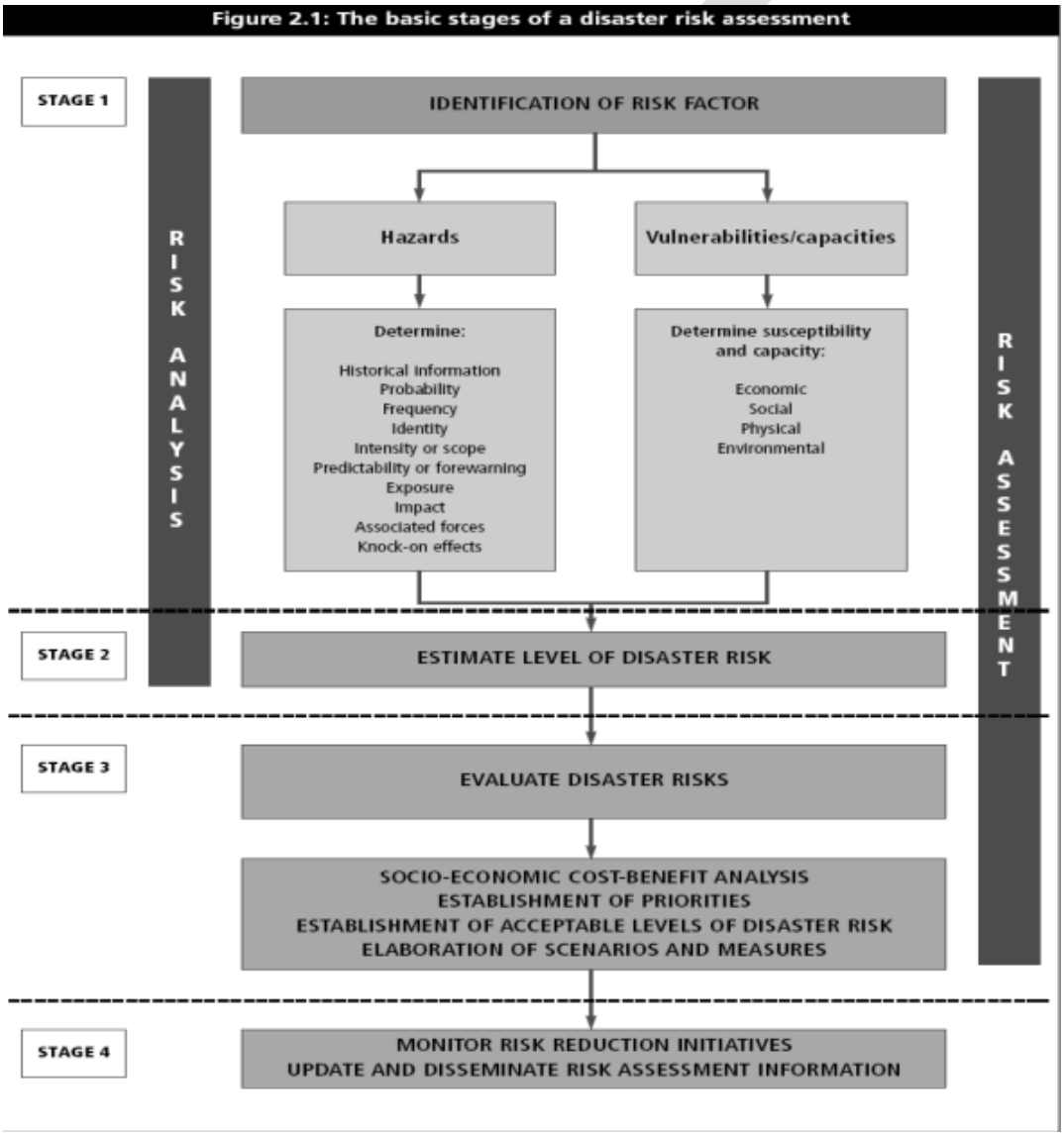
SP 11: Template for the Development of Specifications Required to Commission Disaster Risk Assessments for District Municipalities

Who should commission disaster risk assessments?

The following diagram from the NDMF explains the risk assessment process.

Diagram 1: The stages of a disaster risk assessment process



The first two stages of disaster risk assessments in the municipal sphere must be commissioned by the disaster risk management centre of the district municipality. The findings of these stages of the disaster risk assessment are very important, because they must be used to inform all

municipal vulnerability reduction planning as well as contingency planning for known priority risks necessary for achieving a Level 1 Disaster Risk Management Plan status.

Secondly, the findings of the first two stages will provide direction for conducting the following, more comprehensive stages (Stages 3 and 4) of the disaster risk assessment process. The findings of Stages 3 and 4 will, in turn, inform the development of specific risk reduction methodologies, development plans, programmes and initiatives as well as plans for the management of high-risk developments to be implemented by municipalities to achieve Level 2 and Level 3 Disaster Risk Management Plan status. The responsibility for commissioning the Stages 3 and 4 assessments will rest with a range of role players such as organs of state from the three spheres of government and the private sector.

Specification for conducting Stages 1 and 2 of a disaster risk assessment for the Waterberg District Municipality

Contents

1 Introduction and context

1.1 The purpose of conducting an assessment of disaster risk in the area of the Waterberg District Municipality

Severe flooding of the Cape Flats in June 1994 led to an urgent call for legislative reform of disaster risk management in South Africa. This resulted in an extensive consultative process that began with the drafting of a Green Paper in 1998 followed by the publication of a White Paper on Disaster Management in 1999 and culminating in the promulgation of the Disaster Management Act No. 57 of 2002.

