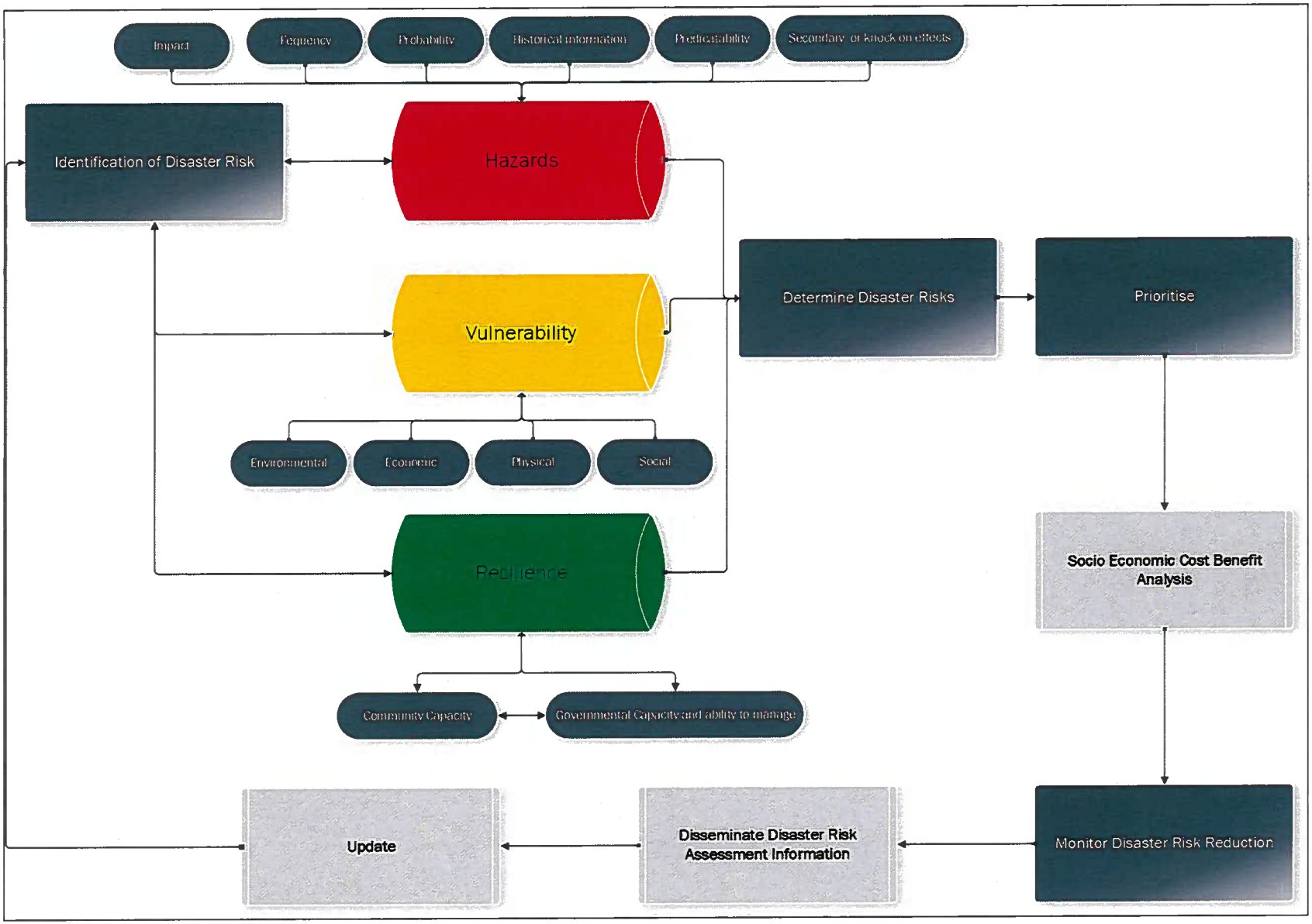

Figure 10:The basic stages of disaster risk assessment

The risk profile for the Sundays River Valley Local Municipality is based on the data received and analysed from the workshop consultations, as well as the base data (including reports) collected during the study and from the Aurecon Disaster Risk Assessment concluded in November 2017. The data collected from the stakeholders was evaluated against the risk assessment results from the Aurecon Disaster Risk Assessment of 2017.

The prioritised risk profile for the Sundays River Valley Local Municipality is based on the data received from the Aurecon Report. The stakeholder perception data and local resilience information was considered and brought into context with the current set of perceived and real disaster risks. The Risk Prioritization for the Sundays River Valley Local Municipality is shown below. Please refer to the detailed disaster risk assessment report 2017 for more details pertaining to the district and local municipal disaster risks.

The following table contains the summarised results of the disaster risk assessment for Sundays River Valley Local Municipality.

Table 6: : Prioritized risks for the Sundays River Valley Local Municipality (Aurecon South Africa (Pty) Ltd, 2017)

Local Municipality	No	Disaster Risk
Sundays River Valley Local Municipality	**1**	Flood
	2	Air Pollution
	3	Drought
	4	Heat Wave
	5	Sewerage and Drainage
	6	Water Pollution
	7	Service Disruption
	8	Illegal and Uncontrolled Solid Waste Disposal
	9	Road Incident
	10	Severe Storms

The Municipal Disaster Risk Assessment (2017 report) has more information on priority risks.

5. Chapter 5: Disaster Risk Reduction

In terms of Section 26(g) of the Municipal Systems Act, 200, Act 32 of 2000, a Municipality's IDP must contain a disaster management plan. Development projects in the Municipality, as contained in the Municipality's IDP, is thus interlinked with disaster management planning and activities. Risk reduction projects identified as part of disaster risk management planning, such as those identified in this plan and the contingency plans and risk assessment should be included into the District and Local Municipal IDP's.

There are eight key planning points or requirements that must be applied by all municipal organs of state and municipalities when planning for disaster risk reduction initiatives. These must form part of the annual reporting of the municipalities and municipal organs of state to the Sundays River Valley Local Disaster Management Centre / Office.

1) Use the disaster risk assessment findings to focus planning efforts;
2) Establish an informed multidisciplinary team with capacity to address identified disaster risk and identify a primary entity to facilitate the initiative;
3) Actively involve the communities or groups at risk;
4) Address identified vulnerabilities in the municipal area wherever possible;
5) Plan for changing risk conditions and uncertainty, including effects of climate variability;
6) Apply the precautionary principle to avoid inadvertently increasing disaster risk;
7) Avoid unintended consequences that undermine risk avoidance behaviour and ownership of disaster risk; and
8) Establish clear goals and targets for disaster risk reduction initiatives, and link monitoring and evaluation criteria to initial disaster risk assessment findings.

Several hazard specific risk reduction project proposals are included in the Sarah Baartman Disaster Risk Assessment (page 404) (Aurecon South Africa (Pty) Ltd, 2017). The following list is an extract from this list

Table 7: Risk reduction project proposals

No	Hazard	Risk reduction project proposals
1	Flood	1. **Physical planning**: poor physical planning causes flooding but where adequate drainage channels are constructed and ongoing maintenance the problem of flooding reduces. 2. **Engineering & Construction**: engineering design and safety standards should be incorporated to assure structural integrity of buildings. 3. **Economic Measures**: address flood related financial needs & investing in forecast-based financing of risk reduction and preparedness measures as climate changes might increase in the future. 4. **Management & Institutional**: in order to achieve ideal flood forecasting and warning systems, cooperation involving stakeholders is necessary. For example SA Weather Services can provide specific advisory services to local communities establishing flood warning systems. 5. **Societal Measures**: traditional and indigenous practices of coping with floods are as important and vital as the modern approaches. Local knowledge approaches should be investigated as it is also the most valuable asset for flood management planning.

No	Hazard	Risk reduction project proposals
10	Air Pollution	1. **Physical planning measures**: develop & implement strategies for land-use planning aimed at improving local air quality. 2. Engineering & construction measures: spatial planning projects that can provide more sustainable transport links between the home, workplace, education, retail & leisure facilities, & identify appropriate locations for potentially polluting industrial development. 3. **Economic measures**: study, understand & implement economic policy instruments such as pollution fees, taxes or emissions trading systems which can lead to the economically most effective abatement allocation. 4. **Management & institutional measures**: Policies that promote high quality building standards, reduce energy use, and require the preparation of low emissions strategies, to help reduce local emissions of air pollutants. 5. **Societal measures**: develop programs and initiatives of air quality interventions that are socially acceptable.
2	Drought	**1. Physical planning:** limit evaporation from swimming pool and other man-made water bodies through implementing appropriate physical planning measures and by-laws. Study and understand the impact of climate change on development. Promote awareness and cultivation of drought resistant crops. Build proper storage and preservation facilities by agricultural produce. 2. **Engineering & Construction:** Monitor observation and production boreholes. Implement water pressure management systems to reduce water network losses. Finding and repairing underground water leaks (on going). **3. Economic Measures:** address drought related financial needs through operating budgets & forecast-based financing of risk reduction & preparedness measures. Introducing the stepped tariffs system of billing. Facilitate affordable and accessible insurance for emerging businesses and small-scale farming communities. 4. **Management & Institutional Measures:** appoint a drought task team with a focus on establishing a multidisciplinary team of stakeholders and securing partnerships. Establish clear drought planning purposes and objectives. **5. Societal Measures**: capacitate rural & urban communities to identify areas where water losses and leakages can and do occur and provide an efficient reporting process. Develop awareness training and workshops in high risk areas. Develop & inform communities of response actions to early warning systems.
26	Sewerage and Drainage	1. **Physical planning measures**: implementation of the Urban Planning & Management Strategy. Investing into a project perhaps that have three components, (i) drainage, (ii) wastewater management & sanitation, and (iii) capacity building. 2. **Engineering & construction measures**: ensures that wastewater pumping stations & treatment plants should be protected against flooding. Every treatment plant must be so positioned that it is not subject to flooding or is otherwise protected from flooding & has all weather road access. 3. **Economic measures**: planning funds & grant programs for post-disaster restoration.

