DISASTER MANAGEMENT PLAN
FOR
UTHUKELA DISTRICT MUNICIPALITY

Executive Summary for
IDP

Compiled by Watees Consulting (PTY) Ltd
March 2006

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ABBREVIATIONS

DDMAF	District Disaster Management Advisory Forum
DDMC	District Disaster Management Centre
DIDMC	District Inter-departmental Disaster Management Committee
DMC	Disaster Management Centre
DMF	Disaster Management Framework
DMP	Disaster Management Plan
UDM	Uthukela District Municipality
IDP	Integrated Development Process
KPA	Key Performance Area
LIDMC	Local Inter-departmental Disaster Management Committee
MDMAC / F	Municipal Disaster Management Advisory Committee / Forum
SDF	Spatial Development Framework
SOP	Standing Operating Procedure

Introduction

After the compilation of a disaster management framework (policy document) and the execution of a detailed disaster risk assessment, it was possible to summarise all findings for IDP purposes. For any further details refer to the detail disaster management plan (DMP) for UDM.

Hence, this document will give an overview of all important finding in the DMP of UDM.

Disaster Management Plan for UDM

The main purpose of the Disaster Management Plan (DMP) is *inter alia* to implement appropriate disaster risk reduction measures to reduce the vulnerability of communities and infrastructure at risk. The DMP is in line with national policy (National Disaster Management Framework), which requires the following:

- The compilation of a Disaster Management Framework (policy).
- The execution of a detailed disaster hazard, vulnerability and risk assessment.
- The compilation of disaster risk reduction measures.
- The compilation of appropriate Standing Operating Procedures (SOP's).
- Establishment of a District Disaster Management Centre (DDMC).
- Establishment of a Disaster Management Advisory Forum.
- Capacity Building, training and awareness programmes.

Hence, to accommodate the above-mentioned requirements, the DMP for Uthukela District Municipality (UDM) comprises various plans, namely;

- District Disaster Management Framework (policy).
- Disaster Hazard, Vulnerability and Risk Plan.
- Disaster Risk Reduction Plan.
- Disaster Response and Recovery Plan (SOP's and checklists).
- District Disaster Management Centre Plan.
- Guidelines to establish the Disaster Management Advisory Forum and Volunteer Contingent.

Disaster Management Framework (Policy) for UDM

The Disaster Management Framework (DMF) is a **strategic policy** document and guides all spheres of government in the implementation of the disaster management act. Hence, the DMF of UDM guides all local municipalities in UDM area of jurisdiction in the implementation of disaster management. To be in line with the National Disaster Management Framework, the DMF of UDM proposed five Key Performance Areas (KPA's), namely;

- Institutional Capacity Building for Disaster Management.
- Pre-Disaster Risk Reduction.
- Post-Disaster Recovery.
- Public Awareness, Education, Training and Research.
- Monitoring, Evaluation and Improvement.

Vision of Disaster Management for UDM

A peaceful environment to ensure and enhance sustainable development in the Uthukela District Municipal area of jurisdiction.

Mission of Disaster Management for UDM

An integrated, holistic and cost effective approach in disaster management to reduce the risk of any possible disaster.

Proposed Objectives for each KPA

KPA	Objective
KPA I: Institutional Capacity Building for Disaster Management	**Objective 1:** To establish effective institutional arrangements (the disaster management structure and organisation) for the development and approval of an integrated disaster management policy. **Objective 2:** To set out the mechanisms for the funding of disaster management. **Objective 3:** To develop a district strategic disaster management implementation plan to implement the Disaster Management Act. **Objective 4:** To establish and maintain a District Disaster Management Centre (DDMC) for UDM. **Objective 5:** To establish a Disaster Management Advisory Forums. **Objective 6:** To establish, train and maintain a Disaster Volunteer Contingent. **Objective 7:** To compile appropriate Mutual Assistance Agreements between all identified role players. **Objective 8:** To develop a comprehensive Disaster Management Information System (DMIS). **Objective 9:** To develop and establish integrated (horisontal and vertical) communication links with all disaster management role players in national, provincial and municipal spheres of government.

KPA II: Pre-Disaster Risk Reduction	**Objective 1:** To identify all potential hazards and threats by inter alia using indigenous knowledge. **Objective 2:** To execute a hazard assessment to compile a disaster hazard profile map for the UDM area of jurisdiction. **Objective 3:** To execute a vulnerability assessment, using GIS analysis to identify communities, property and infrastructure at risk. **Objective 4:** To execute a risk assessment to compile a disaster risk profile for the UDM area of jurisdiction **Objective 5:** To align the disaster management plan with the spatial development plan and with the IDP. **Objective 6:** To compile appropriate risk reduction strategies for each identified hazard. **Objectives 7:** To link each risk reduction strategy with Key Performance Areas of Line Functionaries to ensure effective and efficient implementation of risk reduction strategies. **Objectives 8:** To formulate appropriate development policy to ensure sustainable development in future.

KPA III: Post-Disaster Recovery	**<u>Objectives 1:</u>** To develop effective and efficient response and recovery plans (SOP's and contingency plans) for all identified hazards and risks. **<u>Objectives 2:</u>** To avert or reduce the potential impact in respect of health impacts, personal injury, loss of life, property, infrastructure or environment. **<u>Objectives 4:</u>** To ensure that relief operations following significant events are coordinated and equitably distributed. **<u>Objectives 5:</u>** To ensure that all rehabilitation and reconstruction strategies conducted following a disaster are implemented in a developmental manner.
KPA IV: Public Awareness, Education, Training and Research	**<u>Objectives 1:</u>** To disseminate Disaster Management information to communities at risk, to the public and other identified role players after the execution of a hazard, vulnerability and risk assessment. **<u>Objectives 2:</u>** To continuously execute public awareness campaigns to promote a culture of risk avoidance among stakeholders. **<u>Objectives 3:</u>** To ensure positive media coverage and publicity to increase public awareness and understanding of disaster management. **<u>Objectives 4:</u>** To develop appropriate educational and training programmes for disaster management to be implemented into regular training programmes. **<u>Objectives 5:</u>** To create applied knowledge through disaster management research programmes.

KPA V: Monitoring, Evaluation and Improvement	**<u>Objectives 1:</u>** Performance audits, self-assessments and peer reviews. **<u>Objectives 2:</u>** Mechanisms required for monitoring incidents and significant events, disaster review and reporting. **<u>Objectives 3:</u>** Guidelines for rehearsals, simulations, exercises and drills to evaluate the effectiveness of disaster management planning. **<u>Objectives 4:</u>** Highlights the resources required for effective monitoring, evaluation and improvements.

Disaster Hazard, Vulnerability and Risk Assessment for UDM

Using indigenous knowledge, it was possible to identify all potential hazards in UDM area of jurisdiction. The following table summarise all identified hazards.

Table 1: Identified hazard for UDM, 2006.

Lightning
Strong Winds
Rural Fires
Urban Fires
Hail Storm
Heavy Rain
Drought
Tornado
Disease (HIV, TB, Horse disease)
Cholera
Foot and Mouth disease
Soil Erosion
Environmental Degradation
Lack of appropriate sanitation facilities
Dumping Sites
Floods
Snow
Hazmat
Air Pollution (CO2, Acid rain, Plants)
Water contamination
Aircraft Accidents
Possible dam failure (Thukela and Bushman intersect)
Railway Accidents (railway passes dam wall)
Informal settlement under power lines
Cooling Towers unsafe at Colenso

Prioritising of hazard for UDM

It was possible to prioritise all identified hazards and risk for UDM during the risk assessment analysis. The worst-case scenario for all identified hazards was used to execute the risk assessment. The following results were obtained;

Table 2: Prioritising of potential hazards and risks in UDM, 2005.

	Hazard	Total
1	Poverty	265
2	Epidemics / Disease	245
3	Fire	240
4	Floods	215
5	Erosion	215
6	Environmental Degradation	195
7	Pollution - Water	195
8	Snow	170
9	Drought	167
10	Pollution - Air	140
11	Hazardous Materials	132
12	Road Accidents	110
13	Lightning	110
14	Dam Failure	109
15	Aircraft Accidents	92
16	Geological Hazard	92

Notwithstanding the fact that poverty is not a hazard, it is worthwhile to be mentioned. When a threshold value is linked to poverty, it is clear from the above table that poverty received the highest score. Hence, the alleviation of poverty is the highest priority, above all identified hazards, as this should also have a positive impact on the aspects listed above. UDM therefore has to reallocate its resources to eliminate poverty related issues above all other identified matters.

Epidemic and disease in UDM received a very high threshold value, making this event the most severe hazard for UDM. It is highly recommended that UDM formulates appropriate epidemic and disease prevention and mitigation strategies for all stakeholders in its area of jurisdiction in order to decrease the vulnerability of communities.

Veld fires, floods and erosion follows with threshold values between 200 and 245. Appropriate risk reduction strategies are required to decrease the vulnerability of communities at risk.

The following hazards received a threshold value between 150 and 199;

- Environmental Degradation
- Pollution - Water
- Snow
- Drought

It is deemed necessary to formulate appropriate SOP's and contingency plans for these hazards, which can be activated during an event to enable all Emergency Departments to react timely during such an event.

It is possible to graphically display the information in Table 2 (Figure 1). Figure 1 gives the IDP an indication of how much to spend on prevention and mitigation strategies.