In the context of this reform, the focus of government's disaster risk management policy has shifted from a reactive approach of only dealing with disasters after they have occurred, to that of reducing disaster risk by building resilience through developmental initiatives.

In this regard, the Disaster Management Act provides for an integrated and coordinated policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, ensuring rapid and effective response to disasters, and post-disaster recovery. It places primary responsibility on district municipalities for the implementation of these provisions in their areas of jurisdiction.

In terms of section 47 of the Disaster Management Act, the Waterberg District Municipality's disaster risk management centre is responsible for giving guidance to the relevant stakeholders to assess and prevent or reduce the risk of disasters by:

- determining levels of risk;
- assessing vulnerability of communities and households to disasters that may occur;
- increasing the capacity of communities and households to minimise the risk and impact of disasters that may occur;
- monitoring the likelihood and state of alertness to disasters that may occur;
- developing and implementing appropriate risk reduction methodologies;
- integrating such methodologies into development plans, programmes and initiatives; and
- managing high-risk developments.

The critical first step in ensuring effective and focused risk reduction planning is to commission a disaster risk assessment that will ensure that all the developmental initiatives and contingency plans and practices of the district municipality are risk-based.

In order to achieve this objective, the risk assessment process must correspond to the three levels of Disaster Risk Management Plans for municipalities described in the National Disaster Management Framework (Key Performance Area 3, section 3.1.1.2, pages 41–42), published in 2005. Refer to Annexure A, attached to this document, for a description of the three levels of

Disaster Risk Management Plans. Consequently, the disaster risk assessment will be conducted in two phases.

The first phase of the assessment process must take into account the requirements for a Level 1 Disaster Risk Management Plan. This entails conducting a risk analysis to identify priority risks, which will enable focused contingency planning and the development and implementation of operational plans for response and recovery activities that are associated with the priority risks identified. In addition, the findings must inform the strategic planning of the departments and other municipal entities in the Waterberg District Municipality and that of local municipalities and other municipal entities in the local municipalities in the district. In this regard, the findings should be used to facilitate developmental planning efforts, particularly those focusing on reducing vulnerabilities prevailing in the area and which place households, groups and communities at risk.

A further aspect to be addressed in this phase of the assessment process is the identification of high-risk developments, areas and communities which are categorised as 'high risk' due to their multiple vulnerabilities. The findings in this regard will then become the subject of specific in-depth comprehensive assessments to be conducted in the next phase.

1.2 Description of the working area

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Introduce the area under the jurisdiction of the district municipality by listing the local municipalities in the area and providing a description of the main towns, peri-urban settlements and rural settlements in the local municipalities.

In order to give the Service Provider guidance for the purpose of sampling, provide a breakdown of the number of municipal wards in the jurisdiction of each local municipality.

Provide a description of the prevailing circumstances in the municipality as a whole, including socio-economic status, a spatial and land-use overview and an overview of infrastructure, particularly in respect of housing, access to potable water, sanitation, electricity, storm water drainage, electricity and telecommunications. You may wish to add any other additional information at your disposal which you may consider to be of relevance.

2 Legal aspects

In the development of the disaster risk assessment for the Waterberg District Municipality, the Service Provider must ensure that the study is conducted and developed within the legislative framework for disaster risk management in South Africa and is consistent with the provisions of the Constitution of the Republic of South Africa Act No.108 of 1996, the Disaster Management Act (2002), the National Disaster Management Framework (2005), the disaster risk management

policy framework of the province concerned, the Local Government: Municipal Systems Act No. 32 of 2000 (known as the Systems Act), and any other relevant legislation.

2.1 Implications of flawed assessments

The Service Provider must take cognisance of the legal and other implications of producing a flawed assessment that contains incorrect or unverified risk assessment findings on which planning decisions will be made. The Service Provider must therefore ensure that the assessment is robust and that it can reliably inform risk reduction planning.

2.2 Data provision

In order to avoid duplication, the Waterberg District Municipality will make available to the service provider its own data as well as any other data at its disposal that may be of relevance to the disaster risk assessment or any aspect of it. Ownership and copyright of such data rests with the municipality and, where relevant, the government.

The copyright of the data shall not be infringed for the purposes of:

- correcting errors in the data set;
- derivative works in which the derived work(s) results in original work(s);
- research, private study, or personal or private use; and
- creating a backup copy.

2.3 Data ownership and data custodianship

This section must be customised to suit the needs of your municipality. Consider including a confidentiality clause here. Consult with the Geographic Information System (GIS) section of your municipality in this regard.

Also indicate who the custodian of the data will be. The custodian is usually the head of the disaster risk management centre.

2.4 Data exchange

Data to related this project may not be shared by the Service Provider with any third party for the duration of the project or thereafter.

2.5 Data management

The Service Provider will be responsible for:

- quality control and assurances of newly created datasets;

- the content and formats of such data;
- validation of such data;
- storage and security for the duration of the project, until final delivery of the project data; and
- maintenance and updates of metadata, until final delivery of the project data.

With reference to the set spatial resolution, as described in section 6 below on GIS requirements and specifications, the Service Provider must take into consideration the implications of including or excluding communities in terms of risks and vulnerabilities.

3 Project management and reporting

In compliance with section 2.4.2.1 of the National Disaster Management Framework, the Waterberg District Municipality will appoint a technical advisory committee (TAC) comprising nationally recognised specialists in hazard, risk and vulnerability assessments to assist with the evaluation of tenders, the monitoring of progress with the project and the validation and/or interpretation of the methods and findings generated.

