



UMGUNGUNDOLOVU DISTRICT MUNICIPALITY

DISASTER MANAGEMENT PLAN

2017



Preface



The uMgungundlovu District Municipality (uMDM) is located in the Midlands Region of KwaZulu-Natal Province. Collectively uMgungundlovu District Municipality is comprised of seven Local Municipalities. According to Statistics South Africa Census 2011, uMgungundlovu District Municipality has a total population of 1 017 758 spread across the seven Local Municipalities.

The uMDM is confronted with significant unprecedented disaster risks which in the recent years come more frequently and more intense. Their impacts are exacerbated by a series of dynamic processes including population growth, increasing levels of poverty and marginalization, environmental degradation, poor planning and preparedness and the impacts of climate change. Climate change is likely to increase the frequency and severity of such disasters.

Unfortunately poor communities are more vulnerable to disaster risks. Disasters also place risks to development and therefore in addressing issues of disaster it is important to be futuristic in order for our disaster planning to adapt to the ever-changing nature of disaster. Each community should be aware of the hazards they are exposed to, recognize the potential risks and plan interventions to reduce the impacts of the hazards

Working together we can develop interventions that can help to address not only the impacts but the factors that can turn a hazard into a disaster.

Thank you.

TLS Khuzwayo

Chairperson: uMgungundlovu District Disaster Management Advisory

Foreword

FOREWORD BY HER WORSHIP, THE MAYOR



The intent of the Disaster Management is to ensure when a disaster takes place the impact felt by communities is minimal. The earliest and still predominate approach is for agencies to provide relief to those affected once a disaster has happened. Rescue assistance, medical support and food supply are vital for saving lives which prevent further harm. However, responding to a disaster can only do so much and a level of loss is almost inevitable before a rescue operation can even arrive.

Rather than waiting to respond, disaster management should have both pro-active and re-active measures. Proactive measures can include a range of activities such as hazard, exposure and sensitivity reduction strategies, impact reduction strategies, and capacity building for resilience.

A community located at the bank of river is exposed to flooding but their sensitivity will be low if the embankment is reinforced. A house with a lightning rod is less sensitive to being struck by lightning during a thunderstorm. A house away from the river bank may still be sensitive to flooding but its low exposure makes it less vulnerable to flood.

If individuals and their properties are close to a river bank, their exposure to flooding is higher than those further away or on higher ground.

Together we need to build resilient communities. Collectively let us look at various options through which we could reduce damaging strength of hazard and moderate the impacts of disasters through preventive, response and recovery measures.

“Reducing our vulnerability to natural disasters is the best way to implement sustainable development strategies We must ensure that natural hazards, which are inevitable, do not necessarily turn into major economic and social disasters” **The Hyogo Framework for Action 2005 – 2015: Building the Resilience of Nations and Communities to Disasters.**

His Worship, the Mayor, Cllr T. Maphumulo

Definition of Key Terms

Hazards: A *hazard* refers to the potential occurrence, in a specific time period and geographic area, of a natural phenomenon that may adversely affect human life, property or activity to the extent of causing a disaster. A hazard occurrence (the earthquake, the flood, or the cyclone, for example) becomes a disaster when it results in injuries, loss of life and livelihoods, displacement and homelessness and/or destruction and damage to infrastructure and property.

Risk: Risk may be defined as the expected damage or loss caused by any hazard.

Vulnerability: No matter where one is located, whether in an urban or rural environment, one's chances of experiencing a disaster are usually strongly linked to one's vulnerability to the event. The more vulnerable a community, the greater the physical costs, economic costs and emotional costs of a disaster. Vulnerability, then, is the degree to which an individual, family or community region is at risk of experiencing misfortune following extreme events.

Structural or physical vulnerability: is the extent to which a structure is likely to be damaged or disrupted by a hazard event.

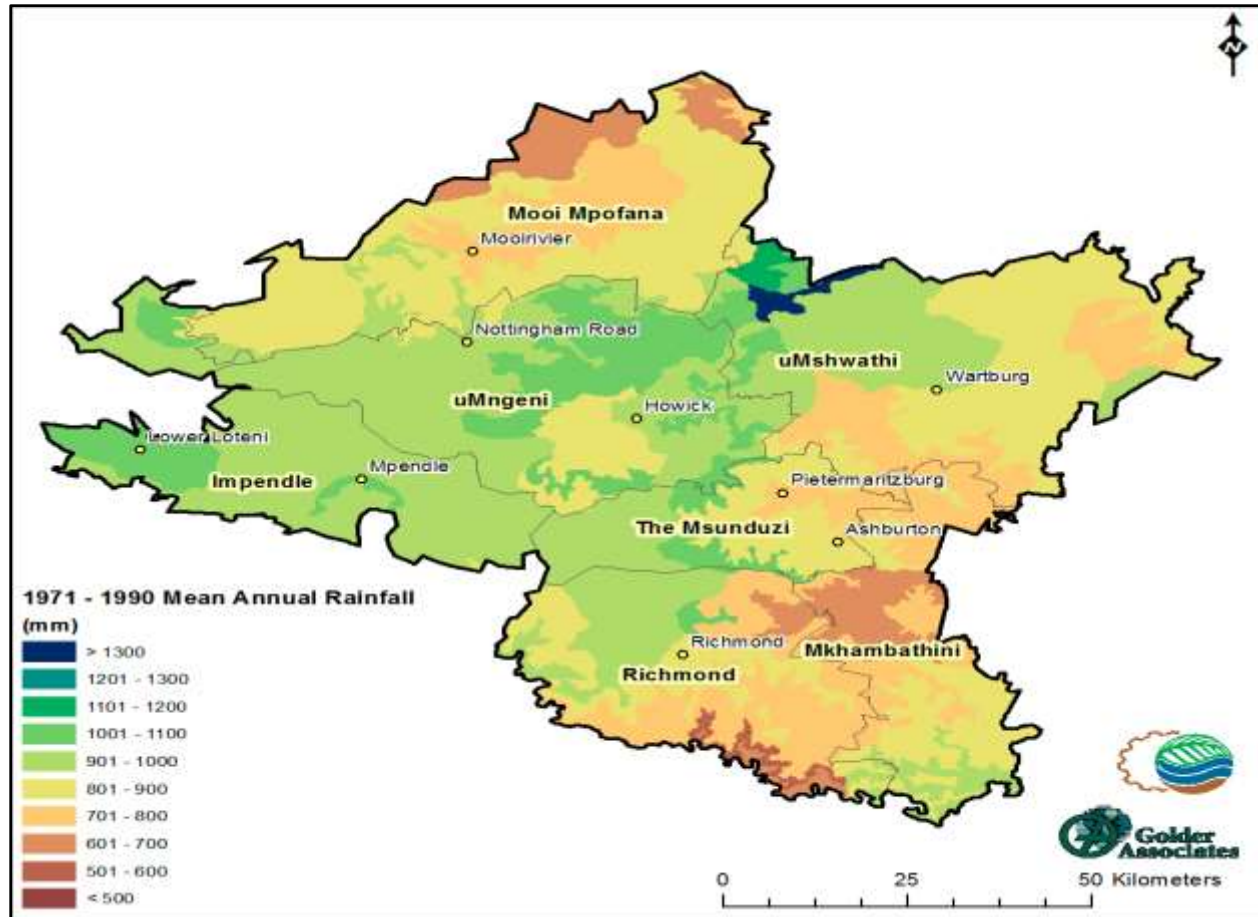
Human vulnerability: is the relative lack of capacity of a person or community to anticipate, cope with, resist and recover from the impact of a hazard. Factors that increase human vulnerability to disasters include rapid urbanization, population growth, and lack of knowledge about how to effectively resist the effects of disasters and poverty.

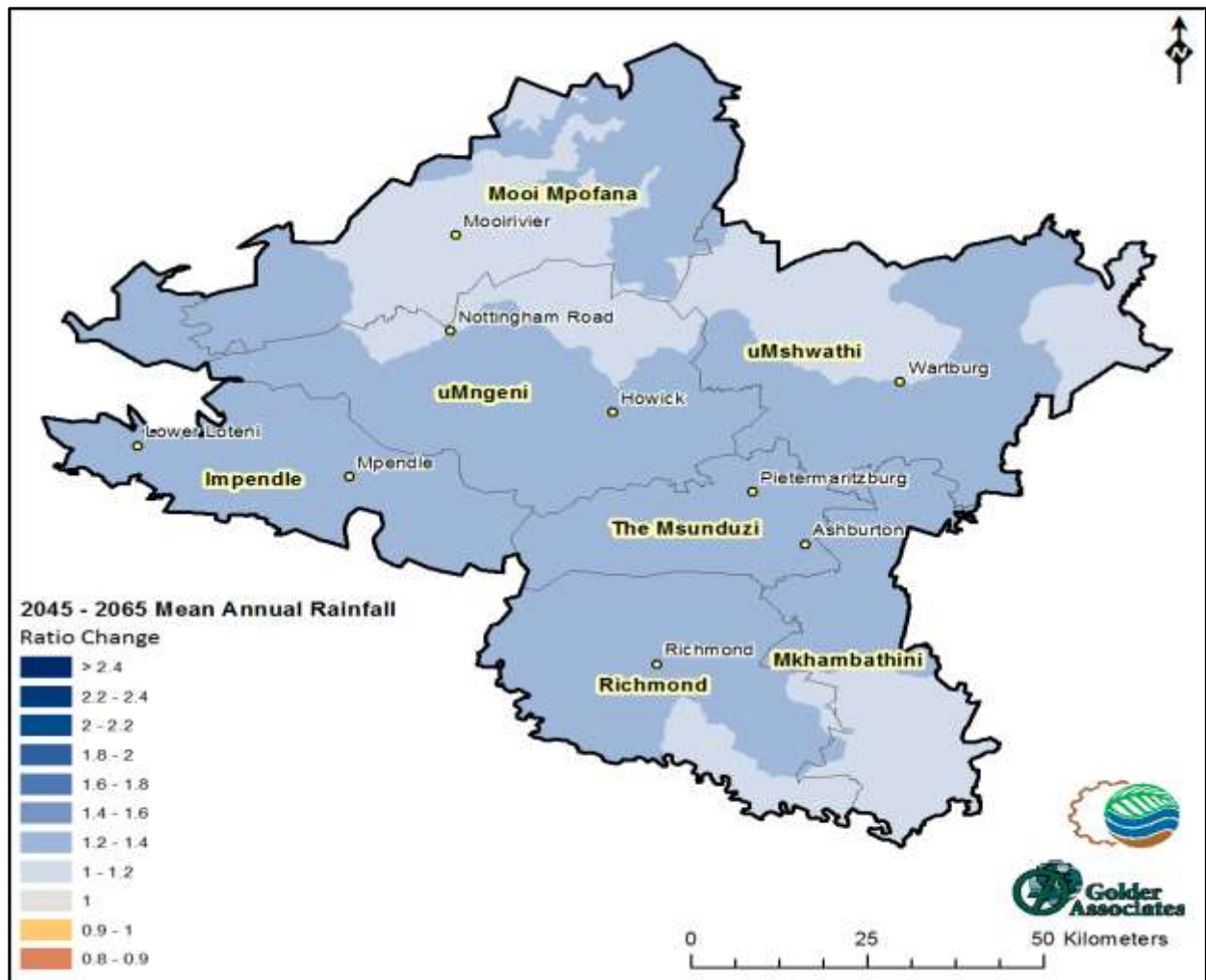
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Annexures

1. Introduction

The preparation of a District Disaster Management Plan is an extensive process and a joint effort between uMgungundlovu District Municipality and its family of Local Municipalities. The plan requires revision at least one per year and on an ongoing basis. Through this process, new projects should be identified and existing projects reviewed. This disaster management plan should be considered by the municipality in conjunction with all other sector plans when developing and reviewing their Integrated Development Plan. It is recommended that the Disaster *Manager* familiarize him/herself fully with the content of this document. The approach adopted for this Plan came from the sources mentioned below. The Disaster Management Unit would like to acknowledge valuable information from these sources, namely:

- Understanding disaster management in practice – with reference to Nepal – <http://www.forestrynepal.org/publications>;
- Getting started with Disaster Management – some useful hints for local government – <http://devplan.kzntl.gov.za/ASALGP/Resource/Documents>;
- Guidelines for preparing District Disaster Management Plan – Islamic Republic of Afghanistan – <http://saarc-sdmc.nic.in/pdf/afghanistan>

In addition, the Disaster Management Unit would like to acknowledge the support received from the following establishments:

- The uMgungundlovu District Municipality (GIS and ICT Units);
- Jeffares and Green - for developing Disaster Risk Assessment Tool;
- The family of Municipalities within the area of jurisdiction of uMgungundlovu;
- The Ward Committee Members and Ward Councilors;
- The Community Development Workers;
- Local Clinics; and
- Farmers Associations

1.1. Purpose and Objectives of the Plan

The purpose of this Disaster Management Plan is to lay a framework from which the day to day disaster management should take place within the uMgungundlovu District Municipality. Firstly, this is intended to assist the municipality with its capacity and preparedness to promptly deal with disasters. Secondly, the uMgungundlovu District Municipality DMP intends to set a guide for the uMgungundlovu District Municipality disaster stakeholders on how future disasters can be mitigated and avoided. Thirdly, this therefore helps the uMgungundlovu District Municipality to efficiently provide support to its local municipalities.

The key objectives of this uMgungundlovu District Municipality Disaster Management Plan is:

- To plan and implement risk reduction and risk reduction activities in the district;
- To have effective disaster preparedness, and effective emergency response for saving of lives;
- To provide relief and humanitarian assistance;
- To enable faster recovery through comprehensive reconstruction and rehabilitation;

- To conduct trainings and capacity building for effective prevention, mitigation and response for disasters; and
- To undertake information, education and communication activities to create awareness amongst the communities and the general public.