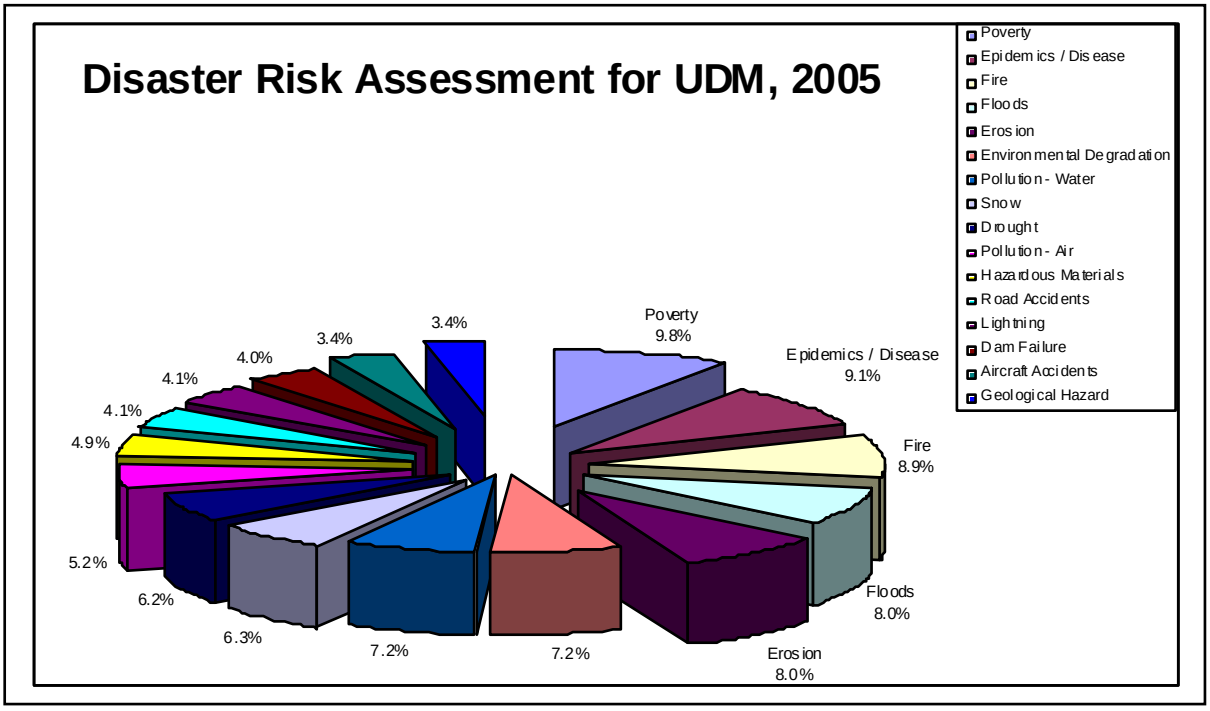


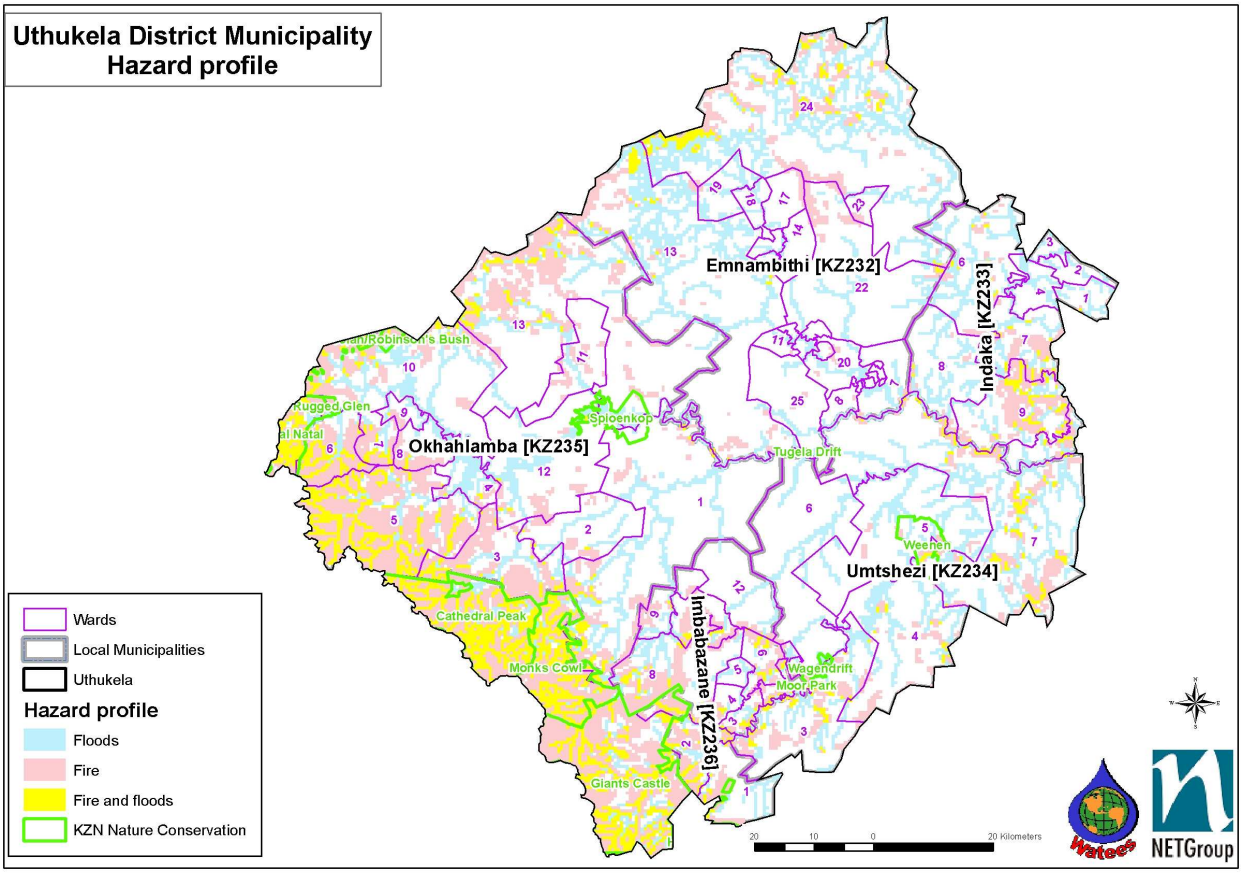
Figure 1: Percentage of total capital budget to be spent on prevention and mitigation strategies.

Ten per cent of the total budget may be spent on poverty alleviation programmes. Twenty seven per cent (9% on each) can be spent on epidemic, veld fire and flood relief measures. This is only a first round indication to guide the IDP in the allocation of funds to line departments, for this purpose.

Hazard Profile of UDM

Using the detail disaster hazard, vulnerability and risk assessments of UDM it was possible to compile appropriate GIS profile maps. These GIS-profile maps summarise the disaster hazard, vulnerability and risk analysis of UDM. Hence, these profile maps indicate the risk profile of the UDM area of jurisdiction.

When floods and veld fires (which received the highest threshold value during the risk assessment) were combined, it was possible to compile a disaster hazard profile map for UDM (Map 1). The blue colour indicates the location of possible flooded areas, red indicates the location of possible fire hazard zones, while the yellow colour indicates the combination of both fire and flooded areas in UDM area of jurisdiction.



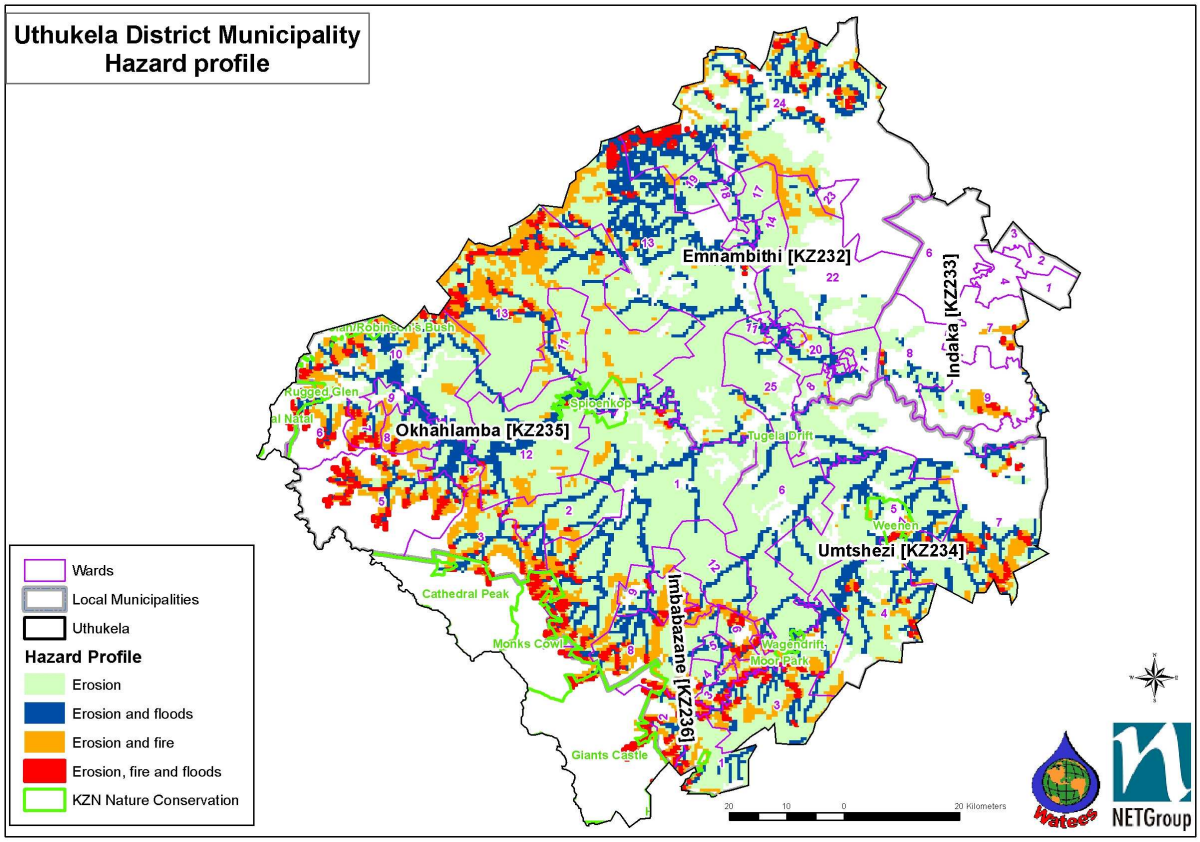
Map 1: Disaster hazard profile (flood and veld fire) for UDM, 2006

From Map 1 it was possible to identified wards at each local municipality at risk (Table 3).

Table 3: Wards at fire and flood risk in UDM area of jurisdiction, 2006.

Ward number	Local Municipality
7 13 22 24	Emnambithi [KZ232]
1 6 7 8 9 10	Indaka [KZ233]
2 3 4 6 7	Umtshezi [KZ234]
1 2 3 4 5 6 7 8 9 10 12 13	Okhahlamba [KZ235]
1 2 3 4 5 6 7 8 9 10 12	Imbabazane [KZ236]

A second hazard profile map was compiled (Map 2). Erosion was added to the flood and veld fire hazard profile map.



Map 2: Disaster hazard profile (flood, veld fire and erosion) for UDM, 2006

Risk profile for UDM

A risk profile map was compiled for UDM, using the threshold values of the risk assessment (Map 3). A high value indicates a high priority to implement risk reduction measures. The mountainous areas around the western border and low lying areas along rivers in the UDM area of jurisdiction seem to be most risky, hence highlights the importance of the implementation of appropriate risk reduction measures in these areas. Table 4 summarises settlements for each local municipality in the UDM area of jurisdiction which are located in a high risk hazard zone.

Table 4: Settlements located in a high risk hazard zone in the UDM area of jurisdiction, 2006.