No	Hazard	Risk reduction project proposals
		4. **Management & institutional measures**: develop a District Environmental Legal Framework, including those for ambient water quality & wastewater discharge guidelines & standards 5. **Societal measures**: public participation is a key part of the development of the urban planning & management strategy from which the above project emerge.
7	Water Pollution	1. **Physical planning**: develop and maintain control measures for effective curbing of water pollution resulting from pollutants seeping into rusted galvanized iron pipes, flood/underground seepage of human and material wastes. 2. **Engineering & construction measures**: 3. **Economic measures**: Providing incentives for environmentally sound behaviour, raising revenue to help finance pollution control activities 4. and ensuring that water quality objectives are achieved at the least possible (overall) cost to society. 5. **Management & institutional measures**: develop a Water Pollution Control Compliance on Construction Sites for Resident Engineers Policy. Ensure compliance with this policy. Adapting practices such as organic farming and integrated pest management could help protect waterways. Develop Wastewater discharge regulation. 6. **Societal measures**: develop intervention projects pertaining to environmental hazards are often more sustainable if they address the driving forces behind pollution at the community level.
6	Service Disruption	1. **Physical planning measures**: establish spatial planning for the environment, investment and project decisions. Develop a strategy to recover maintenance backlogs, run preventive maintenance programmes and deliver a reliable, sustainable service. 2. **Engineering & construction measures**: ensures that infrastructure projects meets the needs for a structure to be designed to avoid failure, which may result in the loss of life, property, waste of resources or damage to the environment. 3. **Economic measures**: municipalities to allocate sufficient budgetary funding to keep infrastructure preventatively maintained. 4. **Management & institutional**: development of legislation and its implementation strongly enough incentivise municipalities to see the need for sound infrastructure maintenance to manage they infrastructure. 5. **Societal measures**:
8	Illegal and Uncontrolled Solid Waste Disposal	1. **Physical planning**: good municipal solid waste management practices requires collection of critical information which is not just for keeping the records up to date but used effectively for taking corrective measures as well as proper planning for the future. Establishment of landfill sites as well as street bins distribution to minimize illegal solid waste dumping. 2. **Engineering & construction measures**: investment for bulk infrastructure development for the establishment of regional waste disposal sites and bulk waste transfer stations within the district. 3. **Economic measures**: Implement and ensure the user-pays principle applied for waste management. 4. **Management & institutional measures**: ensure rules & regulations governing waste management are enforced at all times. Preparing & implementing an IWMP & development of a framework for IDPs & ensuring that IWMPs inform the IDP Process.

No	Hazard	Risk reduction project proposals
		5. **Societal measures**: establishment of waste minimisation programmes, environmental education, and awareness campaigns and workshops.
4	Road Incidents	1. **Physical planning**: looking into the possibility of introducing less safe travel choices. For example rail has shown to be a more safe form of travelling than motorized modes of travelling. 2. **Engineering & Construction measures**: development of local road safety schemes that road safety engineers and urban designers can use in a wide range of measures to improve the safety of the road environment for all road users and to encourage increased use of streets as places that meet the needs of pedestrians, cyclists and public transport users. 3. **Economic**: Speed enforcement detection devices can be effective in reducing RTA's and associated injuries. Appointing and training police for policing on roads can be a beneficial effect on road traffic facilities and crashes. 4. **Management & Institutional** measures: Introduce proper land use planning, residential, commercial and industrial policies to be enforced. Develop of a Road Traffic Accidents Response Strategies. 5. **Societal measures:** enforce seat-belt wearing use as research has shown that seat-belts reduce the risk of death in a crash by approximately 60%. Safety education programmes for pedestrians. Driver training/ education programmes. Awareness, communication and collaboration are key to establishing and sustaining national road safety efforts.
5	Severe Storms	1. **Physical planning measures**: Establish strong relationships and communication strategies between agencies involve in Warning response planning. Assign and train designated "weather watchers". Develop criteria and procedures for notification and activation of "warning systems". 2. **Engineering & construction** measures: Advanced planning during design process. Having a safe shelter constructed in areas-shielded from winds and flying objects. 3. **Economic measures**: Ensure that government decision makers are provided with critical environmental data and forecasts to allow them to better plan for budgets and financial needs to protect life and property. 4. **Management & institutional measures**: Plan be developed to ensure that staff and emergency officials know exactly what to do in an emergency. Develop severe weather plan. Ensures that Weather Services support local, state and federal officials during emergencies and large events. 5. **Societal measures**: to have the community understand and know about evacuation plan. Clearly marked shelters for community members to see.

The Sundays River Valley Municipal Disaster Management Office must ensure that response and recovery plans and disaster risk reduction plans, programmes and projects are incorporated into IDP's, Spatial Development Frameworks, environmental management plans and other strategic developmental plans and initiatives in the Sundays River Local Municipality and in the local municipalities in the district.

5.1 Strategic approach to disaster risk reduction

5.1.1 Strategic Disaster Risk Reduction

The dictionary defines a strategy as follows: *"A plan of action designed to achieve a long-term or overall aim. "Time to develop a coherent strategy" synonyms: master plan, grand design, game plan, plan of action, plan, policy, proposed action, scheme, blueprint, programme, procedure, approach, schedule."*

Disaster risk reduction, through proper planning and management is the new key driving principle in disaster management.

Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Disaster risk reduction is therefore part of disaster management but does not focus primarily on (although it does link with) disaster response and recovery.

Disaster Risk Reduction should not be implemented in an isolated manner. It takes cognisance of international agreements and guidelines.

Disaster risk reduction is closely linked with sustainable development. Development projects should be informed by disaster risk reduction planning and activities.

Disaster risk reduction is influenced by several factors (such as climate change, economic and regional growth and development, capacity to implement planning, etc.) and the municipality has to think carefully and in new ways about effectively reducing its disaster risks.

The Sundays River Valley Local Municipal follows a priority strategic approach to disaster risk reduction. This strategy aims to achieve the following objectives:

- To establish and incorporate the foundational guiding arrangements for disaster risk reduction in the Sundays River Valley Local Municipality.
- To increase awareness and knowledge of disaster risk reduction methods and opportunities.
- To inform the legal and institutional basis for efficient disaster risk reduction planning and implementation.
- To contribute towards the inclusion of disaster risk reduction into development policy, programmes and projects.
- To establish a strategic platform for public-private-sector co-operation in disaster risk reduction.
- To contribute to community resilience against the threats and effects of disasters.

The success of this strategy will lie in its effective implementation and monitoring throughout the municipality. This can however only be achieved through co-operation and partnership between all stakeholders in disaster risk reduction.

The following factors are important to ensure the effectiveness of implementing the strategic goals and initiatives:

- Political buy-in and support.
- Strategic leadership by management.
- Uniform standards supported by national policy and legislation.
- Stakeholders and responsible agencies need to accept responsibility and be held accountable for neglecting responsibilities in terms of disaster risk reduction.
- Capacity and awareness at local level.
- Appropriate systems and technologies.

- Private-sector support.
- Optimising the use of resources: Using fewer resources to achieve more.
- The involvement and co-operation of non-governmental role players and historical information, to be inter alia gathered through indigenous knowledge, is of paramount importance.
- The Disaster Management Centre / Office must establish mechanisms to ensure integration and joint standards of practice in the execution of disaster management policy.