1.2. Methodology

The uMgungundlovu District Municipality adopted a participatory approach was in developing the Disaster Management Plan. A series of risk assessment workshops and information gathering sessions with Ward Councilors, Ward Committee Members, Community Development Workers, special needs groups, local clinics, farmers associations and other relevant stakeholders were conducted. These workshops/information gathering sessions were aimed at identifying the hazards, sectors of the community 'at risk' from hazards and to describe how severely each sector could be affected.

These workshops were also aimed at getting inputs from all relevant role players during the process of preparing the risk reduction and risk preparedness plans. It is important to understand where there is capacity and resources in the municipality that can be used in case of these hazardous events. Details regarding all available resources are required to assist in preparing a comprehensive preparedness plan for the municipality. Projects also have to be identified to assist in the mitigation process.

The participants were introduced to the Disaster Management Plan, disaster management concept and shown the format of the proposed Disaster Management Plan. These workshops capacitated the participants and provided them with experience and training for filling the risk assessment tools with necessary information. It should be appreciated that field consultation improves the quality of the disaster risk assessment findings and increases the accuracy of the disaster risk assessment findings, provides insight into the vulnerability conditions that can potentially be reduced.

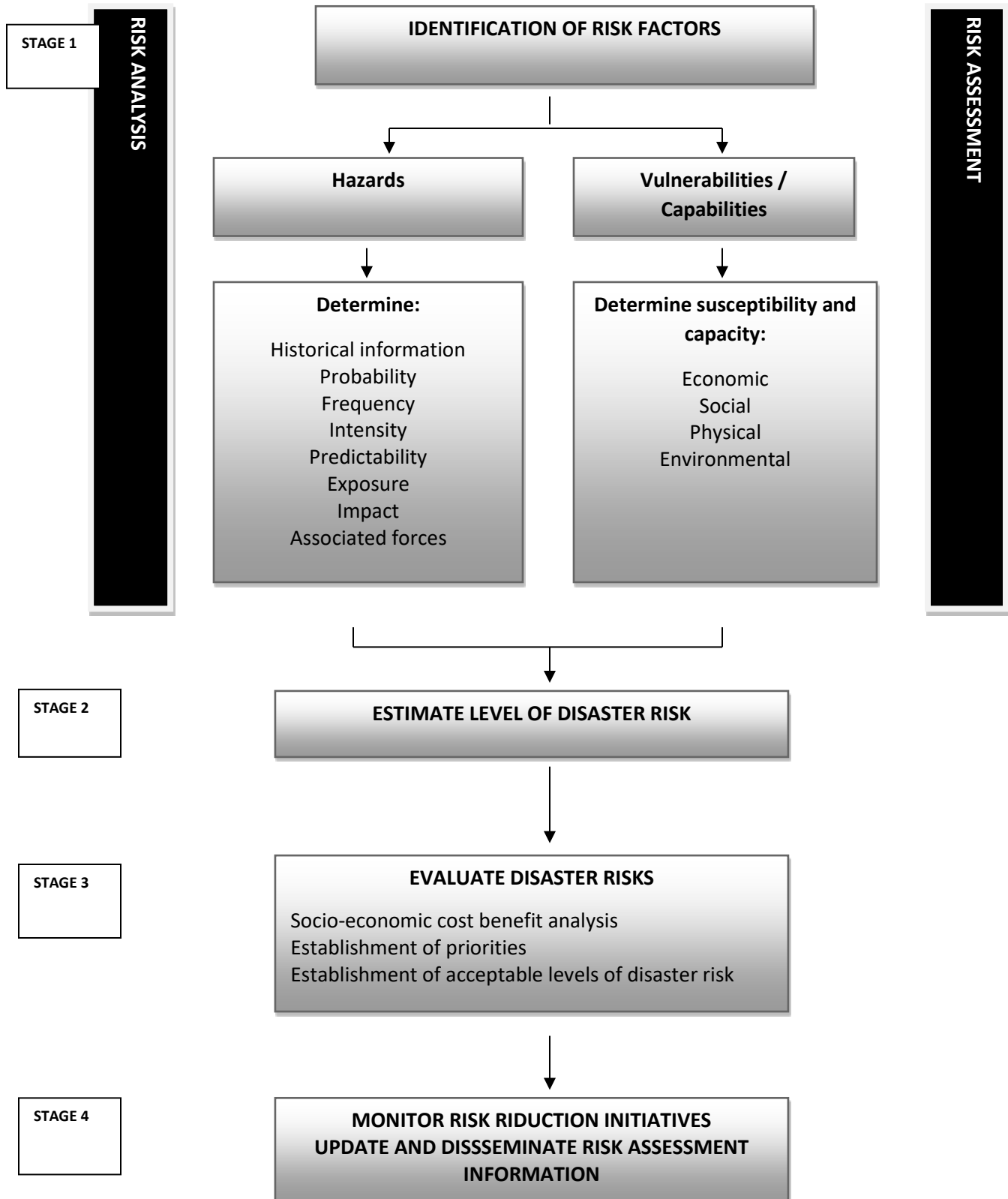
- **Sourcing additional information**

The Disaster Management Team undertook and documented the following when doing risk assessment:

- Audited past significant events and events classified as disasters. Reviewed previous small and medium-size events as well as declared disasters. A review of newspaper articles facilitated this exercise. This exercise will be helpful in identifying areas and communities most at risk and to focus more detailed disaster risk assessment efforts;
- Consulted with community members, special needs groups and traditional leaders in areas affected by past events for information on frequency and severity of events classified as disasters, significant events and recurrent small-scale occurrences.
- Consulted with long-standing members of emergency services who could remember or have recorded ten years or more of past disaster responses.
- Used information obtained during post risk assessment.

The disaster risk assessment was conducted using a staged approach:

Figure: 1 BASIC STAGES OF A DISASTER RISK ASSESSMENT



Summary of Key steps towards the preparation of the Disaster Management Plan:

Step 1	<ul style="list-style-type: none"> • Set long-term and short-term objectives within the context of municipal plans and objectives • Ensure disaster management plan is integrated with all 3 spheres of government • Ensure disaster management plan is integrated with other local plans particularly the integrated development plan
Step 2	<ul style="list-style-type: none"> • Involve all sectors of the community in the Plan • Secure commitment to the plan from all the people that can make it happen
Step 3	<ul style="list-style-type: none"> • Investigate local social, economic and environmental conditions and issues – get assistance from all departments, i.e. GIS, social welfare, IDP
Step 4	<ul style="list-style-type: none"> • Identify the hazards. Use all information available about hazards from locals, experts, government agencies.
Step 5	<ul style="list-style-type: none"> • Identify sectors of the community 'at risk' from hazards • Describe how severely each sector could be affected.
Step 6	<ul style="list-style-type: none"> • This is when you prioritize your strategies based on the highest risk. • Establish a consequence rating for each sector • Determine the likelihood of each event occurring and establish a likelihood rating • Combine the consequence rating with the likelihood rating to develop a risk rating - this will help to develop and prioritize strategies
Step 7	<ul style="list-style-type: none"> • Develop strategies for prevention, preparation, response and recovery • Link strategies to objectives
Step 8	<ul style="list-style-type: none"> • Assess resources available/needed • Document the actions to be taken, the time for completion and who will be responsible for their completion and for monitoring progress. • Review the success of the plan in meeting the objectives i.e. has prevention, preparation, response and recovery from disaster improved? • Evaluate the success of the plan in meeting the longer-term outcomes, i.e. has the plan improved social, economic and environmental well-being?

2. Legislative and Policy Framework

The uMgungundlovu District Municipality Disaster Management is guided by the following legislative frame:

- **Constitution Act 108 of 1996**

The South African Constitution S24 states:

“Everyone has the right:

- a) To an environment that is not harmful to their health and well-being; and*
- b) To have the environment protected for the benefit of the present and future generations, through reasonable legislative and other measures”.*

- **Municipal Systems Act, 32, of 2000**

The Municipal Systems Act, 32, of 2000, section 2 further stipulates that:

“Council of a Municipality has the duty to promote a safe and healthy environment in the municipality”.

This therefore puts more pressure on organs of states to ensure the safety of its people.

- **Disaster Management Act no 57 of 2002**

The Disaster Management Act of 2002, Act no 57 makes provision for emergency preparedness, rapid and effective disaster response and recovery, and the participation of volunteers. The Disaster Management Act define the disaster management as a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at-

- Preventing or reducing the risk of disasters;
- Mitigating the severity or consequences of disasters;
- Emergency preparedness;
- A rapid and effective response to disasters; and
- Post-disaster recovery and rehabilitation;

One of the key features of the Disaster Management Act is that it recognizes that the job of disaster risk reduction cannot be done by government alone. It requires co-operation and collaboration on the part of all spheres of government, civil society and the private sector. However, the Disaster Management Act also acknowledges that the involvement of such adversity of role players and stakeholders brings with it the challenge of achieving consistency in approach. In order to address this and other challenges, the Disaster Management Act prescribes a National Disaster Management Framework to provide a coherent, transparent and inclusive policy on disaster risk management for South Africa as a whole.

The Disaster Management Act also mandates each Province, District Municipality and Metropolitan Municipality to establish and implement a policy framework which is consistent with the National Disaster Management Framework and is aimed at ensuring an integrated and uniform approach to disaster risk management in its area.

- **National Disaster Management Framework, 2005**

The Disaster Management Act stipulates two main provisions for the contents of the National Disaster Management Framework. These are:

- That the framework must be consistent with international best practice in disaster risk reduction; and

- That it must provide a coherent, inclusive and transparent policy on disaster risk management for South Africa.

The framework is organized into four key performance areas (KPA), each with a specific objective. The four Key Performance Areas are supported by three performance enablers. These were necessary in order to achieve the objectives of the KPAs. The four Key Performance Areas are:

KPA 1: Integrated institutional capacity for disaster risk management;

KPA 2: Disaster risk assessment;

KPA 3: Disaster risk reduction; and

KPA 4: Response and recovery.

The three enablers are:

- Performance Enabler 1: Information management and communication;
- Performance Enabler 2: Education, training, public awareness and research (knowledge management); and
- Performance Enabler 3: Funding arrangements for disaster risk management.

3. UMDM Hazard, Risk and Vulnerability Profile

Disaster risk assessment is the first step in planning an effective disaster risk reduction program. It examines the likelihood and outcomes of expected disaster events. It is critical that disaster risk assessments should be ground-trothed (that is, based on the actual situation 'on the ground'), with field consultations in areas and communities most at risk. Disaster risk assessments must be undertaken to anticipate and plan for known hazards or disasters to prevent losses and limit endangering impacts. Disaster risk assessment is a process that determines the level of risk by:

- Identifying and analyzing potential hazards and/or threats;
- Assessing the conditions of vulnerability that increase the chance of loss for particular elements-at-risk (that is, environmental, human, infrastructural, agricultural, economic and other elements that are exposed to a hazard, and are at risk of loss)
- Determining the level of risk for different situations and conditions
- Helping to set priorities for action.

The general process for assessing disaster risk involves the following stages, namely:

Stage 1: This initial stage involves identifying the specific disaster risk to be assessed. Identify and describe the hazard with respect to its frequency, magnitude, speed of onset, affected area and duration. Describe and quantify vulnerability to determine susceptibilities and capacities.

Stage 2: The second stage involves analyzing the disaster risk concerned. Estimate the level of risk associated with a specific threat to determine whether the resulting risk is a priority or not.

Stage 3: The third stage requires an evaluation of the disaster risk being assessed - usually in relation to other risks. It involves undertaking much more comprehensive assessments of specific threats and establishes priorities or action.

Stage 4: The fourth stage is required to inform ongoing disaster risk assessment and planning. It involves monitoring disaster risks and the effectiveness of risk reduction initiatives. It also involves updating disaster risk assessment information and disseminating this information to all stakeholders.

Levels of vulnerability

A simple way of defining the vulnerability levels for a specific geographical area or zone is by using the categories of very high, high, medium, or low, as shown in the table below:

Vulnerability level	Characteristics
No	<ul style="list-style-type: none"> No risk or threats to life.
Low	<ul style="list-style-type: none"> A particular hazard/threat is generally recognized. The affected population is aware of its characteristics and possible occurrence during a particular period of time. There is a high level of both organizational preparedness and response capacity for a possible disaster.
Medium	<ul style="list-style-type: none"> Although threats are not easily identified, there is some level of awareness of the risk, coupled with weak organizational and response capacities.
High	<ul style="list-style-type: none"> Those exposed to hazards/threats may know of them, but pay them little or no attention. They are unaware of which warning and preparedness actions to implement.
Very high	<ul style="list-style-type: none"> Those exposed to a particular hazard/threat have insufficient response capacity or resilience

Risk Profile	
No	The hazard is not applicable in this instance.
Low	Low Risk. Manage by routine procedures
Medium	Moderate Risk. Management responsibility must be specified. Action should be prioritized in medium term.
High	High Risk. Senior Management attention needed. Action required. Budget to be allocated.
Very High	Catastrophes imminent. Senior Management attention needed. Urgent action required. Discretionary budget to be allocated.

The disaster risk assessment exercise conducted throughout the District revealed that the main hazards faced by the District are floods, house fires, veld fires, environmental pollution, transport accidents, severe storms and lightning, snow, drought and thunderstorm. Climate change projections show that extreme events such as flooding and severe storms are expected to increase in frequency and intensity. This is of particular concern to the uMgungundlovu District Municipality, as the district has experienced these events in the past. It is important to take note of the projected increases in these events, and to implement appropriate response measures so that future losses can be avoided.