The Service Provider must provide documented evidence that external validation has taken place. The external validation process must be completed before any reports or maps for planning purposes are generated.

3.1 Disputes

Any dispute arising between the technical advisory committee and the Service Provider will be dealt with in terms of a dispute resolution/arbitration clause included in the contract agreement to be concluded between the Waterberg District Municipality and the Service Provider before commencement of the project.

3.2 Reporting

The Service Provider must include in the project proposal a detailed account of the envisaged disaster risk assessment process, which should include exhaustive project management schedules reflecting specific deliverables linked to time frames, payment intervals, and reporting intervals.

3.3 Distribution of findings

The distribution of findings, outcomes, reports, minutes and other information or data created by the Service Provider may only be released or distributed in accordance with the instructions of the technical advisory committee and/or the Waterberg District Municipality's disaster risk

management centre. No information may be released to any stakeholder or role player without such prior approval.

The methods adopted for the approved distribution of information, findings and/or outcomes must take into account the capacity of relevant role players in respect of access to electronic media and must make provision accordingly.

3.4 User guides

The Service Provider must supply user guides for databases, the geographic information system (GIS), and any other components relating to the disaster risk assessment. User guides must be unambiguous and written in plain language. Where necessary, they must include instructions for making amendments and methods for updating databases, the GIS and other relevant components.

The Waterberg District Municipality reserves the right at any stage during the project and up to six months after the completion of the project to request (written) additional explanation on a particular deliverable. Such information must be supplied by the Service Provider within a reasonable period after the request.

The Service Provider must indicate how certain data should be interpreted. Wherever databases are incomplete or not statistically 'certain', this should be clearly stated, and the limitations of use should be clearly indicated.

The Service Provider must provide metadata as well as a data matrix of the origin of the data and who the custodians of the data are.

3.5 Review of the process and monitoring of results

The Service Provider must undertake to fully co-operate with the external validation process and the technical advisory committee.

The Service Provider must also include internal monitoring and validation mechanisms that are scientifically sound and consistent with generally accepted project management review methodologies. The Service Provider must indicate and fully explain the methods used in this regard.

Methods and conditions for conducting follow-up research must be included in the report. The Service Provider must be available for a reasonable period after completion of the project for questions relating to the data management system, the GIS, and associated research or assessments.

4 Consultation and stakeholder sensitisation

This section establishes the parameters for ensuring that the provisions in section 7(2)(f)(i–iii) of the Disaster Management Act are complied with.

4.1 Stakeholder consultation and interviews

The purpose of stakeholder consultations is firstly to ensure ground-truthing of the study through field consultations with communities at risk of the threats being assessed and secondly, to consult with appropriate end-users in respect of the design of the study.

The study must include field consultations with the following role players:

- Traditional leaders
- Ward committees and community members
- Community-based organisations
- Representatives of organised business and large industries and businesses
- Port and airport authorities
- Locally active, relevant non-governmental organisations
- Scientists and experts (such as, but not confined to, geologists, hydrologists, engineers, climatologists and economists)
- Other relevant role players who may be able to contribute to the outcomes of the assessment

Where appropriate, such consultations can take place through existing representative forums such as Integrated Development Planning structures and the Municipal Disaster Risk Management Advisory Forum.

The Service Provider must conduct interviews with relevant key stakeholders during each stage of the assessment. The purpose of such interviews is to gather information on the formulation of questionnaires and/or the implementation of the assessment as well as on the interpretation of the findings for the functional area of a particular stakeholder.

Interviews must be conducted with, but not confined to, the following stakeholders:

- Municipal councillors responsible for the disaster risk management portfolio
- Municipal manager/s
- Heads of municipal departments and other relevant municipal entities
- The head of the disaster risk management centre of the neighbouring district municipalities
- Disaster risk management personnel of the Waterberg District Municipality's disaster risk management centre
- Key institutional role players of local municipalities in the district
- Relevant national and provincial organs of state

- Emergency and essential services senior officials, for example emergency medical personnel, fire-fighters, police officials, representatives from hospitals, and defence force and traffic personnel
- Traditional leaders
- Relevant institutions of higher learning
- Community leaders

Assessment reports submitted by the Service Provider must show evidence of all consultations and interviews conducted.

4.2 Involving the local community in the disaster risk assessment process

To ensure the engagement of local communities and stakeholders, to promote understanding of disaster risk management and to transfer skills, the Service Provider must employ the services of the relevant community, community development workers, volunteers and, where relevant, students from local institutions of higher learning in the data collection process.

The Service Provider must ensure that project-specific training and the transfer of skills take place. Every effort must be made to ensure that data collectors are exposed to the continuum of data acquisition, capturing and visual representation.

The Service Provider can liaise with the head of the disaster risk management centre to establish contact with appropriate local groups for this purpose.

The Service Provider must make provision in the tender price for the costs associated with training, remuneration, travelling, subsistence and any other incidental expenses for the engagement of local data collectors.

4.3 Assessment of existing capacity in municipal departments and among other role players

The Service Provider must establish contact with all role players to sensitise them to the process and to obtain their co-operation. The Service Provider must conduct an exhaustive audit to ensure the identification of all relevant role players in accordance with the Disaster Management Act.

This part of the assessment should provide a clear overview of existing resources and the capacity of role players (in relation to their functional areas) to contribute to disaster risk management in the Waterberg District Municipality. Any gaps or lack of capacity to meet role expectations and responsibilities must be identified and appropriate alternate options must be recommended.