The following general principles guide the above goals:

- Enhance and support advocacy on disaster risk reduction.
- Work within current reality - optimising usage of existing resources and capacity, whilst awaiting additional funding and capacity, is very important.
- Plan pro-actively and not re-actively for disaster risk reduction.
- Adopt a more holistic approach to disaster risk reduction and building resilience. The 'silos should be broken' and all risk factors should be recognised and addressed holistically and in an integrated manner.
- Utilise the historic indigenous knowledge of the people when disaster risks are assessed.
- Utilise private sector advertisement funding to further disaster risk reduction advocacy and information sharing.
- Communities need to understand the benefits from contributing to disaster risk reduction and support disaster risk reduction initiatives: Disaster risk reduction can save their lives and property.
- Effective law enforcement is critical for disaster risk reduction.
- Communities should be active participants in disaster risk assessments and disaster risk reduction planning and programmes.
- Work, within the correct and sensitive protocols, with traditional leaders and Community-Based Organisations.
- Maintain a balance when assigning resources between proactive and reactive measures.
- Understand that national / regional programmes such as poverty reduction is mid to long-term goals, but disaster resilience should be built / enhanced within current reality as well. Poor and vulnerable people, communities and groups should be assisted to become more resilient within their current realities.
- Cross-cutting considerations such as gender (for example, the value of utilising woman in disaster risk reduction), youth (sustainable disaster risk reduction starts with the children), people with disabilities, people with less access to facilities and risk transfer-mechanisms such as insurance, must be taken cognisance of in disaster risk reduction planning and initiatives.
- Because disaster risks cannot be totally eliminated, the remaining economic risks need to be shared, spread or financed so that individual people, companies and communities are not forced into poverty or bankruptcy if a disastrous event occurs. Mechanisms for sharing or transferring risk are an important component of disaster risk reduction. At the national or district level, this can be achieved through the establishment of reserve funds, contingent credit arrangements, or purchase of offshore insurance or disaster bonds. These usually require supporting arrangements at international level through the private sector or multilateral banks. At local level, the insurance industry can become a partner in disaster risk reduction and communities can be encouraged (through incentives agreed upon with insurance companies) to ensure themselves against loss.

In terms of Section 26(g) of the Municipal Systems Act, Act 32 of 2000, a Municipality's IDP must contain a disaster management plan. Development projects in the Municipality, as contained in the Municipality's IDP, is thus interlinked with disaster management planning and activities. Risk reduction projects identified as part of disaster management planning, such as those identified in this plan and the contingency plans to be developed and risk assessments should be included into the Municipality and local Municipal IDPs.

Sarah Baartman District Municipality has defined strategic objectives in order to reach the overarching goal of developing more resilient communities in the Sarah Baartman Municipal Area. One of the objectives is to improve capacity of Local Municipalities to provide a timely and appropriate response to disasters complex emergencies, and other crises. The strategic objectives include the following:

- Assisting Local Municipalities with the development of fire services plans for their areas;
- Assisting each Local Municipality with the implementation of its fire services plan by rendering support with:
- Establishment of satellite fire stations in identified areas;
- Recruitment of fire fighters, reservists and/or volunteers;
- Restoration of fire hydrants district wide;
- Acquisition of fire/rescue vehicles, equipment and tools; and
- Training of fire officers, fire fighters, reservists and volunteers.
- Lobbying for funding to assist local municipalities with implementation of their fire services plans;
- Preparing business plans where necessary to secure funding; and
- Make general public aware of the dangers of fires.

5.2 Protection of critical infrastructure

Critical infrastructure includes assets and networks, physical or virtual, which is essential for the functioning of a society and economy.

This infrastructure is found in the following sectors/areas:

- Energy
- Communications
- Transportation
- Health Systems
- Public Safety and Security
- Public Administration
- Financial Sector
- Educational Systems
- Water and Sewerage
- Agriculture and Food
- Chemicals and Hazardous Materials

Critical infrastructure in the Municipality should be pro-actively protected and a critical infrastructure protection plan need to be developed by the Municipality.

6. Chapter 6: Preparedness planning

6.1 Education, Training, Public Awareness and research

Communication and stakeholder participation in disaster management in The Sundays River Valley Local Municipality was executed through a consultative process, initiated by the Sarah Baartman District Municipality disaster management function in conjunction with the Sundays River Valley Local Municipality.

The development of disaster management information is critical in ensuring that the community and all facets of the public and private sector are well informed and prepared for any disaster which may occur.

In order to give proper effect to preparedness planning, it is necessary that the local disaster management focal point "Disaster Management Centre / Office", together with the District Disaster Management Centre, develops a plan of action which will engage all the departmental, community, traditional, private and commercial stakeholders. These stakeholders need to be trained in preparedness techniques.

These processes will include the development of disaster management information leaflets, training programmes, media and local-level meetings with disaster management role players, including non-

governmental institutions (to be preferably invited / co-opted on the local disaster management committee) and the local traditional and community leaders, schools, clinics and communities.

Although the main responsibility to plan for, ensure budgeting and executing education, training and research (and the publication and communication of the results thereof) lies with the Sundays River Valley Local Municipality disaster management function and Municipal departments, organs of state and municipal entities will also address these elements pro-actively. This will be co-ordinated through to the Sundays River Valley Local disaster management function and the results communicated to the Eastern Cape Provincial Disaster Management Centre, National Disaster Management Centre and the local disaster management committee.

Training on disaster management in The Sundays River Valley Local Municipality will be in accordance with the National Disaster Management Framework and National Guidelines in this regard. Training can be of an accredited or non-accredited in nature. Practical, 'hands-on' training of The Sundays River Valley Local Municipality and local municipal disaster management officials need to be executed to ensure that at least the following capabilities have been efficiently established in the Sundays River Valley Local Municipality disaster management function:

- Public Awareness: Public Awareness campaigns are ongoing
- Education: to have brochures, talks and presentation for disaster management for schools
- Training: training of staff on emergency evacuation and ensuring that emergency evacuation takes place at schools
- Integrating all of the above into an effective the Sundays River Valley Local Disaster Management operation.

Communication and stakeholder participation in disaster management in the Sundays River Valley Local Municipality is executed through a consultative process, education and public awareness, initiated by the Sundays River Valley Local Municipality disaster management function. These processes include the development of disaster management information leaflets, training programmes, media and local-level meetings with disaster management role players, including non-governmental institutions (to be preferably invited / co-opted on the local disaster management committee) and the local traditional and community leaders, schools, clinics and communities.

Disaster management actions and initiatives, such as results of important meetings and new projects, will be communicated to the communities via media or otherwise.

The Sundays River Valley Local Disaster Management and Sarah Baartman Disaster Management will formulate and implement appropriate disaster management public awareness programmes that are aligned with the national disaster management public awareness strategy and will play an active part in engaging schools to ensure a practical approach to education and awareness programmes.

School level disaster management awareness programmes in The Sundays River Valley Local Municipality will be conducted, assessed and adapted on an annual basis. Community resilience-building is crucial and a first capacity-building priority is the consultative development of a uniform approach to community-based risk assessment for municipalities and non-governmental and community-based organisations throughout The Sundays River Valley Local Municipality this will contribute considerably to forge links between disaster risk reduction and development planning in disaster-prone areas and communities.

6.2 Information Management and Communication

The Sundays River Valley Local Municipality will adhere to the *Integrated Information Management and communication model* as contained in the National Disaster Management Framework, summarised below:

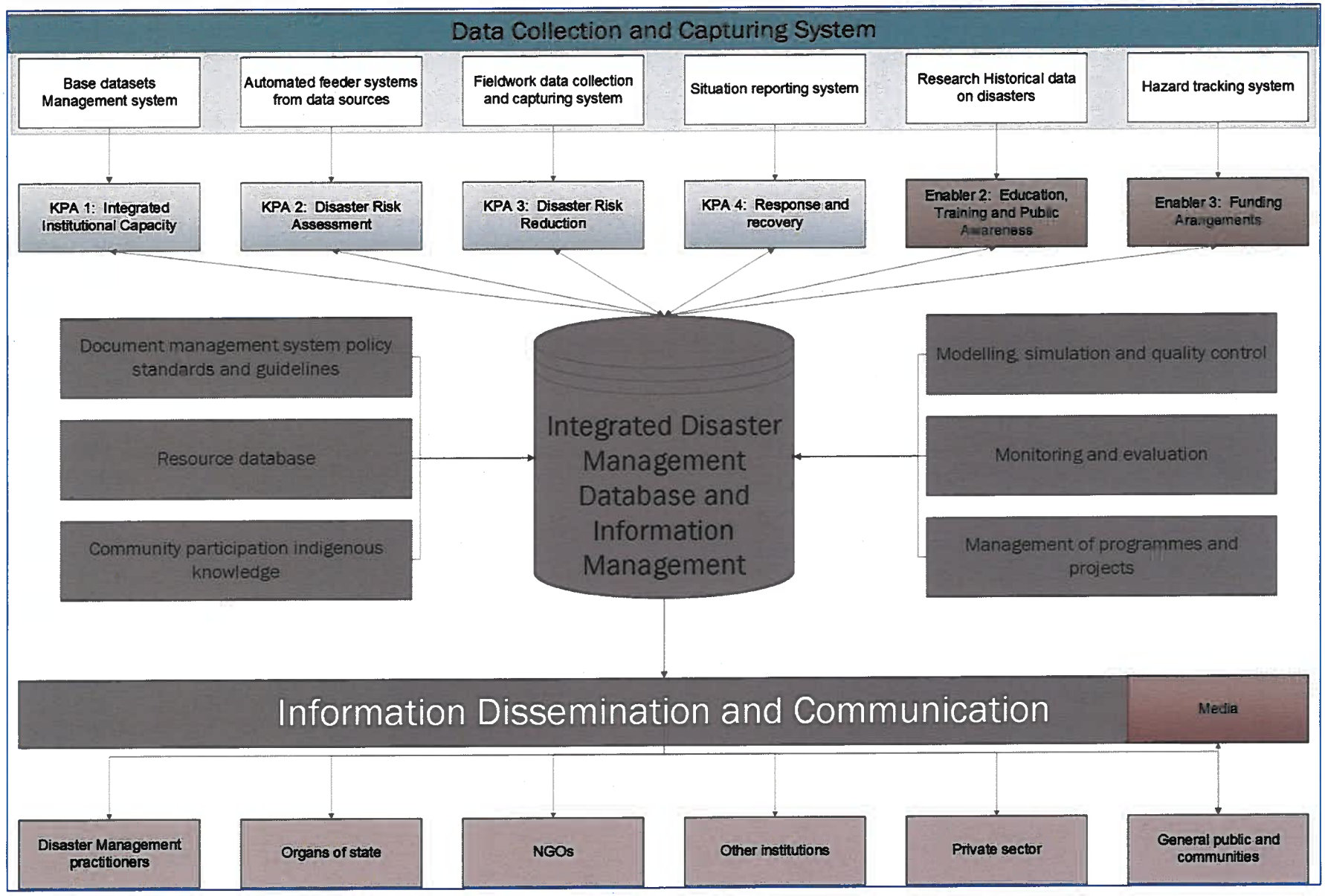

Figure 11: Model of an integrated information management and communication system for disaster risk management

