed or put into crates for transportation to drying or restoration facilities. Materials that can be air-dried on site must be separated from the rest of the materials and a location must be found for them. The stability of the building must be ascertained by a professional before the building is entered. Protective clothing must be worn, as disaster sites can present a health hazard. Leaking sewerage pipes can release bacteria into the water, and this can cause illness amongst the reaction workers (Donnelly, 1993:11; Harvey, 1993a:231-234; Harvey, 1993b:129-131; McIntyre, 1988:44; McIntyre, 1989:6-7; McIntyre, 1990:53-54; Thorburn, 1993:76-78; Watts, 1993:5).

3.2.4. Recovery

The aim of the recovery process is to re-establish normal conditions as soon as possible, so that service to the users can be resumed. This process also involves the restoration of the library materials damaged in the disaster. This may include air-drying on the library's premises or at another location, or, it may include freeze-drying or vacuum-drying at special facilities at another location. While the materials are being treated and restored, the library itself also has to be cleaned up. In the case of a flood, there may be extensive water damage and the interior will need both drying out and restoration. In the case of a fire there will also be a fair amount of destruction. There will be charring, as well as water damage. Hardware and furniture may have to be replaced. The insurance assessment and claim will have to be finalised, and the building may also need structural renovations, depending on the severity of the disaster. In the case of large scale water intrusion, the library will have to be monitored for mould growth.

It is also essential to re-establish library services to users as soon as possible. During this recovery period, the library might continue to operate from a temporary location. Once the crisis has been endured and normal conditions have been re-established, the disaster plan should be evaluated to determine its effectiveness and any inadequacies should be rectified (Fortson, 1992; Griffith, 1983:261-265; Harvey, 1993a:131-132; McIntyre, 1988:46; McIntyre, 1989:7; Watts, 1993:5).

3.3 THE WRITTEN DISASTER PLAN

The disaster control plan should be recorded in writing, usually through the preparation of a manual. This manual should be easily accessible and copies should be kept at strategic places in the library, as well as at the homes of key personnel (Alegbeleye, 1993:94-96; Fortson, 1992:84-90; Greene, 1994:7; Harvey, 1993a:222; Harvey 1993b:124).

The manual should be in loose-leaf format to allow for easy updating. It should include all vital information, but should not be too detailed, so as to make it cumbersome to use. It should include the home phone numbers of staff members, phone numbers of emergency services and insurance agents, information on what to do in the case of an emergency and how to handle and pack damaged materials, the location of disaster boxes and commercial recovery firms (Greene, 1994:7).

Buchanan (1988:7) has the following opinion of a written disaster plan: "A written plan is the single most important step in preparing for disasters. First, such a written document acknowledges that disasters are possible and that there is a commitment on the part of the organisation to accept responsibility in a sensible and logical

way. Second, preparation and a written plan eliminates panic, assures proper decisions, reduces the damage to collections and limits the cost of recovery. Third, a plan consolidates ideas and provides step-by-step instructions which are clear and easy to follow for anyone who is called upon to use them".

There are other reasons for a written plan. The disaster team leader may not be available when the disaster occurs and other staff members should have access to a written plan in order to know which steps to follow. The process of writing and formulating a written document allows for a thorough analysis of the situation and would encourage input from a wider range of staff members. It also serves to make staff members aware of disaster and preservation issues and, being a formal document, would engender financial support from management. It is not essential to have a professional conservator on staff or to have technical conservation knowledge. However, the disaster planning committee should be committed and there must be support from the management structure of the library (Fortson, 1992:84-85).

One of the first steps in writing a disaster plan is the gathering of information about the structure and content of such a plan. It is useful to review the disaster plans of other similar organisations. It is also important to consult with a variety of experts such as professional conservators, insurance advisers, emergency services such as the fire brigade, architects and people who have specific knowledge concerning the premises of the library, such as plumbers and electricians (Fortson, 1992:85-87).

The content of a disaster plan will vary considerably from one institution to another. However, there are four elements that are essential.

They are as follows:

- Introduction: this should be brief, outlining the purpose of the disaster plan.
- Establishment of authority: it is essential that a disaster team leader be appointed to direct operations should a disaster occur. The appropriate authority must also be given to the team leader in order to make decisions.
- Recovery procedures: this is the most detailed part of the written plan. It should include a logical sequence of events that must be taken in the event of a disaster, methods for treating materials, and priority materials for evacuation and treatment should also be indicated.
- Appendices: the appendices must include extra information that might not be needed immediately, such as phone numbers of staff who will assist in the event of a disaster, the availability and location of disaster boxes, the phone numbers of contact people, such as professional conservators and insurance agents, and, floor plans of the library, indicating the location of fire extinguishers and evacuation routes (Fortson, 1992:88-94).

Alegbeleye (1993) and Harvey (1993a,1993b) also give suggestions as to the contents and format of a written disaster plan.

Alegbeleye (1993:95-96) suggests that the following should be included in a written plan:

- The name of the institution.
- The date of completion or revision of the plan.
- A list of staff to be contacted in the event of an emergency, with their phone numbers and addresses.
- Members of the disaster team, with the appropriate phone numbers and addresses, should also be listed.
- The location of disaster boxes must be noted, as well as

commercial firms and agencies who can supply additional disaster materials.

- The procedures for updating various aspects of the plan should be outlined.
- A list of priority materials for evacuation and treatment must be included.
- The details of the insurance policy, as well as the insurance agent should be given.
- Floor plans must be included, indicating emergency exits and fire equipment.
- Salvage methods must be outlined.

The disaster plan must be signed by a member of senior management and should be widely disseminated amongst the staff.

Harvey (1993a:222; 1993b:124) also suggests that a disaster plan should include the following:

- A summary of emergency procedures to be followed for each type of disaster.
- A list of staff to be contacted in the event of an emergency.
- A list of emergency supplies.
- A list of regional and national emergency services and consultants.
- Procedures for obtaining emergency funding.
- Floor plans with priority materials clearly marked.
- Insurance details must be included.
- Arrangements for regular building inspections should be included.
- Arrangements for regular inspection of security equipment such as alarm systems and fire extinguishers should also be included.

3.4 TESTING THE DISASTER PLAN THROUGH SIMULATION

It is important to test the disaster plan to determine its effectiveness. This can be done by organising a disaster drill or workshop. A hypothetical disaster is invented and the library staff have to react to it as if it were a real disaster. These exercises can be very helpful, as any weaknesses in the plan are brought to the fore. Disaster drills and workshops include discussions on various aspects of disaster planning and how to handle disasters, as well as practical exercises in disaster reaction (Cuthbert and Doig, 1994; Harvey, 1989; Murray, 1985; Page, 1993; University of Wyoming Libraries, 1985).

A few examples of disaster workshops are as follows:-

In February 1993, CAVAL held its 2nd disaster response workshop at Ballarat University College. The 'Ballarat is Burning' workshop was attended by 36 people from 4 states. The first day was a theoretical session, which involved discussions of disasters that had occurred, prevention of disasters, contents of disaster boxes, disaster prevention and a demonstration of fire fighting. The second day was devoted to practical experience of a simulated disaster site. This practical session was considered to be the most valuable aspect of the workshop. It was interesting to note the difference in approaches between men and women to disaster reaction. Men tended to immediately begin evacuating material from the disaster area, while the women first wanted to assess the situation and plan what should be done (Cuthbert and Doig, 1994:14-16).

The second example of a workshop was held at the Central Library of the University of California, San Diego in May 1992. Seven library staff members were present. A specific situation was presented to them, and they were asked to react to it, using the library's

disaster plan. The scenario involved a piece of landscaping equipment falling through the ceiling of the recently completed underground addition to the Central Library. Mud, dirt and water caused extensive damage to 25 000 current periodicals. The workshop was useful in that it isolated various strengths and weaknesses of their disaster plan, some of which are as follows:-

- They needed a compensation policy for staff members who assisted in disaster recovery.
- They lacked a list of staff members willing to help in the event of a disaster.
- It is essential that one staff member is appointed to manage the disaster reaction process.
- It is important that such a workshop is as 'true-to-life' as possible.
- All those attending such workshops should actively contribute to the proceedings.
- Sufficient time needs to be allowed for evaluation and comments concerning the effectiveness of the workshop.
- It is important to have a facilitator from outside the staff in attendance (Page, 1993:8-9).

A third example is the workshop entitled 'Ark building for libraries-how to salvage books from a flood' held in August 1984. It was organised by the Worcester Area Cooperating Libraries. Forty-eight people attended from seventeen institutions. It was run over two days and the participants were involved in simulated disaster reaction and handling of over four thousand wet and muddy books, periodicals, microforms and photographs. The workshop was designed to be as 'true-to-life' as possible. The participants were involved in cleaning, sorting, and packing damaged materials and transporting

them to be dried at commercial freeze drying companies (University of Wyoming Libraries, 1985:1).

3.5 DISASTER MANAGEMENT EXPERT SYSTEMS

Computer software is available to assist with the development of disaster plans. Morentz (1987:100-102) discusses an example of such software. He believes that emergency planning for libraries is often a low priority because it is considered to be costly and disasters are perceived to be a low probability.

This software, while expensive, assists in developing disaster plans which are tailored to suit a library's needs. One such program is Emergency Information Systems (EIS). It combines the use of emergency management databases, with computer graphic maps and floorplan displays. This software can also be used for the daily operations of the library in the designing of exhibits, as well as for computer-generated maps and floorplans to help the users find their way around the library.

EIS includes the following databases:-

- Hazard analysis: this database assists in assessing which hazards are relevant to a particular library.
- Automated emergency plan: this consists of a guide for developing a disaster plan using a standard format.
- Personnel resources: this database provides information on experts in the field of disaster planning.
- Resource management: this database includes information on emergency supplies and equipment and how to obtain them (Morentz, 1987:100-102).

3.6 DISASTER MANAGEMENT IN SOUTH AFRICA: THE PRESENT SITUATION

The field of conservation and preservation in South Africa has been sadly neglected and continues to be so. Coates (1993:9) believes that the unstable political situation and the economic recession have contributed towards this neglect. South Africa has a wide climatic diversity and is susceptible to disasters such as fire and flood, as well as humidity problems, which lead to the development of mould and insect damage.

According to the National Libraries Act of 1985, the South African Library has a duty to provide a national restoration service. However, there is no provision in the state subsidy to provide the funding to fulfil this duty. On the whole, the funding for preservation and conservation in this country has to be found from donations and sacrifices made from elsewhere in library budgets. Coates (1993:10-11) reports that, according to a national survey which included national, university and public libraries, only 58% of the respondents had a clear preservation policy. The remainder respond in an ad-hoc way to crises. Very few of the respondents had a disaster plan, even though the South African Library has actively been promoting disaster preparedness.

CHAPTER FOUR: DISASTER PREPAREDNESS AND PREVENTION

4.1 BUILDING DESIGN

Everything possible should be done to prevent a disaster from occurring. A very important aspect of disaster preparedness is safe and desirable building design. It is essential to create a building structure which will provide the highest state of disaster preparedness, which, in turn, will provide an environment which is most suitable for the storage of the library's holdings. A crucial prerequisite in building design, is the employment of a professional consultant who will be able to give advice on safe building design. Building codes also set standards for building design. Close communication is also necessary between the architect and the builder during the planning and construction stages (Ashman, 1995:9; Fortson, 1992:8).

Ashman (1995:9-10) provides an outline of the basic requirements in safe building design, which must be implemented:-

- 1) No water pipes should cross storage areas, other than those of the fire extinguishing system.
- 2) Stopcocks should be fitted to the water supply system, to allow the water to be turned off in the event of a burst pipe.
- 3) In areas where there are water supply pipes, a cavity, which is lower than the other surface area, should be created, so that leaking water can be safely drained away.
- 4) The number of rear doors should be kept to a minimum. The only essential rear doors are emergency exits and service doors.
- 5) Locks on doors should be replaced periodically.

4.1.1 Evacuation Drills

It is essential to have routine evacuation drills to ensure that all staff members are familiar with emergency routines, as well as to ensure that all disaster evacuation equipment is operational. For example, it is important to test the public address system, the fire alarms and the emergency exits, among others. Damage, as the result of a disaster, could be unnecessarily exacerbated if, for example, the emergency exits are jammed through lack of use, and, as a result of this, rescue workers are not able to remove valuable items from the library (Ashman, 1995:2; Fortson, 1992:9).

Most libraries have emergency exit doors, which are fitted with pressure-release bars, which, by law, are not allowed to be locked. These doors can be fitted with audible alarms to alert library staff in the event of a person using these doors unlawfully. It is important to ensure that the location of emergency exit doors are well sign posted (Morris, 1986:2).

Ashman (1995:12-16) points out that evacuation and emergency procedures will differ slightly according to different emergency situations. For example the emergency procedures for a power failure will differ from those for flooding. All staff should be aware of the relevant emergency procedures.

4.2 ALARM SYSTEMS

There are various alarm systems that can be installed and security measures that can be taken, in order to prevent a disaster from occurring, and, to act as a warning device in the event of a disaster (Brawner and Nelson, 1984; Evans, 1992; Fortson, 1992; Morris, 1986) Alegbeleye (1993:35), terms this principle 'disaster mitigation'.

4.2.1. Fire detection and suppression systems

Fire is a major threat to libraries and can result in enormous losses. Arson is also a significant problem, causing between 70% and 85% of all library losses. It is essential that all possible steps are taken to prevent fires from occurring. This involves good building maintenance, regular fire inspections and disciplined use of electrical appliances, among others (Morris, 1986:53). However fires cannot always be avoided, and it is important to have both a fire detection and suppression system.

In the event of a fire, the first essential step is early detection, to enable people to be evacuated swiftly from the building. A detection system should be sensitive, reliable and easy to maintain. A detection system should: a) sense heat, smoke or fire, b) send a alarm to a central monitoring station, and, c) initiate an appropriate fire suppression device, such as an automatic sprinkler system (Alegbeleye, 1993:36; Fortson, 1992:10-11; Morris, 1986:43).

4.2.1.1. Fire detection systems

4.2.1.1.1. Ionization devices

These devices sound an alarm when visible or invisible particles of combustion enter the device and result in changes in the flow of electrical current (Alegbeleye, 1993:36-37; Fortson, 1992:10-12; Morris, 1986:43-45).

4.2.1.1.2. Thermal detectors

These sensors are mostly used for enclosed areas and detect rapid heat rise. They are two types. Fixed temperature detectors sound an alarm when a pre-determined temperature is reached, and, rate of rise detectors sound an alarm when the temperature rises more rapidly than

would normally be expected (Alegbeleye, 1993:36-37; Fortson, 1992:10-12; Morris, 1986:43-45).

4.2.1.1.3. Photoelectric smoke detectors

These detectors activate an alarm when visible smoke particles interfere with the passage of light to a sensing cell within the device (Alegbeleye, 1993:36-37; Fortson, 1992:10-12; Morris, 1986:43-45).