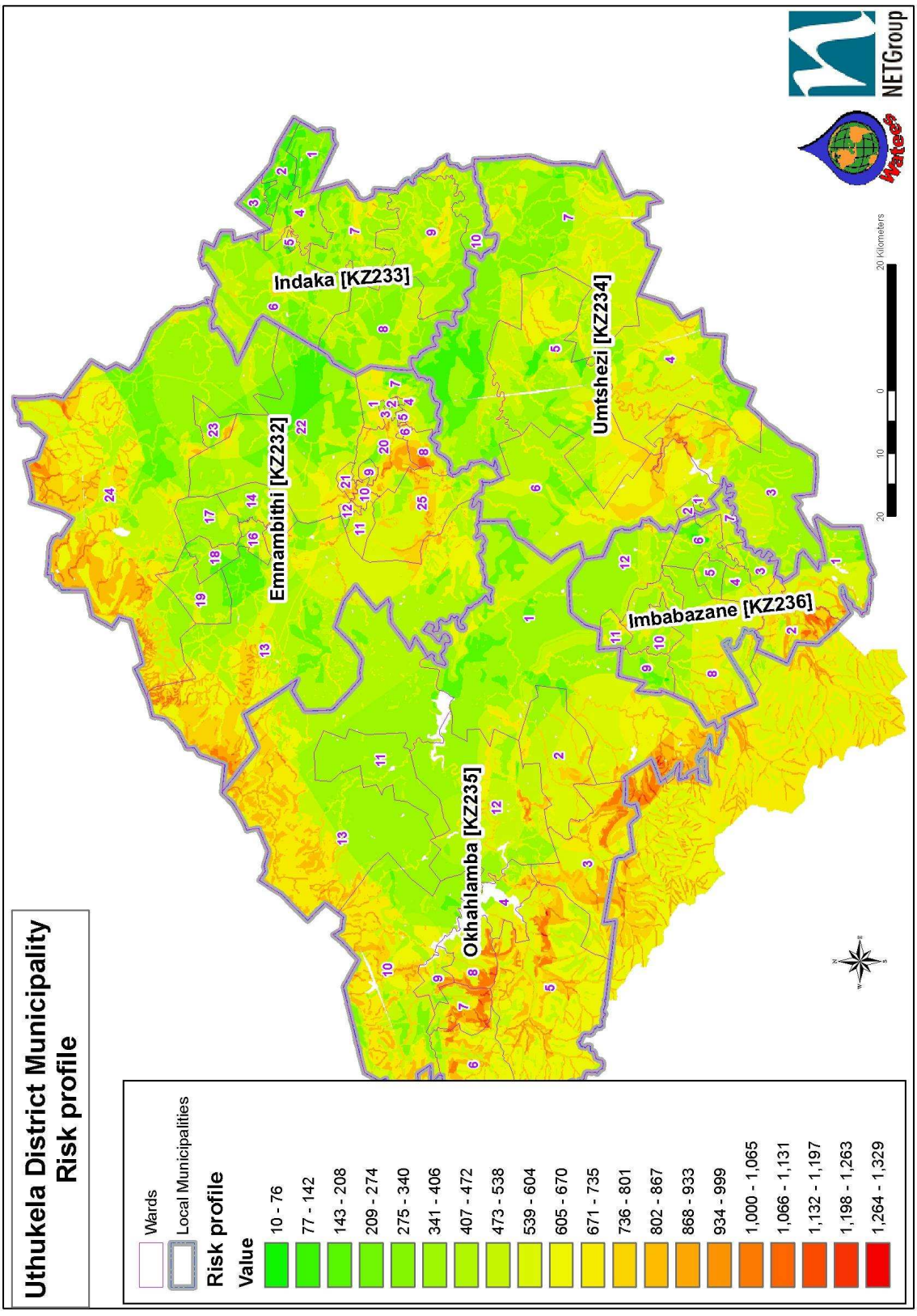
Settlement	Local Municipality
Baldaskraal Colenso Emadongeni Emashiseleni Embizeni Enhlakanhlakeni Esikhaleni Etsheni Ezakheni Ezintabeni Ezitendeni Gcabhane Gcizela Jonono's Kop Kirkintulloch Ladysmith Matiwane's Kop Nkanyezi Peace Town Qinisa Roosboom Steadville Stein Coal Spruit Ukhmtha Umlindazwe II	Emnambithi [KZ232]

Amagezana Amawuza Bhekezulu Craig/Boschoek Dalton Dayimane De Klerk Droogspruit Emakhwaba Emangxenge Emkholombini Endlotsheni Enhlanomkhize Esihlanjeni (A) Esihlanjeni (B) Esikhotweni Esiqhwageni Ezansino Mkhize (A) Ezansino Mkhize (B) Ezansino Mkhize (C) Ezansino Mkhize (D) Ezindongeni Imfolozi Ingodla Inkwezela I Inkwezela II Insonge Intandamuzi Iziqhingi Kwa Mduba Kwa Mubi Kwa Mzozwane Kwagcwingcwi Kwahlabane KwaMathebeni Kwamomnguza Kwamphezulu KwaZulu Loch Sloy Maqeleni New Land Ntababalulela Ntandabantu Ocingweni Okhalweni Phesheya Kwamathamo I Seventeen	Imbabazane [KZ236]

Shiyendlele Silimangamehlo Umloshazana Umqedandaba Umsusampi I	
Amadazane Ebhulubeni Ekuvukeni Emabhekasi I Emagcekeni Emahlathini I Emfundeni Endry Esidakeni Esigodini Ezitendeni Ezitendeni Isidibe Kwa Makhowa Kwa Siponono Kwasomhloshana Majuqula Mhlongohlongo Mkhumbane Mnangeni Nogejane Okhalweni Okhalweni Ondikazawa Sigodiphola Wembley Farm	Indaka [KZ233]

Bergville Bhalekisi Nkolweni Cathkin Peak Drakensberg Driefontein Ebusingatha 1 Ebusingatha II Emantesheni Emcijeni Emlimeleni Emmaus Mission Station Enhlanokhombe Enkoxweni Esigedleni Esikhaleni Esiqomeni Esitulwane Ethunzini Ethunzini Ezinyonyana Eziqalabeni Gangadweni Howe/Tintwa Imvulamehlo Insukangihlale Isigodi Jagersrust Kwa Hlophe Kwa Israel Kwa Maye Kwa Mhlanga Kwa Mvula Kwa Nkosana Kwa Nkosi Kwa Nkoxo Langkloof Mabhulesini Maganganga zi Makhosaneni Makhwabe Manzana Maphophomana "A" Maphophomana "B" Mbizeni Mkhomazana Mkhukhwini	Okhahlamba [KZ235

New Stand Ngoba Ngubhela Ngula/Tintwa Nhzambamasoka Nkwazini Nokopela Obonjaneni Oliviershoek Oqolweni Potshini Qhozo Reserve "A" Reserve "B" Reserve "C" Rheibokspruit/Tintwa Rookdale Entsha Shiyabazali Thamela Vimbukhalo Winterton Wittekop/Tintwa	
Estcourt Kwezi Hostel Wagon Drift Wembesi	Umtshezi [KZ234]



Map 3: Disaster Risk Profile for UDM, 2006

The following tables (Table 5-9) summarise the information in Map 3 for each local municipality. These tables indicate all settlements at local municipal level in the UDM area of jurisdiction expose to disaster risks. Only hazards which can be spatially located were used. Hazards such as poverty, diseases and epidemics are not included in the table as these affect all settlements. Drought and geology, especially seismic activity is difficult to predict and would probably also affect the district as a whole. Traffic accidents can also occur in all settlements as accidents could occur on any road. Red areas indicate a high priority to mitigate, while yellow and green areas indicate a medium and low priority for the implementation of risk reduction measures.

Table 5: Settlements in Emnambithi Municipality expose to disaster risks, 2006.

Settlement	Risk value	Fire	Floods	Erosion	Degradation	Water pollution	Snow	Air pollution	Hazmat	Lightning	Dam failure	Aircraft accidents
Ladysmith	1454	High	✓	✓	✓	✓		✓	✓	8-9		✓
Steadville	1334	Medium	✓	✓	✓	✓		✓	✓	8-9		✓
Matiwane's Kop	1322	High	✓	✓	✓	✓		✓		8-9		✓
Roosboom	1139	Medium	✓	✓	✓			✓	✓	8-9		✓
Baldaskraal	1110	Medium	✓	✓	✓	✓		✓		8-9		
Peace Town	1110	Medium	✓	✓	✓	✓		✓		8-9		
Umlindazwe I	1110	Medium	✓	✓	✓	✓		✓		8-9		
Stein Coal Spruit	1107	High	✓		✓	✓		✓		8-9		✓
Ezakheni	1080	Medium	✓	✓	✓	✓		✓		7-8		
Jonono's Kop	1035	High	✓	✓	✓			✓		8-9		
The Hoek	1035	High	✓	✓	✓			✓		8-9		
Ezintabeni	1007	Medium	✓	✓	✓			✓		8-9		✓
Colenso	999	Medium	✓	✓		✓			✓	8-9		✓
Etsheni	999	Medium	✓	✓	✓				✓	8-9		✓
Nkanyezi	999	Medium	✓	✓		✓			✓	8-9		✓
Emadongeni	970	Medium	✓	✓	✓	✓				8-9		
Emashiseleni	970	Medium	✓	✓	✓	✓				8-9		
Emathondwane	970	Medium	✓	✓	✓	✓				8-9		
Emunywini	970	Medium	✓	✓	✓	✓				8-9		
Esifubeni	970	Medium	✓	✓	✓	✓				8-9		
Ezitendeni	970	Medium	✓	✓	✓	✓				8-9		
Gcabhane	970	Medium	✓	✓	✓	✓				8-9		
Gcizela	970	Medium	✓	✓	✓	✓				8-9		
Kirkintulloch	970	Medium	✓	✓	✓	✓				8-9		
Umhlwane	970	Medium	✓	✓	✓	✓				8-9		
Ukhmtha	950	Medium	✓	✓	✓	✓				7-8		
Brookfield	944	Medium	✓	✓				✓	✓	8-9		✓
Embizeni	924	Medium	✓	✓				✓	✓	7-8		✓
Qinisa	924	Medium	✓	✓				✓	✓	7-8		✓
Enhlakanhlakeni	915	Medium	✓	✓		✓		✓		8-9		
Hobsland	915	Medium	✓	✓	✓			✓		8-9		
Umlindazwe II	915	Medium	✓	✓		✓		✓		8-9		
Madilika	895	High	✓	✓	✓					8-9		
Amanzibilayo	895	Medium	✓	✓	✓			✓		7-8		

Nkamane	895	Medium	✓	✓	✓			✓		7-8		
Lucitania	890	Medium	✓	✓			✓	✓		8-9		
Blue Bank	867	Medium	✓	✓		✓				8-9		✓
St. Joseph's Mission	867	Medium	✓	✓		✓				8-9		✓
Amahuku	775	Medium	✓	✓	✓					8-9		
Bhiriya	775	Medium	✓	✓	✓					8-9		
Egcekeni	775	Medium	✓	✓	✓					8-9		
Ehlathini	775	Medium	✓	✓		✓				8-9		
Emadrayini	775	Medium	✓	✓	✓					8-9		
Emahlabathini	775	Medium	✓	✓		✓				8-9		
Emaswazini	775	Medium	✓	✓	✓					8-9		
Emathondwane	775	Medium	✓	✓	✓					8-9		
Emathondwane	775	Medium	✓	✓	✓					8-9		
Emgazini	775	Medium	✓	✓	✓					8-9		
Emgazini	775	Medium	✓	✓	✓					8-9		
Emtateni	775	Medium	✓	✓	✓					8-9		
Esidakeni	775	Medium	✓	✓	✓					8-9		
Esikhaleni	775	Medium	✓	✓	✓					8-9		
Ezitendeni	775	Medium	✓	✓	✓					8-9		
Gudlintaba	775	Medium	✓	✓		✓				8-9		
Ingogo	775	Medium	✓	✓		✓				8-9		
Klipfontein	775	Medium	✓	✓	✓					8-9		
Mgunjane	775	Medium	✓	✓	✓					8-9		
Riverside	775	Medium	✓	✓		✓				8-9		
Riverside	775	Medium	✓	✓	✓					8-9		
S'Godiphola	775	Medium	✓	✓	✓					8-9		
Shayinduku	775	Medium	✓	✓	✓					8-9		
Usaba	755	Medium	✓	✓	✓					7-8		
Golokodo	735	Medium	✓		✓	✓				7-8		
Emzinimisha	700	Medium	✓	✓				✓		7-8		
Droogwal	652	Medium	✓		✓					8-9		✓
Compensation	580	Medium	✓	✓						8-9		
Egcekeni	580	Medium	✓	✓						8-9		
Emachibini	580	Medium	✓	✓						8-9		
Entonjeni	580	Medium	✓	✓						8-9		
Entuthuwini	580	Medium	✓	✓						8-9		
Gudlintaba	580	Medium	✓	✓						8-9		
Gudlintaba	580	Medium	✓	✓						8-9		
Gunundwini	580	Medium	✓	✓						8-9		
Mbondwane	580	Medium	✓	✓						8-9		
Enkambini	560	Medium		✓	✓					8-9		
Gudlucingo	560	Medium		✓	✓					8-9		
Izinkethe	560	Medium		✓	✓					8-9		
Izitende	560	Medium		✓	✓					8-9		
Sicelo	560	Medium		✓	✓					8-9		
Ezibomvini	560	Medium	✓			✓				8-9		
Kwa Bloy	540	Medium	✓		✓					7-8		
Kwa Mfishane	540	Medium	✓		✓					7-8		
Emndeni	365	Medium		✓						8-9		
Emunywini	365	Medium		✓						8-9		

Table 6: Settlements in Indaka Municipality expose to disaster risks, 2006.