Communication facilities i.e. telephone services and mobile networks are available in most parts of the District. Health facilities are not adequate in certain Local Municipalities. People from certain wards have to walk long distances to reach the health facilities for treatment. Low literacy level, prevalence of HIV/AIDS, high poverty characterizes the District. The condition of roads in many rural wards is poor. As urban areas continue to push outward and displace animals from their natural habitats and as traffic continue to increase every year, collisions between cars and the animals seem an almost inevitable consequence. We often see roadkill - animals that have been killed by passing traffic in our rural areas. Cattle, horses, dogs and antelopes pose the most danger to vehicle occupants. If they are hit they can cause extensive damages and serious or fatal injury. These incidents are however mostly under-reported.

According to the Road Traffic Management Corporation the most vulnerable road user groups are pedestrians and public transport passenger. The most vulnerable ages are 19 – 29. Most fatal crashes per occur on Thursday evening, Friday, Saturday and Sunday. The urban and peri-urban (unmarked tar) are the most common road types for crashes. Sharp bend, poor road surface and visibility are top three road factors. The following have been found to have been among the most common causes of the crashes:

- Speeds too high for conditions, especially, during inclement weather and at night;
- Dangerous, reckless and/or inconsiderate driving, particularly barrier line infringements;
- Abuse of alcohol by drivers and pedestrians;
- Fatigue, especially amongst public passenger drivers;
- Vehicle fitness, particularly tyre failure and defective brakes, and
- Pedestrian negligence (jay walking, walking on freeways, not visible at night and drunken walking).

The non-wearing of seatbelts, whilst not a contributor to crashes has been found to have been a major contributor to fatal or serious injuries following a crash.

Below are pictures of some of the disaster risk assessment sessions conducted throughout the District



3.1 UMDM LANDFILL EVALUATION

Assumptions

1. The proper implementation of this plan has the potential to reduce or prevent the loss of lives in the country.
2. Depending upon the severity and magnitude of the situation, local resources may not be adequate to deal with every occurrence. It may be necessary to request assistance through volunteer organizations, the private sector, mutual aid agreements, or state and federal sources.
3. In almost every emergency situation requiring an evacuation, a number of people will evacuate of their own volition.
4. Most of the people in the affected area will receive and follow the emergency instructions; however a certain portion of the population will not get the information, will not understand it, or purposely not comply with directions.
5. Family groups will evacuate using privately owned vehicles, while persons without automobiles may have to rely upon the sources of transportation.
6. This situation could be multi-jurisdictional, thereby complicating command, control and coordination efforts.
7. Short term and long term planning should be accomplished in order to provide for identification of safe, secure, and reliable evacuation routes that could possibly be utilized.
8. Not all emergency situations resulting from an event at the Landfill will require an evacuation, in most situations; it may be preferable that a 'shelter in place' order be given.
9. Notifications of shelter in place or evacuation will be made in a timely manner.
10. Off-site monitoring will take place.

CONCEPT OF OPERATION

1. Local government has the ultimate responsibility to issue a shelter in place or evacuation order.
2. During any evacuation, close coordination will be required with the following functions:
 - a. Reception and care-The evacuees must have some place to go even if it's in another city.
 - b. Law enforcement- Traffic control along movement routes and security for evacuated areas are a necessity.
 - c. Resources and supply- Transportations for persons without automobiles, food, clothing, and fuel will be required.
3. During evacuation, staging areas and pick-up points will be identified to provide transportation for those without private automobiles or other means.
This will be based on individual needs.
4. No one will be forced from his or her residence after being advised to evacuate.
5. The Unified Command Post will support existing transportation plans for such entities as hospital, nursing homes, schools, etc.
6. Individual transportation provided only when it is safe and practical.

7. Certain day-to-day governmental activities may be curtailed during evacuation operations. The degree to which this is necessary will depend upon the amount of local resources that have been committed to the emergency.
8. The unified Command post will monitor the traffic flow, reception areas, and security for evacuation areas to insure that evacuation functions are proceeding efficiently and effectively.
9. The incident Commander will prepare and present after action reports to the governing body who initiated the shelter in place or evacuation.

ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITY

1. The Police Chief or designate of each jurisdiction impacted by the evacuation/ shelter in place order, will have the responsibility to coordinate all activities within their jurisdiction to carry out the shelter in place/evacuation order, to include the calling off additional Police Officers to respond to the incident.
2. The Coordinators will control all evacuation operations including the following:
 - a. Designating primary and alternate evacuation routes and indicating those routes on a map.
 - b. Estimating traffic capabilities and the amount of time to successfully evacuate the area of concern.
 - c. Identifying potential problems along the evacuation route (i.e., road hazards, or other limiting factors).
 - d. Estimating the number of people requiring supplemental transportation and identifying the best means to transport them.

DIRECTION AND CONTROL

The incident command system will be used to direct, control and coordinate field personnel and the use of resources at the scene of an evacuation emergency.

Agency representatives operating from within the coordination center will provide the Chief Elected Official of their jurisdiction with timely and accurate information regarding the current characteristics of the evacuation and shall act as an agent for that official regarding emergency management issues.

TRANSPORTATION

Evacuation Coordinators

Due to more than one department being impacted by a local or area wide evacuation, the Evacuation Coordinators from each responding agency will:

1. Establish the area of evacuation.

2. Establish the population impacted and number of special care institutions.
3. Establish an evacuation route in concert with support agency plan.
4. Coordinate evacuation pickup points.
5. Contact non-law enforcement support agencies.
6. Determine availability of the main arterial roadways.
7. Identify traffic control points and responsible agencies for staffing and operational control.
8. Establish barricade plan to include location and staffing.
9. Locate electronic message board signs to display evacuation routes, shelter information and staging / rest areas.
10. Emergency removal of roadways hazards (i.e. disabled vehicles, motor vehicle accidents, etc.) through local law enforcement law contracts.
11. During the evacuation, staging areas and pickup points will be identified to provide transportation for those persons without a means of transportation.

ADMINISTRATION AND LOGISTICS

A. Administration

The Finance/Administration Department of each affected community has the responsibility for keeping track of evacuation-related costs, personnel and equipment records. If necessary, a supply officer should be designated and assigned to serve in this capacity.

B. Logistics

Locally owned transportation resources will initially be utilized to evacuate people and relocate essential resources. Contacts and arrangements for outside transportation resources (church buses, school buses, etc.) should also be established.

COMMUNICATIONS

Due to possibility of more than one department and police dispatch center being involved in an area-wide shelter in place/evacuation order, it is anticipated that multiple dispatch center radio communication will be difficult.

PUBLIC INFORMATION AND WARNING

- Emergency public information and warning capability includes public information, alert/warning and notification. It involves developing, coordinating, and disseminating information to the public, coordinating officials, and incident management and responders across all jurisdictions and disciplines effectively under all hazard conditions.

1. The term “public information” refers to any text, voice, or other information provided by an authorized official and include both general information and crisis and emergency risk communication (CERC) activities. CERC incorporates the urgency of disaster communication with risk communication to influence behavior and adhere to directives.
2. The term “alert” refers to any text, voice, or other information provided by an authorized official to provide situational awareness to the public and/or private sector about a potential or ongoing emergency situation that may require actions to protect life, health, and property and is typically issued in connection with immediate danger.

3.2 DROUGHT MANAGEMENT

Step 1. Getting Started

For this type of interdisciplinary analysis, it is essential to bring together the right group of people and supply them with adequate data to make fair, efficient, and informed decisions pertaining to drought risk. This group’s knowledge will need to encompass several aspects of environmental, economic, and social topics. Any shortfall in information or perspective could lead to results that fall far short planning goals.

Step 2. Drought Impact Assessment

Impact assessment examines the consequences of a given event or change. For example, drought is typically associated with a number of outcomes. Drought impact assessments begin by identifying direct consequences of the drought, such as reduced crop yields, livestock losses, and reservoir depletion. These direct outcomes can then be traced to secondary consequences (often social effects), such as the forced sale of household assets or land, dislocation, or physical and emotional stress (Ribot 1996:2). This initial assessment identifies drought impacts but does not identify the underlying reasons for these impacts.

Box 1. Common Types of Drought Impacts

Economics Category

- Agricultural
- Industry
- Tourism and Recreation
- Energy
- Financial
- Transportation

Social Category

- Stress and Health
- Nutrition
- Recreation
- Public safety
- Cultural Values
- Aesthetic Values

Environmental Category

- Animal/Plant
- Wetland
- Water Quality

Step 3. Ranking the Impacts

Once the checklist in Appendix c has been completed, all of categories that were checked should be made into a new list, with the unchecked categories omitted. This new lists contains the drought impacts that are relevant to your location or activity.

From the new lists, the “current” impacts should then be ranked according to the most important impacts. To be effective and equitable, the ranking should into consideration concerns such as cost, areal extent, trends over time, public opinion, fairness, and the ability of the affected area to recover. The general public, community advisory committees, and groups of relevant scientists and policy makers can be included in the process of ranking, or it can be accomplished through some other method. However, it is recommended that, as in all decision-making activities, as many groups as possible be represented for informed and equitable policy formulation.

Step 4. Vulnerability Assessment

Vulnerability assessment provides a framework for identifying the social, economic, and environmental causes of draught impacts. It bridges the gap between impact assessment and policy formulation by directing policy attentions to underlying causes of vulnerability rather than to its results, the negative impacts, which follow triggering events such as drought. For example, the direct impact of a lack of precipitation may be reduces crop yields. The underlying cause of this vulnerability, however, may be that the farmers did not use drought-resistant seeds, either

because they did not believe in their usefulness, the costs were too high, or because of some commitment to cultural beliefs. Another examples of an impact could be a farm foreclosure.

The Step 5. Action Identification

Once drought impact priorities have been set and the corresponding underlying causes of vulnerability have been exposed, it is time to identify actions that are appropriate for reducing drought risk. In accordance with the overall goal of drought mitigation rather than drought response, we stress that mitigated actions should be identified before potential response actions.

Water Supply Sources

In drought planning, it is essential to have an adequate understanding of your water supply sources.

Effects of Drought on Soil/Sediment

The primary drought effect on soil and sediment is increased sheet erosion due to the loss of plant roots and wind.

Effects of Drought on Surface and Ground Water Levels

Rivers and lakes drop to low levels during drought, while turbidity and salinity increase, affecting fish habitat.

Effects on the Air

Air can become dry, warm, and dusty, further desiccating the soil and increasing evaporation from bodies of water. Respiratory ailments increase. Winds enhance sheet erosion from dried soils.

Effects on Wildlife and Plants

Ecosystems depending on soil moisture or the presence of open water become damaged. Fish and game habitat is reduced. If soil is lost due to wind, then damage may be semi-permanent.

Drought and Catastrophic Fire

There are strong intuitive connections between drought and catastrophic wildfire potential in the uMgungundlovu District Municipality.

1. A vacuum exists in the scientific literature and assessment data in understanding drought and post-drought residual impacts on catastrophic fire risk and hazard. Research to address this need could include:

A. To what degree do wildfires in forest types change during and after periods of drought?

B. To what degree do catastrophic wildfires risk and hazard change during and after a drought?

2. Overall, the health of forests plays a major role in levels of catastrophic wildfires and hazards. The scientific community is in general agreement that standing and downed fuel loads, disease, and over competition for available moisture by dense overstay vegetative stands all contribute to reduced understory vigor, lowered streamflow, soil moisture recharge, etc.

In an effort to reduce adverse impacts of drought and fire, and produce positive environmental, social, and economic benefits, answering these questions is important to both understand the difficult and complex impacts associated with drought and catastrophic fire and arrive at a greater consensus for action.

Social Information

A. Structure Fire: Water conservation measures in communities can result in the drying of lawns and landscaping. Dry trees and bushes are vulnerable to fire, which can, in turn, cause fire to spread to adjacent structures. Dry fields in communities are also vulnerable. This potential increase in numbers of structures fires leads to greater community losses and increase risk to firefighters.

B. Mental/Physical Stress: Most drought situations lead to stress that can result in a variety of responses. There is the potential for serious emotional and mental health problems, and there is the potential for family distress and conflict, divorce, and even suicide. Conflicts over water between neighbors, or with governmental agencies/offices, can raise public safety concerns.

Potential Risk Reduction Actions

Water Conservation/Demand Reduction

- Establish stronger economic incentives for private investment in water conservation
- Encourage voluntary water conservation
- Require water users to decrease reliance on ground water and implement reliance measures
- Modify plumbing system, including:
 - Distributing water-saving kits, including replacement showerheads and flow restrictors changing plumbing standards, requiring or offering rebates for ultra-low-flow toilets

Water-saving measures for farms:

- Use lasers for accurate land leveling
- Install return-flow systems
- Line canals or install piping to control seepage

Increasing Water Supply/Supply Augmentation

- Issue emergency permits for water use
- Provide pumps and pipes for distribution
- Propose and implement programs to rehabilitate reservoirs to operate at design capacity
- Undertake water supply vulnerability assessments
- Inventory self-supplied industrial water users for possible use of their supplies for emergency public water supplies

Media Participation

- Select official representatives for media contacts

Conflict Resolution

- Resolve emerging water use conflicts
- Investigate complaints of irrigation wells interfering with domestic wells

Technical Assistance

- Advise people on potential sources of water
- Provide additional training to natural resource personnel
- Advise water suppliers on assessing vulnerability of existing supply systems
- Recommend adopting water conservation measures
- Help water agencies develop contingency plans

Emergency Response

- Stockpile pumps, pipes, water filters, and other equipment
- Establish water hauling programs for livestock
- List livestock watering spots

3.3

Manual on Flood Preparedness Program

Overview

The provincial / district profile will help to qualify flood hazard and its possible effects on people and property ways. It would also set the context of flood preparedness planning in a particular location by mapping out features of the focused areas. It would assist to clearly recognize the linkage between socio-economic characteristics of a location and its community to flood hazards and its past and possible impact on people lives and resources.