4.2.1.1.4. Flame detectors

These detectors activate an alarm when actual flames are detected. These devices are not normally suitable for libraries, as libraries need an early detection device (Alegbeleye, 1993:36-37; Fortson, 1992:10-12; Morris, 1986:43-45).

4.2.1.2. Fire suppression systems

Automatic fire suppression systems are universally accepted as the most effective defense against fire. More than 80% of library fires can be controlled by three or fewer sprinkler heads. However, it is also essential to have a ready supply of hand held fire extinguishers. All staff members should know how to use them. It is important to note, however, that even if a fire extinguisher is used, the fire department should be called anyway to ensure a quick response should the fire get out of hand (Alegbeleye, 1990:104; Alegbeleye, 1993:39-40; Fortson, 1992:17-18).

4.2.1.2.1. Portable fire extinguishers

There are different types of hand held fire extinguishers, and it is essential that the relevant one is available in the event of a fire. Type A, a water-based extinguisher, is for combustible materials,

such as paper or wood, Type B, a carbon dioxide-based extinguisher, is for electrical fires or flammable liquids, and, Type C is a comprehensive extinguisher. These are halon-based and, while expensive, can be used on any type of fire. Halon does not require any cleanup operations, and is popular for use in computer rooms. (Alegbeleye, 1990:104; Alegbeleye, 1993:39-40; Fortson, 1992:17-18).

4.2.1.2.2. Automatic water sprinklers

These are the most popular automatic water suppression systems. The standard wet pipe system consists of sprinkler heads, which are filled with water at all times. In the event of a fire they are activated and emit water until they are turned off manually. The preaction sprinkler system withholds water from the pipes until a fire is detected. The water is then fed into the pipes and released. This system is slightly more expensive. The third system is the on-off sprinkler head system. These operate individually over a fire, so that flooding is restricted to one area. This system also shuts down automatically when the fire is under control and reactivates itself in readiness for a redevelopment of fire (Alegbeleye, 1993:41-42; Fortson, 1992:15-16; Morris, 1986:37-38).

4.2.1.2.3 Total flooding systems

Total flooding systems include the use of carbon dioxide, high expansion foam, and, halon gas. Carbon dioxide is expensive to install, and no cleanup is necessary after its use. However, carbon dioxide is a health hazard, and its use is only allowed in uninhabited rooms in libraries. High expansion foam is a relatively new fire suppression device. It is advantageous as it uses a limited quantity of water. It consists of small, penetrating bubbles which carry a small amount of water. The water is released from these

bubbles, when they come into contact with heat or flames. The third total flooding system is halon gas. This is not hazardous to the safety of people and it is very effective in extinguishing any type of fire. It does have some disadvantages though. Firstly, it is an expensive system. Secondly, it can only be used in an air-tight enclosure. Thirdly, it has recently been found to be harmful to the ozone layer, and, fourthly, it leaves a residue on magnetic material which is extremely difficult to remove (Alegbeleye, 1990:104; Alegbeleye, 1993:42-43; Fortson, 1992:13-15; Morris, 1986:38-43).

4.2.2. Water detection systems

Water detection systems are discussed by Fortson (1992) and Morris (1986). There are two methods to water damage prevention and detection. They are automatic water detection systems, and, effective building design and maintenance.

4.2.2.1. Automatic water detection systems

Water alarms are not as prevalent or varied as fire detection systems. They commonly operate through the activation of electronic sensors and are not normally activated by high humidity levels. Some alarm systems consist of a cellulose sponge which expands when it is immersed in water. This action closes an electric circuit and sets off an alarm. They may consist of separate units or a continuous cable and should be connected to a central response station. They should particularly be placed in areas that have previously experienced water problems and near drains.

One such system is called the Early Warning Aid, which was developed in Sweden and detects water, humidity and temperature extremes.

Another system is Raychem TraceTek 100, which not only detects water, but also reports the exact location of the water (Fortson, 1992:29; Morris, 1986:58).

4.2.2.2. Effective building design against water intrusion

Sound building design and regular maintenance are both essential in the prevention of water intrusion. Prevention is once again better than cure, and it is important that the structure of the building is sound. Precautionary steps against water damage can be expensive, as many involve structural modifications to the library building. Roof leakages cause many flooding problems and this is one area that must be well maintained. Flat roofs are especially problematic, as they do not allow for excess water to drain off. Debris also tends to accumulate on flat roofs and drainage pipes become clogged. Leakage can also develop from inside a building, usually from defective pipes. In cold weather exterior pipes are also prone to burst, or, to freeze up and then defrost when the temperature rises also causing flooding. It is essential to check a building for structural problems after a spell of bad weather (Fortson, 1992:26-29).

Care should also be taken during building repair work and construction to prevent heavy machinery and equipment causing structural openings through which water can seep. All entrances and exits, and, windows should close securely, as leakages in these areas often cause flooding.

Drains should be regularly inspected for blockages and should have manual cutoffs, that can be activated if water threatens to rise to dangerous levels. All water pipes and sewerage drains are a potential threat and these should be well maintained and regularly inspected. Subterranean water flow is particularly risky and basements in such buildings must have an effective pump, which should be regularly maintained. Generally, good building maintenance is the best protection against water intrusion and damage (Fortson, 1992:26-29).

4.2.3. Protection against vandalism and destruction

It is also essential to protect a library building against vandalism and intrusion. There are two methods of achieving this. They are the installation of a security system and, once again, good building design.

4.2.3.1. Security alarm systems

Alarms detect the breaking of glass or the presence of someone in a protected area. They can also be extended to include surveillance of the library grounds and perimeter fence. Alarms are also very necessary to protect valuable collections. It is also an advantage to have an alarm system which is connected to a central monitoring station. These alert the police or a security company, which then comes to check the building (Brawner and Nelson, 1984:47; Morris, 1986:27-28).

4.2.3.2. Effective building design for security against vandalism and theft

Brawner and Nelson (1984) and Morris (1986), discuss sound building design and security in detail. It is important to secure all doors with good quality locks and to keep exterior doors and exits to a minimum. Secure burglar bars are essential. Emergency exits can create problems. By law they are not allowed to be locked. Such doors should be equipped with alarms to alert staff to unlawful exit. Another possibility are magnetic security doors. These doors will only open in an emergency. They have to be activated by a central controlling station (Morris, 1986:2-3). Closed circuit television is another valuable security device. Monitors can be installed at strategic points in the library and staff can monitor the movement of users and possible intruders.

Windows and doors should be secured and the outside of the building should be easy to maintain. Graffiti is often a problem and it should be removed as soon as possible after its application. Landscaping should be low profile, to eliminate hiding places in the library grounds. External, as well as internal, lighting should be good, especially in the parking areas. External lighting should be controlled by timers. Avoid the use of rocks as landscaping elements, as these can be used to break windows. Doors should be solid wood or metal with hinges on the inside to prevent their removal. Key security is essential. Keys must be locked away, and, when staff members leave keys must be returned. Keys should also be changed regularly (Brawner and Nelson, 1984:42-45).

CHAPTER FIVE: TECHNIQUES FOR RESTORATION AND RECOVERY

The restoration and recovery of damaged materials is a crucial phase, as incorrect treatment and handling of materials at this stage can compound the damage caused by the disaster. Restoration and recovery techniques are discussed by Alegbeleye (1993); Buchanan (1979, 1981b); Fortson (1992); Griffith (1983); Harvey (1993a, 1993b); McIntyre (1988, 1989); Morris (1986); Olson (1986); Smith (1992); Sung, Leonov and Waters (1990) Thorburn (1993).

It must be remembered that libraries consist of a number of different media. While the majority of the material may still be paper-based, the chances are that vellum, parchment, photographs, magnetic tapes and CD-ROM discs will also have to be salvaged and different media may demand different solutions.

5.1 RECOVERY OF WATER-DAMAGED MATERIALS

The first step in disaster recovery techniques, is identifying which materials can be air-dried, as opposed to those which would require more specialised treatment such as freeze drying or special restoration techniques. Time is of the essence in disaster recovery. Mould will begin to grow with 24 to 72 hours depending on the level of humidity. In order to keep the humidity levels as low as possible, it is important to use dehumidifiers, which help to keep the air as dry as possible. Materials which can be air-dried should be transported to a suitable location and stood upright with the pages fanned in order to encourage air circulation.

Books that have been thoroughly soaked would require more intensive treatment. They should be stacked in plastic crates, spine down and transported to drying facilities as soon as possible. It is useful to interleave such books with blotting paper. The blotting paper

should be print-free, clean and preferably, acid free. The number of interleaving sheets should constitute no more than one third of the total number of pages in the book. The blotting paper helps to soak up excess water and this assists in the drying process. Books that have become distorted in the disaster, should be gently realigned (Buchanan, 1979; Buchanan, 1981b:246-249; Fortson, 1992:50-66; Griffith, 1983:261; Harvey, 1993a:250-256; Harvey, 1993b:132-134; McIntyre, 1988:46; McIntyre, 1989:6-7). There are a number of popular drying processes.

They are as follows:-

5.1.1. Freezing

Freezing is an excellent stabilization process. This process should be done immediately after a disaster, as an interim step. It buys time, as it halts all further deterioration until proper treatment can commence. It delays the growth of mould, inks will not feather and dyes will not run. It allows for time until the materials can be transported to the appropriate drying facilities (Fortson, 1992:62-63).

5.1.2. Vacuum freeze drying

This process causes the ice crystals on frozen documents or books to pass directly from the solid state to the vapor state, thereby eliminating the liquid phase. Thus further harmful effects are avoided, as the materials are not subjected to water.

The materials are placed on shelves in a chamber, which is then sealed to create a vacuum. The pressure is then increased which encourages the sublimation process. Distorted material should not be placed in the chamber, as they will be dried in their distorted shape. They should first be gently manipulated into their correct

shape. Vacuum freeze drying also helps to arrest the development of mould (Fortson, 1992:63-65).

5.1.3. Vacuum drying

This process is also called vacuum thermal drying. Unlike vacuum freeze drying materials do not have to be frozen before the process begins. Thawed materials are placed in a chamber and the moisture is then removed by a vacuum process. Hot, dry air is introduced until a certain temperature is reached. The moisture is then pumped out of the chamber. This process is repeated until the materials are dry (Fortson, 1992:65-66).

5.1.4. New Soviet drying technology

In the aftermath of the devastating fire at the Library of the Academy of Sciences at the USSR in February 1988, a new, very effective and relatively inexpensive drying technique was developed. Over two hundred thousand books damaged in the fire at the Academy were treated with this method. The process is as follows: materials are frozen and packed into bundles of approximately ten to fifteen books each. These packages are wrapped in absorbent blankets, which have hollow gussets sewn on the inside. These gussets are filled with sawdust, which is very absorbent. These packages are placed in a chamber, where they are defrosted using extraction and thermoelectric fans. Warm air is then introduced and the drying process begins. The whole process takes approximately four to seven days. This method does not result in distortion of books and the books are not bone dry when removed from the chamber. It is also relatively inexpensive and does not require specialised equipment. However, coated paper cannot be dried using this technique and special precautions must be taken to prevent mould growth (Sung, Leonov and Waters, 1990:309).

5.1.5. Water damage of non-book materials

The recovery of non-book materials can be complicated and difficult. It is wise to seek the advice of experts in this field if the damage is serious. These materials might also demand individualised treatment. If the damage is not severe, air drying of these materials is possible. Photographic materials are particularly vulnerable to water damage. Prints are however, more susceptible to damage than negatives. Professional advice may have to be sought in the restoration of prints. Microforms can be treated in much the same way, if the damage is not severe. They can be rinsed in clear water and then air dried. Magnetic tapes, if exposed to water, should also be air-dried. Computer disks, if exposed to water, can be dried using a hand-held hair dryer. If they are very wet, they should be removed from their casings, rinsed and dried with a lint-free cloth. They can then be inserted into new casings and copied onto new disks. This method of recovery was used very effectively at Mankato State University in 1986. A complete run of the microcomputer software serial, Softdisk, was damaged by water. The above methods were used and all the disks were saved (Alegbeleye, 1993:61-91; Fortson, 1992:66-71; Olson, 1986:634-636).

5.2. RECOVERY OF FIRE DAMAGED MATERIALS

In the event of a fire, damage originates not only from burning, but mostly from water damage introduced by automatic sprinkler systems and fire hoses. According to Thorburn (1993:76-78), there is more damage from the water introduced by fire hoses, than from the actual fire. Books packed tightly together on shelves do not, in fact, burn very easily. If books become embrittled by the heat, reformatting, such as microfilming and photocopying might be the best option. If the appropriate methods are used, it is possible to restore the

entire book stock. Only two percent of the books which were lost in one of the worst library fires in history, were destroyed due to charring (Thorburn, 1993:77). If reformatting is not possible, reinforcement of materials is an option. They may be placed in protective boxes or between acid-free boards. They may also be encapsulated or placed in polyester folders. The most common fire damage, is in fact soot and smoke damage, which leaves an oily, grimey residue on everything. This residue can be very difficult to remove. If the right techniques are not used, the residue will be ground into the paper. Professional help should be sought. There are various methods which can be used, some of which are soft cloths, brushes or vacuuming (Fortson, 1992:71-73; Thorburn 1993:76-78).

5.2.1. Fire damage of non-book materials

Non-book materials are very susceptible to fire damage. If they are charred or embrittled, the best option is to replicate the materials. Professional advice would be advisable in this case. Magnetic tape is resistant to temperatures of up to 200 degrees Fahrenheit for up to one hour. If exposed to heat for longer than this period, they will be destroyed. In this case replacement is the only option. However, if they are rescued in time, they may only be embrittled, in which case they must be handled with care, before they can be replicated. The most damage to non-book materials may come from smoke and soot damage, which leaves a grimey residue. As with paper-based materials this must be carefully removed. Dust or grime is particularly hazardous to computer disks, as a small speck of dust can cause data to be lost. Special care must, therefore be taken with computerised material (Fortson, 1992:70-74).

CHAPTER SIX: DISASTER MANAGEMENT OF COMPUTERISED MATERIAL

6.1 CONSIDERATIONS AND APPROACHES

Disaster planning and management of computerised records is essential, as electronic data is an important element of modern libraries. The shelflist or catalogue that is needed to prove ownership in the event of an insurance claim, is very often in electronic format.

While disaster management of computerised and electronic data is essential, it is also important to approach disaster management and planning from a wider perspective. A disaster plan should take all the library's materials into consideration, regardless of their nature. A disaster plan which is restricted to electronic data, would be of no assistance in the recovery of paper-based materials, and, a surprising percentage of company records are still kept in paper or 'hard' copy. The recovery of paper-based materials is often more complicated than that of electronic data. Back-ups of all software and data files should be made and stored at a separate location. In the event of a disaster, software and data files are then not irretrievably lost. Computer hardware would need replacement. However, paper-based records do not generally have back-ups and the recovery process can be a time consuming one. Therefore, it is essential that disaster plans be comprehensive in their approach to library materials (Donnelly and Heaney, 1993:69-70).