Effective communication is paramount to effective disaster management planning and implementation. Each stakeholder's communication, dispatching and other procedural arrangements are governed by its functional role and its related standard operating procedures. Details of specific disaster incident communication protocols are contained in the disaster contingency plans, where such details are required.

Communication during a disaster or major incident needs to be fast and require the provisioning of accurate information. Designated resources that would be favourably positioned to convey messages and collect information would be communications officers (emergency control centre) who would act as a communication and information coordinating hub and municipal representatives who would be in familiar with and trusted by local communities.

The involvement of communities is becoming more prominent to ensure resilience and sustainability.

At the heart of participative strategies is the requirement for a sustainable municipal representative that communities will trust and allow should meetings be held for capacity building or information dissemination.

The nature of communication and information management before an incident is largely gathering and making information available regarding the incident. During the incident it is critical to maintain situational awareness and understanding. In order to fulfil this requirement speed of delivery, accessibility and accuracy is very important. SMSs, direct phone calls and even two-way radios are preferred mechanisms. After an incident the coordination of recovery actions would need to take place. For this purpose, emails and meetings would be sufficient.

6.3 Early warning systems

The Sundays River Valley Local Disaster Management Centre / Office must ensure the technical identification and monitoring of prevailing hazards and must prepare and issue hazard warnings of significance to the municipality and inform the District Disaster Management Unit. The Sundays River Valley Local Disaster Management Centre / Office must develop and implement communication mechanisms and strategies to ensure that such warnings are disseminated immediately to reach at-risk communities, areas and developments as speedily as possible. The Sundays River Valley Local Disaster Management Centre / Office must identify and establish strategic inter sectoral, multi-disciplinary and multi-agency communication mechanisms and must ensure that such communication mechanisms are accessible to at-risk communities and areas in the district.

The Sundays River Valley Local Disaster Management Centre / Office must facilitate the development of a communication plan for the municipality which must be documented.

6.3.1 Early warning through normal functioning

In cases where a hazard is encountered and has the potential to develop into a disaster, it is important that appropriate actions are taken. This can include:

- Initiation of preventative or mitigation measures;
- Awareness to create a broader understanding within the public sector and within government sectors; and
- Using reporting structures/channels so that details of identified hazards, that have the potential to lead to disasters are appropriately communicated to relevant stakeholders.

This is a continuous process and will be enhanced by a greater understanding of disaster management throughout the municipality. However, in order to give effect to the above, it would be necessary to incorporate disaster risk reduction into all activities, projects, and development plans in the municipality.

This means that when there is a need for communication with the Advisory Forum when an early warning or disaster hazards are identified/discovered so that the proper attention can be given to the

warning/hazard. It is only when Early Warning/hazard becomes mainstreamed as part of disaster risk reduction that the true benefit will emerge, and disaster gain made.

There is a need for Early Warning of disaster hazards to be communicated to all sectors (various departments within the municipality). It is only when these are ingrained into the fabric of the employee's functions that proper Early Warning notices can be communicated to decision-makers.

6.3.2 Early Warning as a result of participation in Provincial Disaster Management Advisory Forum

It is important that Sundays River Valley takes part in the Disaster Management Advisory Forum for the Sarah Baartman District that meets at least once every quarter.

As a result, they are provided with information of risks that affect other municipalities and stakeholders. Risks that negatively impact on the municipality must be addressed proactively.

6.3.3 South African Weather Services

SAWS has an extremely important Early Warning function due to the high percentage of disasters that are weather related

6.3.3.1 Impact based Early Warning

The current traditional Severe Weather Warning System (SWWS) in South Africa issues warnings based on weather related thresholds. Typically, such warnings could be of "heavy rain with more than 50 mm in 24 hours". This warning has no real meaning in a local area where only 30 mm, or another area where more than 100 mm of rainfall is required to cause flash flooding that could close bridges or flood properties. An Impact-based (ImpB) Early Warning System (EWS) is not based on weather thresholds, but rather on increasing severity levels of impact, considering the localised socio-economic vulnerability to distinguish between less severe and more severe events.

Currently SAWS is still issuing the traditional threshold warnings as the ImpB EWS is still being piloted/tested while the dissemination tools are being put in place so that the ImpB Warnings can be issued seamlessly.

To fully implement ImpB Warnings there will be a need for Local Municipalities to provide information on the impacts that could be expected for their various mandates.

This information is of utmost importance for the Sundays River Valley municipality given the prioritised hazards in the municipality include flood, draught, heat wave and severe storms which are weather-related.

6.3.3.2 Fire Danger Index

In order for SAWS to comply with the legislative requirements of, for example, the Veld and Forest Fire Act (refer to Chapter 2), it monitors the current and predicted state of the Fire Danger Index (FDI) across South Africa on a daily basis and issues predictions based on the expected future state of FDI over the next few days. As per the requirements of the Veld and Forest Fire Act, the public are furnished with a basic indication (in a binary yes/no sense) whether there is expected to be an "extremely dangerous" level of FDI. For more specialised users, such as NDMC, PDMC, Agriculture and Forestry (forest/plantation managers), SAWS issues more detailed information.

The SAWS make use of Lowveld Fire Index when generating Fire Danger Index (FDI)-related watches and warnings for South Africa. As such, the FDI formula makes use of four (4) basic meteorological parameters, namely: (a) surface (@2m) air temperature (b) relative humidity (%) (c) surface wind speed (@10m) as well as (d) the "antecedent rainfall" occurring over a 21 day period, prior to the current time. When the calculated

FDI meets or exceeds 75 (the lower threshold for the "extremely dangerous" category an FDI warning will be generated and distributed to various media (printed, social media, TV, radio, electronic)."

6.3.3.3 Early Warning planning

As Sundays River Valley Municipality is in the process of developing a Level 2 DMP the Early Warning Planning will be in line with the disaster risk assessment and this will further enable the Municipality to develop more focused early warning mechanisms. As a result, this will enable planning for high level risk. This will also impact the dissemination of warnings and appropriate reactions within the municipality as well as the neighbouring municipalities. Also, important as part of the expansion and improvement of early warning mechanisms is the inclusion of understanding and interpretation of early warning in awareness programmes so the end user receiving the warning is able to interpret the message correctly.

6.4 Contingency planning

In terms of sections 52 and 53 of the Disaster Management Act, Act 57 of 2002, (the Act) each municipality and municipal organ of state must draft disaster management plans for their area.

"52. Preparation of disaster management plans by municipal organs of state other than municipalities.—
(1) Each municipal organ of state other than a municipality must—

(a) conduct a disaster risk assessment for its functional area;

(b) identify and map risks, areas, ecosystems, communities and households that are exposed or vulnerable to physical and human- induced threats;

(c) prepare a disaster management plan setting out—

(i) the way in which the concept and principles of disaster management are to be applied in its functional area, including expected climate change impacts and risks for that municipal entity or administrative unit;

(ii) its role and responsibilities in terms of the national, provincial or municipal dis- aster management framework;

(iii) its role and responsibilities regarding emergency response and post-disaster recovery and rehabilitation;

(iv) its capacity to fulfil its role and responsibilities;

(v) particulars of its disaster management strategies;

(vi) contingency strategies and emergency procedures in the event of a disaster, including measures to finance these strategies; and.

(vii) specific measures taken to address the needs of women, children, the elderly and persons with disabilities during the disaster management process;

(d) co-ordinate and align the implementation of its plan with those of other organs of state and institutional role-players;

(e) provide measures and indicate how it will invest in disaster risk reduction and climate change adaptation, including ecosystem and community-based adaptation approaches;

(f) develop early warning mechanisms and procedures for risks identified in its functional area; and

(g) regularly review and update its plan."