Settlement	Risk value	Fire	Floods	Erosion	Degradation	Water pollution	Snow	Air pollution	Hazmat	Lightning	Dam failure	Aircraft accidents
Emahlathini I	1162	High	✓	✓	✓	✓				7-8		✓
Amadazane	1042	Medium	✓	✓	✓	✓				7-8		✓
Emfundeni	967	High	✓	✓		✓				7-8		✓
Ezitendeni	967	High	✓	✓		✓				7-8		✓
Majuqula	967	High	✓	✓		✓				7-8		✓
Mhlongohlongo	950	Medium	✓	✓	✓	✓				7-8		
Wembley Farm	950	Medium	✓	✓	✓	✓				7-8		
Kwa Shede	947	High	✓		✓	✓				7-8		✓
Mbondwane	947	High	✓		✓	✓				7-8		✓
Okhalweni	947	High	✓		✓	✓				7-8		✓
Kwa Siponono	875	High	✓	✓	✓					7-8		
Nogejane	847	Medium	✓	✓		✓				7-8		✓
Ondikazawa	847	Medium	✓	✓		✓				7-8		✓
Amakhasi I	827	Medium	✓		✓	✓				7-8		✓
Choboza	827	Medium	✓		✓	✓				7-8		✓
Ebomvini	827	Medium	✓		✓	✓				7-8		✓
Ematsheketshe	827	Medium	✓		✓	✓				7-8		✓
Endry	827	Medium	✓		✓	✓				7-8		✓
Entenjaneni	827	Medium	✓		✓	✓				7-8		✓
Kwa Skoti	827	Medium	✓		✓	✓				7-8		✓
Qhimkhowe	827	Medium	✓		✓	✓				7-8		✓
Rockliff	827	Medium	✓		✓	✓				7-8		✓
Somshoek	827	Medium	✓		✓	✓				7-8		✓
Stanford	827	Medium	✓		✓	✓				7-8		✓
Vaalkop	827	Medium	✓		✓	✓				7-8		✓
Emabhekasi I	772	Medium	✓		✓			✓		7-8		✓
Ematshemhlophe	772	Medium	✓		✓			✓		7-8		✓
Esigodini	772	High	✓	✓						7-8		✓
Ezanqaweni	772	High	✓	✓						7-8		✓
Kwa Nomlaka I	772	Medium	✓		✓			✓		7-8		✓
Mnangeni	772	Medium	✓		✓			✓		7-8		✓
Ekuvukeni	764	Medium	✓		✓				✓	7-8		✓
Ebhulubeni	755	Medium	✓	✓		✓				7-8		
Esidakeni	755	Medium	✓	✓		✓				7-8		
Inhlabamasoka	755	Medium	✓	✓		✓				7-8		
Kwa Makhowa	755	Medium	✓	✓		✓				7-8		
Mkhalandoda	755	Medium	✓	✓		✓				7-8		
Mkhumbane	755	Medium	✓	✓		✓				7-8		
Vimbangegazi	755	Medium	✓	✓		✓				7-8		
Endanyana	752	High	✓			✓				7-8		✓
Enhlambeni	752	High	✓			✓				7-8		✓
Esihoxweni	752	High	✓			✓				7-8		✓
Inkolovu	752	High	✓			✓				7-8		✓
Isoye	752	High	✓		✓					7-8		✓
Kwa Xaba	752	High	✓			✓				7-8		✓

Mountain Side	752	High	✓			✓				7-8		✓
Mtebhelu	752	High	✓			✓				7-8		✓
Shabalala	752	High	✓			✓				7-8		✓
Ubhuku	752	High	✓			✓				7-8		✓
Msusampi I	742	High	✓			✓				6-7		✓
Dival	735	Medium	✓		✓	✓				7-8		
Imbiva	735	Medium	✓		✓	✓				7-8		
Limehill	735	Medium	✓		✓	✓				7-8		
Nakho	735	Medium	✓		✓	✓				7-8		
Ward 4 B	735	Medium	✓		✓	✓				7-8		
Emahlathini II	652	Medium	✓	✓						7-8		✓
Ezitendeni	652	Medium	✓	✓						7-8		✓
Amakhasi II	632	Medium	✓		✓					7-8		✓
Asynkraal	632	Medium	✓		✓					7-8		✓
Bhiriya	632	Medium	✓		✓					7-8		✓
Emabhekasi II	632	Medium	✓		✓					7-8		✓
Emaqeleni	632	Medium	✓		✓					7-8		✓
Ematshemhlophe	632	Medium	✓		✓					7-8		✓
Enazaretha	632	Medium	✓		✓					7-8		✓
Endaka	632	Medium	✓		✓					7-8		✓
Enkangala	632	Medium	✓			✓				7-8		✓
Entatshaneni	632	Medium	✓		✓					7-8		✓
Esijozi	632	Medium	✓			✓				7-8		✓
Esikoko	632	Medium	✓		✓					7-8		✓
Ezihlabeni	632	Medium	✓			✓				7-8		✓
Hlathi	632	Medium	✓			✓				7-8		✓
Imbondwane	632	Medium	✓			✓				7-8		✓
Inkawulo I	632	Medium	✓			✓				7-8		✓
Inkawulo II	632	Medium	✓			✓				7-8		✓
Kwa Hlephu	632	Medium	✓		✓					7-8		✓
Kwa Jim	632	Medium	✓			✓				7-8		✓
Kwa Mabedlana	632	Medium	✓		✓					7-8		✓
Kwa Maqala	632	Medium	✓		✓					7-8		✓
Kwa Ndongweni	632	Medium	✓		✓					7-8		✓
Nkundela	632	Medium	✓		✓					7-8		✓
Nogqaza	632	Medium	✓		✓					7-8		✓
Okhalweni	632	Medium	✓		✓					7-8		✓
Okhalweni	632	Medium	✓		✓					7-8		✓
Thembisa	632	Medium	✓			✓				7-8		✓
Umxhaka	632	Medium	✓			✓				7-8		✓
Waaihoek	632	Medium	✓		✓					7-8		✓
Ward 1 B	632	Medium	✓		✓					7-8		✓
Cancane	560	Medium	✓	✓						7-8		
Doornkraal	560	Medium	✓	✓						7-8		
Emalomini	560	Medium	✓	✓						7-8		
Emgudleni	560	Medium	✓	✓						7-8		
Hloshozana	560	Medium	✓	✓						7-8		
Kwa Sathane	560	Medium	✓	✓						7-8		
Mgunjaneni	560	Medium	✓	✓						7-8		
Mteyi	560	Medium	✓	✓						7-8		
Sigodiphola	560	Medium	✓	✓						7-8		
Egunjini	557	High	✓							7-8		✓

Emabhasini	557	High	✓							7-8		✓
Emagcekeni	557	High	✓							7-8		✓
Inkunzang	557	High	✓							7-8		✓
Kwasomhloshana	557	Medium			✓			✓		7-8		✓
Msusampi II	557	High	✓							7-8		✓
Dukemini	540	Medium	✓			✓				7-8		
Emgunjaneni	540	Medium	✓			✓				7-8		
Emkhalanyoni	540	Medium	✓			✓				7-8		
Esibomvu	540	Medium	✓			✓				7-8		
Gudlintaba	540	Medium	✓			✓				7-8		
Jikishoba	540	Medium	✓		✓					7-8		
Nodinda	540	Medium	✓			✓				7-8		
Tholeni	540	Medium	✓		✓					7-8		
Vergelegen	540	Medium	✓			✓				7-8		
Ward 1 A	540	Medium	✓		✓					7-8		
Ward 4 A	540	Medium	✓		✓					7-8		
Amabolwane	437	Medium	✓							7-8		✓
Emahlabathini	437	Medium	✓							7-8		✓
Emalomini	437	Medium	✓							7-8		✓
Embango	437	Medium	✓							7-8		✓
Eplatform	437	Medium	✓							7-8		✓
Kwa Jim	437	Medium	✓							7-8		✓
Kwa Mlenze	437	Medium	✓							7-8		✓
Kwa Thekwane	437	Medium	✓							7-8		✓
Okhalweni	437	Medium	✓							7-8		✓
Umbojaneni	437	Medium	✓							7-8		✓
Umziyana	437	Medium	✓							7-8		✓
Amatsheketshe	417	Medium			✓					7-8		✓
Gudlucingo	417	Medium			✓					7-8		✓
Sondoda	417	Medium			✓					7-8		✓
Vaalkop	417	Medium			✓					7-8		✓
Doringkop	362	Medium						✓		7-8		✓
Cancane	345	Medium	✓							7-8		
Entabenebomvu	345	Medium	✓							7-8		
Kwa Bonda	345	Medium		✓						7-8		
Ndanyana	345	Medium	✓							7-8		
Emoyeni	342	High								7-8		✓
Empophomeni	342	High								7-8		✓
Isidibe	342	High								7-8		✓
Hlongwana Section	325	Medium			✓					7-8		
Lionville Section	325	Medium			✓					7-8		
School Section	325	Medium			✓					7-8		
Sigodiphola	325	Medium			✓					7-8		
Emhohobeni	222	Medium								7-8		✓
Emoyeni	222	Medium								7-8		✓
Kwa Nomlaka II	222	Medium								7-8		✓
Mgwenya	222	Medium								7-8		✓
Mndanyane	222	Medium								7-8		✓
Mzenze	130	Medium								7-8		
Umgababa	130	Medium								7-8		

Table 7: Settlements in Umtshezi Municipality expose to disaster risk, 2006.

Settlement	Risk value	Fire	Floods	Erosion	Degradation	Water pollution	Snow	Air pollution	Hazmat	Lightning	Dam failure	Aircraft accidents
Estcourt	1583	High	✓	✓	✓	✓		✓	✓	9-10	✓	✓
Wembesi	1270	High	✓	✓	✓	✓		✓		10-11		
Kwezi Hostel	1053	Medium	✓	✓				✓	✓	8-9	✓	✓
Thembalihle	987	High	✓	✓	✓					8-9		✓
Wagon Drift	964	Medium	✓	✓				✓	✓	9-10		✓
Cornfields	867	Medium	✓	✓	✓					8-9		✓
Weenen Emergency Camp	755	Medium	✓	✓		✓				7-8		
Chievely Station	589	Medium		✓					✓	8-9		✓

Table 8: Settlements in Okhahlamba Municipality expose to disaster risk, 2006.