Disaster planning for computerised and other media is similar to that of paper-based records. These media are also affected by natural and man-made hazards, and may even be more susceptible to these hazards (Alegbeleye, 1993:61,65).

6.2 THE SEVEN MYTHS OF COMPUTER RECOVERY

Benbow (1992:29-31) discusses what he believes to be seven misconceptions with regard to computer recovery. They are as follows:-

- A computer can be replaced within fourteen days: this is not necessarily true. If it is an IBM compatible it is possible, but it is unlikely otherwise.
- If a computer system is inoperable, then a manual system can be used in the interim: not all computer systems have manual back-ups. If there is a manual back-up, it is viable to use it for a few hours, but few businesses can afford to use it for days.
- Backlog transactions can quickly be done after the installment of a new machine: for every hour that you are out of action, it takes five hours to catch up.
- A computer system does not need to be protected if it has no financial impact on an organisation: a computer system does not need to be financial in nature, to have an impact. The inability to provide information can have an impact on a business.
- A Hot Site recovery centre is the only valid recovery option: there are other more inexpensive options.
- A Hot Site recovery facility is not affordable: corporate profitability must be maintained and, in order to do so, disasters have to be avoided.
Therefore, an organisation cannot afford not to have a disaster recovery plan.
- The organisation does not need a computer recovery plan: accidents do happen, normally at the most inopportune time. The aim is to be prepared for them.

6.3 COMPUTER DISASTER PREVENTION AND RECOVERY

The most basic aspect of computer disaster recovery, is the existence of a back-up facility, in the form of both facilities, hardware and software (Miller, 1988:354-355). Alegbeleye (1993:72-75) suggests eight options to assist in computer disaster preparedness and recovery:-

- A reciprocal agreement: this involves an agreement between two or more compatible sites to provide computer time should one of them experience a disaster.
- 'Cold site': this involves an alternative location, with all the basic amenities, but with no environmental controls or hardware. It is possible however, that two users would need the site at the same time.
- 'Warm site': a 'warm' site is similar to a 'cold' site, except that it has the hardware and environmental controls, that the 'cold' site lacks.
- Vendor agreement: in this option, the organisation is able to use the vendor's facilities in the event of a major computer breakdown.
- Commercial service bureau: these organisations are independent companies which provide alternative data processing facilities. Their advantage is that the client only pays for computer time actually used.
- 'Hot' site: this is an expensive option. A 'hot' site consists of a fully equipped alternative facility, which includes technical staff, communications and storage space. It also has excellent security.
- Redundant site: the organisations' main computer centre is duplicated in another location. Because both locations are owned by the same organisation, there is no problem with compatibility.

This is also an expensive option.

- Electronic vaulting: this is the most advanced method of computer disaster recovery. Data is duplicated in real time and transferred to an off-site, but connected system. This is very expensive, but secure. It also allows for instantaneous, online access to the duplicated data.

A hazard survey should be done of the library's electronic data processing (EDP) centre. Fire is particularly hazardous to computerised equipment and data files. Water is not recommended as a means of extinguishing a fire in a room which houses computer terminals or an EDP centre, as it will seriously damage computer equipment. Other options include the use of carbon dioxide, halon gas, and automatic sprinklers. Halon gas, although effective, is expensive and is not environmentally friendly. It also results in residue which is damaging to computers. Carbon dioxide is very effective, but its use endangers the lives of people in the area. Automatic sprinklers can be used; however they should have cutoff valves to prevent the excess outflow of water (Alegbeleye, 1993:68; Fortson, 1992:13).

Miller (1988:350-356) provides the following suggestions regarding computer disaster prevention and preparedness. In the case of fire, automatic sprinkler systems are the most effective. It is essential though, to instal one that shuts off automatically, when the fire is under control. He does not recommend halon gas. It is expensive, requires a lot of maintenance and, when activated leaves a residue on all surfaces, which is very difficult to remove. Smoke can in fact cause more damage than water. It is important to have an air conditioner, as well as a humidity and moisture monitor. Cuts in

power supply can be very hazardous to computer systems. It is therefore important to have an uninterrupted power supply (UPS). These can ensure that your computer system receives continuous power supply. Computer design can also assist in the event of a power failure. Tandem computers were the first to develop computer systems with duplicate central processing units, operating systems and databases. Computer systems with multiple processors can also help in this respect. Distributed processing is another option. This involves distributing the processing of data amongst various work sites and locations. This method does, however, make security more difficult, as there are so many more locations to protect. Software for file recovery for microcomputers is available, thus information is not necessarily irretrievably lost. It is however, much more efficient to back-up all data regularly.

CHAPTER SEVEN: INSURANCE

Three prominent writers on library insurance are Brawner (1993), Fortson (1992) and Morris (1986). The practice of insuring the building and its furnishings, the entire collection and the activities of the library, is an essential aspect of disaster management and planning. This process is, according to Morris (1986:93), called risk management for the following reason: in the insurance industry, all insurable items are classified in terms of their level of risk. In other words, something is either a good risk or a bad risk. Library collections are often valuable and both difficult and expensive to replace. Inflation is also a factor to consider when dealing with replacing items. In the event of a disaster, a library will most likely be faced with a combination of replacement and restoration of items.

The principle of insuring libraries in Africa is not as widespread as it is in other more developed parts of the world (Alegbeleye, 1993:10). Nigerians, according to Alegbeleye (1990:102-103) seem to have a general dislike of insurance. Alegbeleye did a study in which he surveyed Nigerian University libraries to determine how many had insurance policies. Only one out of twenty had insurance.

The basic elements of an insurance policy are the parties involved, the dangers insured against, property to be covered, value of insurance, the premium to be charged and the date of commencement and expiration (Fortson, 1992:99).

Wright (1979:255-258), gives requirements for efficient contingency planning and insurance.

- The library must have an inventory of stock in the form of a shelflist or catalogue.

- This inventory must be maintained and kept up to date at all times.
- It is essential to secure technical details and plans of the building. This is very often a condition of the insurer.
- The fourth requirement is to determine the cost parameters, which will be used to determine the value of its collection. For example, should each item be priced separately?
- After a disaster has occurred, the insurer will need to know whether it will cost less to repair items than to replace them. Readily available expert advice is needed to determine this.
- It is essential that the insured party keep up to date on the conditions and liabilities of the insurance contract.
- It is very important to know which items are insured, where the most expensive items are, and how to contact emergency preservation services, such as vacuum drying facilities.
- Disaster supplies, often known as disaster boxes, should be readily available in the library and a list should be kept of the contents.
- Security of the disaster area must be ensured. There are various reasons for this: it is important to allow the insurer to ascertain the cause of the disaster, to ensure the safety of the staff, to prevent further damage by inexperienced helpers and to ensure that the library can meet the requirements made by the insurer.

While occupying alternative accommodation, during the reaction and recovery stages, all receipts and invoices for all expenses should be kept. These expenses should be covered by the insurance policy. Establish a cash account for this period and assign someone the authority to dispense it (Kahn, 1994:23).

7.1 FIVE ESSENTIAL INSURANCE PRINCIPLES AND PRACTICES

There are five very important aspects to remember regarding insurance. Firstly, the insured party should be well versed in the conditions and liabilities of the insurance. Secondly, all involved should be familiar with the procedures to be followed after a disaster in order to satisfy the insurer's conditions. Thirdly, it is of utmost importance that the insurance is renewed periodically and not allowed to expire (Fortson, 1992:98; Wright, 1979:255).

The third aspect might seem very obvious, but it is very important, and many an institution has been caught out by expired insurance (Wright, 1979:255). An example of this is as follows: "1865 London...by this same fire there was also destroyed the Humboldt Library, consisting of about 17 000 volumes. I fear a good friend of our Association was a heavy loser by this event. A \$5000 policy expired at noon on the very day of the fire and had not been renewed" (Morris, 1986:93). Almost everything in a library is insurable. Libraries either have their own insurance policies or they fall under the insurance policies of their governing body (Griffith, 1983:265).

A fourth critical factor is proof of loss. An insurance company will not pay out unless the insured party can prove ownership of the materials destroyed. In the case of a library collection, the inventory normally consists of the shelflist or catalogue. Because the shelflist or catalogue is also prone to destruction in a flood or fire, a duplicate must always be kept separately at another site or in a fireproof cabinet. In the case of a computerised catalogue, a duplicate tape must be kept at another site. The shelflist or catalogue must be kept up to date, with up to date valuations for each item. It may even be necessary to present circulation records

for items on loan at the time of a disaster (Fortson, 1992:102; Griffith, 1983:265; Wright, 1979:255). A written disaster plan may lead to a reduction in premiums.

Fifthly, it is also essential that the insured party gives notice of the damage or loss to the insurer as soon as possible after the damage has occurred. It may also be one of the conditions of the insurance that an insurance agent be called in to inspect the site of the disaster before cleaning up begins. It is thus essential that the insured party be familiar with the conditions and liabilities laid out in the insurance contract (Wright, 1979:255). It is also wise to report the incident in writing as well as by telephone call, as soon as possible after the disaster has occurred. There are two incidents that particularly demand an immediate telephone call. They are major property damage or loss or injury to a user (Morris, 1986:100).

7.2 TYPES OF INSURANCE

There are three basic kinds of insurance. They are: blanket policies, specified coverage, and, the Hartford library policy. A blanket policy ensures all the library's holdings under one contract. This is a relatively simple process. However, this kind of policy might not allow for adequate coverage for some more valuable materials. Specified coverage refers to the insuring of a group of items, such as rare books or specialised collections. The rest of the building and the collection is then covered by a blanket policy. The third type of coverage is the Hartford library policy. This type of policy is not offered by all insurers. It is based on a set of agreed upon values, which are the basis of the claim. The actual replacement value of individual items is not taken into account. It

is not as flexible as blanket coverage, which does not limit the specific value of each item (Fortson, 1992:104-106; Morris, 1986:99).

Brawner (1993:29-32) discusses several different types of special coverage, which are relevant to libraries. They are as follows:-

- Glass insurance: this type of insurance covers the breakage of plate glass windows, doors, exhibition cases and counter-tops, among others.
- Data processing insurance: this is a very important type of insurance in modern times. It covers the loss of equipment, as well as data loss and time needed to restore lost data.
- Earthquake insurance: this is essential for areas which are susceptible to earthquakes, such as the Americas and the East.
- Errors and Omissions: this is also an essential type of insurance, although it is expensive. It covers legal and court costs, as well as penalties brought against the library or any of its staff.

The other factor to consider is whether to insure against all risks, except for those specifically excluded, or, to insure only for certain stated risks. This type of coverage is called 'named peril' coverage (Fortson, 1992:107).

7.3 METHODS OF REMUNERATION

There are three methods of remuneration, which apply to libraries. They are as follows:

- Replacement: this can be described as what it would cost to acquire a new item or completely restore the damaged one. The replacement value should also cover the handling and processing costs, staff time and any supplies needed to complete the job.

- Actual cash value: this provides for payment in cash of the equivalent market value of the collection and, in the case of the building or furnishings, the replacement cost minus depreciation. The reimbursement however, while stated to be the market value, may be less than the amount needed for replacement.
- Average replacement cost: this kind of insurance is used for items which are not exceptionally valuable. Coverage is calculated according to the average cost of an institutions holdings. This type of coverage should be carefully considered as it can result in average replacement for items that maybe worth far more. In order to overcome this problem it is suggested that an institutions' holdings be broken down into smaller categories according to their varying replacement values (Fortson, 1992:100-102).

There are three basic ways in which the value of an item may be determined: original purchase price, standard trade price or an independent appraisal. Whatever method is used, it is essential that these valuations be kept up to date. An independent appraiser is normally used to determine the value of rare and very valuable items (Fortson, 1992:103-104).

7.4 OTHER CONSIDERATIONS

Morris (1986:94) stresses the point that insurance needs vary according to the type and size of the library and the nature of its collections. It is also essential to obtain the services of a professional insurance broker and not to adopt the do-it-yourself method. It is also important to review insurance conditions frequently and to remain up to date with regards to these details and to keep valuations of materials up to date.

The insurance industry offers discounts on insurance premiums if certain loss control devices are installed or are in operation in the library. These can be described as security features which help to reduce the risk of a disaster occurring. One loss control device is an automatic sprinkler system to be used for fire suppression. Another loss control device is the regular maintenance of mobile/compactus shelving. It is important that these are well maintained in order to prevent people being inadvertently crushed between the stacks. It is also advisable that these compactus shelves be used for less used library materials (Morris, 1986:97-98).

Maximum insurance cover is normally granted to libraries. Such a policy will normally include a combination of different types of coverage. It is advantageous for a library to have an blanket insurance policy as this insures a number of locations with one premium. It is also important to have comprehensive or umbrella coverage. This insures against bodily injury and property damage, including liability for damage to lifts, products (if any are produced), and the operations of independent contractors (Morris, 1986:98-99).

CHAPTER EIGHT: OVERVIEW OF THE MAIN DISASTER PLANNING

ISSUES

In this Chapter, the main issues that were discussed in Chapters Two to Seven, will be synthesised and highlighted to establish the most important issues addressed in the past by sources in library and information services. This synthesis will serve as a framework for the empirical component of this study, and more specifically, for the questionnaire.

Although library disaster management and planning has traditionally been a neglected field in librarianship, the conceptual issues have grown and developed, particularly since the flooding of the Arno River in Florence, which acted as a catalyst, inspiring the increase in research in this field. Therefore, within the past twenty years, there has been a marked increase in the amount of published literature dealing with this subject. The literature is comprehensive and the conceptual issues have been well developed and discussed.

8.1 TYPES OF DISASTERS:

Library disasters can be broadly divided into two categories, viz. natural and man-made disasters. Natural disasters include fire, flood, storm damage, and, earthquake damage. Man-made disasters include bombing and bomb threats, destruction due to rioting or unrest, deliberate vandalism, arson, and, power failures or surges. In the South African context, the mostly likely natural disasters are fire, flood or storm damage, while all the man-made disasters mentioned above, have a likelihood of occurring (cf. Chapter Two).

8.2 DISASTER PLANNING:

It is important to be prepared for a disaster should such an event occur. This involves the development of a disaster plan. The risks which are relevant to each institution or area should be evaluated and a plan drawn up to ensure that, in the possible event of a disaster, the damage will be minimised as a result of efficient reaction and recovery procedures. The disaster plan, which should preferably be a formal, written document, should be drawn up stating the procedures to be followed in the event of a disaster, with regards to both reaction and recovery. It is important that the staff are involved in the development of the plan, and, ideally there should be a staff member who is responsible for the library's disaster planning. The plan must be kept current and up to date and all staff must be familiar with the disaster procedures. The disaster plan may involve co-operative arrangements with other libraries or external organisations. To ensure that the plan is effective and in order to isolate problems, the disaster plan should be tested in the form of a simulation exercise (cf. Chapter Three).