Furthermore, the Service Provider must present an overview of all existing (departmental, local and other) disaster risk management plans and their relevance and/or shortcomings in this

section of the assessment report. The report must indicate which aspects of existing plans can be incorporated into the new disaster risk management plan(s) and structures.

4.4 Definition of stakeholder roles and responsibilities

In order for the municipality to meet the requirements of section 47 and the relevant subsections of section 52 of the Disaster Management Act, the Service Provider must facilitate a process to ensure that the relevant organs of state, other municipal entities and role players are fully informed as to their roles and responsibilities in respect of disaster risk management for their functional areas.

Assistance and guidance must be provided by the Service Provider specifically to the heads of municipal departments as well as to key personnel in departments to enable them to identify their requirements with regard to the outcomes of the assessment for their functional areas.

4.5 Establishing contacts and building capacity

The Service Provider must ensure that the entire disaster risk assessment process is based on the principles of stakeholder participation and capacity building. As indicated in the next section (section 5), methods of investigation must include interviews and workshops with role players and contact sessions with other stakeholders, including traditional leaders and local communities. These contact sessions must be used as an opportunity to build capacity among the people of the Waterberg District Municipality.

At every opportunity the Service Provider must incorporate an introduction to the concepts of disaster risk management with particular emphasis on the shift in focus to disaster risk reduction. In cases where more than one meeting is being held with the same group or individual, the Service Provider must aim to build further understanding of disaster risk management concepts.

The goal of consultations must therefore be twofold: to collect data for the research, and simultaneously to build capacity among the people of the Waterberg District Municipality.

The Service Provider must apply the principle of capacity building throughout the process of the assessment.

5 Methods of investigation

The methodology adopted in conducting the disaster risk assessment for the Waterberg District Municipality must be consistent with that described in the National Disaster Management Framework (Key Performance Area 2: Disaster risk assessment, pages 25–38) and with the specifications provided in this document. The findings must provide the necessary direction to enable the Waterberg District Municipality and the local municipalities in the district to develop

and implement disaster risk management plans in accordance with the provisions of the Disaster Management Act and the National Disaster Management Framework (Key Performance Area 3: Disaster risk reduction, pages 39–53).

5.1 Scope of the assessment

In order to enable the Waterberg District Municipality to initiate and fast-track the development and implementation of disaster risk reduction and contingency planning, the disaster risk assessment process shall be conducted in two phases.

As indicated in section 1.1 above, the outcomes of this first phase of the assessment process must inform the first phase of the development of a Level 1 Disaster Risk Management Plan. Therefore, the assessment must show evidence of the following, which must be detailed in the assessment report.

- the development of contingency plans for known priority risks;
- the development of operational plans for all response and recovery activities associated with the priority risks identified;
- strategic developmental planning focused on vulnerability reduction and increasing capacity;
- the identification of developments, areas and communities that are at high risk due to their multiple vulnerabilities and accordingly will require strategic interventions in the next level of planning;
- the development of hazard and risk maps;
- the provision of information to populate the disaster risk management information system database and the resource database in particular. The information provided must include baseline data which will assist with determining the subcategories and variables to be taken into account when conducting rapid assessments of the impact of disasters on the following key categories:
    - human
    - social
    - physical (infrastructure)
    - economic
    - natural/environmental; and
- contribution towards the development and establishment of an early warning and emergency communication system for the municipality and communities at risk.

A graphic representation illustrating the planning components is included for information as Annexure B to this document.

The research and assessments should at all stages conform to the requirements set out below in sections 5.2 to 5.7.4.

5.2 Methodology

In conducting the research, the Service Provider must utilise various methods of investigation, including questionnaires, (general and in-depth) interviews, consultations with experts, workshops, transect walks, and so forth. Other methods can be randomly chosen (e.g. direct observation, children's drawings, historical profiling, etc.) according to the required outcomes. Specific attention must be given to the engagement of indigenous knowledge. The methodology for qualitative and/or quantitative research designs should be in accordance with scientific research principles that ensure trustworthiness and validity.

5.3 Ground-truthing

In order to correctly interpret and integrate historical facts, traditional knowledge and capacities, and past experience(s), the investigation must be ground-truthed to ensure that the assessment accurately reflects the situation 'on the ground'.

All data must be cross-checked according to scientifically sound methods.

5.4 Mechanisms for updating data

The report must include recommended methods and time intervals for the updating of all data gathered as well as an indication of the minimum level of skills required to conduct future updates or additions to the data.

5.5 Data gathering and integration

All data gathered by the Service Provider must be made available to all relevant role players who, in terms of the Disaster Management Act, have disaster risk management responsibilities. The making available of information should be in accordance with the requirements for the distribution of findings set out in section 3.3 above.

Any data gathered must be presented in a logical and clear manner. Databases must be consistent, easily understandable and user-friendly. The design of the databases must be documented for future reference and maintenance purposes. Databases must be easily updateable.

To facilitate the development of the disaster risk management information system, simultaneous geo-referencing should take place wherever possible.

The role of GIS must be specified in the methodology, as proposed by the Service Provider. Specific attention must be given to:

- the use of existing data;
- creating new datasets;

- applying formulae;
- filling out of questionnaires; and
- spatial analysis.

A data-flow diagram must be compiled and updated as the project progresses, in accordance with the research methodology. Any deviation and adjustment to the methodology must be motivated and indicated in the data-flow diagram.