Settlement	Risk value	Fire	Floods	Erosion	Degradation	Water pollution	Snow	Air pollution	Hazmat	Lightning	Dam failure	Aircraft accidents
Makhosaneni	1389	High	✓	✓	✓	✓	✓			9-10	✓	
Driefontein	1357	High	✓	✓		✓	✓	✓		11-12		✓
Langkloof	1352	High	✓	✓	✓	✓	✓			8-9		✓
Isigodi	1300	High	✓	✓	✓	✓	✓			10-11		
Mbizeni	1300	High	✓	✓	✓	✓	✓			10-11		
Qhozo	1300	High	✓	✓	✓	✓	✓			10-11		
Mkhomazana	1280	High	✓	✓	✓	✓	✓			9-10		
Esitulwane	1270	High	✓	✓	✓	✓		✓		10-11		
Maphophomana "A"	1260	High	✓	✓	✓	✓	✓			8-9		
New Stand	1260	High	✓	✓	✓	✓	✓			8-9		
Obonjaneni	1260	High	✓	✓	✓	✓	✓			8-9		
Ethunzini	1245	High	✓	✓		✓	✓	✓		10-11		
Nhzambamasoka	1245	High	✓	✓		✓	✓	✓		10-11		
Thamela	1217	High	✓	✓		✓	✓			11-12		✓
Unknown	1197	High	✓	✓		✓	✓			10-11		✓
Unknown_2	1197	High	✓	✓		✓	✓			10-11		✓
Oqolweni	1160	Medium	✓	✓	✓	✓	✓			9-10		
Mkhukhwini	1157	High	✓	✓	✓		✓			8-9		✓
Magangangozi	1150	Medium	✓	✓	✓	✓		✓		10-11		
Nokopela	1150	Medium	✓	✓	✓	✓		✓		10-11		
Emcijeni	1146	Medium	✓	✓	✓		✓			8-9	✓	✓
Bergville	1128	Medium	✓	✓		✓			✓	9-10	✓	✓
Makhwabe	1125	Medium	✓	✓	✓		✓	✓		10-11		
Kwa Hlophe	1105	High	✓	✓		✓	✓			10-11		
Kwa Mhlanga	1105	High	✓	✓		✓	✓			10-11		
Ngoba	1105	High	✓	✓		✓	✓			10-11		

Bhalekisi Nkolweni	1085	High	✓	✓	✓		✓			9-10		
Enhlanokhombe	1085	High	✓	✓	✓		✓			9-10		
Enkoxweni	1085	High	✓	✓	✓		✓			9-10		
Esigedleni	1085	High	✓	✓		✓	✓			9-10		
Ethunzini	1085	High	✓	✓	✓		✓			9-10		
Gangadweni	1085	High	✓	✓	✓		✓			9-10		
Kwa Mvula	1085	High	✓	✓	✓		✓			9-10		
Kwa Nkosana	1085	High	✓	✓	✓		✓			9-10		
Mabhulesini	1085	High	✓	✓		✓	✓			9-10		
Ngubhela	1085	High	✓	✓	✓		✓			9-10		
Kwa Nkoxo	1075	High	✓	✓	✓			✓		10-11		
Potshini	1075	High	✓	✓	✓			✓		10-11		
Vimbukhalo	1075	High	✓	✓	✓			✓		10-11		
Ebusingatha 1	1065	High	✓	✓		✓	✓			8-9		
Reserve "C"	1065	High	✓	✓	✓		✓			8-9		
Rookdale Entsha	1065	High	✓	✓	✓		✓			8-9		
Shiyabazali	1065	High	✓	✓	✓		✓			8-9		
Unknkown_4	1050	High	✓	✓			✓	✓		10-11		
Unknown_3	1050	High	✓	✓			✓	✓		10-11		
Kwa Israel	1037	Medium	✓	✓	✓		✓			8-9		✓
Kwa Israel	1037	Medium	✓	✓	✓		✓			8-9		✓
Kwa Maye	1024	High	✓	✓	✓					9-10	✓	
Nkwazini	1022	Medium	✓	✓			✓	✓		10-11		✓
Imvulamehlo	965	Medium	✓	✓	✓		✓			9-10		
Emmaus Mission Station	955	Medium	✓	✓		✓		✓		10-11		
Ezinyonyana	955	Medium	✓	✓	✓			✓		10-11		
Insukangihlale	945	Medium	✓	✓		✓	✓			8-9		
Maphophomana "B"	945	Medium	✓	✓	✓		✓			8-9		
Ngula/Tintwa	945	Medium	✓	✓		✓	✓			8-9		
Oliviershoek	945	Medium	✓	✓	✓		✓			8-9		
Reserve "A"	945	Medium	✓	✓	✓		✓			8-9		
Reserve "B"	945	Medium	✓	✓	✓		✓			8-9		
Eziqalabeni	910	High	✓	✓			✓			10-11		
Kwa Nkosi	910	High	✓	✓			✓			10-11		
Manzana	910	High	✓	✓			✓			10-11		
Greenpoint	895	High	✓	✓		✓				8-9		
Malottaskraal	895	High	✓	✓		✓				8-9		
Unknkown_4	880	High	✓	✓				✓		10-11		
Ebusingatha II	870	High	✓	✓			✓			8-9		
Howe/Tintwa	870	High	✓	✓			✓			8-9		
Wittekop/Tintwa	870	High	✓	✓			✓			8-9		
Bethany	867	Medium	✓	✓		✓				8-9		✓
Woodford	867	Medium	✓	✓		✓				8-9		✓
Cathkin Peak	852	Medium	✓	✓				✓		10-11		✓
Acton Homes	775	Medium	✓	✓		✓				8-9		
Hambrook	775	Medium	✓	✓		✓				8-9		
Emantesheni	770	Medium	✓	✓			✓			9-10		
Esiqomeni	770	Medium	✓	✓			✓			9-10		
Othukela	770	Medium	✓	✓			✓			9-10		
Emlimeleni	760	Medium	✓	✓				✓		10-11		
Esikhaleni	760	Medium	✓	✓				✓		10-11		
Rheibokspruit/Tintwa	750	Medium	✓	✓			✓			8-9		

DRAKENSBERG	736	Medium		✓			✓			8-9	✓	✓
JAGERSRUST	736	Medium		✓			✓			8-9	✓	✓
Winterton	732	Medium	✓	✓					✓	9-10		
Rooihoek	700	High	✓	✓						8-9		
GELUKSBERG	655	High		✓			✓			8-9		
Rosenstein	627	Medium		✓			✓			8-9		✓
Uitzigt	537	Medium		✓					✓	10-11		
Estcourt Emergency Camp	517	Medium		✓					✓	9-10		
Nooitgedacht	385	Medium		✓						9-10		

Table 9: Settlements in Imbabazane Municipality expose to disaster risks, 2006.

Settlement	Risk value	Fire	Floods	Erosion	Degradation	Water pollution	Snow	Air pollution	Hazmat	Lightning	Dam failure	Aircraft accidents
Craig/Boschoek	1362	High	✓	✓	✓	✓		✓		10-11		✓
Kwamphezulu	1320	High	✓	✓	✓	✓	✓			11-12		
Ocingweni	1320	High	✓	✓	✓	✓	✓			11-12		
Umloshazana	1320	High	✓	✓	✓	✓	✓			11-12		
Bhekezulu	1262	High	✓	✓	✓	✓			✓	10-11		
Droogspruit	1262	High	✓	✓	✓	✓			✓	10-11		
Amawuza	1200	Medium	✓	✓	✓	✓	✓			11-12		
Ezansino Mkhize (A)	1200	Medium	✓	✓	✓	✓	✓			11-12		
Okhalweni	1200	Medium	✓	✓	✓	✓	✓			11-12		
Loch Sloy	1167	High	✓	✓	✓			✓		10-11		✓
Emangxenge	1125	High	✓	✓	✓		✓			11-12		
Emkholombini	1125	High	✓	✓	✓		✓			11-12		
Endlotsheni	1125	High	✓	✓		✓	✓			11-12		
Enhlanomkhize	1125	High	✓	✓		✓	✓			11-12		
Esiqhwageni	1125	High	✓	✓	✓		✓			11-12		
Ezansino Mkhize (D)	1125	High	✓	✓	✓		✓			11-12		
Ezindongeni	1125	High	✓	✓	✓		✓			11-12		
Maqeleni	1125	High	✓	✓		✓	✓			11-12		
UNKNOWN	1125	High	✓	✓	✓		✓			11-12		
Emakhwaba	1067	High	✓	✓	✓				✓	10-11		
Egoboslunjane	1047	High	✓	✓		✓				11-12		✓
Ezithaleni	1027	High	✓	✓		✓				10-11		✓
New Land	1027	High	✓	✓	✓					10-11		✓
Shayamoya (B)	1027	High	✓	✓	✓					10-11		✓
De Klerk	1010	Medium	✓	✓	✓	✓				10-11		
Ithamela	1010	Medium	✓	✓	✓	✓				10-11		
Phesheya Kwamathamo I	1010	Medium	✓	✓	✓	✓				10-11		
Dalton	1007	High	✓	✓		✓				9-10		✓
Dayimane	1005	Medium	✓	✓	✓		✓			11-12		
Esihlanjeni (A)	1005	Medium	✓	✓	✓		✓			11-12		
Esihlanjeni (B)	1005	Medium	✓	✓	✓		✓			11-12		

Ezansino Mkhize (B)	1005	Medium	✓	✓	✓		✓			11-12		
Ezansino Mkhize (C)	1005	Medium	✓	✓	✓		✓			11-12		
Gwilimbiza	1005	Medium	✓	✓		✓	✓			11-12		
Inkwezela I	1005	Medium	✓	✓		✓	✓			11-12		
Kwa Mubi	1005	Medium	✓	✓	✓		✓			11-12		
Kwahlabane	1005	Medium	✓	✓		✓	✓			11-12		
KwaMathebeni	1005	Medium	✓	✓		✓	✓			11-12		
Ntababalulela	1005	Medium	✓	✓	✓		✓			11-12		
Ntandabantu	1005	Medium	✓	✓	✓		✓			11-12		
Amagezana	947	Medium	✓	✓	✓				✓	10-11		
Iziqhingi	947	Medium	✓	✓	✓				✓	10-11		
Kwagcwingcwi	947	Medium	✓	✓	✓				✓	10-11		
Umqedandaba	947	Medium	✓	✓	✓				✓	10-11		
Ididi	935	High	✓	✓		✓				10-11		
Imfolozi	935	High	✓	✓	✓					10-11		
Imfoumazi	935	High	✓	✓		✓				10-11		
Ingodla	935	High	✓	✓		✓				10-11		
Intandamuzi	935	High	✓	✓		✓				10-11		
Kwamomnguza	935	High	✓	✓	✓					10-11		
Seventeen	935	High	✓	✓	✓					10-11		
Shiyendlele	935	High	✓	✓		✓				10-11		
Umsusampi I	935	High	✓	✓		✓				10-11		
Umsusampi II	935	High	✓	✓		✓				10-11		
Dodoci	930	High	✓	✓			✓			11-12		
Inkwezela II	930	High	✓	✓			✓			11-12		
Insonge	930	High	✓	✓			✓			11-12		
Kwa Mzozwane	930	High	✓	✓			✓			11-12		
KwaZulu	930	High	✓	✓			✓			11-12		
Silimangamehlo	930	High	✓	✓			✓			11-12		
UNKNOWN	930	High	✓	✓			✓			11-12		
Emazambaneni	927	Medium	✓	✓		✓				11-12		✓
Amagebuzi	910	High	✓	✓			✓			10-11		
Emnyangweni	910	High	✓	✓			✓			10-11		
Esluyabazali	907	Medium	✓	✓		✓				10-11		✓
Kwa Mduba	907	Medium	✓	✓		✓				10-11		✓
Kwavezunyawo	902	Medium	✓	✓			✓			11-12		✓
Emhubheni	852	Medium	✓	✓				✓		10-11		✓
Lochsloy No 1	852	Medium	✓	✓				✓		10-11		✓
Ebhoshi	832	High	✓	✓						10-11		✓
Endikini	832	High	✓	✓						10-11		✓
Ebhadeni	815	Medium	✓	✓		✓				10-11		
Edindini	815	Medium	✓	✓	✓					10-11		
Edwaleni	815	Medium	✓	✓		✓				10-11		
Ekuphumuleni	815	Medium	✓	✓	✓					10-11		
Emangweni Mission Station	815	Medium	✓	✓		✓				10-11		
Emfoloma	815	Medium	✓	✓		✓				10-11		
Emgubaneni	815	Medium	✓	✓		✓				10-11		
Emjondolo	815	Medium	✓	✓	✓					10-11		
Emvundlweni I	815	Medium	✓	✓		✓				10-11		
Endakeni	815	Medium	✓	✓		✓				10-11		
Engunjini	815	Medium	✓	✓	✓					10-11		