8.3 DISASTER PREPAREDNESS AND PREVENTION:

Building design is another important aspect of disaster planning. Good building design serves to reduce the likelihood of a disaster occurring. The building should be conducive to easy and swift evacuation and emergency exits should be well planned and maintained. The structural design of the building should be sound, and there should be regular building maintenance inspections.

It is important that roofs are well pitched and without leaks, that water pipes and electric wiring are well positioned and maintained, and that they should not be lead through main storage areas. It is

also important that there are effective fire and water detection-and alarm systems (cf. Chapter Four).

8.4 TECHNIQUES FOR RESTORATION AND RECOVERY:

The recovery phase of disaster planning involves restoring and repairing those materials damaged in a disaster. These techniques include the repairing of water- and fire damaged materials, among others. The techniques for the recovery of water damaged materials include freezing, vacuum freeze drying, vacuum drying and a relatively new technique still known as the New Soviet drying technology. The recovery of fire damaged materials is more difficult, as once material is burnt, the image maybe very difficult to reproduce or restore to its' original condition, depending on the degree of damage. Reformatting techniques, which require skill and expensive materials and machinery, enable pages of a document to be restored by filling in the sections that have been destroyed. However, if reformatting is not possible, then the materials should be placed in protective boxes or between acid-free boards. Materials damaged in a fire suffer not only fire damage, but also water damage as a result of the water used to douse the fire (cf. Chapter Five).

8.5 DISASTER MANAGEMENT OF COMPUTERISED MATERIAL:

The disaster management of computerised material is becoming an increasingly essential aspect of disaster planning, as a large number of library catalogues and issue systems are now computerised. The most fundamental precaution with regards to computerised disaster planning and prevention is the regular backing-up of such information. The back-up tapes should be stored at a separate location. It is also important to insure the computer hardware and to provide the correct conditions for the location of the computers.

The room temperature and humidity should be kept as constant as possible and the electric wiring should be well maintained and safely installed (cf. Chapter Six).

8.6 INSURANCE:

An important aspect of disaster planning is insurance. A library's insurance needs vary according to the size of the library, the nature of the potential risks, the nature of the collection, and, the finance available. Each library has to decide on the type of insurance, what is to be insured and the value of the insurance. It is important that the conditions of the insurance be included in the disaster plan (cf. Chapter Seven).

CHAPTER NINE: EMPIRICAL RESEARCH METHODOLOGY

9.1 INTRODUCTION

As mentioned in Chapter One, this research study can be broadly divided into two approaches. The first approach, which was covered in Chapters Two to Eight, was a conceptual overview of the literature on disaster management and planning. The second approach (covered in Chapters Nine to Eleven) involved an empirical study, which investigated the present situation regarding disaster management and planning amongst research/academic and public libraries in the Greater Cape Metropolitan Area, which includes the Cape Metropolitan Area and the adjoining Stellenbosch region; the methodology of which shall be discussed in this chapter.

9.2 SURVEY RESEARCH

There is a predominance of survey research in librarianship. Survey research involves investigating a sample of a population by means of interviews, questionnaires, observation, or, examination of documentary sources.

Howard and Sharp (1983:12) define survey research as follows: "...the survey...as a method of extracting attitudes and opinions from a sizeable sample of respondents".

Smith (unpub:33) describes survey research as a method of determining an overall perspective of a field, by investigating a number of variables which occur in a natural setting. Survey research may involve both individuals, as well as groups of people.

Generalisations can then be made concerning characteristics, beliefs, and attitudes of the population. Survey research thus allows investigators to gather information about target populations without undertaking a survey of the complete population (Busha and Harter, 1980:54).

9.2.1 Demarcation of the population

For the purposes of this investigation, the researcher concentrated on research/academic and public libraries in the Greater Cape Metropolitan Area. This area includes the Cape Metropolitan Area, as defined by the Local Government Demarcation Board for the Western Cape (Proposed substructure boundaries for the Cape Metropolitan Area, 1995:102), and the contiguous Stellenbosch region, as defined by the Cape Provincial Library Service. Although the boundaries of the Cape Metropolitan Area had not yet been finalised, this investigation was based on the proposed boundaries, which were Mamre in the north, Somerset West in the east, Cape Point in the south and the Atlantic Seaboard in the west. The Stellenbosch region, as defined by the Cape Provincial Library Service, included Wellington in the north, Paarl and Franschoek in the east, and Stellenbosch in the south.

The Stellenbosch region was included for the following reasons:-

- Stellenbosch University Library is a major research/academic library in the Western Cape.
- It is located in a relatively new building, which houses valuable material.
- Some of the public libraries within this region lie within the Cape Metropolitan Area boundaries.

All the major research/academic libraries in the designated area, were included in the survey. They are as follows:-

9.2.1.1 Research/academic Libraries

- South African Library
- University of Cape Town Libraries
- Stellenbosch University Libraries
- University of the Western Cape Library
- Cape Technikon Library
- Peninsula Technikon Library

CAPE METROPOLITAN AREA

ANNEXURE 20.2

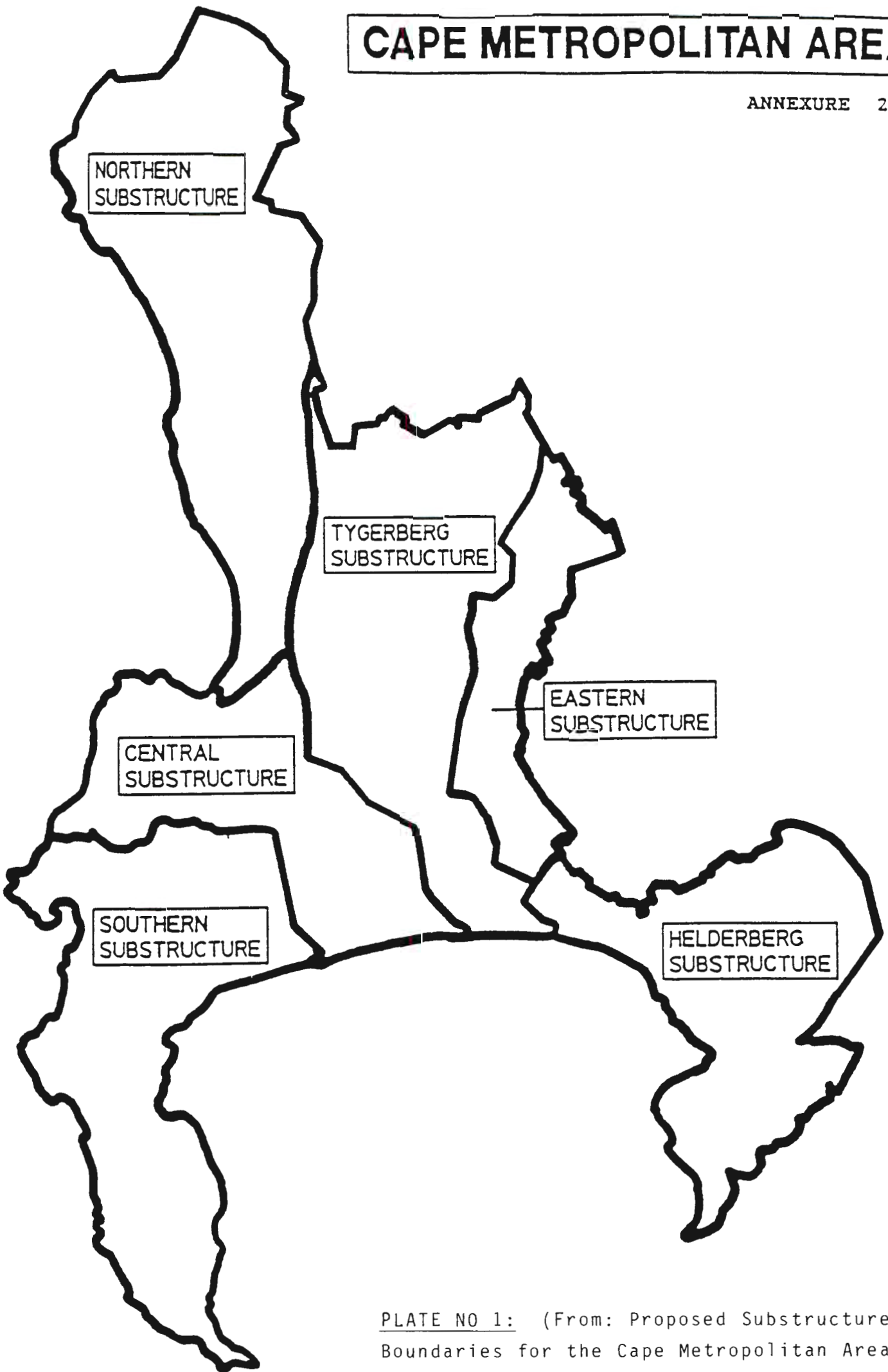


PLATE NO 1: (From: Proposed Substructure Boundaries for the Cape Metropolitan Area)

9.2.1.2 Public Libraries

In the Greater Cape Metropolitan Area, there are two major public library systems, which were both included in the survey. They are as follows:-

9.2.1.2.1 Cape Town City Libraries: as this is a library system with branches controlled by a central administration, it was assumed that the disaster principles and plans are developed centrally. These plans were thus used for the survey, as they should be applicable to all the libraries in the system.

9.2.1.2.2 Cape Provincial Library Services: the libraries within this system are not branches, but affiliates and are thus each responsible for developing their own disaster plans. The Cape Provincial Library Services is divided into a number of regions, each of which has a number of affiliated libraries. Five of these regions fall within the demarcated area for the study (cf. 9.2.1), four of which fall within the boundaries of the Cape Metropolitan Area, viz.:-

- Bellville
- Blue Downs
- Elsie's River
- Milnerton

The fifth region, Stellenbosch, is contiguous to the Cape Metropolitan Area, and it includes libraries, such as the Somerset West Public Library, which lie within the Cape Metropolitan Area.

As each of the five regions mentioned above include a number of regional libraries, it was not possible to include all these libraries in the survey. The researcher thus obtained a purposive sample from each region.

A purposive sample can be defined as using one's knowledge of the population and the objectives of the study in order to select a sample from the population to be surveyed (Powell, 1985:70). This is in contrast to a random sample in which the selection of a percentage of a population is totally random. The researcher used the 1994 Cape Provincial Library Service statistics (unpub.) for this purpose. One library was selected from each of the five regions by using the highest total book circulation statistics as the criteria. The highest circulation statistics were used for the following reasons: the higher the total book circulation statistics, the larger the library would tend to be. It was essential to include the larger public libraries in this survey, as the research/academic libraries which were surveyed, were large libraries. Another reason was that some of the libraries in each region were very small and these libraries were unlikely to have disaster plans.

9.2.1.3 School and special libraries

School libraries or special libraries were not included in this study, as it was assumed that their disaster plans would not be the responsibility of the library as such, but would be formulated by the parent organisation or school, and would be applicable to all departments, not just the library.

9.2.2. Survey Research: Data Collection Methods

There are three main data collection methods in survey research. They are as follows: questioning (which includes questionnaires and interviewing), observation, and, investigation of documentary sources. Questionnaire methods, which are generally accepted as the most effective method for determining information needs, involve the drawing up of a written set of questions, which is then given to the survey sample to complete. Interviewing, which is the second

questioning method, involves talking to people involved in a particular task or organisation and questioning them in order to obtain information. Observation occurs when the subject of the investigation is subjected to close scrutiny and the information obtained is then analysed and related to more general theories. The fourth method of survey research is that of documentary investigation. This involves studying institutional records, collected statistics, historical documents, library records and bulletins, and, case studies, among others (Smith, unpub:34-36).

9.2.3 Choice of Data Collection Method

The researcher chose questionnaires as the primary data collection method, with interviews as a secondary method, to provide supplementary information. Questionnaires and interviews were the most suitable methods for this particular research, as this was an exploratory survey, with the purpose of obtaining factual data. Observation would not have been appropriate, as one cannot observe a disaster plan. Observation is most suitable in instances where behaviour can be observed. This study did not, however, involve scrutinising behaviour. Investigation of documentary methods would also not have been suitable, as this was an area about which there was minimal documentation concerning disaster plans in South African libraries.

9.2.3.1 Questionnaires

Questionnaires are very well suited to exploratory research and the gathering of factual information. Therefore, this data collection method was very applicable, taking into account the nature of this study. An inherent disadvantage of questionnaires is the tendency to

achieve a low response rate (Howard and Sharp, 1983:138; Martyn and Lancaster, 1981:6-14). However, as the sample to be surveyed was relatively small, the researcher could monitor the response rate, and; therefore ensure a hundred percent response rate. It was very important that the questionnaires be carefully worded and developed, as they could easily be misunderstood or misinterpreted. Therefore, bias had to be avoided and the questions and instructions had to be very clear and carefully worded (Martyn and Lancaster, 1981:6-14). The researcher, being aware of these difficulties, was meticulous in the structuring and wording of the questionnaire, and great care was taken to keep the questionnaire as short as possible. Ample opportunity was provided for respondents to give their own opinions on issues.

The questionnaire investigated the main issues of disaster planning; as discussed in the survey of the literature (See Chapters Two to Eight). The questionnaire investigated the existence of disaster plans amongst the demarcated population, their nature and development, emergency routines, the protection of computerised data, insurance measures, and, co-operative arrangements with regards to disaster planning. (See Appendix A, for an example of the questionnaire).

9.2.3.2 Interviews

Interviews were used as the secondary data collection technique, in order to supplement and clarify the information obtained from the questionnaires. Interviews are more time consuming, but they enable the researcher to obtain more detailed information and to clarify information, therefore avoiding misinterpretation. Interviews are, however, not anonymous. Respondents do tend to be more frank if they are able to maintain their anonymity, as in questionnaire data

collection methods (Comstock and McCombs, 1981:147-149; Howard and Sharp, 1983:139-140).

9.2.4 Data Gathering

Questionnaires were posted to 12 libraries, (the selection of which was explained in section 9.2.1 above). In order to gather more information, the libraries surveyed were requested to provide a copy of their disaster plans. The size of the sample was such that the response rate was able to be monitored and therefore a hundred percent response rate was ensured. Once all the questionnaires were returned, the researcher determined whether the information provided was sufficient, and where information was lacking, extra information was obtained through interviews.

9.2.4.1. Pilot study

In order to test the validity of the questionnaire, a small pilot study was conducted. Five people were requested to complete the questionnaire and make any comments on how it could be improved. Four of the respondents were professional librarians in management level positions at the University of Cape Town Libraries; the fifth was a professional computer scientist. The computer scientist was included in the pilot study to provide valuable insight into computer disaster recovery, and, therefore would be able to comment on the computer-based questions. This pilot study was very useful as it generated very useful and valid comments and constructive criticism, which enabled the researcher to adapt the original questionnaire.

CHAPTER TEN: ANALYSIS OF DATA COLLECTED

In this section the responses obtained from the questionnaires and interviews shall be explored by focusing on the issues emphasised in the questionnaire.