To clarify this further it is important to understand the definition of a "municipal organ of state" as defined in the Disaster Management Act no 57 of 2002: *"municipal organ of state" means—*

(a) a municipality;

(b) a department or other administrative unit with- in the administration of a municipality, including an internal business unit referred to in section 76 (a) (ii) of the Local Government: Municipal Systems Act, 2000; or

(c) a municipal entity;"

The District Disaster Management Centre / Unit is therefore responsible for the application of the Act, however, the local disaster management office must assist in the provision of guidance to municipal departments, local municipalities and other municipal entities as indicated above are primarily responsible, and can be held liable for their Disaster Management Plans.

In terms of section 54 of the Act, a Municipality must deal with a local disaster through existing legislation and contingency arrangements, even if a local state of disaster is not declared.

In terms of the National Disaster Management Framework, contingency planning is defined as follows:

"The forward planning process for an event that may or may not occur, in which scenarios and objectives are agreed, managerial and technical actions defined, and potential response systems put in place to prevent, or respond effectively to, an emergency situation."

Contingency plans for all major disaster risks will be developed.

The Sundays River Valley Local Municipality have developed hazard specific contingency plans for a Seasonal preparedness plan.

6.5 Planning Calendar

There is a seasonal nature to a many hazards and events. Examples of these are grass or veld fires that predominantly happen in winter, and events such as the Major Events. The Sundays River Valley Local Disaster Management Centre / Office should keep a "Planning Calendar" for such events that can be reviewed and ensure update planning is completed on an annual basis.

6.6 Funding arrangements

Funding arrangements for disaster management are specified in the National Disaster Management Framework as indicated below and these guidelines will be followed in the municipality.

Table 8: Funding arrangements for disaster management

Activity	Funding source	Funding mechanism
Start-up activities (KPA 1, Enabler 1)	National government	Conditional grant for local government – district and metropolitan municipalities, where necessary
		Conditional grant for provinces with counter-funding component1
		Budget of national departments
Disaster risk management ongoing operations (KPAs 2 and 3)	National and provincial government	Own departmental budgets
	New assignment to local government	Increase in the I (Institutional) component of the equitable share of local government
Disaster risk reduction (KPAs 2 and 3)	National departments	Own budgets
	Provincial departments	Own budgets but can be augmented by application for funding to the NDMC for special national priority risk reduction projects
	District municipalities	Own budgets but can be augmented by application for funding to the NDMC for special national priority risk reduction projects
	In the case of low-capacity, resource-poor municipalities2	Additional funding released from the NDMC targeted at these categories of municipalities
Response, recovery and rehabilitation and reconstruction efforts (KPA 4)	National government	Own budget for those departments frequently affected by disasters
		Access to central contingency funds
		Reprioritise within capital budgets for infrastructure reconstruction
	Provincial government	Own budget, particularly for those departments frequently affected by disasters
		Conditional infrastructure grants
		Access to central contingency fund once threshold is exceeded on a matching basis
		Reprioritize within capital budget for infrastructure reconstruction
	Local government	Access to central contingency fund once threshold is exceeded
		Conditional infrastructure grant, i.e. Municipal Infrastructure Grant (MIG)
Education, training and capacity-building programmes (Enabler 2)	All spheres of government	Own budgets and reimbursement through SETAs
		Public awareness programmes and research activities can also be funded through the private sector, research foundations, NGOs and donor

Section 7.6.2 of the NDMF states that *"Cost expenditure on routine disaster management activities must be funded through the budgets of the relevant organs of state. Preparedness must be funded through the budgets of national, provincial and local organs of state as part of their routine disaster management activities".*

Considering the above it is evident that the municipality must fund and implement disaster management from their own budgets.

6.6.1 Funding of post-disaster recovery and rehabilitation

In the case of post-disaster recovery and rehabilitation, section 56 of the Act states:

"56. Guiding principles (1) This Chapter is subject to sections 16 and 25 of the Public Finance Management Act, 1999, which provide for the use of funds in emergency situations.

(2) When a disaster occurs, the following principles apply:

(a) National, provincial and local organs of state may financially contribute to response efforts and post-disaster recovery and rehabilitation.

(b) The cost of repairing or replacing public sector infrastructure should be borne by the organ of state responsible for the maintenance of such infrastructure."

6.6.2 Procurement of essential goods & services

To understand the importance of this it should be viewed in context

Section 53(2) of the Disaster Management Act states the following:

"(2) A disaster management plan for a municipal area must—

(a) form an integral part of the municipality's integrated development plan;

(b) anticipate the types of disaster that are likely to occur in the municipal area and their possible effects;

(c) place emphasis on measures that reduce the vulnerability of disaster-prone areas, communities and households;

(d) seek to develop a system of incentives that will promote disaster management in the municipality;

(e) identify the areas, communities or households at risk;

(f) take into account indigenous knowledge relating to disaster management;

(g) promote disaster management research;

(h) identify and address weaknesses in capacity to deal with possible disasters;

(i) provide for appropriate prevention and mitigation strategies;

(j) facilitate maximum emergency preparedness; and

(k) contain contingency plans and emergency procedures in the event of a disaster, providing for—

(i) the allocation of responsibilities to the various role-players and co-ordination in the carrying out of those responsibilities;

(ii) prompt disaster response and relief;

(iii) the procurement of essential goods and services;

(iv) the establishment of strategic communication links;

(v) the dissemination of information; and

(vi) other matters that may be prescribed."

Sundays River Valley Local Municipality must have an emergency procedures for the procurement of essential goods and services.

Section 55(2) states the following:

"(2) If a local state of disaster has been declared in terms of subsection (1), the municipal council concerned may, subject to subsection (3), make by-laws or issue directions, or authorise the issue of directions, concerning—

(a) the release of any available resources of the municipality, including stores, equipment, vehicles and facilities;

(b) the release of personnel of the municipality for the rendering of emergency services;

(c) the implementation of all or any of the provisions of a municipal disaster management plan that are applicable in the circumstances;

(d) the evacuation to temporary shelters of all or part of the population from the disaster- stricken or threatened area if such action is necessary for the preservation of life;

(e) the regulation of traffic to, from or within the disaster-stricken or threatened area;

(f) the regulation of the movement of persons and goods to, from or within the disaster- stricken or threatened area;

(g) the control and occupancy of premises in the disaster-stricken or threatened area;

(h) the provision, control or use of temporary emergency accommodation;

(i) the suspension or limiting of the sale, dispensing or transportation of alcoholic beverages in the disaster-stricken or threatened area;

(j) the maintenance or installation of temporary lines of communication to, from or within the disaster area;

(k) the dissemination of information required for dealing with the disaster;

(l) emergency procurement procedures;

(m) the facilitation of response and post-disaster recovery and rehabilitation; or

(n) other steps that may be necessary to prevent an escalation of the disaster, or to alleviate, contain and minimise the effects of the disaster."

Sundays River Valley Local Municipality in conjunction with the District may, when a local state of disaster has been declared, make by-laws or issue directions, or authorise the issue of directions, concerning emergency procurement procedures.

It should be noted that procurement of essential goods and services should take place during all stages of disaster management, including disaster risk reduction, response and recovery.

Procurement for disaster risk reduction will happen in accordance with the relevant legislation and Sundays River Valley Local Municipality procurement policies and procedures. Procurement for disaster recovery and reconstruction will happen in accordance with section 56 of the Act.

Emergency procurement during a disaster and for disaster relief will take place in accordance with Section 55 of the Act.

The contingency arrangements for emergency procurement should a local state of disaster not be declared will be as follows:

- The Disaster Management Centre / Office to be informed of any emergency procurement requirements during a disaster or major incident;
- The Director Community Services will have access to the Municipal Manager to request emergency procurement in the required format;
- The Municipal Manager will urgently attend the approvals for the emergency procurement.

7. Chapter 7: Response

7.1 Immediate and effective response

To clarify this, it is important to take note of first section in the Disaster Management Act, 57 of 2002. The purpose of the Act states the following:

"To provide for—

- *an integrated and co-ordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and* ***effective response*** *to disasters and post-disaster recovery and rehabilitation;*
- *the establishment and functioning of national, provincial and municipal disaster management centres;*
- *disaster management volunteers; and*
- *matters incidental thereto."*

What constitutes an integrated, co-ordinated, rapid and effective response? This can only be achieved through planning, implementation and exercise. A Technical Advisory Committee will be appointed by the Sundays River Valley Local Advisory Forum. A response policy will be drafted. This document must address amongst other factors the following:

- Effective communication
- Who is in command?
- Co-ordination of response
- Roles and Responsibilities

Section 54 of the Disaster Management Act states the following:

"54. Responsibilities in event of local disaster.—

(1) Irrespective of whether a local state of disaster has been declared in terms of section 55—

(a) the council of a metropolitan municipality is primarily responsible for the co-ordination and management of local disasters that occur in its area; and

(b) the council of a district municipality, acting after consultation with the relevant local municipality, is primarily responsible for the co- ordination and management of local disasters that occur in its area.

(2) A district municipality and the relevant local municipality may, despite subsection (1) (b), agree that the council of the local municipality assumes primary responsibility for the co-ordination and management of a local disaster that has occurred or may occur in the area of the local municipality.