Ezibomvini	815	Medium	✓	✓		✓				10-11		
Ezinyosini	815	Medium	✓	✓		✓				10-11		
Gabazini	815	Medium	✓	✓	✓					10-11		
Good Home (A)	815	Medium	✓	✓		✓				10-11		
Good Home (B)	815	Medium	✓	✓	✓					10-11		
Inkunzi	815	Medium	✓	✓	✓					10-11		
Khangela	815	Medium	✓	✓	✓					10-11		
Kwandema	815	Medium	✓	✓	✓					10-11		
KwaNyathi	815	Medium	✓	✓		✓				10-11		
Seventeen	815	Medium	✓	✓	✓					10-11		
Sgodi Phola	815	Medium	✓	✓	✓					10-11		
Shayamoya (A)	815	Medium	✓	✓	✓					10-11		
Shayamoya Enkanjini	815	Medium	✓	✓		✓				10-11		
Sobabili	815	Medium	✓	✓		✓				10-11		
Umbango	815	Medium	✓	✓	✓					10-11		
Emothalanga	810	Medium	✓	✓			✓			11-12		
Esikhotweni	810	Medium	✓	✓			✓			11-12		
Kwa Nqubuka	810	Medium	✓	✓			✓			11-12		
Kwambangeni	810	Medium	✓	✓			✓			11-12		
Bhekabezwayo	790	Medium	✓	✓			✓			10-11		
Edashi	790	Medium	✓	✓			✓			10-11		
Ezimfeneni	790	Medium	✓	✓			✓			10-11		
Kwa Gcinusizi	790	Medium	✓	✓			✓			10-11		
Shiyabazali	790	Medium	✓	✓			✓			10-11		
Emagangeni	760	Medium	✓	✓				✓		10-11		
Phansikwentaba II	760	Medium	✓	✓				✓		10-11		
Emagonsi	752	Medium	✓	✓					✓	10-11		
Emahlabathini	752	Medium	✓	✓					✓	10-11		
Empangweni Mission	752	Medium	✓	✓					✓	10-11		
Kwageza	752	Medium	✓	✓					✓	10-11		
Emahlaghwaneni	740	High	✓	✓						10-11		
Empofubeni	740	High	✓	✓						10-11		
Esikhokweni	740	High	✓	✓						10-11		
Mtabhane	740	High	✓	✓						10-11		
Phansikwentaba I	740	High	✓	✓						10-11		
Izimpande	712	Medium	✓	✓						10-11		✓
Phesheya Kwamathamo II	695		✓	✓		✓				10-11		
Edabe	620	Medium	✓	✓						10-11		
Efamukekani	620	Medium	✓	✓						10-11		
Ekhenane	620	Medium	✓	✓						10-11		
Emagangeni	620	Medium	✓	✓						10-11		
Emahlabathini	620	Medium	✓	✓						10-11		
Esikhaleni	620	Medium	✓	✓						10-11		
Isimungwane	620	Medium	✓	✓						10-11		
Maqele	620	Medium	✓	✓						10-11		
Ndondakusuka	620	Medium	✓	✓						10-11		

Community capacity

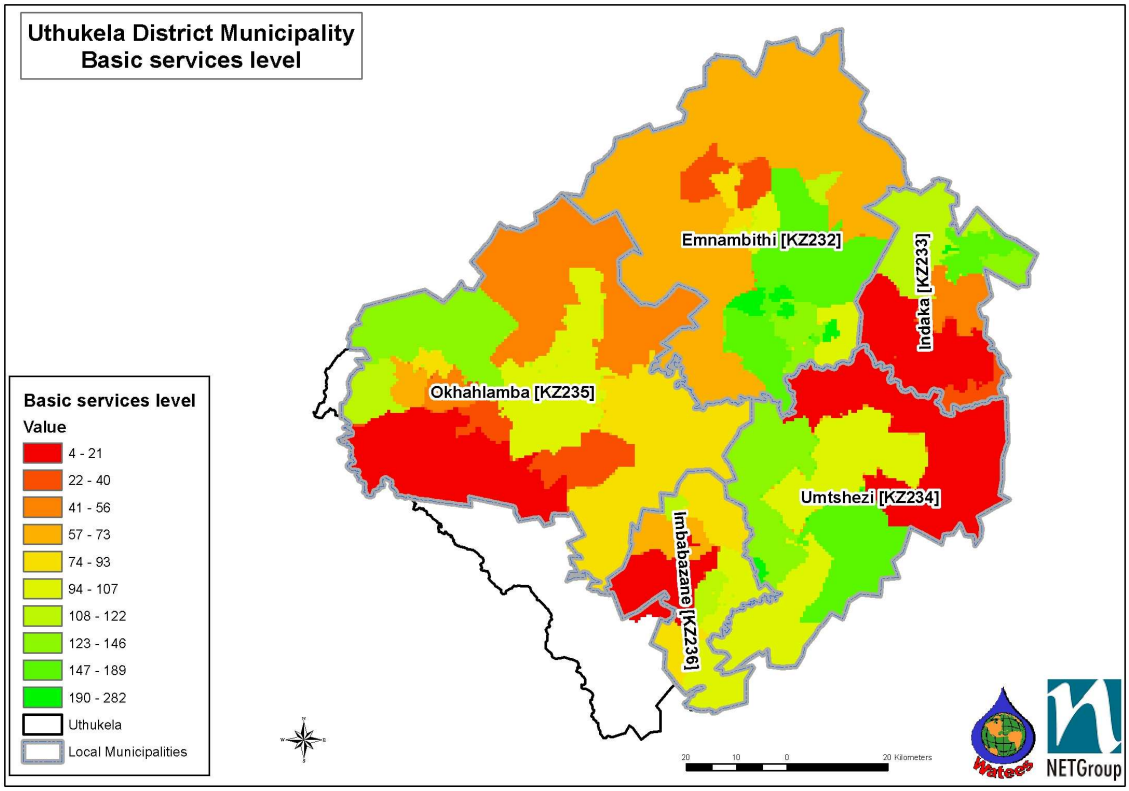
Next was to analyse the capacity of the community and institutions (such as emergency services) to deal with disaster risk. For this purpose distinguish was made between the **socio-economic status** of communities and the **level and institutional resources**. The socio economic level of communities could contribute to the vulnerability of a community to disasters. The lower the socio economic status of communities, the higher the vulnerability of the community to disasters. In contras with last-mentioned, access to institutions with appropriate risk reduction resources could decrease the level of vulnerability to disasters.

Socio-economic status

The assumption is made that communities with a low socio-economic status will be more vulnerable to disaster than communities with a higher socio-economic status. Hence, it was decided to compile a socio-economic status profile map for UDM, indicating the vulnerability status of communities in the UDM area of jurisdiction.

The percentage of households in all wards that have access to piped water, electricity and flush toilets have been added together. A total of 300 would indicate that a community has full access to all basic services, while 0 would indicate no access to services at all.

The red and orange shaded areas indicate communities with a higher need for basic services / infrastructure in comparison with the yellow and green areas (Map 4).



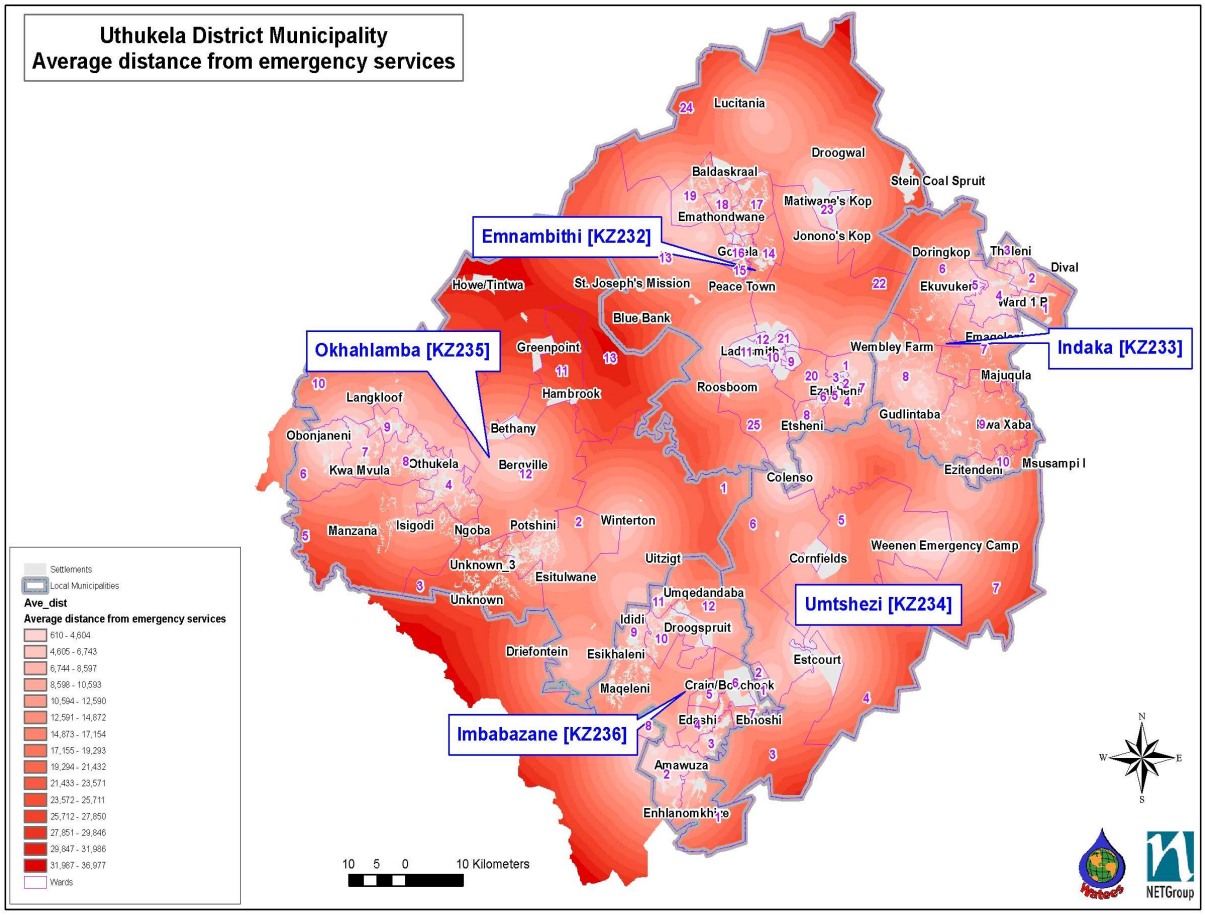
Map 4: Socio-economic status profile map for the UDM area of jurisdiction, 2006.

Institutional capacity: Access to emergency services

The presence and well equipped emergency services could lower the vulnerability of communities to disaster. Map 5 is a distance matrix, indicating the average straight-line distance to the nearest police station or health facility. Communities that are located more than 20km from the nearest police or health facility are indicated in Table 10.

Table 10: Settlements located more than 20km from emergency services in the UDM area of jurisdiction, 2006.