10.1 NUMBER OF LIBRARIES WITH DISASTER PLANS

(cf. Question one of questionnaire, Appendix A)

Of the 12 libraries investigated, five (42%) had formal disaster plans, five (42%) had no disaster plans, and two (17%) had informal plans for assistance from external emergency services.

Table 1: The existence of disaster plans

YES	NO	INFORMAL
42%	42%	17%
a) Milnerton Public Library b) South African Library c) Somerset West Public Library d) Stellenbosch University Libraries e) University of Cape Town Libraries	a) Bellville Public Library b) Bishop Lavis Public Library c) Cape Technikon Library d) Peninsula Technikon Library e) Cape Town City Libraries	a) Strand Public Library b) University of the Western Cape Library

10.2 NUMBER OF LIBRARIES WITH FORMAL DISASTER PLANS

(cf. Question one of questionnaire, Appendix A)

As indicated in 10.1, 5 of the 12 libraries surveyed had formal disaster plans. This amounts to 42% of the total surveyed. Three of these were research\academic libraries and two were public libraries. The research\academic libraries included the University of Cape Town and the University of Stellenbosch, with the third being the South

African Library. The South African Library, being a National Library, would tend to be very involved with conservation and restoration, and therefore would be expected to be one of the leaders in disaster planning. The public libraries were those of Milnerton and Somerset West. It is however, surprising that bigger, and relatively newer libraries, such as Cape Technikon Library, the Bellville Public Library and Peninsula Technikon Library, indicated that they did not have formal disaster plans.

10.3 CURRENCY OF DISASTER PLANS

(cf. Question two of questionnaire, Appendix A)

The frequency of revision varied with regard to the five libraries with formal disaster plans. Two of these libraries, The South African Library and the University of Cape Town Libraries, updated their plans on an ad-hoc basis, when it was deemed necessary.

Milnerton Public Library's disaster plan, which was formulated by the Milnerton Municipality, was updated annually and Somerset West Public Library's disaster plan was updated biennially. Stellenbosch University Libraries updated their plans quarterly. This was the most frequent of all the libraries surveyed.

10.4 PROCESS USED TO DEVELOP THE PLANS

(cf. Question three of questionnaire, Appendix A)

The process which was used to develop these plans, varied from library to library. Two of the five libraries with formal disaster plans, Stellenbosch University Libraries and The University of Cape Town Libraries, used internal task groups to develop their plans. The disaster plan of the South African Library was drawn up by an individual staff member, while that of the Somerset West Public Library involved a combined effort of all the staff members. The

overall disaster plan for the whole Municipal Area was drawn up by the Municipality, but the evacuation plan of the Milnerton Public Library was also a combined effort of all its staff members.

10.5 STAFF MEMBER(S) RESPONSIBLE FOR THE LIBRARY'S DISASTER PLANNING

(cf. Question four of questionnaire, Appendix A)

Four of the libraries (80%) with formal disaster plans indicated that they had a staff member(s) who was(were) responsible for their library's disaster planning. These libraries were: Somerset West Public Library, South African Library, University of Cape Town Libraries and Stellenbosch University Libraries. The fifth, Milnerton Public Library indicated that their disaster plan was largely the responsibility of their municipality. Their evacuation plan was drawn up by all staff members, and they indicated that all staff members knew what to do in the case of an emergency. The University of Cape Town, the University of Stellenbosch, and Somerset West Public Library indicated that the staff member(s) responsible for their disaster planning had received some form of disaster management training, while Milnerton Public Library and the South African Library indicated their staff member(s) had not received any training. All five libraries with formal disaster plans reported that the staff member(s) responsible were involved in the drawing up of the plans.

10.6 POTENTIAL DISASTERS PROVIDED FOR IN DISASTER PLANS

(cf. Questions five and six of questionnaire, Appendix A)

10.6.1 Natural disasters

The different types of natural disasters (which are elaborated on in Section 2.1.1. of the Review of the Literature in Chapter Two),

covered by disasters plans were very much in accordance with the potential natural disasters of the area. Emergency provision was made for fire and storm damage by all five libraries with formal disaster plans. Milnerton Public Library, the South African Library and the University of Cape Town Libraries also made provision for flood damage. The reason given for the exclusion of floods as a potential disaster by the University of Stellenbosch Libraries was that the area being surveyed was not in a flood zone. Milnerton Public Library and the University of Cape Town Libraries also made provision for potential earthquake damage.

Table 2: Natural disasters

n = no of libraries (out of a maximum of 5) with formal disaster plans, that have provided for these potential disasters in their disaster plans.

NATURAL DISASTERS	n
a) Fire	5
b) Flood	3
c) Storm damage	5
d) Earthquake	2

10.6.2. Man-made disasters

The different types of man-made disasters are discussed in Section 2.1.2. of the Review of the Literature in Chapter Two. Milnerton Public Library, the University of Cape Town Libraries and Stellenbosch University Libraries indicated that they made provision for all of the potential man-made disasters enumerated in the questionnaire (See Table below). The South African Library indicated that they made provision for deliberate vandalism and arson, while Somerset West Public Library made provision for bombing, bomb threats, destruction due to unrest/rioting and power failures.

However, they also indicated that they made provision for armed hold-ups and robbery. Their precaution with regard to these potential disasters was a strategically placed panic button. The fact that four of the five libraries with formal disaster plans made provision for incidents of bombing, bomb threats and destruction due to rioting seems to reflect our country's unstable political history.

Table 3: Man-made disasters

n = no of libraries (out of maximum of 5) with formal disaster plans, that have provided for these potential disasters in their disaster plans.

MAN-MADE DISASTERS	n
a) Bombing	4
b) Bomb threats	4
c) Destruction due to rioting/unrest	4
d) Deliberate vandalism	4
e) Arson	4
f) Power failures/surges	4

10.7 LOCATION OF THE DISASTER PLAN

(cf. Question seven of questionnaire, Appendix A)

The location, at which the plan is kept, varied considerably between the five libraries, which had formal disaster plans. The University of Cape Town Libraries kept its' disaster plan in filing cabinets in the library's administration department. Somerset West Public Library kept their plan at the library's main key case. The University of Stellenbosch Libraries had two locations at which their plan was kept. The Stellenbosch Risk Management Section had one copy; and the library staff member, who was responsible for risk management, kept the other copy in his office. The Milnerton Public Library kept the library's evacuation plan on the workroom door in the library, while the full disaster plan, which involved all the

Municipality's emergency services, was kept at the Municipal offices. It would seem sensible to have as many copies as possible with various people, as this would help to make the plan as accessible as possible, and, in this instance, the South African Library was the most prepared and organised. They kept copies in four different places as follows: 1) the Co-ordinator's Office, 2) the Co-ordinator's house, 3) one in each of the team-leaders houses; and, 4) one in the security staff office.

10.8 STAFF MEMBERS' AWARENESS OF DISASTER EMERGENCY ROUTINES

(cf. Question eight of questionnaire, Appendix A)

All five libraries (100%) with formal disaster plans indicated that their staff members were fully aware of the disaster routines.

10.9 THE LAST REAL DISASTER SITUATION FOR WHICH THE PLAN WAS USED

(cf. Question nine of questionnaire, Appendix A)

Only two (40%) of the libraries with a formal disaster plan, has ever had to use their plan to manage a real disaster. In 1990 the South African Library had to cope with a fire started by arsonists in a storage building.

Milnerton Public Library has used their plan to evacuate the building on occasions when their have been bomb threats.

10.10 CO-OPERATIVE ARRANGEMENTS WITH FORMAL DISASTER PLANS

(cf. Question ten of questionnaire, Appendix A)

All five of the libraries with formal disaster plans indicated that they had co-operative arrangements with external organisations. This co-operation can, however, be divided into two types. The first type was as follows: three of the five libraries (60%), indicated that their co-operation involved assistance from the various municipal

emergency services. For example, Milnerton Public Library involved the fire, police and traffic departments in their precautionary arrangements. Stellenbosch Municipal Services would provide back-up to the University should a disaster occur. They have a proven response time of four minutes. Stellenbosch University Campus Control Services also provided back-up in the case of an emergency. Somerset West Public Library also had a panic button, which alerts their Municipal Services of an impending emergency.

The second type involves co-operation with regard to the sharing or hiring of facilities, services and computer back-up. The South African Library and University of Cape Town Libraries reported this type of co-operation.

The South African Library indicated that they had the use of off-site freeze drying and freezing equipment in order to store water damaged books, should a disaster occur. Their disaster planning routines and activities also involved the adjacent nursery school. The University of Cape Town Libraries indicated that they had an agreement to use the cold storage facilities, as well as computer back-up facilities of Safmarine, among others.

10.11 SIMULATION EXERCISES

(cf. Questions eleven to thirteen of questionnaire, Appendix A)

It is essential to test a disaster plan, to determine its efficiency and effectiveness. Section 3.6 of the Review of the Literature in Chapter Three discusses the background on simulation exercises more thoroughly. Only two out of the five (40%) libraries with formal disaster plans had ever simulated a disaster situation in order to test their disaster plan. Stellenbosch University Libraries carried out a full-scale, worst case scenario simulation exercise in order to

test their plan. It included a simulated bomb explosion, fire and a number of injured people. The Stellenbosch Municipal Emergency Services were also involved in the exercise. They regarded the exercise as very successful with positive feedback from all participants, including a number of suggestions for improving their plan.

The University of Cape Town Libraries tested the Conservation section of their plan by conducting a workshop on how to handle books damaged by water and how to dry them. The workshop did not test the whole disaster plan, but was only for the Conservation Department staff. They also regarded the exercise as very useful. They created a very realistic disaster situation and staff had to resolve problems on their own and use their initiative. They were considering organising other simulation exercises which would test other sections of their plan.

10.12 COMPUTER BACK-UP AND STORAGE OF BACK-UPS

(cf. Questions fourteen, fifteen and sixteen of questionnaire, Appendix A)

Computer back-up and recovery procedures are discussed in Chapter Seven of the Review of the Literature. Nine of the twelve libraries which were surveyed, were computerised. This amounted to 75% of the total surveyed. All nine of these libraries (100%) carried out back-up procedures for computerised data.

Six of the eight libraries, which did back-up their computerised data, stored the back-up tapes in a different building. This amounted to 75%. The South African Library was intending to do so, as soon as they had access to the safe in a nearby building. The eighth library, the University of the Western Cape, stored their back-up tapes in the same building.

Table 4: Computer back-up in computerised libraries (Total no = 9)

YES
100%
<ul style="list-style-type: none"> a) UWC Library b) US Library c) UCT Libraries d) Milnerton Public Library e) Bellville Public Library f) South African Library g) Cape Town City Libraries h) Peninsula Technikon Library i) Cape Technikon Library

Table 5: Storage of back-up tapes

DIFFERENT BUILDING	SAME BUILDING	INTENDED
78%	11%	11%
<ul style="list-style-type: none"> a) Milnerton Public Library b) Bellville Public Library c) Peninsula Technikon Library d) US Library e) UCT Library f) Cape Town City Libraries g) Cape Technikon Library 	<ul style="list-style-type: none"> a) UWC Library 	<ul style="list-style-type: none"> a) South African Library

10.12.1 Types of back-up

The nature of computerised library systems can vary quite considerably. As a result of this the back-up procedures of the nine libraries varied quite significantly, as discussed below.

10.12.1.1 University of Cape Town Libraries (UCT)

The University Library had two main systems which required back-up. The first was the Bookplus integrated library system. These back-ups were the library's responsibility. They did daily data back-ups,

which were kept in the library; and a non-system back-up every three weeks, which included data and programs, excluding the operating system. This copy was kept off campus. The operating system was saved after each change or modification, which usually occurred quarterly.

The second system requiring back-up was the Network file server. Here back-up was the responsibility of the central campus computer centre and this was done weekly.

Important personal files were the individual's responsibility and should be backed-up onto hard disk, which was then backed-up weekly as explained above.

10.12.1.2 South African Library

The South African Library used STYLIS, as its integrated library system, which it ran on a minicomputer. Back-ups of software and data files were done on a daily basis. They kept these tapes in a fireproof safe in the library building. They will, in the not too distant future, have access to another safe, in a different building. Their plan will then be to keep other generation tapes in this safe.

10.12.1.3 Cape Town City Libraries

Information on the computerised library system was backed-up on a daily basis. Information on the Local Area Network (LAN) at the Head Office was also backed-up daily by means of a dedicated line to the Office of the Directorate of Information Services in the Civic Centre, where their back-ups were kept.

This information was administrative and consisted mainly of statistics and correspondence.

10.12.1.4 Milnerton Public Library

Milnerton Public Library used the PALS library system and was connected to a mainframe at the Milnerton Municipality. This computer system was, in turn, linked to a government bureau in the centre of Cape Town, which managed the data files and software, and which organised all back-ups, which were continuous. The back-ups were then stored at the bureau.

10.12.1.5 Peninsula Technikon Library

The Peninsula Technikon used the BOOKPLUS integrated library system, which it ran on an IBM mainframe. Back-ups of datafiles were done on tape drives and were carried out daily, weekly, monthly, quarterly, per semester and annually.

These tapes were then stored in a different building.

10.12.1.6 Bellville Public Library

Bellville used the PALS system, which was run on a mainframe, so back-up was automatic and continuous, and all information was stored at the mainframe. They used Wordperfect for administrative purposes and back-ups were done daily onto tapes. These tapes were stored in a different building. They also had a Uninterruptible Power Supply (UPS), which provided electricity in the event of a power failure.

10.12.1.7 University of Stellenbosch Libraries (US)

The University of Stellenbosch uses the ERUDITE integrated library system, which they ran on a midi-computer. They did incremental back-ups of both software and data files on a daily basis. This was then consolidated in a weekly back-up. A full back-up on the fileserver was done once a month. The back-up tapes were kept in another building on campus.

10.12.1.8 University of the Western Cape Library (UWC)

The UWC University Library used the PALS integrated library system. They used a tape drive to do back-ups of software and datafiles on the fileserver. They did two types of back-up: daily back-ups, which were done from Mondays to Thursdays. Back-ups were done of specified directories only. A full back-up was done every Friday. The back-up tapes were kept in the same building.

10.12.1.9 Cape Technikon Library

The Cape Technikon Library used the ITS (Integrated Tertiary Software) integrated library system. They carried out back-ups of software and data files on a daily basis, and they did a cumulative back-up every Friday. The first generation tapes were kept in a fire-proof safe in a separate building on campus; and the second generation tapes were kept off campus. Back-ups of the administrative system, which was a campus-wide Novell network, were being planned for 1996.

10.13 EVACUATION DRILLS

(cf. Question seventeen of questionnaire, Appendix A)

Of the 12 libraries surveyed, six (50%) had routine evacuation drills, and one (8%), the South African Library was in the process of drawing up an evacuation plan. Five (42%) had no routine evacuation drills. Bellville Public Library had one ad-hoc drill exercise in December 1991.