5.6 Adaptation of methods of investigation according to outcomes

Although the original tender must be in line with the current reality in the Waterberg District Municipality, it is possible that in the process new data could emerge that may have an influence on the further development of the disaster risk assessment and on project planning. In this regard, the Service Provider must indicate any adjustments of or adaptations to project plans necessitated by the emerging data. This should however not have any financial implications or influence on the timing of the project.

5.7 Elements of the study

The disaster risk assessment must contain an exhaustive description of the levels of risk in the Waterberg District Municipality. It must determine the levels of risk by analysing and describing the potential hazards prevalent in the area and must assess the conditions of vulnerability that increase the chance of loss for particular elements at risk, including environmental, social, infrastructural, agricultural, economic and other elements that are exposed to a hazard and are at risk of loss. It must determine the levels of risk for different situations and conditions and must help to set priorities for action. It must also include a description of the available capacities to cope with those risks.

Disaster risk must be represented as a function of the following three aspects:

$$\text{Disaster Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity}}$$

The Service Provider must utilise a variety of methods of investigation to achieve a realistic and robust disaster risk assessment for the Waterberg District Municipality.

As stated in section 1.1 above, the disaster risk assessment is a process which must produce several outcomes. Sections 5.7.1 to 5.7.4 below give an overview of the outcomes expected from the Service Provider for each of the factors in the equation above.

In accordance with section 2.1.2 of the National Disaster Management Framework, the disaster risk assessment for a specific threat must answer the following questions:

- How frequently can one expect an incident or disaster to happen?

- Which areas, communities or households are most at risk?
- What are the likely impacts?
- What are the vulnerability or environmental and socio-economic risk factors that increase the severity of the threat?
- What capabilities or resources exist to manage the risk?
- Is the risk becoming more serious?
- Is the risk undermining development progress in the areas, communities and households it affects?
- If so, is the management of the risk a development priority?
- In the areas and communities affected by the risk, are there any other significant risks?

5.7.1 Hazard analysis

The findings of the hazard analysis must contain the following aspects:

- The findings must include the identification of all potential hazards to which the area of the Waterberg District Municipality could be exposed.
- The identified hazards must be classified in accordance with the uniform classification method described in Table 2.3 of the National Disaster Management Framework. This table is included as Annexure C in this document.
- Where possible, a quantified assessment of all the potential hazards identified in the study must be included to establish a prioritised list of specific known hazards, which will serve to inform contingency planning for the Waterberg District Municipality. The assessment must take into account probability of occurrence in a specified future time period, the intensity and area of impact, and any other relevant factors
- The hazard analysis must include an exhaustive description of each specific known priority hazard for the area as a whole, in respect of frequency, magnitude, speed of onset, geographical location of areas affected, and duration. In order to ensure uniformity, use should as far as possible be made of known hazard scales such as the Fujita / Beauford / Palmer Drought Index for the analysis of hazard probability / intensity / frequency.
- The results of the hazard analysis must include the presentation of hazard maps in GIS format.

5.7.2 Vulnerability assessment

The vulnerability assessment must describe and, where possible, quantify the vulnerability of people, infrastructure, services, economic activities and natural resources exposed to the hazard. The vulnerability assessment must cover the following categories:

- human/social;
- physical (infrastructure)

- economic; and
- environmental.

To provide indicators for the prioritisation of developmental planning for the district municipality, the vulnerability assessment for this phase of the disaster risk assessment must include:

- the identification of vulnerabilities commonly prevalent throughout the municipal area as a whole;
- an exhaustive description of these vulnerabilities;
- where possible, the quantification of these vulnerabilities; and
- GIS-format maps showing the identified vulnerabilities.

The findings of the vulnerability assessment must include the identification of highly vulnerable groups or categories such as the elderly, children and child-headed households.

The assessment must also identify, quantify and map, in GIS format, high-risk developments, including areas and communities with multiple vulnerabilities, which will be the subject of more detailed risk investigations in the next phase of the disaster risk assessment for the Waterberg District Municipality.

5.7.2.1 Common vulnerabilities

Common vulnerabilities refer to indicators that specify the vulnerability of a certain population in terms of its economical, social, environmental and physical vulnerability (sub-categories).

The Service Provider must identify and assess indicators that describe common vulnerabilities in relation to (a particular) hazard(s). Those indicators should be a valid, ground-truthed and scientifically sound description of a factor contributing to the vulnerability of areas, communities and households.

Common vulnerability indicators must be presented for the smallest demarcated geographical area, i.e. a municipal ward. Every ward must be awarded values according to the indicators, and a function of all the indicators should describe their 'total vulnerability' in relation to (a particular) disaster(s).

The resulting database (wards, indicators and resulting 'total vulnerability') must be represented on the GIS.

5.7.2.2 Multiple vulnerabilities

In preparation for the next stage of the disaster risk assessment, the report must identify areas and communities that are specifically at high risk. The assessment must indicate such areas and communities, their location, the specific hazard(s), and indicate which vulnerabilities contribute to the risk. The report must make recommendations on the type of expertise necessary to

participate in conducting more detailed and specific risk investigations, the results of which will inform the development and implementation of holistic disaster risk reduction programmes and projects to address the problem. The outcomes of the assessment must be represented in GIS format and must describe and fully motivate the methodology adopted.

In order to avoid future high-risk developments, the report must identify and propose methodologies for the assessment of future developments, and set minimum criteria for the identification of developments requiring assessment.