Settlement	Local Municipality
Blue Bank	Emnambithi [KZ232]
Stein Coal Spruit	Emnambithi [KZ232]
Acton Homes	Okhahlamba [KZ235]
Geluksberg	Okhahlamba [KZ235]
Greenpoint	Okhahlamba [KZ235]
Hambrook	Okhahlamba [KZ235]
Howe/Tintwa	Okhahlamba [KZ235]
Malottaskraal	Okhahlamba [KZ235]
Ngula/Tintwa	Okhahlamba [KZ235]
Rheibokspruit/Tintwa	Okhahlamba [KZ235]
Rooihoek	Okhahlamba [KZ235]
Thamela	Okhahlamba [KZ235]
Wittekop/Tintwa	Okhahlamba [KZ235]



Map 5: **Average distance of communities from emergency services in the UDM area of jurisdiction, 2006.**

Contingency planning

Easy access to institutions or good spatial distribution of emergency services amongst communities will have no effect on the vulnerability status of communities if not well equipped to deal with potential disaster risks.

Hence, it is deemed necessary to compile a institutional resource profile map to assist UDM in resource management at each emergency service station.

Institutional resource profile

The results from the hazard and risk assessment have again been used to compile an institutional resource profile. For this purpose, the following hazards were used:

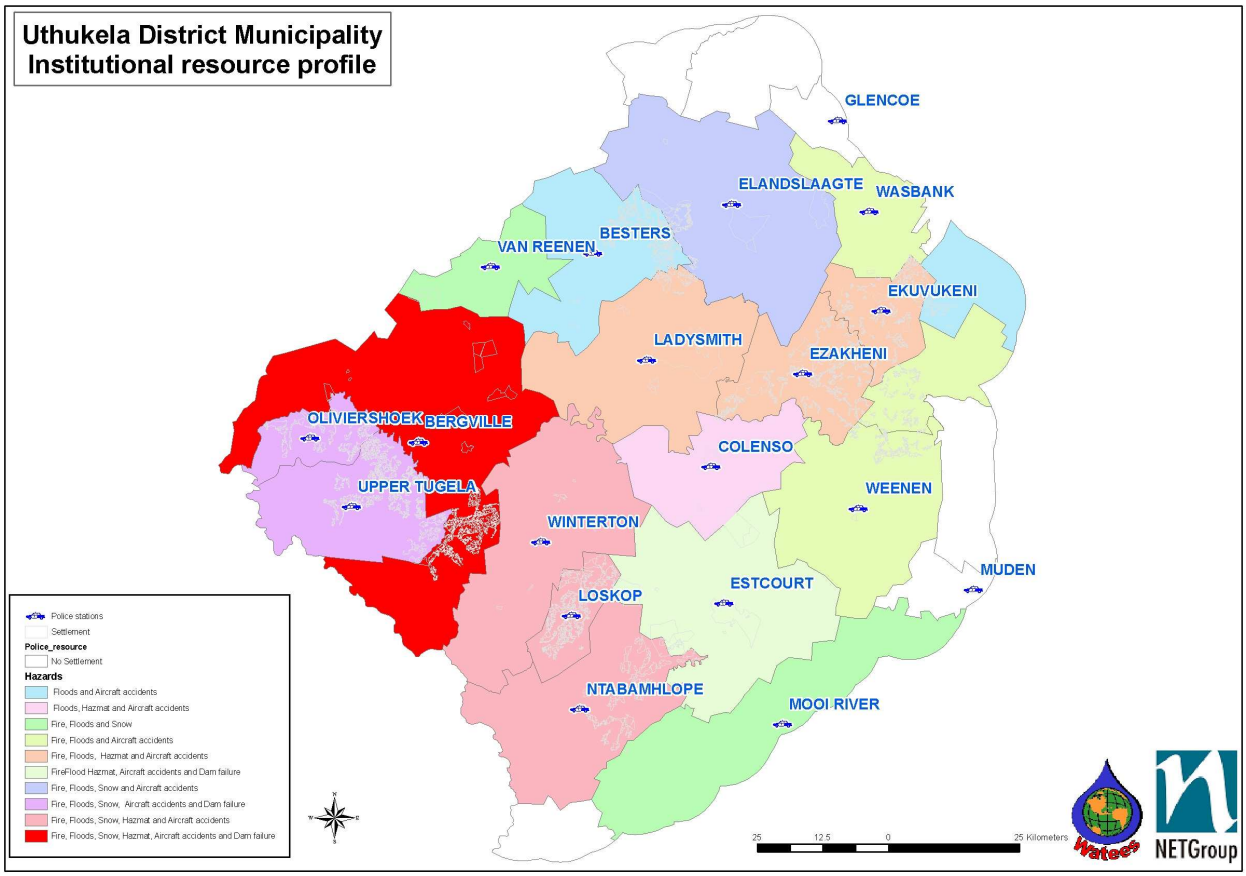
- Fire (high hazard areas)
- Floods
- Snow
- Hazmat
- Road accidents
- Dam failure
- Aircraft accidents

The spatial distribution of these hazards was then compared to the spatial distribution of emergency services to assess the type of resources these institutions may need to respond to a potential incident and / or disaster. Firstly it was assumed that road accidents could occur on any road and therefore all emergency services should be able to respond to car accidents. The remaining hazards were then used to compile Map 6.

Map 6 indicates the types of relevant hazards found in each emergency service area of jurisdiction. The emergency services in these areas should therefore have measures in place to be able to respond to these potential disaster risks. It must also be considered that the patrol boundaries of police stations are not restricted by municipal boundaries and some emergency services might need to respond to emergency situations outside their area of jurisdiction.

Table 11: Institutional Resource profile for UDM, 2006.

Police patrol area	Hazards						
	Fire	Flood	Snow	Hazmat	Aircraft	Traffic accidents	Dam failure
BERGVILLE	✓	✓	✓	✓	✓	✓	✓
LOSKOP	✓	✓	✓	✓	✓	✓	
NTABAMHLOPE	✓	✓	✓	✓	✓	✓	
WINTERTON	✓	✓	✓	✓	✓	✓	
ELANDSLAAGTE	✓	✓	✓		✓	✓	
OLIVIERSHOEK	✓	✓	✓		✓	✓	✓
UPPER TUGELA	✓	✓	✓		✓	✓	✓
MOOI RIVER	✓	✓	✓			✓	
VAN REENEN	✓	✓	✓			✓	
ESTCOURT	✓	✓		✓	✓	✓	✓
EKUVUKENI	✓	✓		✓	✓	✓	
EZAKHENI	✓	✓		✓	✓	✓	
LADYSMITH	✓	✓		✓	✓	✓	
POMEROY	✓	✓			✓	✓	
WASBANK	✓	✓			✓	✓	
WEENEN	✓	✓			✓	✓	
COLENSO		✓		✓	✓	✓	
BESTERS		✓			✓	✓	
HELPMEKAAR		✓			✓	✓	
TUGELA FERRY						✓	
DANNHAUSER						✓	
GLENCOE						✓	
IMPENDLE						✓	
MUDEN						✓	
NORMANDIEN						✓	



Map 6: Institutional Resource Profile map for UDM, 2006.

Disaster Risk Reduction Strategies

General

All disaster risk management plans must give explicit priority to the core principles of disaster prevention and mitigation. Internationally, disaster prevention, mitigation and preparedness are referred to as disaster risk reduction measures, mainly because it lessen likelihood of harmful losses by avoiding endangering hazards or reducing vulnerability. In this way, prevention and mitigation are central to achieving the goal of disaster risk reduction, in which vulnerabilities and disaster risks are reduced an sustainable development opportunities strengthened.

It is often difficult to distinguish between preventive or mitigative intervention. For this reason it is more practical to refer to risk reduction measures. Both (prevention and mitigation measures) minimise the risk of disasters.

Disaster Prevention
Disaster prevention refers to actions that provide "outright avoidance" of the adverse impact of hazards and related environmental, technological and biological disasters. Strategies applicable to preventive intervention are *inter alia (*see Appendix A for detail list*)*;

- Effective land-use planning,
- Basic public works and
- Effective municipal services that factor in the frequency and severity of natural or other hazards as well as human actions.

Examples are;

- Replanting indigenous grasses or trees on a recently burned slope near roads or dwellings to stabilise the soil and prevent damaging land subsidence.
- Locating critical rail. Road and telecommunications structures behind a coastal "setback" line in areas exposed to storm surges to prevent disruption to critical services during violent summer or winter storms.
- Careful positioning of storm water drainage and its ongoing maintenance, along with protection of natural wetlands, to prevent destructive flooding during heavy rain.

It is not possible to completely prevent all disaster events. Their severity can be reduced, however, through ongoing disaster mitigation efforts.

Disaster Mitigation
Disaster Mitigation refers to structural and non-structural measures that are undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards on vulnerable areas, communities and households. These efforts can target the hazard or threat itself – e.g. a fire break that stops a fire spreading close to residential areas. This is often referred to as structural mitigation, since it requires **infrastructure or engineering** measures to keep the hazard away from those at risk.

Disaster mitigation efforts can also target people who are at risk, by reducing their vulnerability to a specific threat – e.g. promoting community responsibility for controlling fire risk in an informal settlement. This is often called "non-structural" mitigation, as it **promotes risk-avoidance behaviours** and attitudes. A shift from structural to non-structural measures took place worldwide. The main reason for this is mainly because of the non contribution of structural measures to sustainable development objectives. In most cases, structural measures only reduce disaster damage and the level of risk remains the same. Hence, structural measures only create a false sense of security for communities.

The following non-structural measures strategies may be considered by disaster management (see Appendix A for detail list):

Public Instruments
The main aim of public instruments is to guide human behaviour in such a way that it will contribute to the reduction of disaster risk and / or the vulnerability of communities and infrastructure

- Disaster Information – Dissemination of disaster information to communities as part of awareness campaigns. This will also guide communities in the implementation of more safe best practices.
- Training and education of communities in disaster related matters.
- Disaster Insurance
    - Only act to reduce the impact of the loss after it has occurred, hence it does not reduce any risk, but rather redistribute the risk to the insurer.
    - However, the premium gives an indication of the risk involved, when insured against any possible loss.
- Tax and subsidies
- Disaster precautions
- Disaster Aid and Relief actions

Planning and Organising

Dangerous, uneconomical and undesired actions can be reduced by better planning and organising. Such measures include;

- Zoning and building regulations
- Disaster Proofing – "A body of adjustments to structures and building contents")
  - Permanent – Choice of building material to erect buildings
  - Unforeseen – After early warning has been distributed, e.g. secure of walls and closing of unnecessary openings ect.
  - Emergency – e.g. the use of sand bags during a flood.
- Land-use planning (Planning and establishment, permanently evacuation)
- Development Policy (which will contribute to sustainable development objectives)
- Organising for disasters
- Early warning systems – the better communities react on any warning message, the lower the impact of a disaster.
- Health related regulations
- Permanent Evacuation – this option leads to huge reallocation and development project. The social disruption to reallocate people cannot always be justified.

Research indicates that it is not economic viable to implement risk reduction measures to prevent the total risk of a disasters. Hence, it is important to determine the optimum in such a way that the total benefit exceed the total cost (must include all economical and social benefits and costs). In some cases the optimum may only be reached by the implementation of both structural and non-structural measures.

Risk Management

The following operational sequence is important during risk management to take cognisance of.

Risk Control

- Terminate: Eliminate the potential of loss
- Tolerate: Live with the risk
- Treat: Implement risk reduction measures

Risk Financing

- Terminate: Transfer -Self-funding or Insurance

Risk Control Hierarchy

- Elimination, Avoidance or Substitution.
- Control at Source
- Minimisation of Frequency
- Minimisation of Consequences
- Mitigation

Disaster Management plays a fundamental role to ensure that the identified risks are brought to a level which the municipality / community is willing to tolerate. Risk management programmes should pay for itself due to lower number of injuries, less disruptions, etc - if implemented properly it will ensure more sustainable practices.