Table 6: Evacuation drills

YES	NO	IN PROCESS
50%	42%	8%
a) Cape Technikon Library b) Milnerton Public Library c) Peninsula Technikon Library d) Somerset West Public Library e) University of Cape Town Libraries f) University of Stellenbosch Libraries	a) Bellville Public Library b) Bishop Lavis Public Library c) Cape Town City Libraries d) Strand Public Library e) University of the Western Cape Library	a) South African Library

The frequency of these evacuation drills differed greatly from library to library. Of the six libraries that had evacuation drills, two (33%) had them annually, two (33%) had them on an ad-hoc basis, one (17%) biennially, and one (17%) every six months.

10.14 USE OF EMERGENCY EXITS DURING EVACUATION DRILLS

(cf. Question eighteen of questionnaire, Appendix A)

Of the six libraries which had routine emergency evacuation drills, four (66%) used the emergency exits during the drills. The remaining two libraries (33%) did not use the emergency exits during evacuation drills. One of the other twelve libraries surveyed (the South African Library), was in the process of planning evacuation drills, which would include use of the emergency exits.

10.15 BUILDING MAINTENANCE AND INSPECTIONS

(cf. Question nineteen of questionnaire, Appendix A)

Ten of the twelve libraries surveyed (83%), indicated that they had routine building maintenance inspections.

Table 7: Building maintenance and inspections

BUILDING INSPECTIONS		
MONTHLY	ANNUALLY	AD-HOC
a) Bellville Public Library	a) Cape Town City Libraries	a) South African Library
b) Cape Technikon Library	b) Peninsula Technikon Library	b) University of Cape Town Libraries
c) Milnerton Public Library	c) Somerset West Public Library	
d) University of Stellenbosch Libraries	d) University of the Western Cape Library	

10.16 INSURANCE

(cf. Questions twenty to twenty-three of questionnaire, Appendix A)

Insurance is very important in order to recover costs incurred due to damage (see Chapter Four of the Review of the Literature). All twelve (100%) of the libraries surveyed indicated that they had insurance.

Table 8: Disaster insurance in libraries

YES
100%
a) Bellville Public Library b) Cape Town City Libraries c) Milnerton Public Library d) Peninsula Technikon Library e) Somerset West Public Library f) Strand Public Library g) University of Cape Town Libraries h) University of Stellenbosch Libraries i) University of the Western Cape Libraries j) South African Library k) Bishop Lavis Public Library l) Cape Technikon Library

10.16.1 Facilities insured

Eleven of the twelve libraries which had insurance, indicated that they insured their library buildings, furnishings, and, where computerised, their computer hardware. The twelfth library, the South African Library, indicated that, while they insured their furnishings, computer hardware and art works, their building was not insured.

However, not all were in agreement on the issue of library stock, and, computer software and data files. Nine of the twelve libraries did insure their library stock. The remaining three, Cape Town City Libraries, the Cape Technikon Library, and, the South African Library did not insure their stock. It was ascertained from the empirical study that insuring library stock is a very lengthy and expensive process as most insurers demand that stock be valued annually, and therefore some institutions prefer to carry the cost of a disaster rather than insure the material. The South African Library stated that the conditions under which claims could be made, were so restrictive that insurance would not be worthwhile.

The nine libraries that were computerised, all agreed that computer hardware had to be insured. However, not all agreed that software or data files had to be insured. Four of the nine computerised libraries insured data files or software. However, Cape Town City Libraries did not insure software or data files. Their reason for this was that data files are unique and cannot be purchased anyway if destroyed, and this type of insurance was regarded as unnecessary. Cape Technikon Library, Milnerton Public Library and Peninsula Technikon Library also followed this principle. The South African Library was uncertain whether their insurance covered computer

software.

Thus insurance does seem to be popular, even when disaster plans are not present. However, opinions vary with regard to the insuring of computer software and library stock as this is an expensive procedure, they are difficult to value, and, therefore this is not always worthwhile.

10.17 TYPES OF DISASTERS THAT HAVE BEEN EXPERIENCED

(cf. Question twenty-four of questionnaire, Appendix A)

Three of the twelve libraries (25%) surveyed had never experienced any of the disasters listed in questions 5 and 6. The remaining nine libraries (75%) had at one stage or another experienced various disasters. It is interesting that natural disasters occur frequently due to negligence. The survey showed that, with regard to natural disasters, damage due to leaking roofs, fires caused by faulty electrical wiring and flooding due to undesirable building design and failed basement pumps, were an all too often occurrence (see Table 5). It was interesting to note that the overall incidence of man-made disasters was higher than that of natural disasters. The survey also showed that man-made disasters were often the result of wilful and malicious intent, such as arson, vandalism and bomb threats (see Table 6).

Table 9: Natural disasters experienced

n = No of libraries (out of a maximum of 12) that have experienced this type of disaster

NATURAL DISASTERS	n
a) Fire	1
b) Flood	3
c) Storm Damage	1
d) Earthquake	0

Table 10: Man-made disasters experienced

n = no of libraries (out of a maximum of 12) that have experienced this type of disaster.

MAN-MADE DISASTERS	n
a) Bombing	0
b) Bomb Threats	3
c) Destruction due to rioting/unrest	0
d) Deliberate vandalism	1
e) Arson	2
f) Power failures/surges	2

10.18 FACILITIES FOR THE REPAIRING OF DISASTER DAMAGED MATERIALS

(cf. Question twenty-five of questionnaire, Appendix A)

Five out of twelve (42%) libraries surveyed had facilities for repairing disaster damaged materials. The extent of these facilities, however, varied from library to library.

10.18.1 Milnerton Public Library

Damaged items were repaired by the Municipality's central workshop or, if this were not possible, they would be repaired by external contractors.

10.18.2 Stellenbosch University Libraries

Stellenbosch University Libraries had limited facilities and could do basic repairs on library items.

10.18.3 Cape Town City Libraries

They indicated that their book binding section was able to repair items that have been water damaged.

10.18.4 University of Cape Town Libraries

Equipment existed for the drying of items, the controlling of mould growth and the repairing of pages and bindings after the drying process had been completed.

10.18.5 The South African Library

This library had the most extensive restoration facilities of all the libraries surveyed. This was to be expected, as being a national library, they have a very definite and well defined conservation function. They had a bindery, with a staff of nine; a conservation laboratory with a staff of three; and a photographic laboratory. The bindery and conservation laboratory could repair and process all paper-based materials; and the photographic laboratory could repair all microfilms.

10.19 CO-OPERATIVE FACILITIES FOR THE REPAIRING OF DISASTER-DAMAGED MATERIALS

(cf. Question twenty-six of questionnaire, Appendix A)

Of the twelve libraries surveyed, three (25%), indicated that they had co-operative arrangements for the repairing of disaster damaged materials. The University of Cape Town Libraries indicated that they had arrangements to share and make use of the conservation facilities at the South African Library and the Library of Parliament. Milnerton Library would send damaged materials to the Municipality's workshop to be repaired. If they were not able to repair the material, it would be sent to external contractors. The South African Library did not have fixed co-operative arrangements, but in emergencies they could arrange for assistance from external organisations.

10.20 TRENDS WITH REGARD TO PUBLIC LIBRARIES

From the general comments made, valuable additional information was received, and has been incorporated in this section.

10.20.1. Cape Town City Libraries

Cape Town City Libraries did not have a formal disaster plan, but did carry out certain safety procedures, such as regular building inspections, according to the guidelines laid down in the National Health and Safety Act. As anticipated these procedures were developed centrally and were applicable to all the branch libraries of the system.

10.20.2. Cape Provincial Library Service

The libraries within this system were each responsible for developing their own disaster plans. Thus, there was a certain amount of variation with regard to the responses received.

Table 11: Disaster planning in the Cape Provincial Library Service

FORMAL	INFORMAL	NONE
40%	20%	40%
a) Milnerton Public Library b) Somerset West Public Library	a) Strand Public Library	a) Bellville Library b) Bishop Lavis Public Library

10.20.2.1. Milnerton Public Library and Somerset West Public Library

Two of the five Cape Provincial Libraries that were surveyed, had formal disaster plans. They were Milnerton and Somerset West. In both cases there was some collaboration with their municipalities, but to a differing extent. The Milnerton Public Library disaster plan was largely formulated and updated by their controlling Municipality, i.e. the Milnerton Municipality. The Municipality's emergency services, such as the fire, police and traffic departments

all assisted in providing back-up services. The insurance was also subsumed under their municipality. The evacuation plan for the library, was however, drawn up by the library staff.

Somerset West Public Library was more involved in the formulation and revision of their disaster plan. It was developed more independently of their Municipality than Milnerton Public Library. However, their insurance was included with the comprehensive insurance of the Municipality and their disaster plan did include co-operation and assistance from the various municipal emergency services, such as the Waterworks Dept, Fire Brigade, Security and Emergency Services, Health Dept, and the Engineering Dept.

10.20.2.2. Strand Public Library

Strand Public Library indicated that, while they had no formal disaster plan, they had informal co-operation and assistance agreements with their Municipality. They had a direct panic button, which connected them with the fire and rescue services.

10.20.2.3. Bellville Public Library and Bishop Lavis Public Library

Bellville Public Library and Bishop Lavis Public Library indicated that they had no disaster plans at all. While Bishop Lavis Public Library's lack of a disaster plan is not surprising, due to past political circumstances and subsequent neglect; Bellville's lack of a disaster plan was particularly surprising as this a large and relatively new public library with excellent facilities.

Thus, the arrangements regarding disaster planning differed significantly within the Cape Provincial Library Services. Each affiliated library arranged its own disaster planning. Cape Town City Libraries, on the other hand, had a uniform policy, which was applicable to all its branch libraries.

CHAPTER ELEVEN: CONCLUSIONS AND RECOMMENDATIONS

The analysis of the data collected showed that the present situation regarding disaster management and planning in the Greater Cape Metropolitan Area, is generally inadequate. The four main phases of disaster management and planning (as discussed in Chapter Four), are prevention, preparedness, reaction and recovery. The present situation, based on these four phases, is as follows:-

11.1. PREVENTION: The prevention phase is concerned with preventing a disaster from occurring. This is mainly achieved by ensuring that buildings are well designed and maintained. The most important features, as identified in Chapter Five, to be included in building inspections, are the following: the building should be structurally sound, roofs should be well maintained, there should be no leakages and underground water must be monitored, and, electric wiring should be kept in good condition. The data collected showed that of the twelve libraries surveyed, ten conducted building maintenance inspections. This accounted for 83% of the total number of libraries surveyed. Four of the ten libraries had inspections monthly, another four had inspections annually, and the remaining two had ad-hoc inspections. The researcher thus contends that, while the percentage of libraries which have building inspections is adequate, the frequency of these inspections should be addressed. Monthly building inspections are adequate, however annual inspections are not frequent enough, and ad-hoc inspections would tend to be postponed, when matters regarded as more urgent arise.

11.2 PREPAREDNESS AND REACTION: The preparedness and reaction phases involve being prepared for a disaster, should one occur. Only five of the twelve libraries surveyed, had formal disaster plans (42%), two had informal arrangements with emergency services to assist in the event of a disaster (17%), and five libraries (42%) had no disaster plans.

Those libraries that had formal disaster plans were well prepared and organised and their disaster plans were relatively comprehensive. Their plans were updated or revised either regularly or on an ad-hoc basis, and the staff members were aware of disaster routines. Four of the five, indicated that there was a staff member who was responsible for disaster planning. The disasters, (both natural and man-made) that were catered for, were in keeping with the risks relevant to each institution and each area. Thus, the researcher contends that the above formal disaster planning arrangements are adequate and well covered.

Two (17%) of the libraries surveyed, had informal disaster plans. These informal plans mainly comprised arrangements with local emergency service providers, such as the Fire Brigade and the Police, and, in one case, the Campus Protection Services. However, the researcher contends that these arrangements are not adequate, as formal disaster plans serve to make staff aware of potential dangers, and they also formalise certain routine emergency procedures, such as evacuation drills, which are also very necessary. The two libraries with informal disaster plans did not, for example, have routine evacuation drills. Thus, the researcher contends that, while informal disaster plans are better than none, they are still inadequate.

Five (42%) of the libraries surveyed had no disaster plans. This was particularly surprising in the case of the Bellville Public Library, the Cape Technikon Library, and the Peninsula Technikon Library, which are relatively new libraries. The respondent from one of these libraries commented as follows: "We are probably woefully unprepared for a real disaster." It was also surprising in the case of Cape Town City Libraries, as this is a large and well established public library system. Bishop Lavis Public Library, on the other hand, is a relatively small public library, in a previously politically neglected and underdeveloped area. Therefore the lack of a disaster plan was not as surprising as with the former four libraries. However, the researcher contends that this lack of disaster planning is unacceptable and inadequate.

11.2.1. Co-operative arrangements with external emergency services:

The five libraries with formal disaster plans all indicated that they had co-operative arrangements with external service providers. These co-operative arrangements can be divided into two categories. Three of the five libraries which had formal disaster plans indicated that they had informal co-operative arrangements with external emergency services, such as the fire brigade, which would assist them in the event of a disaster. The remaining two libraries with formal disaster plans indicated that they had co-operative arrangements with outside contractors to provide freeze-and freeze-drying facilities, as well as computer back-up, in the event of a disaster.

The five libraries, which did not have any disaster plans, did not have co-operative emergency arrangements with external service providers, however the two libraries which had informal co-operative arrangements, had arrangements with emergency service providers, such as the Fire Brigade and the Police.

It has been ascertained from the research conducted that arrangements with emergency service providers such as the Fire Brigade and the Police are among the most fundamental aspects of disaster planning, and thus these arrangements are sometimes present even when there is no formal plan.

The researcher contends that these co-operative arrangements are inadequate. Co-operative arrangements with emergency service providers such as the fire brigade and the police are fundamental and necessary aspects of a disaster plan and should be in existence. It is also essential for institutions to have access to computer back-up facilities and to freeze-drying contractors. Quick access to freeze-drying facilities is important, as mould will develop on water damaged material within 24 to 48 hours, if this process is not halted by means of freeze-drying processes.

The researcher is of the opinion that access to these facilities can be shared in order to reduce financial outlay.

11.2.2. Computer disaster recovery:

Computer data back-up is a very important aspect of disaster management and planning today. It is essential that computerised catalogue and issue information be backed-up regularly. Nine of the twelve libraries included in the survey were computerised. The survey showed that all nine of these libraries carried out back-up procedures for their computerised information. This amounts to 100% of the total. In two cases, viz. the Milnerton Public Library and the Bellville Public Library, the back-up procedures were not the direct responsibility of the library. Both of these libraries used the PALS integrated library system, which runs on a mainframe. The Milnerton Public Library's computer system was managed by a government bureau in the centre of Cape Town, which carried out

continuous back-up procedures. The Bellville Public Library, which also runs PALS off an offsite mainframe, had a similar procedure. Their computer system was backed-up continuously at the mainframe. Thus, even though some of these libraries did not have formal disaster plans, they still backed-up computerised information. The researcher contends that this aspect of disaster planning is very adequately dealt with. Libraries are very aware of this necessity.