5.7.3 Assessing capacity

This element of the assessment embraces the following three aspects:

- institutional capacity;
- individual capacity; and
- societal capacity.

5.7.3.1 Assessment of institutional capacity

In conducting the assessment of existing infrastructure, the Service Provider must ensure that the assessment includes, but is not confined to, the gathering of information that will enable the Waterberg District Municipality to comply with the provisions of sections 16(1)(2), 17(2) and 46(1)(a–b) of the Disaster Management Act.

In addition, the assessment must include information gathered on the status of all other relevant infrastructure such as:

- key installations and other critical lifeline infrastructure;
- electricity supply and communications systems, including alternate sources in the event of a breakdown;
- information technology;
- water supplies, including distribution, dams, rivers and reservoirs;
- major roads and access routes, including bridges;
- the availability of stocks of emergency supplies such as water, food and blankets; and
- emergency and essential services and their capacity to contribute to disaster response and recovery activities such as other disaster risk management centres, policing and security services, fire services, private business institutions, non-governmental organisations and community-based organisations.

The information must be represented on (a) map(s) using GIS.

5.7.3.2 Assessment of individual and societal capacity

A livelihoods assessment using a variety of known techniques should be used to allow the Service Provider to identify and assess indicators that describe the capacity of areas, communities and households to use existing resources to withstand, cope and recover from unusual and adverse conditions as a result of significant events and/or disasters. Indicators should be a valid, ground-truthed and scientifically sound description of coping capacities.

Individual and societal capacity indicators should at least be presented on a ward level. Every ward should receive values according to those indicators, and a function of all the indicators should describe their 'total capacity' in relation to significant events and/or disasters.

The resulting database (wards, indicators and resulting 'total capacity') must be represented on the GIS.

5.7.4 Determining levels of risk

Levels of risk must be determined through a mathematical formula consistent with the scales and variables used to determine hazard, vulnerability and capacity. This formula must be scientifically sound and robust and must take into account the changing environment.

The risk must be represented on the GIS, at least at ward level.

6 GIS requirements and specifications

The purpose of using GIS in the context of this project is firstly to support the Service Provider in conducting the assessment. This implies that GIS functions will be required in all tasks, where appropriate. The second reason is that it serves as a management and decision making tool for disaster risk management in the Waterberg District Municipality.

It must be emphasised that GIS technology should not be used as a 'map-making tool' only, and that the Service Provider must be able to carry out at least the following functions:

- data sourcing;
- data capturing;
- data evaluation and validation;
- spatial analysis;
- map composition; and
- data management.

6.1 Data requirements

The Waterberg District Municipality will provide all GIS data that it has at its disposal. The legal implications with regard to data provision discussed in section 2 above must be noted. Before

commencing with any GIS work, the data provided by the Waterberg District Municipality must be assessed and evaluated in terms of the goals and objectives, as proposed by the Service Provider.

The following requirements apply:

- All data capturing must be conducted on a ward level.
- The input data for all maps generated during the course of the project must be specified.
- All changes to existing datasets must be specified and reflected in the meta database.
- All datasets must conform to sound database principles, e.g. datasets must be free of duplicate features or records.

6.2 Technical requirements

The following data formats are specified:

- **Spatial data**
  - File format Portable GIS format across different platforms.
  - Projection Transverse Mercator.
  - Datum Hartbeeshoek Lo 27 (WGS84).
- **Metadata**
  - XML file, selected metadata fields requiring population to be agreed upon during project start up.

7 Deliverables

The final project deliverables must include the provision of the items outlined below.

7.1 Database for the disaster risk management information management system

A comprehensive database must be designed and populated in accordance with sections 16, 17, 46, 47 and 48 of the Disaster Management Act and the National Disaster Management Framework.

In order to facilitate the development of the disaster risk management information management system required by the sections of the Act referred to above, simultaneous geo-referencing should wherever possible routinely take place during the data collection process.

7.1.1 Spatial data

Spatial data must be provided for at least the following:

- all newly created data used as input for the assessment;
- all newly created data resulting from the assessment; and
- base data provided by the Waterberg District Municipality and which has been updated.

7.1.2 Alpha-numeric data

Alpha-numeric data must be provided for at least the following:

- all attribute data associated with geographic features; and
- all attribute data used as input for applying formulae.

7.1.3 Metadata

Metadata must be provided for at least the following:

- existing data obtained from the Waterberg District Municipality;
- all newly created spatial data;
- all newly created alpha-numeric data; and
- all changes and updates to existing data.

7.2 Maps

An electronic version of each final map must be provided in either PDF or JPG format.

7.3 Media

Copies of all final electronic deliverables must be provided on Digital Video (Versatile) Disks (DVDs), clearly marked for content, date and version together with two hard copies.

7.4 Roles and responsibilities

In terms of the definition of a data custodian, the Waterberg District Municipality will be responsible for data maintenance and upgrading.

The Service Provider is required to prepare a strategic implementation document, which must:

- fully describe the product as delivered to the Waterberg District Municipality;
- describe and recommend actions that need to be carried out in terms of the updating of data; and
- state the possibilities and restrictions with regard to data changes and updates.

8 Interface between disaster risk assessment findings and the disaster risk management planning process

The Service Provider must at all times maintain close co-operation with the Municipal Disaster Risk Management Advisory Forum of the Waterberg District Municipality and the technical advisory committee. Progress reports and findings of this project must be presented to the advisory forum for consultation and comment. The comments and recommendations of the advisory forum must be taken into consideration, and relevant amendments and/or adaptations must take place accordingly.