Main Concepts

Information about the province / district, past and floods and the community are essential building blocks for an effective flood preparedness programme.

Participatory Flood Risk Assessment Tools

PRA tools commonly used for such assessments are:

- Hazard mapping
- Historical profile
- Seasonal calendar
- Resource mapping
- Transect walk
- Institutional/ social network analysis
- Semi-structured interviews
- Focus group discussion (FGD)

- Problem tree
- Ranking
- Observation

Vulnerability assessment

- unplanned development with poor drainage and sanitation
- Development of squatter communities on marginal land such as on embankments, riverbanks and within river channels.
- Poor housing
- Poverty
- Inadequate flood preparedness
- Lack of awareness about the flood hazard
- Lack of early warning systems
- Climate change effect over a particular area
- Environmental and geographical vulnerabilities

Vulnerability assessment

Flood hazard	Element at Risk	Unsafe conditions	Dynamic pressures	Root causes
<p>Caused by (depending on the location of the community)</p> <ul style="list-style-type: none"> • Typhoon(floods induced by storm surge) • Monsoon rain • High tide 	<ul style="list-style-type: none"> • Houses and buildings • People • Livestock • Household assets • Agricultural land • Other infrastructure such as bridges, roads, levees dykes, etc. 	<ul style="list-style-type: none"> • Livelihood • House sited on low land, along creeks, canals, on rivers and seas • Housing materials that easily rot or get damaged • No food stocks or savings • No vaccination • Excluded from flood protection • No safe area safe haven • Unable to replace lost assets • Livelihood liable to disruption • Houses and buildings 	<ul style="list-style-type: none"> • Low income levels, unstable livelihoods • Lack of proper allocation of land and/ or housing for the poor • Inadequate economic progress to provide alternative livelihood • Low education hampering employment • Alternative income from anti-social or illegal activities • Threat of demolition to make way for development projects 	<ul style="list-style-type: none"> • Migration into a unplanned urbanization in areas prone to flooding • Lack of implementing land use plans or their implementation • Environmental degradation increasing flood risk • Surely there are more...

		<p>that can cause water-logging and increase diseases</p> <ul style="list-style-type: none"> • Poor existing health and malnutrition • No safe drinking water • Lack of coordination/ and unity in community 	<ul style="list-style-type: none"> • Poor government support for urban poor • Political and social conflict 	
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Capacity assessment

- a. Shelter facilities
- b. Transportation facilities
- c. Communication system
- d. Flood protection facilities
- e. Storage facilities
- f. Medical facilities
- g. Institutional and other facilities
- h. Human resources

Vulnerability and capacities

	Vulnerabilities	Capacities
Physical/ material	<ul style="list-style-type: none"> Proximity and exposure to flooding living on a flood plain, poor housing poverty few options, meagre financial savings, few assets Resources limited technology, skills or employment 	<ul style="list-style-type: none"> Protected location Money, assets, jobs, savings Insurance Access to credit Good health Skills and expertise
Social/ organizational	<ul style="list-style-type: none"> Marginalization people excluded due to politics, religion, ethnicity, social customs and norms Organization- limited community or legal structures Discrimination lack of support, reduced access to resources and services 	<ul style="list-style-type: none"> Community support leadership, institutions Political structures, adequate management Community harmony Social network patronage
Motivational/ attitudinal	<ul style="list-style-type: none"> Perception of risk deny the threat, unaware of the threat Attitude no confidence in abilities, view as dependent upon others, lack of confidence in the existing systems and structures(in dealing with floods) Power no influence within the community 	<ul style="list-style-type: none"> having knowledge of/ aware of what prevailing disasters exist in the immediate environment and their impact having confidence to cope with crisis ability to influence the environment having strong belief in existing system and consequently support the structure

General disaster preparedness and mitigation

- Organize and develop the information system of global, regional and local climate changes; process information for improved forecasting and early warning;
- Develop plans and standards for construction of flood mitigation structures and application of disaster preparedness measures.
- Prepare plans for budget allocation of: dyke constructions and their improvement and maintenance; dredging of river beds; protection and maintenance of forests, riversides and coastal areas
- Offer proper allocation plan for residential areas, infrastructure and buildings in disaster-prone location;
- Define appropriate methods for agriculture and fishery production that can be adapted to incorporate local disaster events, in this case flooding;
- Apply advanced science and technology in disaster preparedness and management practices;
- Disseminate and transfer knowledge, experience and legislation relating to flood and storm control and disaster mitigation;
- Monitor and evaluate periodically the implementation of disaster preparedness plans.

Annual planning for flood and storm control and disaster mitigation

- Support flood preparedness initiatives by preventing activities that could possibly disrupt flood mitigation and other related work;
- Inspect and assess frequently the safety of flood mitigation structures, if there are any damages, timely repairs must be undertaken, if local authorities are unable to deal with the damages, it must be reported to higher level and repaired before the rain/ typhoons season;
- Develop plans for flood and storm control and disaster mitigation for the entire area and for every focal points;
- Prepare and provide rescue facilities and equipment when flooding occurs;
- Ensure adequate storage of food, medicines and other necessities at selected locations in flood-prone areas;
- Organize and train emergency response and volunteers group.

Early Warning and decision making for urgent response and disaster preparedness

Specific tasks with regard to flood preparation will include:

- Broadcasting flood/ storm information; development and dissemination of warning messages; carry out urgent mobilization of resources and other measures;

- Ensure regular, timely and smooth communication and instruction;
- Deploy emergency response teams and resources to ensure a timely response to floods;
- Protect and reactivate disaster preparedness works that are threatened;
- Provide first aid to the injured; evacuate people out of dangerous areas and protect the property of individuals and of the state;
- Ensure both social and economic security and safety in the affected areas;
- Guide local people in environmental care and disease/ epidemic prevention in affected areas and in id
Notified safe areas;

Recovery and rehabilitation

- Mobilize emergency response forces and resources to save people and property;
- Provide timely relief and support to local people, enabling a return to their normal lives as soon as possible in the affected areas;
- Implement necessary measures for recovery of the local economy;
- Organize environmental cleaning/ protection and disease/ epidemic prevention;
- Repair the damaged flood mitigation structures (dyke, levees, etc) and buildings/ infrastructure;
- Conduct assessment on losses and damages.

Evacuation and Relief

- Activating evacuation points and areas and individual needs.
- Providing relief and medical supplies to disaster victims.
- Undertaking rehabilitation activities.

Recovery

- Identifying immediate community and individual needs.
- Developing recovery plans based on community needs and priority.
- Implementing agreed recovery management arrangements as required.
- Preparing damage assessment reports.

<ol style="list-style-type: none"> 1. Protect roads and bridges. 2. Prepare trucks/vehicles to transport soil/sand bags 3. Zonation of protected areas. 4. Set up flood preparedness strategy at least one month earlier. 	<ol style="list-style-type: none"> 1. Distribute emergency relief 2. Provide transportation to health personnel, to the safe areas. 3. Repair roads and bridges. 	<ol style="list-style-type: none"> 1. Set up plan to rehabilitate the damaged infrastructure including pathways, bridges and national roads.
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PROVINCIAL DEPARTMENT OF RURAL DEVELOPMENT

<ol style="list-style-type: none"> 1. Provide training on planning regarding emergency relief at the community level. 2. Construct toilets and wells in safe areas. 3. Conduct first aid training course for villagers. 4. Conduct training courses for community on health care and hygiene. 	<ol style="list-style-type: none"> 1. Participation with PCDM. 2. Collect flood and damage information and report to relevant stakeholders. 3. Provide transportation services & fuels. 4. Prepare proposals and submit to donors. 5. Provide food to people. 	<ol style="list-style-type: none"> 1. Restore and repair wells. 2. Conduct first aid training courses for villagers. 3. Conduct training courses for community on health care & hygiene. 4. Restore and repair all damaged infrastructure including pathways/ roads, bridges & water gates.
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Public Awareness about Flood Warning: It is vital that people living in flood-prone areas have a clear picture and sufficient knowledge of the risks they face and are actively involved in the development and implementation of an early warning system. For the community to be in a state of preparedness, the following actions can be undertaken to raise their awareness regarding flood warning:

- Installation of flood markers (as stand-alone structure or on telephone poles or buildings that are visible from a distance.)
- Periodic articles in local newspapers on the existing warning system and steps to be taken in case of a flood.
- Provision of flood action guidelines in the form of notices, posters, brochures and booklets to schools and libraries or posting them in public places.
- Periodic meetings for the community (a mechanism that can also be employed to review the existing systems and how to improve them.)
- Periodic drills.

WATER, SANITATION AND HEALTH CARE PLANNING

One of the challenges that emergency response practitioners face during floods, is access to clean water and sanitation facilities. Rapid assessment must be made during the planning stage, to determine the capacity of existing facilities and the need for improvement for a suitable water supply system. The water supply and public works department must work closely with national and international agencies to ensure the availability of clean water for drinking, cooking, washing, as well as for animals.

Consuming or coming into contact with contaminated water is a health risk brought upon by floods. Contamination of water can occur due to various causes. The fresh water supply often gets contaminated during flooding from overflowing sewage systems, and agricultural and industrial by-products. In addition, there is likelihood of downstream seepage contamination to existing fresh water bodies. Although skin contact with flood water does not in itself pose a serious health risk, there is risk of becoming ill from eating or drinking anything contaminated by flood water. Proper care must be given to pumping out contaminated water, as it may cause infection, requiring immediate medical attention.

FLOOD RESPONSE OPERATIONS

The effectiveness of flood response is based on the following key components:

- a) **Effective Coordination:** Extensive coordination among all agencies taking part in emergency response activities dictate the success of any emergency response operations, guaranteeing minimum overlap of roles and responsibilities and maximum effective utilization of available resources. A focal agency should be deployed as the principal coordinating body.

b) **Effective Logistics Managements:** It is critical in any disaster situation to quickly identify the resources needed, i.e., the response team equipment and commodities, as well as mobilize and transport them to the right place at the right time. Two major elements to make it happen are:

- **Time assessment and deployment list:** A prioritized list of the most critical resource requirements developed in advance of an event.
- **Movement coordination:** Acquiring transportation services and coordinating the transportation flow of resources in and around the flooded area using the prioritized list; continuously reporting on the movement of all transported resources into, within and out of the flood area; monitoring the floods effect on transportation systems and resolving routes or destination issues.
- **Level of Responsiveness of the Community:** The more aware the community is of the risks they face with regards to flooding and the actions to be taken, the more effective and significant the impact of the emergency response will be.

FORECASTING AND EARLY WARNING DISSEMINATION

As mentioned in the preparedness measures section of this chapter, flood warning messages should be appropriate and easily understood by the community and the officials who will perform response activities. They are formulated from the real time situation (information provided through flood monitoring, flood referencing, etc.)

One aspect of relief coordination and management that requires extreme caution and discretion is dealing with the media. When the impact of flooding overwhelms the ability of the local authorities and communities, signals should be sent out to the external players. This can be done through various media: from official government channels, to announcing the appeals on national television. In any case, care should be taken not to sensationalize the situation; only actual facts should be started with a specific call for help. Only then the external aid agencies can understand the need and offer the exact resources required.

Immediately after flooding, any damages to the important infrastructure should be repaired as soon as possible. The basic infrastructure that need immediate attention include:

- Electricity generation facilities and their networks
- Water distribution facilities as well as sewage system, drains, dams, levees and other protective water structures,
- Education facilities such as schools,
- Health facilities such as hospitals and clinics

- Religious facilities such as temples and pagodas
- Communications facilities
- Transportation facilities such as roads and bridges
- Damaged houses.

CAPACITY BUILDING AND ENHANCING THE INDIGENOUS KNOWLEDGE AND PRACTISES.

Regarding capacity building of stakeholders in flood mitigation, a careful analysis is needed of the variety of stakeholders, their respective interests, need, and gaps in skills, knowledge and capacities. The cost of education and capacity building programs need to be recognized as a maintenance cost of effective flood management, and be treated as such with respect to budget allocation.

Inventory of Resources for Flood Preparedness Planning

A resource inventory developed for flood preparedness planning identifies the availability of the following resources:

- Human resources – e.g. volunteers, firemen, medical professionals, skilled search and rescue workers.
- Material resources – e.g. transportation resources, communication resources, shelter and related resources, storage system, and medical system.
- Financial resources – e.g. emergency response funds held by local authorities for rapid dispersal at the time of a flood, and contribution from private sources.