(3) The municipality having primary responsibility for the co-ordination and management of a local disaster must deal with a local disaster—

(a) in terms of existing legislation and contingency arrangements, if a local state of disaster has not been declared in terms of section 55 (1); or

(b) in terms of existing legislation and contingency arrangements as augmented by by-laws or directions made or issued in terms of section 55 (2), if a local state of disaster has been declared."

Each of the departments involved have specific response and/or recovery roles and functions, which includes the following generic requirements.

The Departmental Heads: must ensure that Disaster Risk Management Plans are compiled and maintained within their respective departments, with specific reference to the following:

- Compilation of pro-active departmental disaster risk management programmes to support disaster risk reduction;
- Compilation of reactive departmental disaster management plans to ensure service continuation during emergency/disaster situations;
- Submit departmental disaster management plans to the Head of Disaster Management and ensure regular review of such plans; and
- Provide a representative at the Disaster Operations Centre if this has been activated.

Section 55 of the Disaster Management Act stipulates the following:

"*55. Declaration of local state of disaster.—*

(1) In the event of a local disaster the council of a municipality having primary responsibility for the co-ordination and management of the disaster may, by notice in the Provincial Gazette, declare a local state of disaster if—

(a) existing legislation and contingency arrangements do not adequately provide for that municipality to deal effectively with the disaster; or

(b) other special circumstances warrant the declaration of a local state of disaster.

(2) If a local state of disaster has been declared in terms of subsection (1), the municipal council concerned may, subject to subsection (3), make by-laws or issue directions, or authorise the issue of directions, concerning—

(a) the release of any available resources of the municipality, including stores, equipment, vehicles and facilities;

(b) the release of personnel of the municipality for the rendering of emergency services;

(c) the implementation of all or any of the provisions of a municipal disaster management plan that are applicable in the circumstances;

(d) the evacuation to temporary shelters of all or part of the population from the disaster- stricken or threatened area if such action is necessary for the preservation of life;

(e) the regulation of traffic to, from or within the disaster-stricken or threatened area;

(f) the regulation of the movement of persons and goods to, from or within the disaster- stricken or threatened area;

(g) the control and occupancy of premises in the disaster-stricken or threatened area;

(h) the provision, control or use of temporary emergency accommodation;

(i) the suspension or limiting of the sale, dispensing or transportation of alcoholic beverages in the disaster-stricken or threatened area;

(j) the maintenance or installation of temporary lines of communication to, from or within the disaster area;

(k) the dissemination of information required for dealing with the disaster;

(l) emergency procurement procedures;

(m) the facilitation of response and post-disaster recovery and rehabilitation; or

(n) other steps that may be necessary to prevent an escalation of the disaster, or to alleviate, contain and minimise the effects of the disaster.

(3) The powers referred to in subsection (2) may be exercised only to the extent that this is necessary for the purpose of—

(a) assisting and protecting the public;

(b) providing relief to the public;

(c) protecting property;

(d) preventing or combating disruption; or

(e) dealing with the destructive and other effects of the disaster.

(4) By-laws made in terms of subsection (2) may include by-laws prescribing penalties for any contravention of the by- laws.

(5) A municipal state of disaster that has been declared in terms of subsection (1)—

(a) lapses three months after it has so been declared;

(b) may be terminated by the council by notice in the Provincial Gazette before it lapses in terms of paragraph (a); and

(c) may be extended by the council by notice in the Provincial Gazette for one month at a time before it lapses in terms of paragraph (a) or the existing extension is due to expire."

The Sundays River Valley Local Disaster Management Centre / Office will draft these bylaws in conjunction with Sarah Baartman District to ensure continuity in the District and have them approved with the provision that they should only be valid if a State of Disaster has been declared.

7.2 Declaration of a state of disaster

There are a number of sections in Act 57 of 2002 as amended Act 16 of 2015 that contains stipulations that affects the declarations of a Disaster. These sections include:

- Section 2. Instances where the Disaster Management Act does not apply;
- Section 23. Classification and recording of Disasters. When is a Disaster a:
    - Local Disaster
    - Provincial Disaster
    - National Disaster
- Section 27. Declaration of a National state of Disaster
- Section 35. Disaster occurring or threatening to occur in provinces
- Section 41. Declaration of Provincial state of Disaster
- Section 49. Disasters occurring or threatening to occur in municipal areas
- Section 55. Declaration of a local state of Disaster

It is important to note that none of these sections can be applied in isolation and cognisance should be taken of all these sections during the declaration of a Disaster. The following section highlights these stipulations that are more applicable to declaring a Local state of Disaster.

7.2.1 Section 2. Instances where the Disaster Management Act does not apply

"2. Application of Act. (1) This Act does not apply to an occurrence falling within the definition of "disaster" in section 1—

(a) if, and from the date on which, a state of emergency is declared to deal with that occurrence in terms of the State of Emergency Act, 1997 (Act No. 64 of 1997); or

(b) to the extent that that occurrence can be dealt with effectively in terms of other national legislation—

(i) aimed at reducing the risk, and addressing the consequences, of occurrences of that nature; and

(ii) identified by the Minister by notice in the Gazette.

(2) The Minister may, in consultation with Cabinet members responsible for the administration of national legislation referred to in subsection (1) (b), issue guidelines on the application of that subsection.

(3) Where provincial legislation regulating disaster management in a province is inconsistent with this Act, this Act prevails over the provincial legislation subject to section

146 of the Constitution."

7.2.2 Section 23. Classification and recording of disasters

"23. Classification and recording of disasters.

(1) When a disastrous event occurs or threatens to occur, the National Centre must, for the purpose of the proper application of this Act, determine whether the event should be regarded as a disaster in terms of this Act, and if so, the National Centre must immediately—

(a) assess the magnitude and severity or potential magnitude and severity of the disaster;

(b) classify the disaster as a local, provincial or national disaster in accordance with subsections (4), (5) and (6);

(bA) inform the relevant provincial disaster management centre of the decision on the classification of the disaster made in terms of para- graph (b); and

(c) record the prescribed particulars concerning the disaster in the prescribed register.

(2) When assessing the magnitude and severity or potential magnitude and severity of a disaster, the National Centre—

(a) must consider any information and recommendations concerning the disaster received from a provincial or municipal disaster management centre in terms of section 35 or 49; and

(b) may enlist the assistance of an independent assessor to evaluate the disaster on site.

(3) The National Centre may reclassify a disaster classified in terms of subsection (1) (b) as a local, provincial or national disaster at any time after consultation with the relevant provincial or municipal disaster management centres, if the magnitude and severity or potential magnitude and severity of the disaster is greater or lesser than the initial assessment.

(4) A disaster is a local disaster if—

(a) it affects a single metropolitan, district or local municipality only; and

(b) the municipality concerned, or, if it is a district or local municipality, that municipality either alone or with the assistance of local municipalities in the area of the district municipality is able to deal with it effectively.

(5) A disaster is a provincial disaster if—

(a) it affects—

(i) more than one metropolitan or district municipality in the same province; or

(ii) a single metropolitan or district municipality in the province and that metropolitan municipality, or that district municipality with the assistance of the local municipalities within its area, is unable to deal with it effectively; and

(b) the province concerned is able to deal with it effectively.

(6) A disaster is a national disaster if it affects—

(a) more than one province; or

(b) a single province which is unable to deal with it effectively.

(7) Until a disaster is classified in terms of this section, the disaster must be regarded as a local disaster.

(8) The classification of a disaster in terms of this section designates primary responsibility to a particular sphere of government for the co-ordination and management of the disaster, but an organ of state in another sphere may assist the sphere having primary responsibility to deal with the dis- aster and its consequences."

7.2.3 Section 49. Disasters occurring or threatening to occur in municipal areas

"49. Disaster occurring or threatening to occur in municipal areas.—

(1) When a disastrous event occurs or is threatening to occur in the area of a municipality, the disaster management centre of the municipality concerned must determine whether the event should be regarded as a disaster in terms of this Act, and, if so, must immediately—

(a) initiate efforts to assess the magnitude and severity or potential magnitude and severity of the disaster;

(b) inform the National Centre and the relevant provincial disaster management centre of the disaster and its initial assessment of the magnitude and severity or potential magnitude and severity of the disaster;

(c) alert disaster management role-players in the municipal area that may be of assistance in the circumstances; and

(d) initiate the implementation of any contingency plans and emergency procedures that may be applicable in the circumstances.

(2) When informing the National Centre and the relevant provincial disaster management centre in terms of subsection (1) (b), the municipal disaster management centre may make such recommendations regarding the classification of the disaster as may be appropriate."

7.2.4 Section 55. Declaration of a local state of Disaster

"55. Declaration of local state of disaster.—

(1) In the event of a local disaster the council of a municipality having primary responsibility for the co-ordination and management of the disaster may, by notice in the Provincial Gazette, declare a local state of disaster if—

(a) existing legislation and contingency arrangements do not adequately provide for that municipality to deal effectively with the disaster; or

(b) other special circumstances warrant the declaration of a local state of disaster.