11.2.3 Evacuation drills:

Of the twelve libraries surveyed, six (50%) had emergency evacuation drills. A seventh (8%) library was in the process of developing such a plan, and five (42%) had no routine emergency evacuation drills. This is a very important aspect, as it helps to make the staff aware of disaster routines. Of the six that had emergency evacuation drills, four had formal disaster plans. The library which was in the process of developing an evacuation drill, also had a formal disaster plan. Of the five libraries with formal disaster plans, four had evacuation drills, and one was in the process of developing an evacuation drill. Thus, there were two libraries, without formal disaster plans, which had emergency evacuation drills. Although this aspect, which is a very important part of disaster planning, is well provided for among libraries with formal disaster plans, it is neglected amongst the libraries without formal disaster plans.

11.2.4 Insurance:

Insurance is a very important aspect in disaster planning, as it allows the library to recover the cost of damages, should a disaster occur. Of the twelve libraries surveyed, all twelve (100%) had disaster insurance. Thus, this is also an aspect of which the existence does not depend on having a formal disaster plan. However,

it was ascertained from the empirical study that while libraries generally insure their buildings and fixed assets such as furniture and computer hardware, the practices with regard to library stock and computer software and data files, are varied. The disaster insurance procedures for library stock are expensive and a complicated process, and some libraries prefer to carry the cost of damage should a disaster occur. The situation with regard to computer software and data files is similar. The researcher contends that it is these factors which have a negative impact on disaster insurance investment.

11.3 RECOVERY: The recovery phase involves restoring the library to normal after a disaster, the main aspect of which is the repairing of disaster damaged materials. This procedure involves specialised techniques and, very often external facilities such as freeze- and freeze-drying equipment. Five out of the twelve libraries surveyed indicated that they had facilities for the repairing of disaster damaged materials. However, their capabilities were mostly limited to basic repairs and to the restoring of water-damaged materials. The repairing of fire-damaged materials is a difficult process and the skills and techniques are rare in the Greater Cape Metropolitan Area. The library with the most extensive facilities for the repairing of disaster damaged materials, was the South African Library, which had a well equipped conservation laboratory. They were able to repair all paper-based materials, as well as photographic materials. Thus, the situation regarding the facilities for the repairing of disaster damaged materials is inadequate and is limited to the basic repair techniques.

11.4 CONCLUSIONS

Thus, the present situation regarding disaster management and planning in the Greater Cape Metropolitan Area varies considerably. The number of libraries with formal disaster plans are very much in the minority. These formal disaster plans are, however, generally of high quality.

However, the majority of the libraries surveyed are not well prepared should a disaster occur and disaster routines, such as evacuation drills, tend to be organised on an ad-hoc basis, and irregularly. Three aspects, viz. building maintenance inspections, computer back-up and disaster insurance are adequate and well provided for. It is most surprising that relatively large and newly built libraries such as the Bellville Public Library and the Cape Technikon Library do not have formal disaster plans.

The researcher acknowledges that financial and human resources restraints are a major inhibiting factor, and yet there is not much evidence that libraries have attempted to overcome this problem by engaging in co-operative disaster planning activities. The researcher contends that it would be feasible to share both expertise and skills, as well as facilities. The researcher is also of the opinion that it would be feasible for the libraries in the Greater Cape Metropolitan Area to have disaster plans and be adequately prepared for any emergency, if they can work together and learn to share resources.

Library disaster planning is, however, also an area that is not given much thought or attention. On the whole, libraries seem to take the attitude that "It will never happen to us!".

The researcher concludes that, (cf. The Research Question 1.3) after an exploration of the conceptual issues and the completion of the

empirical research study, disaster management and planning in the Greater Cape Metropolitan Area is inadequate and that libraries are, generally, not prepared should a disaster occur. The researcher is of the opinion that the major reasons for this inadequacy are twofold: 1) inadequate financial and human resources, and, 2) an apathetic attitude on the part of library management and staff. As a result of this investigation, the researcher advocates the recommendations outlined below in Section 11.5, and is hopeful that this study will provide a stimulus for the development of disaster plans, where such plans were found wanting. The model disaster plan, as shown in Section 11.6, was developed by the researcher, as a further outcome of this investigation, and it is hoped that it would assist other organisations in the development of disaster plans or improvement of existing plans.

11.5 RECOMMENDATIONS

The researcher recommends the following:-

- 11.5.1** It is important that all libraries have a formal disaster plan.
- 11.5.2** In order that this be achieved, the management structure in libraries should recognise that it is important in practice, and afford it more attention than it receives at present. This will assist to dispel the apathetic attitude which exists with regard to disaster planning.
- 11.5.3** While it is recognised that financial and human resources restraints are a major prohibitive factor, the best should be done with the little funds available.
- 11.5.4** While the researcher acknowledges that financial and human resources restraints, are a major prohibitive factor, there is very little evidence of efforts to overcome this problem

by engaging in co-operative arrangements in order to share costs and resources. This is a particularly important consideration, as the CALICO library co-operative is at present being planned. Disaster planning is an important issue, however at present it is being neglected. It is the researchers' opinion that both skills and facilities can be shared in a co-operative effort to benefit all concerned.

11.5.4.1 It is possible that emergency services, such as freeze and freeze-drying facilities, temporary storage areas, as well as computer back-up facilities, can be shared to reduce costs.

11.5.4.2 Restoration skills and techniques are very specialised, and these resources are mainly concentrated at the Library of Parliament and at the South African Library. These techniques and skills can be shared should a disaster occur.

11.5.4.3 In order to make librarians more aware of disaster management and planning, it is recommended that more opportunities for training be created, and that, if possible, workshops be organised in order to train librarians in the practical aspects of disaster management and planning. Training is also an expensive exercise, and the holding of co-operative workshops can reduce expenses, and, knowledge and skills can be shared.

The aim of the following model disaster plan, is to provide a practical guide to assist other institutions in the practical aspects of disaster management.

11.6 MODEL DISASTER PLAN

The following model disaster plan, developed by the researcher, is an outline of the general aspects that should be included in a disaster plan. It is important to note that each library operates under different circumstances and conditions, and therefore, each library has different needs. Thus, the following model disaster plan is not specific to the needs of a particular library, but is a general layout, which can be adapted to specific needs. It is hoped that it will serve as a useful guideline in format, content and layout for the development of disaster plans.

11.6.1 General Requirements and Considerations:

It is essential that a disaster plan be formal and documented. In the event of a disaster, people often tend to panic and forget even the most obvious and well rehearsed procedures (Fortson, 1992:84).

It is important that the plan be well researched and relevant to the library's specific needs. The procedures laid out, should be concise, clear and simply explained. All staff should be aware of the existence of such a plan and the location of the copies.

Disaster team members should have their own copies and should be well versed in the emergency procedures. It is also important that the plan is not too lengthy or verbose, but that it should provide only the most essential information needed to cope with the immediate reaction and recovery procedures (Ashman, 1995:11).

Another benefit of a written disaster plan, is the possibility that, in the event of a disaster, the staff member(s) who is(are) responsible for disaster reaction, might not be available, and, the staff member(s) present would have to take charge and organise. This would be very difficult to do without a written guideline. It is

also essential to set up a disaster team, which would be responsible for the disaster planning process.

In the initial stages of the development of such a plan, experts in the field should be consulted, as well as libraries which have already developed their own disaster plans, and, those that have experienced a disaster(s) (Fortson, 1992:84-86). Particularly in the South African context, where financial and staff resources are limited, co-operation between libraries in the sharing of both resources and skills, would be favourable.

11.6.2 Model Disaster Plan

A disaster plan should have the following components:

11.6.2.1 List of Personnel:

This section should include the following:-

- Names, addresses and phone numbers of all the members of the disaster team. The leader of the team must be clearly indicated.
- Names, addresses and phone numbers of all the staff who are willing to volunteer their services in the event of an emergency.

11.6.2.2 Disaster Reaction Procedures:

This section must include:

- A summary of the reaction and evacuation procedures.
- Procedures for contacting disaster team members, and volunteer staff, if not already on site.
- Procedures for alerting emergency services, such as the fire department and external expert consultants.
- Reaction procedures relevant to different types of disasters. There should be a brief explanation about how to deal with different types of disasters. For example, in the event of a power failure, staff must know where the battery operated equipment is stored and where the Uninterruptible Power Supply (UPS) is located.

- A floor plan indicating the location of fire extinguishers, emergency exits, and, gas- water- and electricity mains switches.
- The location of disaster supplies must be indicated.
- Procedures for immediate disaster reaction must be explained.
- Procedures for determining further potential threats and assessing the stability of the building, before it can be entered safely to assess the damage.
- Procedures for evacuating the materials to a safe, temporary storage area.

11.6.2.3 Salvage and Recovery Procedures:

Once the material is in a safe storage area, prompt decisions must be taken regarding salvage procedures, according to the different types and extent of damage. Swift reaction is important as, for example, in the event of a flood, mould will begin to grow within 48 hours. This section must, therefore, include the following guidelines:

- Each type of recovery procedure, eg. freeze-drying, vacuum-freeze drying, air drying, amongst others, should be briefly explained.
- Volunteers must be organised to help with the assessing and sorting of damaged materials.
- The damage must be assessed, preferrably with the help of an expert, and the material must be divided up according to the different types of salvage procedures necessary. Guidelines should be provided for the assessing of damaged materials.
- The material that has to be sent to external contractors then has to be carefully packed into crates ready for transportation to freeze-drying or vacuum-drying facilities.
- Materials which can be air-dryed on site, must be placed in a safe storage area with the pages fanned out to facilitate drying.
- The building must be assessed to determine the extent of the damage

and clearing up must begin.

- A decision would have to be taken concerning the possible closure of the library to the public while clearing up commences, and possible dates for re-opening would have to be announced.

11.6.2.4 Equipment and Supplies:

This section should include the following details:

- The location of disaster boxes, which should contain the materials immediately needed for reaction procedures, as well as materials needed for the packing, securing and crating of damaged materials to be transported to external facilities.
- The contents of a disaster box should consist, amongst others, of the following materials:-
 - Plastic sheeting
 - Scissors
 - Unprinted newsprint
 - Buckets
 - Absorbent mops
 - Large rubbish bins
 - Large garbage bags
 - Soft cloths
 - Paper pads and pencils
 - Heavy duty masking tape
 - Plastic crates for transportation
 - Weights
 - Blotting paper
 - Bookends
 - Torches
 - Sponges
 - Wax paper
 - Dustcloths
- Larger equipment will also be necessary, and the location of this equipment must be indicated. Some of the larger equipment that will be needed is as follows:
 - Wet and dry vacuum cleaners
 - Hand- or battery operated water pumps
 - Fire extinguishers
 - Fans
 - Dehumidifiers
 - Water hoses

- Protective clothing and first aid supplies must also be provided.

In disaster areas where there is overflowing water or burst pipes, there is a very real danger of contamination due to leaking sewage.

There have been cases where rescue workers have fallen ill due to such contamination. Items of protective clothing should include the following:

- Waterproof aprons, overalls and pants
- Waterproof boots
- Rubber gloves
- Hard hats
- First aid box should be kept on the site, in case of cuts or burns

11.6.2.5 Priority Materials:

This section should include:

- Important and/or rare materials, which should be evacuated first, must be clearly indicated.
- If there are different categories of such materials, their order of evacuation must also be clearly indicated.
- Floor plans indicating the location of these materials must also be included.

11.6.2.6 Directory of External Services and Products:

- A list of local providers of services and back-up is essential. Their names, addresses and phone numbers should be given. In each case a second contact should be given in case the first is not available.
- The directory should include the following:
 - Equipment hire, freezing and transport services
 - Emergency services, such as the police and fire department
 - Disaster management experts, who will provide help and advice, when needed.

11.6.2.7 Co-operative Arrangements:

This section must include:

- The details of co-operative arrangements, which exist to share facilities and services in the event of an emergency.
- The nature of the co-operation must be indicated.
- The names and contact numbers of disaster managers at the other institutions must be given.

11.6.2.8 Insurance:

This section should include:

- Details regarding insurance cover, claim procedures, and conditions of insurance.
- The adherence to insurance conditions is important, in order not to jeopardise the validity of possible claims. For example, the damaged premises might have to be inspected by an insurance agent, before anything is moved or any clearing up begins.
- Contact phone numbers of the insurance agent responsible.

11.6.2.9 Procedures for obtaining Emergency Funding:

- Very often, in an emergency, ready cash is needed for various reasons, which may include the buying of extra disaster supplies, or, for the providing of much needed refreshments for rescue workers, among others.
- Arrangements must be made for the accessibility of cash in such circumstances.

The following two sections should also be included in the disaster plan. They do not refer directly to emergency procedures, but are routine activities which should be conducted regularly:-

11.6.2.10 Arrangements for Regular Building Inspections:

- The facilities for inspection and the frequency between inspections should be indicated.
- If inspections are carried out by external contractors, then contact names and phone numbers should be provided.

11.6.2.11 Arrangements for Regular Inspection of Security Equipment:

- Facilities such as fire extinguishers and security alarms should be regularly inspected to ensure that they are in good working order.
- Details of the service contractor, contact names and phone numbers should be provided, as well as information regarding the frequency of such inspections.

11.6.2.12 Arrangements for Regular Evacuation Drills:

Routine evacuation drills are essential, both to ensure that staff are aware of procedures, and, that emergency evacuation procedures, exits and equipment such as fire alarms, are in working order. This section should include:

- List of staff member(s) responsible for organising evacuation drills.
- Frequency of evacuation drills.
- Details of the evacuation route, and the equipment and exits, which must be checked in the process.

11.6.2.13 Appendices:

- The appendices should include floor plans, indicating where priority materials are located, the location of emergency exits, security and safety equipment, and, the location of disaster boxes and equipment.
- Other items which can be included in the appendices are disaster reaction flow charts, and damage lists.

- The information mentioned in 11.6.2.1 and 11.6.2.6, can, if so preferred, be included in the appendices.

11.7 CONCLUDING REMARKS

It is concluded that, while the conceptual principles of disaster management are well developed internationally, particularly in Great Britain and the United States of America, disaster principles in the South African context have been overlooked. In practice, disaster management and planning has generally been sorely neglected, particularly in South Africa, and, the researcher hopes that this research study will provide an adequate stimulus for both the conceptual and practical development of this essential field of management, and that its recommendations and model will serve as a basis for further research and development in this field.

APPENDIX A

QUESTIONNAIRE

QUESTIONNAIRE ON LIBRARY DISASTER MANAGEMENT

Library disaster management is a very important aspect of library preservation and the aim of this survey which I am undertaking, is to determine the current situation regarding library disaster preparedness in the Greater Cape Metropolitan Area and the adjoining region of Stellenbosch. I would be most grateful if you would complete the attached questionnaire and return it to me, using the stamped, addressed envelope enclosed, by the **30 November 1995**. Your co-operation and assistance is greatly appreciated.