3.4

Table 1: Risk profiling per LM

uMshwathi Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	High	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	High	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	Medium	Rare	1	Minor	2	2	Low
Strong wind	Natural	Summer	High	Possible	3	Minor	2	6	Medium
uMngeni Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	Medium	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	medium	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Mpofana Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	High	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	High	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	Medium	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Autumn	Medium	Possible	3	Minor	2	6	Medium

Impendle Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	high	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	Medium	Almost certain	5	Minor	2	10	High
Lighting	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Autumn	High	Possible	3	Minor	2	6	Medium
Msunduzi Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	high	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	high	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Autumn	High	Possible	3	Minor	2	6	Medium
Mkhambathini Local Municipality									
Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	high	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	high	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Autumn	High	Possible	3	Minor	2	6	Medium
Richmond Local Municipality									

Potential Hazards or Hazardous Events	Category	Peak Season	Vulnerability	Likelihood	Rating	Consequence	Rating	Risk Rating	Risk Profile
Flooding	Natural	Summer	High	Likely	4	Moderate	3	12	High
Heavy rainfall	Natural	Summer	High	Likely	4	Moderate	3	12	High
Lightning	Natural	Summer	High	Possible	3	Minor	2	6	Medium
Strong wind	Natural	Summer	Low	Unlikely	2	Minor	2	4	Low

1.1. Variables more susceptible to weather changes and flooding

The intent of Table 3 is to show the variables that are vulnerable to weather pattern changes and their vulnerability scales:

Table 2: Variables vulnerable to disasters

Vulnerability of various elements to different hazards within the area of jurisdiction of uMgungundlovu District Municipality									
Potential Hazards or Hazardous Events	Elements								
	populace	Animals	Agriculture	Drinking water	Roads	River	Hospitals	Houses	Schools
Flooding	High	High	High	High	High	High	Low	High	Low
Heavy rainfall	High	High	High	High	High	High	Low	High	Low
Lightning	Medium	Medium	No	No	No	No	No	Medium	No
Strong wind	Medium	Medium	Medium	No	No	No	Low	Medium	Medium

Table 3: Analysis of disasters and risk reduction strategies

HAZARD	LIKELIHOOD	IMPACT	POTENTIAL RISK	RISK REDUCTION STRATEGIES
Floods	Likely	Moderate	<ul style="list-style-type: none"> • Loss of life; • Loss of breadwinner and homemaker; • Severe injury ; • Loss to property; • Loss of crops; • Stock loss; and • Increased risk of diseases 	<ul style="list-style-type: none"> • Development of early warning system • Develop protocols for specific risks • Public awareness campaign • Upgrade and maintenance of infrastructure <p>NB: These are addressed through the municipality's Integrated Development Plan which have inputs from Sector departments</p>
Heavy Rainfall	Likely	Moderate		
Strong winds	Possible	Moderate		
Lightning	Possible	Moderate		

4. UMDM Family of Municipalities' Disaster Profile

4.1. uMshwathi Local Municipality (KZ221)

The uMshwathi LM faces very high risks ratings of severe storms and floods risk. It is possible or almost certain that one can expect flooding or severe storms to happen in these areas, namely wards 1, 2, 3, 4, 5, 7, 8, 9, 10, 12 & 13. Houses of poor standards and dwellings on steep hillsides (e.g. Ward 4, Emahlanzeni) make these areas vulnerable to floods and severe storms.

The risk rating of house and veld fires is also high because a large number of houses have thatched roofs. There is a shortage of fire hydrants or water filling points in many wards. There is a shortage of available resources and personnel in New Hanover Fire Station. Another cause of house fires is lack of information and overloading of electricity. There is prevalence of HIV&AIDS, TB and alcoholism in almost all the wards; hence the risk rating of epidemic human diseases is high. Road accidents happen frequently during festive season along R33 and R614 due to poor road conditions. The traffic unit of the uMshwathi Local Municipality does not have sufficient capacity or resources. Animal and plant diseases that occur but very rare in terms of frequency are sixer and Eldina. People are economically and socially vulnerable because of a lack of economic growth potential and high level of unemployment and poverty. The communities that are in urban areas are least vulnerable because there is a high level of both organizational preparedness and response capacity for possible disasters.

4.2. UMngeni Local Municipality (KZ222)

The main hazards faced by the uMngeni Municipality are house fires, veld fires, environmental pollution, transport accidents, severe storms and epidemic human diseases. The risk rating of severe storms and flooding is low. It is rare that one can expect flooding or severe storms to happen in areas / wards of uMngeni Local Municipality.

There is prevalence of HIV&AIDS, TB, malnutrition, children abuse, alcoholism, rape, theft, water contamination and lack of access to essential services, particularly in rural areas, semi-rural township(s) and informal settlements.

There is always a possibility that one can expect the risk of environmental pollution to happen. Areas with poor quality drinking water, poor sanitation and poor waste disposal management are most at risk of environmental pollution. The likely impacts of environmental pollution are loss of life and spread of diseases and the risk factors that increase the severity of environmental pollution are high level of unemployment, poverty, loss of self-respect and poor personal hygiene and nutrition. The capabilities or resources that exist to manage the risk are Qualified Environmental Health staff with standard operating procedures and response plans.

Midmar dam is the primary drinking water source to communities around Pietermaritzburg and Durban. Midmar dam is the top-end of the cascade of dams going down to Umgeni river system. It cascades down to Albert Falls dam to Nagel dam, and on from there to Inanda dam.

The semi-rural township of Mpophomeni lies in a valley about 12km south of Howick. Mpophomeni Township with its overloaded sewerage system is polluting Midmar dam and its rivers. Contamination of the Midmar dam would pose a great risk because of its key position.

Rob McCarthy (environmental lawyer), said poor water and sanitation management of Mpophomeni Township has already caused significant sewage seepage into the dam, Natal Witness, 03 June 2011.

Drains are blocked, rubbish has been thrown into manhole and broken sewerage pipes have been left unattended. The filth is carried to the dam by a small tributary. Condoms, sanitary pads and such likes flow through the water system.

DUZI uMngeni Conservation Trust (Duct) volunteer, Liz Taylor, said "Informal settlements and townships have no access to regular refuse removal and no landfill or dumping site near their homes. Consequently, they resort to burning rubbish or leaving it in the street, where it gets washed into the rivers by rain.

Siphumelele is a 357 low cost housing unit development, build 100 meters from the edge of Umgeni River. The failing sanitation and failing waste disposal management system as well as sewerage spill and flow into Umgeni River result into health risks.

Skomplaas, Zuzokuhle “Zoo”, Shiyabazali informal settlements are areas that are most at risk. Most people from these areas come from neighboring countries. The Lidgeton Community is also exposed to health serious health risks. There is no fixed clinic in Lidgeton area. The nearest clinic is in Balgowan about 20km north.

There are no toilets in Shiyabazali informal settlement. Skomplaas informal settlement is built in flood plain. Poor sanitation system in Skomplaas area poses serious health risks.

4.3. Mpofana Local Municipality (KZ223)

The main hazards faced by the Mpofana Municipality are floods, house fires, veld fires, environmental pollution, transport accidents, epidemic human diseases, snow, severe storms and lightning and thunderstorm. The risk rating of severe storms and flooding is very high. It is possible or almost certain that one can expect flooding or severe storms to happen in all the wards. Houses of poor standards and dwellings (particularly in Ward 4, Muden) make the area vulnerable to floods and severe storms.

People are economically and socially vulnerable because of a lack of economic growth potential and high level of unemployment and poverty. Road accidents happen frequently along N3. Roads in many wards are in poor conditions. The communities that are in urban areas are least vulnerable because there is a high level of both organizational preparedness and response capacity for possible disasters.

4.4. Impendle Local Municipality (KZ224)

The frequency of house fires is high because many houses have thatched roofs. It is likely or almost certain that one can expect flooding and severe storms to happen in wards 1, 2, 3 and 4.

Houses of poor standards and dwellings on steep hillsides make these areas vulnerable to floods and severe storms. There is prevalence of HIV&AIDS, TB and alcoholism in almost all the Wards. There is a shortage of resources and personnel at Impendle Fire Station.

4.5. Msunduzi Local Municipality (KZ225)

The vulnerabilities of Msunduzi Municipality include low literacy level, unemployment, poor building standards, high poverty level, low awareness and poor transportation facilities.

There is prevalence of HIV&AIDS and TB. In most cases the community members visit the local clinics and hospitals for medical attention against diarrhea, minor ailments, hypertension, diabetes mellitus, epilepsy and dog bites etc. There is 2 Community Health Care Centers within the area of jurisdiction of Msunduzi Municipality, namely, Imbalenhle and East-Boom Community Health Care Centers. The wards that comprise Imbalenhle CHC catchment area are 10, 13, 14, 15, 16, 17, 18, 19, 21, 22 and 23. The services offered by the Imbalenhle CHC include, but not limited to antenatal and postnatal clinic, chronic illnesses, IMCI, minor ailments, HIV management, emergency and family planning. Imbalenhle CHC attends on average \pm 22 000 people a month.

The staff complement at Imbalenhle CHC is 126. There is capacity of 1 Community Health Facilitator, 44 Professional nurses, and 6 enrolled nurses, 6 Nursing Assistants and 1 HIV & AIDS Councilor. The communities that are in urban areas are least vulnerable because there is a high level of both organizational preparedness and response capacity for possible disasters. Waste management was identified as one of the significant risks.

4.6. Mkhambathini Local Municipality (KZ226)

It is likely or almost certain that one can expect flooding or severe storms to happen in wards 1, 2, 3, 4, 5 and 7. The vulnerabilities of Mkhambathini Municipality include low literacy level, unemployment, poor building standards, high poverty level, low awareness and poor transportation facilities.

There is prevalence of HIV&AIDS and TB. In most cases the community members visit the local clinics for treatment against diarrhea, minor ailments, hypertension, diabetes mellitus, epilepsy, injuries resulting from stick fighting, snake bites, dog bites etc. There is a Community Health Care Centre in Ward 7 (Embo CHC).

The areas that comprise Embo CHC catchment area are Mpangisa, Gulube, Iqgulu, Madlanyoka, Okhalweni, Othiyeni, Ismont, Dwengu, Sdingani, Esigodini, Jilafohla, Mgwenyu, and Ngilanyoni. Currently the CHC operates more or less like a PHC. The population of Embo CHC catchment area is ±23 279. The services offered by the Embo CHC include, but not limited to antenatal and postnatal clinic, chronic illnesses, IMCI, minor ailments, HIV management, emergency and family planning. Embo CHC attend ± 5000 people a month. There is capacity of 7 registered nurses, 5 enrolled nurses, 1 HIV & AIDS Councilor and 19 CCGs at Embo CHC. There are 42 CCGs within the area of jurisdiction of Mkhambathini. The communities that are in urban areas are least vulnerable because there is a high level of both organizational preparedness and response capacity for possible disasters.

4.7. Richmond Local Municipality (KZ227)

The main hazards faced by the Richmond Local Municipality are floods, house fires, epidemic human diseases, veld fires, environmental pollution, transport accidents, severe storms and lightning and thunderstorm. The risk factors or vulnerabilities of Richmond Municipality include low literacy level, poverty, low awareness, inadequate health facilities and poor transportation facilities. The communities that are in urban areas are least vulnerable because there is a high level of both organizational preparedness and response capacity for possible disasters.

The underlying risk factors as well as prevention and mitigation strategies are given in the table below:

Physical factors	Economic factors
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<ul style="list-style-type: none"> • Water Services with poor reticulation network • Electricity overload • Sewerage system resulting to health risk • Road infrastructure with poor water drainage system increase accidents • Unsafe pedestrian crossing • Presence of animals on the roads • Oil and chemical spills mainly along the N3 • Water contamination • Poor building standards • Building in flood plains • Building next to railway lines • Power failure due to systems • Fallen trees and debris • Wetland destruction • Environmental degradation • Lack of appropriate spatial planning 	<ul style="list-style-type: none"> • Lack of economic diversification • Lack of economic growth potential • Lack of skilled • Lack of economic investment • Unstable social environment • Growth of unemployment • Lack of suitable and affordable land
Social factors	Prevention and Mitigation Strategies
<ul style="list-style-type: none"> • Rapid urbanization • Lack of access to essential services • Increase in communicable diseases • Uncontrolled pollution • Substance abuse • Low literacy • Theft/burglaries • TB • HIV & AIDS • Malnutrition • Children abuse • Rape • Bee stings, snake bites and dog bites • Urbanization 	<ul style="list-style-type: none"> • Develop early warning system on natural disasters such as floods, hailstorm & drought • Prevent forest fires by having fire breaks • LED programs • Upgrade and maintenance of infrastructure • Develop protocols for specific risks • Road sidewalk maintenance • Maintenance of landfill site • Public awareness campaigns • Replacement of old vehicles and machinery • Establish Rehabilitation Centres • Develop poverty alleviation strategies • Develop job creation programs i.e. cleaning campaign • Implementing of regular patrol

Some natural and non-natural hazards considered include:

Natural Hazards		Non-natural Hazards	
Meteorological	<ul style="list-style-type: none"> • Cyclone • Storm Tide • Severe storms • Bushfire • Heat wave • Flood • Tornado 	Human Caused	<ul style="list-style-type: none"> • Civil disturbance/riot • Bombing • Arson • Sabotage of essential services • Shooting massacre • Information technology virus/significant compromise

Geological	<ul style="list-style-type: none"> • Earthquake • Landslip and/or debris flow • Erosion • Tsunami 	Technical origin	<ul style="list-style-type: none"> • Bridge collapse • Failure in critical infrastructure • Hazardous material incidents • Transport accident • Industrial accident • Dam failure
Biological	<ul style="list-style-type: none"> • Epidemic human diseases, e.g. chicken pox outbreak • Animal and plant diseases, e.g. Foot and mouth diseases • Insects and vermin plague, e.g. locust plague, rat infestation • Food crop diseases, e.g. citrus canker • Emerging catastrophic diseases, e.g. avian influenza 		

5. Disaster Recovery Action Plan

The activities of disaster management will be considered in three stages of disaster, namely, pre disaster, during disaster and post disaster as follows:

	Pre Disaster These activities include preparedness to face likely disasters, dissemination of early warnings
Post Disaster These activities include recovery and rehabilitation programs in disaster affected areas	During Disaster These activities include quick response, provision of relief, and mobilization of search & rescue and damage assessment