8.1 Contingency plans for priority risks

The Service Provider must ensure that the findings of the assessment will facilitate the development of risk-based contingency plans for the priority risks identified in the study by the relevant role players in municipal departments and other municipal entities of the district municipality and in local municipalities (including municipal departments) and other municipal entities of local municipalities in the district.

8.2 Integration of findings into the IDP to address vulnerabilities

The report must include recommendations in respect of priorities for developmental projects and programmes to address the most prevalent common vulnerabilities for inclusion in the IDP.

9 Special financial provisions

Provision must be made by the Service Provider in the tender amount to cover all logistical costs associated with stakeholder consultation, data collection and capacity building.

10 Glossary of terms and core concepts used in this document[1]

Capacity – A combination of all strengths and resources available within a community, society or organisation that can reduce the level of risk or the effects of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled personnel or collective attributes such as leadership and management.

[1] Sources:

- United Nations – International Strategy for Disaster Risk Reduction (UNISDR). 2004. *Living with risk. A global review of disaster reduction initiatives.*
- Department of Provincial and Local Government, Republic of South Africa. 2005. *National Disaster Management Framework*.

Capacity building – Efforts aimed to develop human skills or societal infrastructures within a community or organisation needed to reduce the level of risk. It may also include the development of institutional, financial, political and other resources, such as technology, at different levels and sectors of society.

Coping capacity – The means by which people or organisations use available resources to face adverse consequences that could lead to a disaster.

Disaster risk – Disaster risk refers specifically to the probability of harmful consequences or expected losses (deaths, injuries, property, livelihoods, disrupted economic activity or environmental damage) resulting from interactions between natural and human-induced hazards and vulnerable conditions. Conventionally risk is expressed as Disaster Risk = Hazard x Vulnerability.

Disaster risk management – The systematic process of using administrative decisions, organisation, operational skills and capacities to implement policies, strategies and coping capacities of the society and community to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities including structural and non-structural measures to avoid (prevention) or to limit (mitigation) adverse effects of hazards.

(Disaster) risk assessment – A process to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.

Disaster risk reduction (disaster reduction) – The conceptual framework of elements considered with the possibilities to minimise vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards within the broad context of sustainable development.

Hazard – A potentially damaging physical event, phenomenon and/or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (hydrometeorological and biological) or human-induced processes (environmental degradation and technological hazards). Hazards can be single, consequential or combined in their origin and effects. Each hazard is characterised by its location, intensity, frequency and probability.

Hazard analysis – Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behaviour.

Vulnerability – The degree to which an individual, a household, a community, an area, or a development may be adversely affected by the impact of a hazard. Conditions of vulnerability

and susceptibility to the impact of hazards may be determined by physical, social, economic and environmental factors or processes.

ANNEXURE A: Levels of Disaster Risk Management Plans

To address the wide range of disaster risk management planning capabilities, the National Disaster Management Framework provides for a phased approach to disaster risk management planning and implementation. It comprises three progressive steps from a Level 1 Disaster Risk Management Plan to a Level 3 Disaster Risk Management Plan.

The completion of each level of disaster risk management plan will yield indicative information about common vulnerabilities in communities, local areas or provinces. This information should be incorporated into IDP planning processes and projects.

The requirements for each level of disaster risk management plan and the steps to be taken in developing the different levels are detailed in priority guidelines in the *South African Disaster Risk Management Handbook Series*, published by the National Disaster Management Centre (NDMC) and distributed to all stakeholders. The implementation of these plans forms an integral part of the implementation strategy of the Disaster Management Act.

Level 1 Disaster Risk Management Plan

A Level 1 Disaster Risk Management Plan applies to national or provincial organs of state and municipal entities that have not previously developed a coherent disaster risk management plan. It focuses primarily on establishing foundation institutional arrangements for disaster risk management, putting in place contingency plans for responding to known priority threats as identified in the initial stages of the disaster risk assessment, identifying key governmental and other stakeholders, and developing the capability to generate a Level 2 Disaster Risk Management Plan.

Level 2 Disaster Risk Management Plan

A Level 2 Disaster Risk Management Plan applies to national, provincial and municipal organs of state that have established the foundation institutional arrangements, and are building the essential supportive capabilities needed to carry out comprehensive disaster risk management activities. It includes establishing processes for a comprehensive disaster risk assessment, identifying and establishing formal consultative mechanisms for development of disaster risk reduction projects and introducing a supportive information management and communication system and emergency communications capabilities.

Level 3 Disaster Risk Management Plan

A Level 3 Disaster Risk Management Plan applies to national, provincial and municipal organs of state that have established both the foundation institutional arrangements for disaster risk management and essential supportive capabilities. The plan must specify clear institutional arrangements for coordinating and aligning the plan with other governmental initiatives and plans of institutional role players. It must also show evidence of informed disaster risk

assessment and on-going disaster risk monitoring capabilities as well as relevant developmental measures that reduce the vulnerability of disaster-prone areas, communities and households.

The National Disaster Management Framework foresees that within two years of the commencement of the Disaster Management Act, all national, provincial and municipal organs of state will have submitted to the NDMC, at a minimum, Level 1 Disaster Risk Management Plans. Within three years of the commencement of the Act, all national, provincial and municipal organs of state will have submitted, at a minimum, Level 2 Disaster Risk Management Plans. Within four years of the commencement of the Act, all national, provincial and municipal organs of state will have submitted Level 3 Disaster Risk Management Plans.