If you have any queries, please contact me at:

Telephone: (021) 531-1832 (H)
(021) 650-3115 (W)
Fax number: (021) 650-3127 (W)

Please tick next to the relevant answers

1. Does your library have a disaster plan?
- Yes (If yes, please answer questions 2-27)
 - No (If no, please answer questions 15-27)

If you answered yes to the above, is your plan:

- *Formal (i.e. written down/documentated)
- **Informal (eg. a verbal arrangement)

2. Are your disaster plans renewed/revised/updated every:

- 6 months
- Annually
- Biennially (i.e. once every two years)
- Never
- Other: please specify:.....
.....
.....

3. What process was used to develop the disaster plan?

- External consultation
- Internal task group
- Individual staff member
- Other: please specify.....
.....
.....
.....
.....

4. Does your library have a staff member(s) who is(are) responsible for the library's disaster planning and who would lead a disaster team or relief effort in the event of such an occurrence?

Yes No

If yes,

4.1 Did the staff member(s) receive any training in disaster management?

Yes No

4.2 Was the staff member(s) involved in drawing up the disaster plan?

Yes No

5. Please indicate which of the following natural disasters your plan makes provision for:

- Fire
- Flood
- Storm damage
- Earthquake
- All of the above
- Other: please specify which additional natural disasters your plan covers:.....
.....
.....
.....

6. Please indicate which of the following man-made disasters your plan makes provision for:

- Bombing
- Bomb threats
- Destruction due to rioting/unrest
- Deliberate vandalism
- Arson
- Power failure/surges
- All of the above
- Other: please specify which additional man-made disasters your plan covers:.....
.....
.....

7. Where is the plan kept?.....
.....
.....
.....

8. Are staff aware of disaster emergency routines?

Yes No

9. When was the plan last used to manage a real disaster situation?.....
.....
.....
.....
.....

10. Does your disaster management plan involve cooperative arrangements or shared facilities with any other organisation?

Yes No

If yes,

10.1 Please explain briefly the nature of this cooperation.....
.....
.....
.....
.....

11. Have you ever tested your disaster plan by simulating a disaster situation?

Yes No

If yes,

11.1 Please indicate how often:

- Once
- More than once, but irregularly
- More than once, but regularly: if so please indicate how often.....
.....
.....
.....

12. If you answered 'yes' to question number 11, please indicate what kinds of disasters you have simulated.....
.....
.....
.....
.....
.....
.....

13. In your opinion, was the simulation exercise useful?

Yes No

13.1 Please could you briefly explain your answer to question 13 above.....
.....
.....
.....
.....

14. If your disaster plan includes the protection of electronic/computerised information, does this protection apply to:

- Hardware
- Software
- Data files
- All of the above

15. Please could you describe what back-up systems you use in order to protect your electronic/computerised information, indicating how frequently back-ups are made.....

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16. Are back-up tapes stored at a different location?

Yes No

17. Do you have emergency evacuation drills?

Yes No

If yes,

17.1 Please indicate how often: Every

- 6 months
 - Annually
 - Biennially (i.e. once every two years)
 - Other: please specify:.....
-

18. During emergency evacuation drills, are the emergency exits used?

Yes No

19. Are routine building maintenance inspections done?

Yes No

If yes,

19.1 How often: Every

- Monthly
- 6 months
- Annually
- Other: Please specify:.....
.....
.....

20. Does your library have disaster insurance?

Yes No

If yes,

20.1 Does this insurance apply to:

- Natural disasters
- Man-made disasters
- Both

21. What type of disaster insurance does your library have?

- Blanket insurance
- Specialised insurance
- Combination of blanket and specialised insurance
- Other types: Please specify:.....
.....
.....
.....

22. If your answer to no 20 above was 'No': please give reasons for not investing in insurance:.....
.....
.....
.....
.....
.....
.....

23. Please indicate which facilities your insurance covers:

- Library building
- Furnishings
- Computer hardware
- Library stock/items
- Electronic information/software/databases
- All of the above
- Other: please specify:.....
.....
.....

24. Has your library ever experienced any of the disasters listed in questions 5 and 6?

Yes No

If yes,

24.1 Please give a short account of the disaster(s) experienced.....
.....
.....
.....
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.....

25. Does your library have the necessary facilities for the repairing of disaster-damaged materials?

Yes No

If yes,

25.1 Could you briefly describe the facilities in your library for repairing disaster-damaged materials. In your description please indicate the kind of materials which can be processed and the capacity of the facilities?
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26. Are your library's facilities for the repairing of disaster damaged materials shared with any other institution?

Yes No

If yes,

26.1 Could you please describe the nature of this cooperation and in what proportions the institutions share the facilities?.....

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27. I would appreciate any further comments you would like to make:.....

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NB

- * If your library has a **formal** disaster plan, or other related documentation, I would very much appreciate a copy thereof.

- ** If your library's disaster plan is an **informal** agreement, I would very much appreciate a brief summary of the arrangements:.....
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NB Please could you supply the following information:

- YOUR NAME:**.....
- ORGANISATION:**.....
- YOUR RANK/POSITION IN ORGANISATION:**.....
- TELEPHONE NUMBER (WORK):**.....

I assure you that the information that you supply will be handled with the utmost discretion.

Thank you very much for your cooperation. I look forward to hearing from you by the 30 November 1995. Your assistance is greatly appreciated.

Regards
Gillian Morgan

REFERENCES

1. Alegbeleye, `Bunmi 1990. Disaster control planning in Nigeria. Journal of librarianship, 22(2):91-106
2. Alegbeleye, `Bunmi 1993. Disaster control planning for libraries, archives and electronic data processing centres in Africa. Ibadan : Options Book and Information Services
3. Anderson, Hazel and McIntyre, John E. 1985. Planning manual for disaster control in Scottish libraries and record offices. Edinburgh : National Library of Scotland
4. Ashman, John 1995. Disaster planning for library and information services. London : Aslib
5. Benbow, Gary 1992. The seven myths of computer recovery. International journal of information resource management, 3(4):29-31
6. Blades, William 1880. The enemies of books. London : Trubner
7. Bohem, Hilda 1979. Regional conservation services: what can we do for ourselves? Library journal, 104(13):1428-1431
8. Brawner, Lee B and Nelson, Norman 1984. Improving security and safety for libraries. Public library quarterly, 5(1):41-58
9. Brawner, Lee B. 1993. Insurance risk management for libraries. Public library quarterly, 13(2):29-34
10. Buchanan, Sally 1979. The Stanford library flood restoration project. College and research libraries, 40(6):539-548
11. Buchanan, Sally 1981a. Disasters: prevention and coping. proceedings of the conference, May 21-22, 1980. Stanford, Calif. : Stanford University Press
12. Buchanan, Sally 1981b. Disaster prevention, preparedness and action. Library trends, 30(2):241-250
13. Buchanan, Sally 1988. Disaster planning: preparedness and recovery for libraries and archives. a RAMP study with guidelines. Paris : Unesco
14. Burgess, Dean 1989. The library has blown up! Library journal, 114(16):59-61
15. Busha, Charles H and Harter, Stephen P 1980. Research methods in librarianship. New York : Academic Press
16. [Cape Provincial Library Service Statistics for 1994]. Unpub.
17. Chambers twentieth century dictionary (Rev.ed.) 1972. Edinburgh : Chambers

18. Coates, P.R. 1987. Planning for disaster control. In: Books in peril: proceedings of the symposium on the preservation of library and archival materials in Southern Africa held at the South African Library, Cape Town, 19-21 Nov 1986. Cape Town : South African Library, 51-61
19. Coates, P.R. 1993. Preservation in South Africa: the present situation. International preservation news, (6):9-11
20. Comstock, George and McCombs, Maxwell E 1981. Survey research. In: Research methods in mass communication. Stempel, G.H. (ed.) Englewood Cliffs, N.J. : Prentice-Hall, 144-166
21. Coping with disasters 1995. Library conservation news, (47): [1?]
22. Cuthbert, Sheena and Doig, Judith 1994. Disaster plans: who needs them? Australian academic and research libraries, 25(1):13-18
23. Davis, Mary, Fraser, Susan and Reed, Judith 1991. Preparing for library emergencies: a cooperative approach. Wilson library bulletin, 66(3):42-44
24. DeCandido, Graceanne A. 1988. Special report: fire at the USSR Academy of Sciences Library. Library journal, 113(1):10-12
25. DeCandido, Robert and Graceanne A. 1985. Micro-preservation: conserving the small library. Library resources and technical services, 29(2):151-160
26. Donnelly, Helene 1993. Disaster planning in the 90's: getting it right. Conservation administration news, (52):10-11
27. Donnelly, Helene and Heaney, Martin 1993. Disaster planning: a wider approach. Aslib information, 21(2):69-71
28. Evans, G.E., Amodeo, A.J. and Carter, T.L. 1992. Introduction to library services. 5th ed. Englewood, Colo. : Libraries Unlimited
29. Fink, Arlene and Kosecoff, Jacqueline 1985. How to conduct surveys: a step-by-step guide. Newbury Park, Calif. : Sage
30. Fitzgerald, Angela 1980. Preservation for libraries. The library scene, 9(3):22-23
31. Fortson, Judith 1992. Disaster planning and recovery: a how-to-do-it manual for librarians and archivists. New York : Neal-Schuman
32. Greene, Harlan 1994. Build it and they will come: libraries and disaster preparedness. North Carolina libraries, 52(1):6-7
33. Griffith, J.W. 1983. After the disaster: restoring the library service. Wilson library bulletin, 58(4):258-265
34. Harmon, James D. 1993. Pest management and disaster preparedness. Conservation administration news, (52):6-7

35. Harrison, A.W. 1979. Conservation of library materials: clip no. 9. APLA bulletin, 43(1):7
36. Harvey, Ross 1989. Lessons from 'Lessons from Leningrad'. Australian academic and research libraries, 20(3):149-153
37. Harvey, Ross 1993a. Preservation in libraries: a reader. London : Bowker
38. Harvey, Ross 1993b. Preservation in libraries: principles, strategies and practices for librarians. London : Bowker
39. Howard, Keith and Sharp, John A 1983. The management of a student research project. Aldershot, Hants. : Gower
40. Hutton, B.G. 1987. Disaster control planning. In: Conservation in crisis: proceedings of a seminar at Loughborough University of Technology, 16-17 July 1986. London : British Library, 65-67.
41. Hutton, Brian 1988. Preserving Scotland's heritage. Library conservation news, (19):1-3
42. Ivey, Dorothy Lyle 1986. Attitudes towards the library and information profession among practising librarians and information workers in the Western Cape. (MBibl dissertation) Cape Town : University of Cape Town
43. Joseph, G.W. and Couturier, G.W. 1993. Essential management activities to support effective disaster planning. International journal of information management, 13(5):315-325
44. Kahn, Miriam 1994. Fires, earthquakes and floods. Online, 18(3):19-24
45. Lenzuni, Anna 1987. Coping with disaster. In: Preservation of library materials: conference held at the National Library of Austria, Vienna, April 7-10, 1986, Vol. 2. Smith, Merrily A. (ed.) Munchen : Saur, 98-102
46. Martyn, John and Lancaster F.W. 1981. Investigative methods in library and information science. Arlington, Va : Information Resources Press
47. McIntyre, John E. 1988. Disaster control planning. Serials, 1(2):42-46
48. McIntyre, John E. 1989. Action planning for disaster. Refer, 5(4):1-7
49. McIntyre, John E. 1990. Disaster control planning: a national concern? Alexandria, 2(2):51-61
50. Miller, R. Bruce 1988. Libraries and computers: disaster prevention and recovery. Information technology and libraries, 7(4):349-358
51. Morentz, James W. 1987. Computerising libraries for emergency planning. Special libraries, 78(2):100-104

52. Morris, John 1986. The library disaster preparedness handbook
Chicago : American Library Association
53. Murray, Toby 1985. Flood recover in Tulsa. Conservation
administration news, (22):4-5
54. Nance, Warren 1993. Issues in disaster preparedness for
information and referral providers. Information and referral,
(15):63-71
55. Olson, Nancy B. 1986. Hanging your software out to dry.
College and research libraries news, 47(10):635-636
56. Page, Julie A. 1993. Exercising your disaster plans: a tabletop
drill. Conservation administration news, (54):8-9
57. Parsons, E.A. 1952. The Alexandrian library: glory of the
Hellenistic world, its rise, antiquities and destructions.
Amsterdam : Elsevier
58. Powell, Ronald R. 1985. Basic research methods for librarians.
Norwood, N.J. : Ablex Publishers
59. Proposed substructure boundaries for the Cape Metropolitan Area.
1995. (Report no. 13) S.l. : Local Government Demarcation Board
for the Western Cape
60. Rawsthorne, Lawrence 1990. Conservation in Wales: some co-
operative initiatives. Library management, 11(4):20-22
61. Schmelzer, Menachem 1968. Fire and water: book salvage in New
York and Florence. Special libraries, 59(8):620-625
62. Smith, J.G. Information need assessment methodologies. (Unpub)
63. Smith, Richard D. 1992. Disaster recovery: problems and
procedures. IFLA journal, 18(1):13-23
64. South African Official Yearbook (18th ed.) 1992. Pretoria? :
Government Printer
65. Strong, Gary E. 1987. Rats! oh no, not rats! Special
libraries, 78(2):105-111
66. Sung, Carolyn H., Leonov, Valerii Pavlovich, and Waters, Peter
1990. Fire recovery at the Library of the Academy of Sciences of
the USSR. American archivist, 53(2):298-312
67. Syphus, Matthew Tertius 1990. The marketing of university
libraries with special reference to South African university
libraries. (MBibl dissertation) Cape Town : University of Cape
Town
68. Thorburn, G. 1993. Library fire and flood: successful salvage,
but beware of the cowboy. Aslib information, 21(2):76-78
69. Turabian, Kate 1987. A manual for writers of term papers,
theses, and dissertations. Chicago : University of Chicago Press

70. University of Wyoming Libraries 1985. Ark building workshop for Worcester librarians. Conservation administration news, (21):19-21
71. Waters, Peter 1990. Phased preservation: a philosophical concept and practical approach to preservation. Special libraries, 81(1):35-43
72. Watson, Tom 1989. Out of the ashes: the Los Angeles Public Library. Wilson library bulletin, Dec:34-41
73. Watts, Annette 1993. Disaster planning and management. Inform, (156):5
74. World Book Encyclopedia, 1995. Vol.4. London : World Book International
75. Wright, Gordon H. 1979. Fire! anguish! dumb luck! or contingency planning. Canadian library journal, 36(5):254-260
76. Yujiro, Ogawa 1991. Disaster prevention in records management in Japan. Records management journal, 3(2):43-46