5.1. Response to Major Disaster

Pre disaster

- Set up institutions, governance and functioning mechanism;
- Update past disaster events and analyze reasons and root causes for the disaster;
- Assess hazards, exposure, sensitivity, coping capacity and vulnerability to different disasters;
- Review human resources, equipment, fund and other resources situation available and required;
- Plan mitigation activities for short and longer terms to reduce underlying risks for individual hazards such as check dams, bridges, water supply, fire prevention measures;
- Plan preparedness, rescue and relief activities, and the resources and technologies needed;
- Raise awareness and train volunteers, communities and planners in the required skills and capabilities;
- Prepare relief materials, emergency shelters, rescue tools and equipment and operating mechanism;
- Establish early warning systems and communication mechanism that reach vulnerable communities;
- Organize preparedness meetings, orientations, and rehearsal exercises for rescue and relief; and
- Start contingency planning

During Disaster

- Inform vulnerable communities, mobilize volunteers and activate communication channel to inform as much as relevant stakeholders;
- Search and rescue, bring affected to shelter, organize treatment;
- Mobilize health workers maintain security, distribute relief material, provide counseling;
- Manage dead bodies (handing over to the relatives), document losses;

- Survey and assess situation of needs, supplies and manage resources to fill the gaps;
- Manage temporary shelter (include ensuring clean and accessible water and sanitation);
- Review situation and effectiveness of rescue and relief operation; and
- Keep record of lives lost during each operation and as well as effectiveness of the operation for future review

Post Disasters

- Survey in detail the losses, causes and future impacts, review pre and during disaster activities;
- Health and livelihood support to disaster victims;
- Resettlement and restoration of livelihoods of affected families;
- Reconstruct physical infrastructure like bridges, culverts and roads;
- Review of disaster management plans, strategies and policies where necessary; and
- Mitigation and preparedness activities for likely future events

5.2. Implementation Mechanism

5.2.1. District Disaster Advisory Forum

Disaster preparedness activities will be planned and decided upon by the District Disaster Advisory Forum. The District Disaster Advisory Forum comprises the following district authorities:

Head: Disaster Management

Members

- South African Police Services;
- Department of Transport;
- Department of Health;
- Department of Transport;
- Department of Public Works;
- Department of Agriculture, Environmental Affairs and Rural Department;
- Department of Social Development;
- Department of Human Settlements;
- Representatives of Local Municipalities;
- Non-Governmental Organizations (NGOs)

The meetings of the District Advisory Forum will be held on quarterly basis, when a disaster or major incident occurs, the district will activate all members of the forum to convene for a special meeting. Those members will form a Joint Operations Committee (JOC) to assess the situation and make prompt decision on provision of rapid and effective response to normalize the lives of the victims.

The communities pass on information on the likely occurrence of a disaster to the respective authorities or JOC. The magnitude of the incident will determine whether there is a necessity to convene a special JOC. The Head: District Disaster Management will coordinate the meeting and other logistics required for the committee to execute its tasks diligently.

During established disaster prone phases in the year, the Forum will meet as a preparedness measure and will oversee preparedness activities being implemented on the ground.

Once the Joint Operations Committee (JOC) deems magnitude of the incident to be beyond its management and capability, the committee shall activate the Provincial Disaster Management Centre (PDMC) and forward the report to the Provincial Disaster Management Centre (PDMC) to seek immediate support and appropriate provincial/national intervention.

On verification of the magnitude of the disaster, and the scale of response required, the Provincial Disaster Management Centre (PDMC) will mobilize resources to support the district, if the magnitude of the incident is beyond its management and capacity.

The Provincial Disaster Management Centre (PDMC) shall coordinate and facilitate with National Disaster Management Centre (NDMC) for classification and declaration with the intent to invoke Section 4 chapter 41 of the Disaster Management Act 57 of 2002. A comprehensive report about the incident will be submitted to National Disaster Management Centre (NDMC) for Classification and Declaration of Disaster.

The National Disaster Management Centre (NDMC) will have to confirm, classify and declare the incident whether it is a local, district & provincial disaster. This administrative process is duly for activation of disaster contingency funding to fast track response and recovery.

The role of various departments of the District is given under "Standard Operating Procedures". The Departments will keep in close contact and will coordinate their activities with those of their parent Departments at the provincial level and will keep the parent Departments informed of the situation and actions taken in case of District level disasters.

5.3. Standard Operating Hours

The following text can be adapted. However, the names and role of the stakeholders should be reviewed and corrected as necessary.

The Standard Operating Procedures (SOP) for various stakeholders in the District has been prepared with the objective of making the concerned persons understand their duties and responsibilities regarding disaster management at all levels.

All Departments and agencies shall prepare their own action plans in respect of their responsibilities, under the standard operating procedures for efficient implementation. The Standard operating procedure shall be

followed during normal times, warning stage, disaster stage and post disaster stage. Standard Operating Procedures for the relevant departments at the District level are listed below:

Head: Disaster Management

In the event of emergency situations, the Head: Disaster Management will coordinate among District level Officers of different Departments and non-governmental agencies. The Head: Disaster Management will perform the following duties:

<p>Normal Times</p> <ul style="list-style-type: none"> • Prepare District Disaster Management Plan and disseminate to different departments, agencies, volunteers and community groups. • Ensure basic facilities for personnel who will work at district level for disaster response. • Review the preparedness level in the district twice a year and advice corrective steps in case of any weakness. • Ensure preparation and maintenance of updated inventory of personnel, aid material and equipment. • Ensure training of teams of volunteers for disseminating disaster warnings to the field level and also for assessment, evacuation, search, rescue, relief and rehabilitation operations. • Ensure availability of communication and transport facilities for delivery of warnings and relevant material to field personnel. • Ensure that adequate budget provision is made available to implement disaster management operations. • Ensure drills on disaster preparedness by the people of disaster prone areas for acquiring knowledge and consciousness of such preparedness in coordination with concerned departments and agencies. • Identify high risk areas and populations and prepare vulnerability profiles, resource profiles and contingency plans for them. • Organize survey of buildings and installations for using as shelters/relief centres during disaster times. • Ensure state of readiness and operational status of facilities designated to serve as shelters. • Help Local Municipalities with additional resources for disaster preparedness, if necessary. • Arrange sufficient medical assistance for post-disaster medical treatment and control of contagious diseases and ensure stock of essential medicines.
<p>Alert and Warning stage</p> <ul style="list-style-type: none"> • Maintain contact with forecasting agencies and gather all possible information regarding the alert. • Ensure that all concerned in areas likely to be affected by imminent disaster receive warning signals and respond accordingly. • Inform members of District Disaster Advisory Forum. • Maintain contact with Provincial Disaster Management Centre. • Instruct all concerned to remain in readiness for responding to the emergency. • Advice concerned officials to carry out evacuations where required, and to keep transport, relief and medical teams ready to move to the affected areas at a short notice.
<p>During Disaster</p> <ul style="list-style-type: none"> • Convene meeting of District Advisory Forum. • Conduct Rapid Assessment and launch Quick Response. • Keep Provincial Disaster Management Centre informed of the situation.
<p>After Disaster</p>

- Organize initial and subsequent technical assessments of disaster affected areas and determine the extent of loss and damage and volume and nature of relief required.
- Keep the District Disaster Advisory Forum and the Provincial Disaster Management Centre informed of the situation.
- Ensure supply of food, drinking water, medical supplies and other emergency items to the affected people.
- Request Provincial Government for assistance if the District Disaster Advisory Forum deems the situation to be beyond the capacity of the District to manage.
- Visit, coordinate and implement of various relief and rehabilitation programmes.
- Coordinate the activities of NGOs in relief and rehabilitation programmes.

5.4. Inter-Departmental Roles

5.4.1. Department of Agriculture, Environmental Affairs and Rural Development

The Department of Agriculture, Environmental Affairs and Rural Development has a role in assessment of damage to agricultural crops and livestock, and impact of possible locust attacks. Their main role is to provide seeds and necessary planting material and other inputs to assist in early recovery.

Normal Times
<ul style="list-style-type: none"> ➤ Designate a focal point for disaster management within the Department. ➤ Identify areas likely to be affected. ➤ Organize distribution of seeds, seedlings, fertilizer and implements to the affected people. ➤ Arrange for keeping stock of seeds, fertilizers and pesticides. ➤ Select and earmark highlands for use as shelter for livestock during flash floods. ➤ Programme for vaccination for protection of livestock against contagious diseases. ➤ Prepare schemes for supplementary arrangements for rehabilitation of livestock and recouping their loss. ➤ Take up schemes for procurement of animal feed on emergency basis for distribution in the affected areas. ➤ Establish fodder bank schemes as security against fodder shortage for livestock due to disasters.
During Disaster
<ul style="list-style-type: none"> ➤ Monitor damage to crops and identify steps for early recovery. ➤ During floods arrange for the quick vaccination and treatment of livestock and poultry at shelter places. ➤ During prolonged droughts arrange for sustainability of livestock population.
After Disaster
<ul style="list-style-type: none"> ➤ Quantify the loss and damage within the quickest possible time and finalizes planning of agriculture rehabilitation. ➤ Ensure availability of adequate supply of seeds, seedlings, fertilizers, pesticides and agricultural implements. ➤ Arrange a rapid survey to assess the loss. ➤ Form and dispatch Veterinary teams with appropriate equipment and medicines to aid affected livestock. ➤ Arrange for disposal of dead bodies of animals. ➤ Implement all schemes for rehabilitation of livestock.

5.4.2. Department of Transport

During disaster situations, the Department of Transport will take steps to arrange for sending personnel and relief material to the disaster affected area, and relocate the affected people.

Non Disaster Times
<ul style="list-style-type: none"> • Designate one Liaison Officer of the Department as the Focal Point and inform all concerned.
Alert and Warning stage
<ul style="list-style-type: none"> • Identify and make inventory of transport vehicles, and ensure that they are all in good working condition. • Ensure availability of fuel, recovery vehicles and equipment. • Take steps for arrangement of vehicles for possible evacuation of people
During Disaster
<ul style="list-style-type: none"> • Take steps for transportation of relief personnel and material to affected areas. • Take steps for movement of affected people to safer areas. • Collate and disseminate information regarding fuel availability etc. to personnel operating in the field. • Launch recovery missions for stranded vehicles.
After Disaster
<ul style="list-style-type: none"> • Assess damage to transportation vehicles. • Take steps to ensure speedy repair and restoration of transport facilities.

5.4.3. Department of Public Works

The Department of Public Works has a vital role in provision and maintenance of public infrastructure.

Normal Times
<ul style="list-style-type: none"> • Designate one Liaison Officer in the Department as the Disaster Preparedness Focal Point. • Take precautionary steps for the protection of government property against possible loss and damage during disaster. • Formulate guidelines for safe construction of public works. • Prepare list, with specifications and position, of heavy construction equipment in the province. • Organize periodic training of engineers and other construction personnel on disaster resistant construction technologies.
Alert and Warning stage
<ul style="list-style-type: none"> • Instruct all officials at construction sites to keep manpower and materials prepared for protection and repair of public works.
During Disaster
<ul style="list-style-type: none"> • Provide assistance to the damage assessment teams for survey of damage to roads infrastructure. • Take steps to clear debris and assist search and rescue teams. • Provide sites for rehabilitation of affected population. • Collate and disseminate information regarding operational and safe routes and alternate routes, fuel availability etc. to personnel operating in the field. • Launch repair missions for damaged critical infrastructure and routes. • Take steps for prompt removal of uprooted trees on the roads.
After Disaster
<ul style="list-style-type: none"> • Carry out detailed technical assessment of damage to public works. • Assist in construction of temporary shelters. • Organize repairs of buildings damaged during the disaster. • Prepare detailed programmes for rehabilitation of damaged public works. • Arrange technical assistance and supervision for reconstruction works as per request. • Assess damage to transportation infrastructure. • Take steps to ensure speedy repair and restoration of transport links.

5.4.4. Department of Human Settlements

The Department of Human Settlements will prepare its own contingency plan for the maintenance of public infrastructure and identify safer places for relocation. The Department also plays an important role in developing appropriate national building codes and their proper implementation. In the post disaster phase, the Department will take adequate steps to undertake building damage assessment and promote reconstruction.

Normal Times
<ul style="list-style-type: none">• Designate one Liaison Officer as the Disaster Preparedness Focal Point.• Take precautionary steps for the protection of property against possible loss and damage during disaster.• Periodic training of engineers and other construction personnel on safe construction.• Identify and plan for rehabilitation locations for those living in disaster vulnerable areas.• Prepare building regulations for safe construction.
Alert and Warning stage
<ul style="list-style-type: none">• Coordinate with other development agencies for possible assistance in disaster affected areas.
During Disaster
<ul style="list-style-type: none">• Provide vital information to the Disaster Advisory Forum and relevant agencies in the field regarding status of available infrastructure that can be of use during relief operations.
After Disaster
<ul style="list-style-type: none">• Coordinate with concerned agencies for all reconstruction activities under rehabilitation programmes.• Arrange technical assistance and supervision for reconstruction works as per request.

5.4.5. Department of Social Development

The Department of Social Development will provide necessary help and assistance for socio-economic rehabilitation.

Normal Times
<ul style="list-style-type: none">• Designate a liaison officer as a focal point and inform all concerned.• Prepare special projects for socio economic uplifting the public towards disaster risk reduction.• Organize training programs for the public to cope with disaster situations.• Assist in provision of drinking water facilities near settlements.
During Disaster
<ul style="list-style-type: none">• Provide necessary help and assistance for social relief and socio-economic rehabilitation.• Establish relief camps for the public and ensure the fulfillment of basic needs of the District Communities in relief camps.• To take steps for safety of the affected population in general and women and children in particular, in disaster affected areas.• Provide counseling to the victims.
After Disaster
<ul style="list-style-type: none">• Prepare special programmes for the rehabilitation of affected Communities.