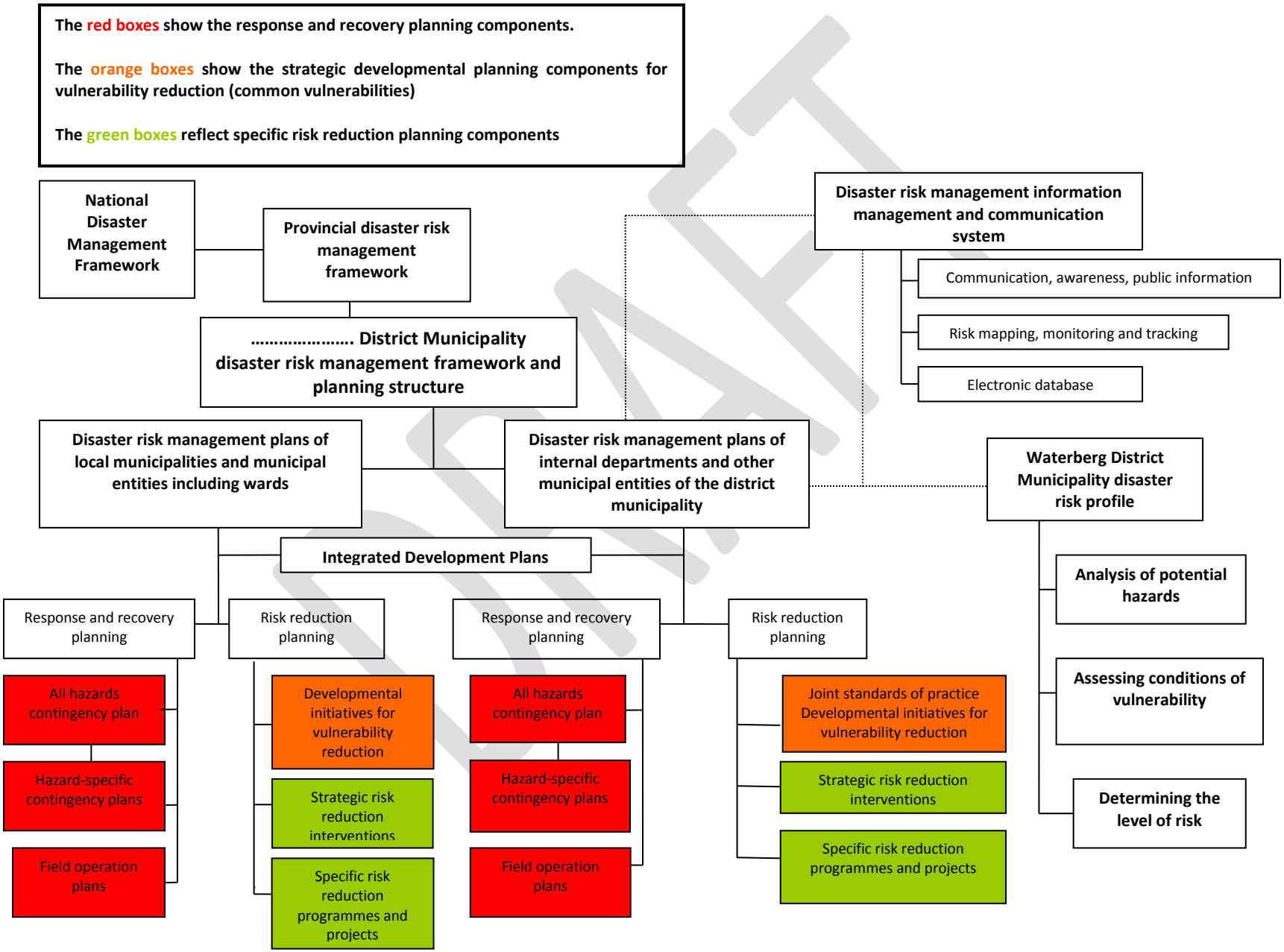
National, provincial and municipal organs of state must specify which one of the three specified disaster risk management planning levels is most appropriate for their respective capabilities, experience and functional responsibilities. They must also indicate proposed steps that will allow progress to more advanced planning levels.

ANNEXURE B: The relationship between disaster risk management policy frameworks and disaster risk management plans across the spheres of government

The diagram below provides an illustration of the various components of disaster risk management plans for a district municipality. Note the following:

- The red text boxes show the response and recovery planning components. These components will be informed by the findings described in section 5.7 of this specification.
- The orange text boxes reflect the strategic developmental planning component for vulnerability reduction (common vulnerabilities). This component will be informed by the findings described in section 5.7 of this specification.
- The green text boxes in the diagram reflect specific risk reduction planning components. These will be informed by the findings described in section 5.7 of this specification.

Diagram 2: The municipal disaster risk management policy framework and disaster risk management plans across departments and between the district and local spheres



ANNEXURE C: Classification of Hazards

TABLE 2.3: CLASSIFICATION OF HAZARDS	
NATURAL HAZARDS	**EXAMPLES**
Geological	Landslides, rockslides, liquefaction, subsidence
Biological	Epidemic diseases affecting people or livestock, veld fires, plant infestations
Hydrometeorological	Floods, debris flows, tropical cyclones, storm surges, severe storms, drought, desertification
TECHNOLOGICAL HAZARDS	**EXAMPLES**
	Industrial pollution, nuclear activities, toxic waste, dam failure, transport accidents
ENVIRONMENTAL HAZARDS	**EXAMPLES**
Environmental degradation	Land degradation, deforestation, loss of biodiversity