(2) If a local state of disaster has been declared in terms of subsection (1), the municipal council concerned may, subject to subsection (3), make by-laws or issue directions, or authorise the issue of directions, concerning—

(a) the release of any available resources of the municipality, including stores, equipment, vehicles and facilities;

(b) the release of personnel of the municipality for the rendering of emergency services;

(c) the implementation of all or any of the provisions of a municipal disaster management plan that are applicable in the circumstances;

(d) the evacuation to temporary shelters of all or part of the population from the disaster- stricken or threatened area if such action is necessary for the preservation of life;

(e) the regulation of traffic to, from or within the disaster-stricken or threatened area;

(f) the regulation of the movement of persons and goods to, from or within the disaster- stricken or threatened area;

(g) the control and occupancy of premises in the disaster-stricken or threatened area;

(h) the provision, control or use of temporary emergency accommodation;

(i) the suspension or limiting of the sale, dispensing or transportation of alcoholic beverages in the disaster-stricken or threatened area;

(j) the maintenance or installation of temporary lines of communication to, from or within the disaster area;

(k) the dissemination of information required for dealing with the disaster;

(l) emergency procurement procedures;

(m) the facilitation of response and post-disaster recovery and rehabilitation; or

(n) other steps that may be necessary to prevent an escalation of the disaster, or to alleviate, contain and minimise the effects of the disaster.

(3) The powers referred to in subsection (2) may be exercised only to the extent that this is necessary for the purpose of—

(a) assisting and protecting the public; (b) providing relief to the public;

(c) protecting property;

(d) preventing or combating disruption; or

(e) dealing with the destructive and other effects of the disaster.

(4) By-laws made in terms of subsection (2) may include by-laws prescribing penalties for any contravention of the by- laws.

(5) A municipal state of disaster that has been declared in terms of subsection (1)—

(a) lapses three months after it has so been declared;

(b) may be terminated by the council by notice in the Provincial Gazette before it lapses in terms of paragraph (a); and

(c) may be extended by the council by notice in the Provincial Gazette for one month at a time before it lapses in terms of paragraph (a) or the existing extension is due to expire".

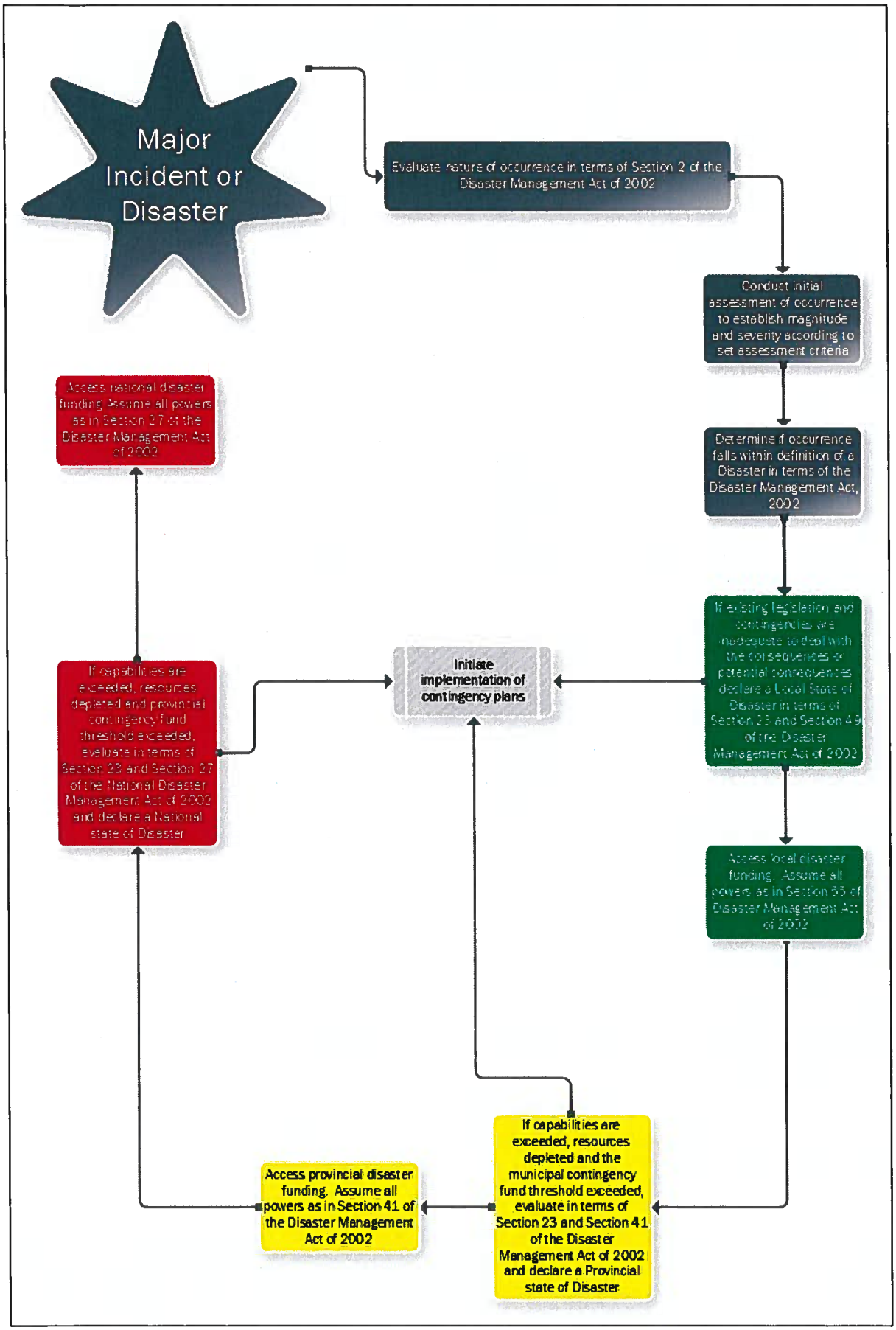

Figure 12: Process of declaration of states of disaster

The internal process following during declaration of a disaster is summarised below:

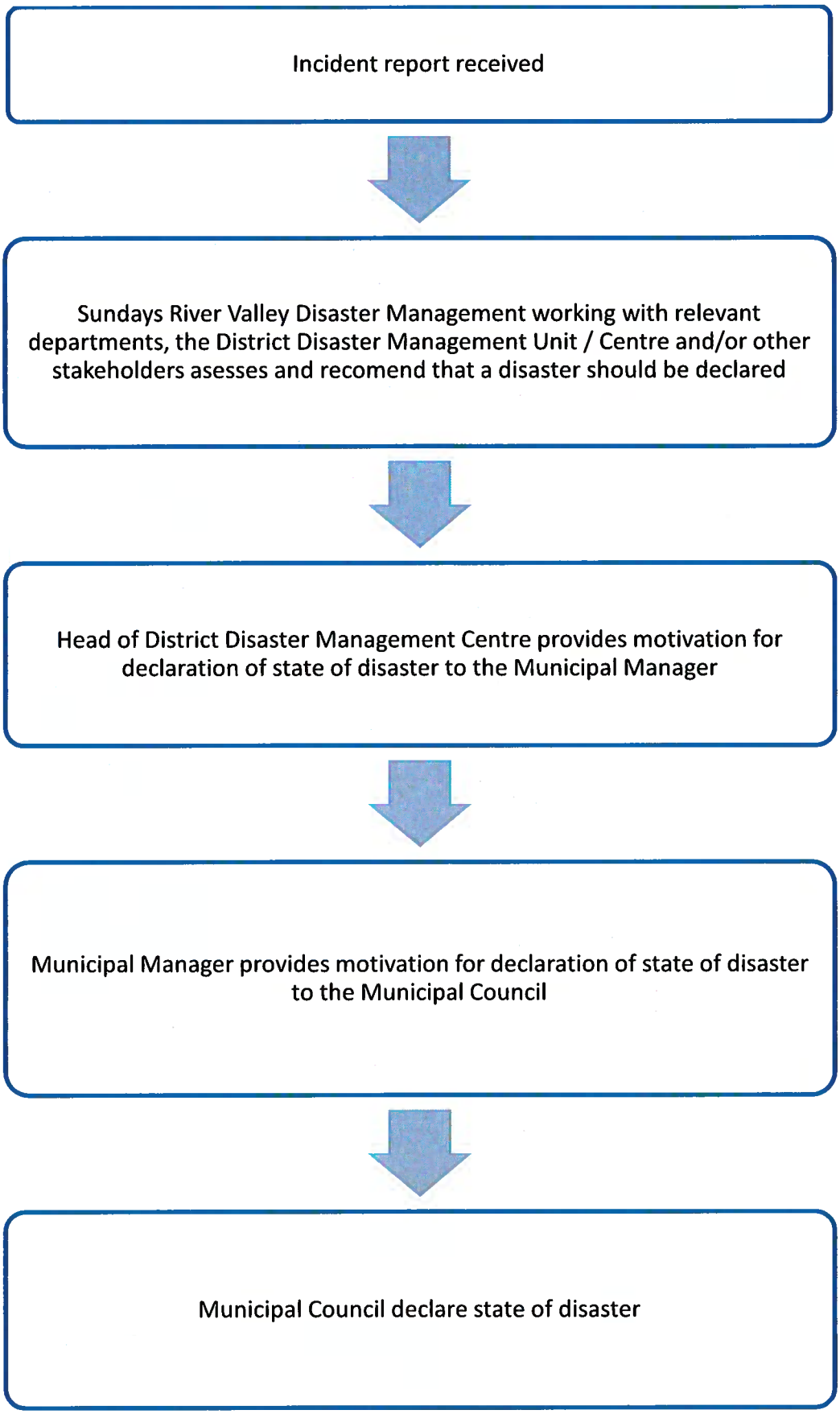

Figure 13: Internal process following during declaration of a disaster

7.3 Disaster relief

The National Disaster Management Framework defines Relief as follows:

"The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can include the provision of shelter, food, medicine, clothing, water, etc."