5.4.6. Department of Water Affairs

The Department is involved in disaster mitigation in relation to drought and floods, as they affect agricultural production, irrigation systems and water supply and management. Some of these mitigation activities include rehabilitation and management of watersheds and water catchment areas and enforcement of land use patterns. The role of the Department is critical for improving and expanding irrigation systems to cope with drought situations and manage flood problems.

Normal Times
<ul style="list-style-type: none">• Designate one Liaison Officer in the Department as the Disaster Management Focal Point.• Promote Watershed Development Programs• Develop Schemes for restoration/conservation of spring systems.• Ensure efficient management of flood forecasting and warning centers and improve procedure of flood forecasts.• Operate Flood Information Centre in the flood season every year.• Collect all the information on weather forecast, water level of all principal rivers flowing through the province.• Inform all concerned about daily weather news and issue regular press bulletins.• Take steps for strengthening of flood protection works and rivers before the flood season
Alert and Warning stage
<ul style="list-style-type: none">• Alert District Disaster Advisory Forum.• Since flash floods get triggered within short time-spans, take steps to alert all through telephone and wireless according to needs.• Mount watch on flood protection.
During Disaster
<ul style="list-style-type: none">• Open the Control Room in the Department.• Launch emergency repair operations for critically damaged flood protection works.
After Disaster
<ul style="list-style-type: none">• Take up sustained programmes for rehabilitation of flood protection works and springs.

5.4.7. Department of Health

The Department of Health has a responsibility in the reduction and prevention of suffering during natural and man-made disasters, as well as in the investigation and response to outbreak of communicable diseases.

Normal Times
<ul style="list-style-type: none">• Carry out and disseminate a risk evaluation of the population.• Develop a district plan on emergency preparedness and response within the health sector.• Develop policy framework for the department.• Ensure adequate availability of Emergency Health Kits in high risk areas• Train volunteers on emergency preparedness programmes such as first aid and preventive measure against diseases in disaster prone areas.• Prepare a list of medical and paramedical personnel in disaster prone areas and disseminate it to concerned administrators.• Establish and operate an early warning system for health threats based on the routine health information and in collaboration with other departments.
Alert and Warning stage
<ul style="list-style-type: none">• To ensure pre-positioning of Emergency Health Kits and Personnel.• Assess likely health impacts and share with District Disaster Advisory Forum for planning purpose
During Disaster
<ul style="list-style-type: none">• Mobilize medical teams and paramedical personnel to go to the affected areas as part of the Rapid Assessment and Quick Response Teams.• Provide medical assistance to the affected population.• Carry out technical assessment on health infrastructure availability and need.
After Disaster
<ul style="list-style-type: none">• Remain vigilant about outbreak /possibility of any epidemics and take effective steps against them.• Send report of health related activities in affected areas to the province for planning purpose.

DISASTER RISK MANAGEMENT AND PLANNING FOR HOSPITALS & HEALTHCARE FACILITIES

“The price we pay for the failure of hospitals or health facilities due to disaster is too high. In comparison, the cost of making hospitals, safe from disaster is tiny.

Disaster management to health system is a human tragedy, results in huge economic losses, deals devastating blows to development goals, and shakes social confidants.

Making hospitals and health facilities safe from disaster is an economic requirement, and also social, moral and ethical necessity.”

LEGISLATION

- National Health Act, Act 61 of 2004
- Disaster Management Act, Act 57 of 2002
- Disaster Management Framework of 2005

DISASTER CLASSIFICATIONS

- Internal:
 - Structural (Building, oxygen, Electricity, etc.)
 - Functional (Strike action, Surge of patients, CNBR, etc.)
- External
 - Floods
 - Mass Casualty Incidents
- Natural & Human induced disaster continue to strike and increase in magnitude, complexity and economic impact.
- Worldwide, the poor and socially disadvantaged groups suffer most from disasters and are usually least equipped to deal with them.

DISASTER RISK MANAGEMENT

- Hospital planning should ensure that interest groups within the drainage community are included in disaster risk management and preparedness plan:
 - Rural communities
 - Aged persons
 - Woman
 - Children
 - Disabled persons

- Mentally ill persons
- Refugees
- Homes for the aged
- Homes for the disabled
- Informal settlements

COMPREHENSIVE APPROACH

1. Prevention & Mitigation

- Vulnerability reduction and mitigation through programs such as socio-economic activities and addressing root causes.
- Regulatory and physical measures to prevent disasters from occurring or to mitigate their effects.

2. Preparedness

- Plans and programs, systems and procedures, training and education to ensure that when and if disasters do occur, resources (personnel and equipment) can be mobilized and deployed efficiently and effectively.

3. Response

- Actions taken leading up to and immediately after the impact of a disaster to minimize the effects, and to provide immediate rescue, relief and support to the community.

4. Recovery

- The long-term restoration and rehabilitation of an affected community. It's a complex and protracted process, taking many years. Recovery activities should be connected with prevention and mitigation.

INTEGRATED APPROACH

- Effective disaster risk management requires an active partnership between all relevant agencies and authorities.
- It means that all organizations with a role to play have to work together in MANAGING RISK REDUCTION. A cooperative and integrated working relationship is essential.
- The entire system needs to operate with a common goal; local up to national and vice-versa.

DISASTER MITIGATION IN HOSPITALS

- Improved design of new health care facilities
- Retrofitting of old healthcare facilities
- National policy & guidelines
- Hospital Disaster Preparedness Plan
- Testing the plan
- Revising & updating the plan
- Vulnerability Analysis

THE PLANNING PROCESS

STEP 1

Leadership resolves to plan

- The authority to develop an emergency preparedness plan within the healthcare facility should be established.

Step 2

Established planning committee

- Representatives of each hospital department.
- Representatives of the community health system including public health and mental health.
- External emergency services such as the Emergency Medical Services, South African Police Services, South African Military Health Service and Fire/Rescue Services, to name but a few.

STEP 3

Conduct hazard risk assessment

- Analysis of hazards (internal and external to the hospital)
- A detailed hospital vulnerability analysis to determine the scope and priorities for planning.
- Hazard risk assessments continue throughout the planning process and are constantly monitored and evaluated for any changes.

STEP 4

Set planning objectives

- Based on the results of the risk analysis.
- Identify the disaster management strategies agreed upon by the committee

STEP 5

Determine Responsibilities

- Sorting of the responsibilities of hospital departments and personnel.
- Other health agencies in the community (State, Private and NGO's)
- Tasks must always be allocated to people and organizations who are capable of carrying them out effectively and efficiently.

STEP 6

Analyze Resources

- Identify what a facility will require, rather than what it has.
- If a gap/s exist, the planning committee must identify sources of personnel and equipment which can be called upon speedily and efficiently.
- Mutual aid agreements with other health care facilities within the immediate area and/or region must be implemented.

STEP 7

Write the plan

- The document must be distributed to all who will use it, both internal and external role-players.
- The document must be simple and straight forward.
-Or people won't read it and/or understand it.

STEP 8 & 9

Train personnel – Test plans, personnel and procedures

- This is the critical foundation of emergency preparedness.
- Response activities will require personnel to function outside of their normal day-to-day roles and responsibilities and;
- To assume tasks with which they are less familiar and that must be carried out within a highly stressful environment.

STEP 10 & 11

Review and amend the plan

- Plans – must be tested, reviewed and updated on a regular basis (at least annually)
- Each time the plan – or part of the plan – is activated for an exercise or an actual event, identify improvements needed, etc (SWOT ANALYSIS)
- Planning is a DYNAMIC process; it never stops.
- The written plan is simply one outcome of the planning process, but it's not an end point, only a piece of the planning process.
- The written plan is a living document which must be constantly tested, reviewed and updated. NOT RESUSCITATED

NATIONAL HEALTH INCIDENT MANAGEMENT SYSTEM (BASED ON HMIMMS)

TRIAGE OFFICER
MISSION
Triage of patients in Emergency Centre according to protocol
IMMEDIATE ACTIONS
<ul style="list-style-type: none"> • Read action card • Wear ID Vest • Get briefing from Emergency Centre Medical Commander • Triage patients as they arrive, according to protocol.
RESPONSIBILITIES
<ul style="list-style-type: none"> • Preparation of areas to triage patients • Overall control of Emergency Centre triage • Liaise with Emergency Centre Medical Commander and Emergency Centre Nursing Commander.
WHEN YOU HAVE FINISHED YOUR TASKING, REPORT TO YOUR IMMEDIATE SUPERIOR.

5.4.8 South African Police Services

The South African Police Service is the representative of the South African Police Services in the District. This is one of the main departments to provide support to the Governor in dealing with disaster situation.

Normal Times
<ul style="list-style-type: none">• The Chief Police Commander shall be the Focal Point for the Department.• Impart training to the members of Police Force in first aid, evacuation, rescue and relief operations.• Identify the 'High Risk' and 'Risk' areas for different disasters and instruct the existing police installations located in those areas for keeping themselves in readiness for undertaking emergency rescue, evacuation relief operations.• Coordinate the wireless frequency of Police with the wireless network of other departments.• Train volunteers from among citizens and voluntary organizations.
Alert and Warning stage
<ul style="list-style-type: none">• Establish the Disaster Control Room at District level.• Arrange drills for fire extinguishing, rescue, evacuation and transportation of injured persons and prepare coordinated Action Plans in cooperation with concerned local agencies.• Maintain communications with the police installations in the areas likely to be affected by disaster.• Instruct all concerned to accord priority to disaster related wireless messages if required by appropriate officials.• On receipt of directives from the District Head of Department for evacuation - organize personnel and equipment for evacuation and undertake evacuation operations.
During Disaster
<ul style="list-style-type: none">• Carry out search & rescue operations.• Set up emergency evacuation shelters and transport affected people to the shelters.• Maintain law and order, especially during relief distribution.• Keep close watch for any criminal and anti-state activity in the area.
After Disaster
<ul style="list-style-type: none">• Arrange security of government property and installations damaged in a disaster.• Participate in damage and need assessment.• Coordinate with other offices of South African Polices Services for traffic management in and around damaged areas.• Assist the local administration in putting a stop to theft and misuse in relief operation.

5.4.9

SCHOOL SAFETY PLAN

Scope

The School Site Emergency Plan guides a coordinated school staff response to an emergency, disaster, or event and aids in directing emergency response activities toward reaching an agreed upon goal. School

Site Emergency Plan procedures are scalable in order to address incidents that may develop over time and those that may occur without warning.

Objectives

The objectives for the School Site Emergency Plan are as follows:

1. Protect the safety and welfare of scholars, school staff, and visitors.
2. Provide for a safe and coordinated response to emergencies.
3. Protect the District's facilities and properties.
4. Enable the District to restore normal conditions with minimal confusion in the shortest time possible.
5. Provide for the interface and coordination between sites and the District Department Operations Center (DOC).

CONCEPT OF OPERATIONS

National Incident Management System

The National Incident Management System (NIMS) is a comprehensive, national approach – applicable to all jurisdictional levels across functional disciplines – designed to improve the effectiveness of emergency management/response personnel across the full spectrum of potential incidents and hazard scenarios. NIMS is based on the premise that using a common incident management framework will give emergency management/response personnel a flexible but standardized system for emergency management and incident response activities.

Overview of NIMS

- A comprehensive, nationwide, systematic approach to incident management, including ICS, Multi-agency Coordination Systems, and Public Information.
- A set of preparedness concepts and principles for all hazards.
- A set of essential principles for a common operation picture and interoperability of communications and information management.
- A set of standardized resource management procedures that enable coordination among different jurisdictions or organizations.
- Scalable to enable its use for all incident (from day-to-day to large-scale incidents).
- A dynamic system that promotes ongoing management and maintenance.

PREPAREDNESS EFFORTS

Preparedness

Emergency preparedness at schools starts with school staff emergency preparedness at home. To ensure school staff are able to adequately respond to an emergency, disaster, or event, the following personal preparedness measures should be taken:

- Create a 72-hour emergency supply kit for the home.
- Create an emergency car kit / office kit, including comfortable clothes and shoes as well as medications.
- Develop a plan to reunite with family members.
- Develop a neighborhood preparedness program.

Responsibilities - District Responsibilities

In case of declared emergency by the superintendent during school hours, all students will be required to remain at schools, an alternate safe site under the supervision of the school principal/site manager or other school staff assigned by the principal/site manager or designee. Students will not be permitted to leave the school site until:

1. Regular dismissal time and only if it is considered safe to do so, or
2. An adult authorized by the parent or legal guardian whose name appears on the Student Emergency/Medical Information Card arrives to pick up the student. Additionally, please note the following:
 - a. If students are en route to school, they shall continue to school.
 - b. If students are on their way home from school, they are to continue home.

Drills - Fire Drills

The following standards must be met to ensure a successful fire drill:

- ✓ The Fire Alarm/Public Announcement can be heard and/or seen by all staff and students.
- ✓ Orderly evacuation begins immediately and is completed within minutes of the initial alarm, with minimal congestion at exit gates.
- ✓ Teachers and students will gather in an orderly fashion in pre-designated evacuation areas away from fire lanes.
- ✓ Teachers will take roll once in the evacuation area. Any missing students will be immediately reported to the Principal/Site Manager or designee.
- ✓ Upon sounding of the *all clear*, students and staff will return to their appropriate classroom and the teacher will take roll. Missing students must be reported to the principal/site manager or designee immediately.

EMERGENCY RESPONSE ROLES

Overview

In the event of an emergency, school personnel must be aware and familiar with their emergency response Roles and responsibilities. School personnel emergency response roles are identified and described in this Section. In those incidences involving localized emergencies normally concerning once school, the Crises Response Team (CRT) will be activated.

Emergency Response Team

The Site Emergency Response Team (ERT) is responsible for coordinating emergency response by all staff and students at the school site. The ERT organization, which is consistent with the statewide Standardized Emergency Management System (SEMS), is composed of the Command, Operations, Planning, Logistics, and Administration/Finance Sections. ERT functions will be activated to the extent required by the situation, and within the limits of available staff to fulfil each function. When necessary, available personnel may assume more than one role until additional personnel are able to respond. ERTs will remain in charge of the incident until relieved by emergency first responders.

Non-Instructional Staff

Non-Instructional staff members not assigned as ERT members will assist with emergency response duties as assigned by the School Administrator or designee. Teachers and child development center staff not assigned as ERT members are responsible for providing care and supervision of students; directing students in appropriate emergency procedures; sending students in need of first aid to the first aid station; calming frightened students; helping restore order; taking attendance; reporting missing and their last known location to the Search and Rescue Team; and assisting other staff and students as needed. Evacuation procedure will then be activated.

5.5. Disaster Mapping

During a disaster, all resources available with the government, as well as outside the government, shall be made available to the District Municipality for search, rescue and relief activities.

A compilation of available medical facilities, search and rescue facilities and evacuation centres within the District is given below.

Resource inventory is useful in quick retrieval of vital information regarding availability and sources of rescue and relief material and personnel during times of emergency. An inventory will be prepared and maintained through regular updating. Inventories will include the following basic elements, and other locally relevant information:

- Contact details of all personnel and organizations concerned with emergency management
- List, with specifications and availability procedures of all equipment that may be used for responding to an emergency. This will include communication equipment, transport vehicles, earth moving equipment, cranes, and tools etc. that are available from various agencies within the jurisdiction of uMgungundlovu District Municipality

5.6. Mitigation Activities Planning

Planning of mitigation activities should be made in the format of the example tables given below.

Mitigation activities actually eliminate or reduce the probability of disaster occurrence, or reduce the effects of unavoidable disasters. A precursor to mitigation is the identification of risks.

Disaster mitigation planning will comprise all activities that can be done for risk reduction. Mitigation measures can be structural or non-structural. Structural measures use technological solutions like flood levees. Non-structural measures include legislation and land-use planning.

Such activities that need to be undertaken by each Department should be identified and compiled. These activities can be planned after ascertaining the condition and status of infrastructure, equipment and manpower at the disposal of each department. The activities may include creation of any new infrastructure facility for risk reduction, repair, retrofitting or upgrading of existing infrastructures, procurement, hiring, or repairing of equipment; recruitment, hiring, and training of volunteers.

The detailed planning of the above activities will lead to the preparation of budget for disaster mitigation activities. The following activities need to be taken up for reducing the future impact of disasters:

- Roads and bridges or culverts
- Communication facilities (satellite telephones, mobile phone network)
- Health facilities
- Search and rescue facilities

- Flood control measures
- Disaster awareness through schools

(Details on the abovementioned requirements should be compiled in the format of the following tables.)

Mitigation activities (equipment and construction activities)				
Local Municipality	Type of activity	Material to be procured	Cost estimate	Reason for demand

Manpower requirement					
Type of personnel required	Number	To be recruited	To be made available from private	Volunteers	Estimated Expenditure

Information, Education, Communication materials					
Type of manual required	For whom	How many to be printed	How to be distributed	Estimated Cost	Remarks

5.7. Preparedness Activities Planning

Planning of preparedness activities should be made in the format of the example table given below.

Disaster preparedness is a broad concept that describes a set of measures that minimizes the adverse effects of a hazard including loss of life and property and disruption of livelihoods.

Disaster preparedness is best viewed from a broad perspective and is more appropriately conceived of as a goal, rather than as a specialized program or stage that immediately precedes disaster response. Disaster preparedness is a continuous and integrated process resulting from a wide range of activities and resources rather than from a distinct sectoral activity by itself. It requires the contributions of many different areas—ranging from training and logistics, to health care to institutional development. Preparedness can also take the form of ensuring that strategic reserves of food, equipment, water, medicines and other essentials are maintained in cases of national or local catastrophes.

Preparedness activities will comprise all activities that should be done to meet the response and immediate relief requirements in the event of a disaster. Such activities that need to be undertaken by each Department should be identified and compiled. The activities may include training, mock drills, evacuation, pre-positioning of relief materials, etc. The detailed planning of the above activities will lead to preparation of budget for preparedness activities.

A comprehensive disaster preparedness strategy would include the following elements:

- Hazard, risk and vulnerability assessments
- Response mechanisms and strategies
- Preparedness plans
- Coordination
- Information management
- Early warning systems
- Resource mobilization
- Public education, training, & rehearsals
- Community-Based disaster preparedness

All planning and implementation of disaster preparedness measures should be based on an assessment and prioritization of the hazards and risks that people face, as well as their ability or inability to cope with and withstand the effects of those hazards.

5.8. Emergency Response and Recovery Planning

The aim of emergency response is to provide immediate assistance to maintain life, improve health and support the morale of the affected population. Such assistance may range from providing specific but limited

aid, such as assisting refugees with transport, temporary shelter, and food, to establishing semi-permanent settlement in camps and other locations. It also may involve initial repairs to damaged infrastructure. The focus in the response phase is on meeting the basic needs of the people until more permanent and sustainable solutions can be found. Humanitarian organizations are often strongly present in this phase of the disaster management cycle.

The aim of the recovery phase is to restore the affected area to its previous state. It differs from the response phase in its focus; recovery efforts are concerned with issues and decisions that must be made after immediate needs are addressed. Recovery efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure.

The Departments should have detailed response plan in place for each type of disaster. The actions to be taken at different times and the responsible person within the District should be identified in the response plan. The response actions for such disasters that can be forewarned (e.g. flood) will start from 72 hours before the occurrence. The response actions for such disasters that cannot be forewarned (e.g. Earthquake) will start immediately after the occurrence of the disaster. The response planning should be prepared for each type of disaster.

5.9

DISASTER MANAGEMENT EVENTS FILE

DISASTER MANAGEMENT: CHECKLIST FOR EVENT FILE

NAME OF EVENT: _____

DATE: _____ **VENUE/STADIUM:** _____

CONTACT PERSON: _____

TEL. /CELL NO.: _____

RESPONSIBLE DISASTER MANAGEMENT CONSULTANT: _____

ITEM	FUNCTION	YES	NO
CLASSIFICATION/STATUS	High Medium Low		
Applications:	To comply with the Gatherings Act. Road closure helicopter landings Sign indemnity form		
	EMS – Fire Safety		
	Roads Agency Road Closure		
	Environmental Health Noise control		

	Food		
	SAPS Liquor License		
	CITY PARKS/SPORTS AND RECREATION Book Avenue		

ITEM	FUNCTION	YES	NO
NOTIFY:	Events Office Disaster Management And all other role players Mobilization		
APPROVAL:	SAPS		
	Parking Arrangements		
	Manpower		
	Tow Trucks		
	Other Assistance		
	Helicopter Landing		
	Permission		
	EMS Fire Safety Inspection		
	Marquee Tents/Stages inspected – Certificates issued		
	Fire Extinguisher Requirements		
	Fire Retardant/Drippings		
	Signage		
	Evacuation Routes		
	ENGINEERS REPORTS/CERTIFICATES to be handed over to Fire Safety		
	Marquee Tents		
	Stages		

	Electricity		
	Buildings		
	Sound system/other		
	Road closure		
	Signage		

ITEM	FUNCTION	YES	NO
APPROVAL CONTINUE	Environmental Health (Noise control)		
	Food Traders Licenses		
	Use of facilities/venue		
	SAPS		
	Liquor License		
Floor plan:	Event Layout/Water/Toilets Evacuation Routes, Overflow etc.		
Date of presentation	Book a date to present an overview at the JOC.		
Public Liability Insurance:	Amount: R		
Ticketing: IF ANY	Cut of Dates		
PROGRAM	Outlay of program		
	Need Cones		
	Barriers		
	Signage		

ENVIRONMENTAL HEALTH	Noise		
	Hygiene: Toilets etc. (Number of toilets & maintenance)		
	Food		

ITEM	FUNCTION	YES	NO
EMS – FIRE OPERATIONAL	Communications		
	Two-way radios		
	Medical – Response Cars		
	Ambulances		
	Medics on Bikes		
	Fire Engines		
POWER	Back-up Power available		
	Need Generators		
	Power Failure – Standby		
	Electrician Needed		
WATER	Sufficient Water		
	Need Water Sachets		
PIKITUP	Need – Clean-Up		
	Bins/Black Bags		
	Assistance		
	Sufficient Water		
	Sufficient Power		
	Availability of Medical Facilities		

	Drainage		
	PIKITUP Assistance		
TRANSPORT	Need Buses		
	Identification of buses/color codes		
	Luxury coaches/normal buses		
	Parking Arrangements		
ITEM	FUNCTION	YES	NO
Council VIP's	Was the Mayor invited?		
	Was the City Manager invited?		
	Other Council VIP's		
External VIP's	President		
	Ministers		
	What level of VIP's		
JOC/VOC	Full JOC/VOC		
	Mini JOC/VOC		
	Appoint a JOV/VOC Commander		
	Attendance Register		
	Incident reports to be completed on the day of the event.		
ADDITIONAL PARKING	Provision for overflow of vehicles/buses		
MEDICAL	Council		
	ER24		
	Netcare		
	First Aid Organization		
	Other		

	(Copy of the operational plan to be submitted to EMS)		
	INSPECTION (Council property only)		

ITEM	FUNCTION	YES	NO
SAPS INVOLVEMENT:	SAPS NATIONAL		
	SAPS PROVINCIAL		
	SAPS LOCAL		
	PROTECTION UNITS		
CHILDREN	LOST CHILDREN TENT		
	IDENTIFICATION OF CHILDREN – NAME TAGS		
	RESPONSIBLE PERSON TO LOOK AFTER LOST CHILDREN		
	AFTER EVENT SHELTER		
SECURITY	SECURITY PLAN		
	HAZARDS		
	LEVEL OF TRAINING		
	EVACUATION ROUTES		
	ASSEMBLY POINTS		
	MARSHALLS		
NOTIFICATION	Were businesses and communities informed of the event-taking place?		
SUBMISSION OF FILES TO:	DATE:		
	DISASTER MANAGEMENT		
	Event Office		
	Venue JOC/VOC		

	SAPS		
EVALUATION/DEBRIEFING DATE:			

**PLEASE TAKE NOTE THAT THIS DOCUMENT IS ONLY A GUIDELINE FOR EVENT PLANNING PURPOSES.
EVENT FILES TO BE COMPLETED IN FULL ACCORDING TO THE TABLE OF CONTENTS.
PLEASE DO NOT ANSWER YES OR NO ONLY ELABORATE?**

**DISASTER MANAGEMENT
INCIDENT / SITUATION REPORT**

DATE: _____ VENUE: _____

Role Player's No.	TIME	SITUATION / INCIDENT	SOURCE	OUTCOME	TIME – (Incident is finalized)	PROBLEM SOLVED YES/NO	Venue No.

ATTAEENDANCE REGISTER

NAME OF EVENT: _____ **JOC/VOC COMMANDER:** _____

DATE: _____

VENUE: _____

NAME & SURNAME	ORGANIZATION	CELL. NO.	FAX. NO.	SIGNATURE

6. Budget

Budget allocation estimate annually is at R3.2million.

7. Review and updating of the Plan

The District Disaster Management Plan will be reviewed and updated by _District Disaster Management Unit
The plan will be reviewed every year in the month of _May /June and updating of the District Disaster

Management Plan will be completed by 2022

8	GLOSSARY OF TERMS
Accreditation	The certification, usually for the particular period of time, of a person, a body or an institution, having met specific requirements to fulfill a particular function in the quality assurance system set up by the South African Qualifications Authority (SAQA).
Audit	A way of measuring the quality of products, services or processes that have already been delivered or undertaken.
Capacity	A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effect of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled persons or collective attributes such as leadership and management.
Capacity Building	Effort aimed to develop human skills or infrastructures within a community or organization needed to reduce the level of risk. It may also include the development of institutional, financial, political and other resources, sectors of the society.
Contingency Planning	The forward planning process from an event that may or may not occur, in which scenarios, objectives are agreed, managerial and technological actions defined, and potential response systems put in place to prevent, or respond effectively to, an emergency situation.
Criteria	Standards, rules, guides or tests against which a judgement or decision is based.
Development	A process for improving human well-being through reallocation of resources that may involve some modification to the environment. It addresses basic needs, equity and the redistribution of wealth.
Disaster	A natural or human-caused event, occurring with or without warning, causing widespread human, material, economic or environmental losses which exceeds the ability of the affected community or society to cope with its effects using only their own resources. A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of the disaster risk.
Disaster Operations Centre	A fully equipped dedicated facility within the disaster management center of a particular sphere. Such a facility must be capable of accommodating any combination of emergency and essential services representatives, including all relevant role players and stakeholders identified in response and recovery operations, when a local, provincial or national disaster occurs or threatening to occur.
Disaster Risk Management	The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impact of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to prevent or to limit (mitigation and preparedness) adverse effects of hazards.
Disaster Risk Reduction	The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risk throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impact of hazards, within the broad context of sustainable development.