The Sundays River Valley Local Disaster Management Centre / Office will establish a Technical Task Team to formulate a Disaster Relief Strategy which will inter alia address the following matters:

- Database of resources
- Manpower & resource contingencies
- Effective needs assessments
- Education as part of relief provision and sustainable relief provision, linking to prevention/mitigation
- Relief protocols, including communication
- Emergency kits
- Venues for relief
- Relief reporting
- Funding & procurement

8. Chapter 8: Recovery

8.1 Post disaster impact assessments

After a disaster, the following disaster impact assessment activities will be undertaken, including an impact analysis relating to:

- Direct and indirect impact on communities;
- Social impact;
- Agricultural impact;
- Infrastructural impact, including critical infrastructure;
- Environmental impact; and
- Economic impact.

8.2 Logistics

Whether during disaster response, or while implementing mitigation activities, the basic task of a logistics system is to deliver the appropriate supplies, in good condition, in the quantities required, and at the place and time they are needed. The type of supplies or goods transported in the specific logistical system will be influenced by the operation and activities supported by the logistical system, for example, if the aim is emergency relief, the good might include food or shelter items; while, if a reconstruction or rehabilitation initiative is implemented, the goods transported might include equipment, or construction material. Therefore, irrespective of the disaster phase for which the logistical system is required and implemented (prevention, mitigation, response, recovery), some general considerations can be identified.

The aim of this section is to provide an overview of a general logistical system, and to provide guidance on conducting planning for logistical support during disaster mitigation activities.

8.2.1 Role of Logistics in Mitigation Activities

For the purpose of this discussion, Mitigation activities will be considered to include components such as Preparedness, Recovery and Reconstruction. Mitigation activities can generally also be grouped into two

levels, namely structural and non-structural. Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure. Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts. In terms of logistical systems in support of mitigation activities, and in line with the above-mentioned definition, the aim of mitigation logistics will be to ensure appropriate mitigation related supplies or goods, in good condition, in the quantities required, are available at the place and time they are needed in order to implement preparedness, recovery and reconstruction activities. These items can include, amongst others:

- Equipment
    - Construction (Concrete Mixers and Pumps, Scaffolding, Construction Plant, Earthwork Machinery, etc.)
    - Communication and Information Technology (Radio broadcasting, receiving, Cabling, Networks, Servers, etc.)
    - Office Equipment (Computer, Photocopiers, Printers, Plotters, etc.)
- Tools
    - (Power tools, Hand tools, Cleaning tools, Machine tools, Measuring tools, Surveying tools, Electrical, Kitchen, etc.);
- Furniture
    - (Desks, tables, chairs, beds, etc.);
- Vehicles
    - (Air, Land, Water vehicles) (Freight transport, People carriers, Medical vehicles, communication vehicles, etc.);
- Construction Material
    - (Wood, Metals, Stone, Water, etc.);
- Food Material;
- Human Resources
    - (Specialists, support staff, construction workers, field workers, disaster victims, etc.); and
- Disaster Waste. Solid and liquid waste generated from a disaster, including
    - Concrete, steel, wood, clay and tar elements from damaged buildings and infrastructures;
    - Parts from the power and telephone grids such as electrical poles, wire, electronic equipment, transformers;
    - Parts from water and sewage distribution systems;
    - Natural debris such as clay, mud, trees;
    - Chemicals, dyes and other raw materials from industries and workshops;
    - Waste from relief operations;
    - Waste from disaster settlements and camps including food waste, packaging materials, excreta and other wastes from relief supplies; and

- Healthcare waste.

All of these items might be required to support the implemented mitigation activities, be it preparedness, recovery or reconstruction related.

8.2.2 Overview of Logistics

The UNDAC (United Nations Disaster Assessment and Coordination) indicates that: *"Emergency logistics is a "systems exercise"* and requires:

- Delivery of the appropriate supplies in good condition, when and where they are needed;
- A wide range of transport, often improvised at the local level;
- Limited, rapid, and specific deliveries from outside the area;
- A system of prioritising various relief inputs;
- Storing, staging, and moving bulk commodities;
- Moving people;
- Coordination and prioritization of the use of limited and shared transport assets; and
- Possible military involvement in logistics support (especially in cases of civil conflict).

Main factors in the operating environment which shape the response are:

- Capacity of the infrastructure;
- Availability and quantity of transport assets in the country;
- Politics of the situation; and
- Civil conflict in the area of operations.

Even though the above relates specifically to 'Emergency logistics' the above-mentioned aspects apply equally to logistics during the mitigation phase.

8.2.3 Components and Requirements of Logistical System Structure of a Logistical System

A typical logistical system will generally consist of the following components:

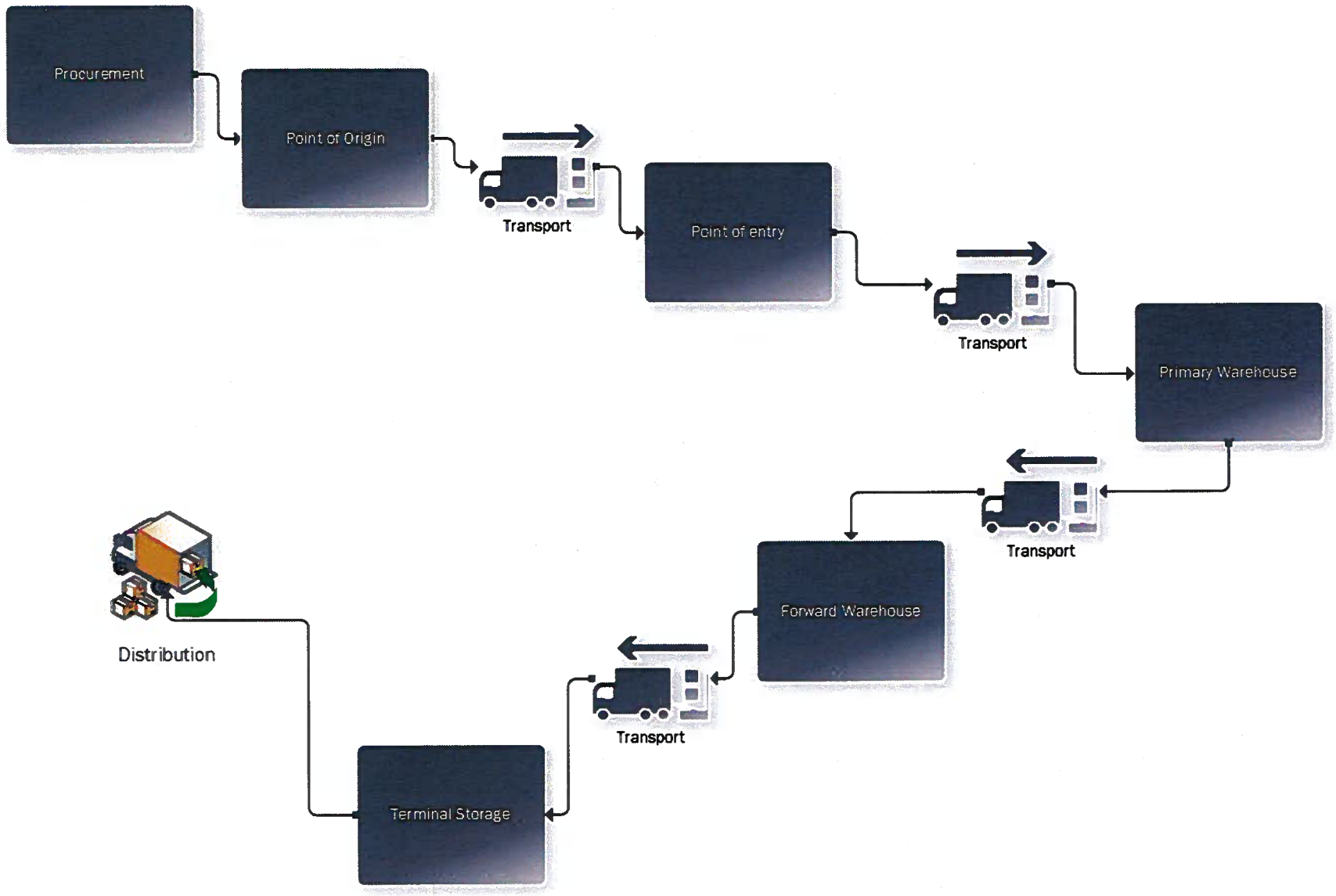

Figure 14: Logistical system