Risk reduction strategies, when appropriately implemented, will;

- Stimulate the economy growth
- Strengthen infrastructure
- Help create more employment
- Vastly improve general development
- Ensure greater stability

Disaster Risk Reduction Plans, Projects and Programmes

According to the National Disaster Management Framework, there are eight requirements that must be applied and documented by all spheres of government. When planning for disaster risk reduction initiatives.

1. Use disaster risk assessment findings to focus planning efforts.

Any disaster risk reduction effort must be informed by a reliable disaster risk assessment.

2. Establish an informed multidisciplinary team with capacity to address the disaster risk and identify a primary entity to facilitate the initiative

Disaster risk reduction planning must be multidisciplinary and must draw on appropriate expertise. Disaster risk management requires both technical expertise in hazard processes as well as understanding of the complex social and economic conditions that drive disaster risk in vulnerable communities.

3. Actively involve communities or groups at risk

All initiatives must involve constructive consultation between at-risk groups and/or communities and external service providers. Risk reduction initiatives are more effective when they are discussed and implemented collaboratively with those affected, as this allows for the inclusion of local knowledge and expertise.

4. Address multiple vulnerabilities wherever possible

Risk reduction is a value-adding capability, as it aims at reducing disaster losses in vulnerable areas and groups. Hence, any disaster risk reduction projects and programmes must add value to other development initiatives. Vulnerabilities can be addressed by:

- improving socio-economic conditions and building community cohesion
- ensuring the continuity of protective environmental services
- increasing resilience and/or continuity of public services and infrastructure to better respond to expected external shocks.

5. Plan for changing risk conditions and uncertainty, including the effects of climate variability

Disaster risk is extremely dynamic and is driven by many rapidly changing environmental, atmospheric and socio-economic conditions. Hence, plans are not sufficiently adaptive to minimize the impacts of unexpected events or processes.

6. Apply the precautionary principle to avoid inadvertently increasing disaster risk

Effective disaster risk reduction planning efforts must apply the precautionary principle of "do no harm". The likelihood of negative consequences is reduced if a careful disaster risk assessment actively informs the planning process, a competent multidisciplinary team is established, and mechanisms for transparent community consultation are put in place.

7. Avoid unintended consequences that undermine risk-avoidance behaviour and ownership of disaster risk

The disaster risk reduction planning process must anticipate and manage unintended consequences that increase disaster risk. Well-intentioned disaster risk reduction programmes that deliver external services to at-risk areas, communities and households can inadvertently reward risk-promotive behaviour and undermine existing capabilities.

8. Establish clear goals and targets for disaster risk reduction initiatives, and link monitoring and evaluation criteria to initial disaster risk assessment findings

Disaster risk reduction plans must define clear monitoring and evaluation criteria for measuring their effectiveness. These must be linked to initial assessment findings to demonstrate the effectiveness of the specific initiative in reducing vulnerability or reducing disaster loss. Assessment findings must also be used to highlight learning points for future projects and programmes.

Municipal and provincial disaster management centres must include documented accounts of the disaster risk reduction projects, programmes and initiatives planned and implemented.

Including Disaster Risk Reduction efforts in other structures and process

Disaster Risk Reduction initiatives must also be included in other structures and processes, hence the Disaster Management Plan has to be aligned with the Spatial Development Plan and the IDP.

- **Spatial development planning**
  Disaster risk is driven by both hazard and vulnerability factors reflected in spatial development frameworks. All disaster risk assessment findings are directly applicable to spatial development planning. Hence, all relevant spatial information must inform disaster risk reduction planning and also ensure that verified risk information is incorporated into spatial development plans and maps.

- **Integrated development planning**
  Disaster risk reduction efforts are multi-sectoral efforts focused on vulnerability reduction over a medium to long term period. To be efficient and effective they must be incorporated into ongoing IDP projects, processes, programmes and structures. They are best planned and implemented as development initiatives through IDP mechanisms and phases.

- **Risk avoidance enforcement**
  Critical components of effective disaster risk reduction are regulations, standards, by-laws and other legal enforcement instruments that discourage risk-promotive behaviour and minimize the potential for loss. Within provincial and municipal spheres, this may involve:

  - amendment of urban planning standards
  - amendment of land-use regulations and zoning
  - amendment of minimum standards for environmental impact assessments
  - introduction of standards for risk-proofing lifeline services and critical facilities from known priority disaster risks
  - introduction of by-laws to implement extraordinary measures to prevent an escalation of a disaster or to minimize its effects.

Implementation and monitoring of Disaster Risk Reduction Plans, Projects and Programmes

Effective implementation
The monitoring processes and evaluations for disaster risk reduction initiatives specifically targeted at at-risk communities and must include both qualitative and quantitative vulnerability reduction outcomes.

Measurable reductions in disaster losses
The provincial and municipal disaster management centre must include in their annual reports documented accounts of the disaster risk reduction projects, programmes and initiatives planned and implemented. All centres must report on disasters that occurred within their areas of jurisdiction, e.g. on the frequency and severity of small-, medium- and large-scale disaster events, especially those in communities and areas identified as high risk through disaster risk assessment processes.

Reduced need for social relief
The disaster management centre must indicate the number of households received social relief assistance. This information must be further differentiated by location, date, disaster type and amount provided.
An important benchmark for monitoring the effectiveness of disaster risk reduction initiatives in the most vulnerable communities will be changing demands for social relief assistance.

Generation and dissemination of case studies and best-practice guides in disaster risk reduction
The promotion of a "culture of prevention" is practically enabled by access to examples of best practice in disaster risk reduction. Disaster management centres must develop as a component of its education, training and capacity-building strategy, and mechanisms for disseminating information on best practice in disaster risk reduction.

Three levels of implementation of disaster risk reduction strategies, plans and projects
The next diagram (Figure 1) summaries the implementation of appropriate disaster risk reduction strategies at three levels, namely a strategic, tactical and operational level.

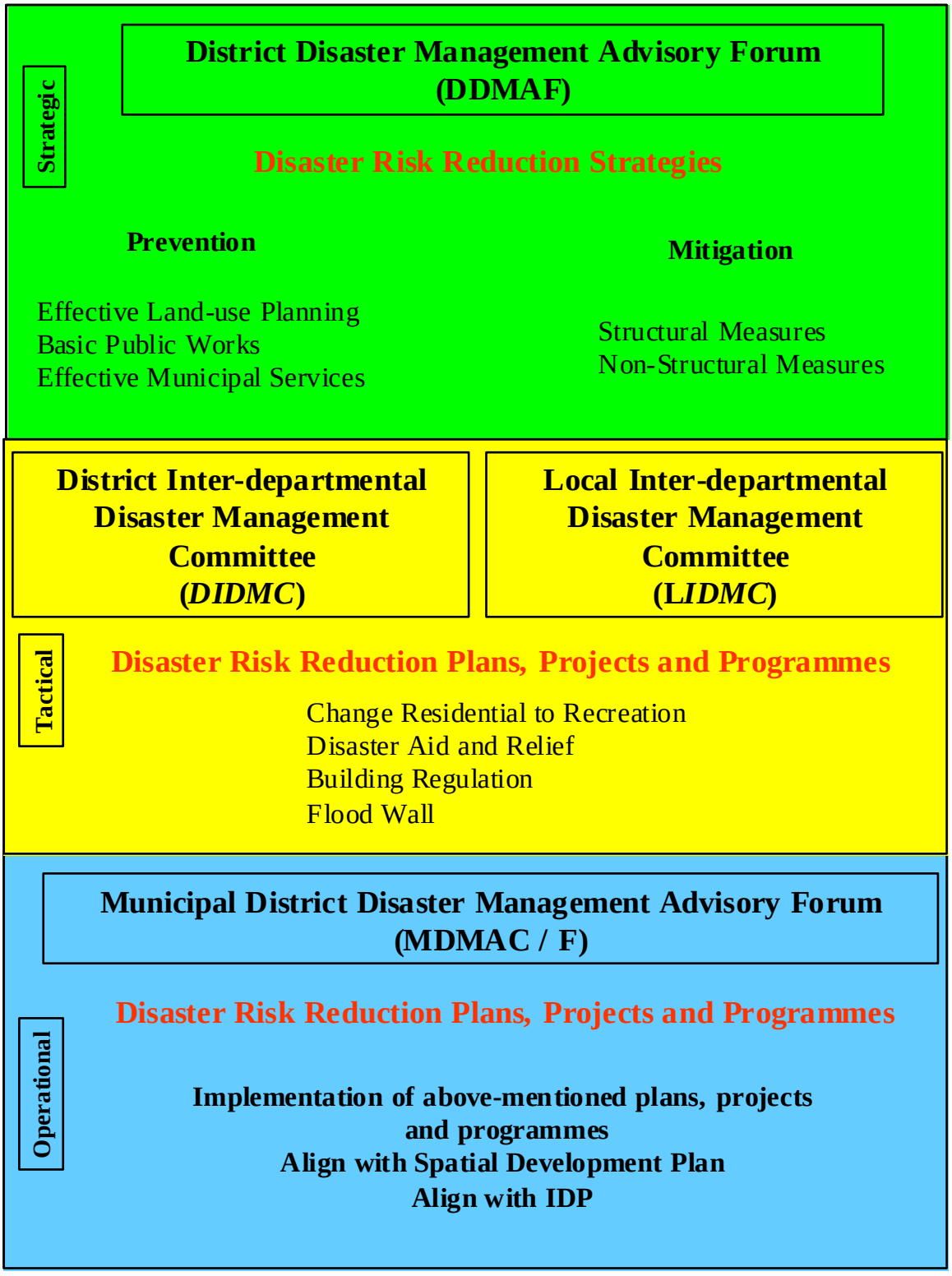


Figure 1: **Three levels of implementing disaster risk reduction strategies, plan and projects.**

Strategic Phase
It is the District Disaster Management Advisory Forum's (DDMAF) responsibility to identify appropriate risk reduction strategies for the district municipality (as discussed above). The next step is to identify appropriate risk reduction plans, projects and programmes which are based on a reliable disaster risk assessment, and they will be discussed next.

Tactical Phase
The identification of disaster risk reduction projects can take place after appropriate risk reduction strategies were adapted by the DDMAF. Hence, the proposed tactical bodies, namely the District Inter-departmental Disaster Management Committee (DIDMC) and a Local Inter-departmental Disaster Management Committee (LIDMC), are mainly responsible for facilitating this process.
Risk reduction projects must be evaluated in terms of:

- Effectiveness,
- Efficiency,
- Appropriateness,
- Cost-effectiveness and
- Sustainability.

Economic and social cost benefit analysis and sustainable principles can inter alia be used for this purpose. Implementing of such programmes must be cost effective. This involves looking for ways in which disaster management can be implemented without the programme being a huge extra cost to government. Existing resources and programmes must be used, rather than creating new one. A multidisciplinary team is required and can be co-opted to be part of the tactical body.

Disaster management must be sustainable. This means that the issues must be kept alive. Two useful approaches to keep the issues in the public mind are training and public awareness programmes. Training cannot only take place when money is available or once every five years. Therefore, the training process must be integrated and ensure that people are being trained on a regular basis so that people can know what their responsibilities are in the implementation of disaster management programmes. In the same way public awareness can contribute to sustainability. "Ongoing public awareness, with the momentum shifting to community representatives, can lay the foundations of this ownership". Public awareness must be a two way process which establishes dialogue, rather to focused too much on officials passing on to communities what they feel communities should know (Westgate, 1999).

Finally, mitigation actions and development are not synonymous and therefore not too much emphasis must be placed on mitigation. Mitigation actions aim to reduce the impact from future disasters, while development aims to build community capacity and to promote self-reliance in relation to social and economic parameters. According to Westgate (1999) the precursor to any effective risk and vulnerability reduction is not purely the implementation of a comprehensive disaster management programme; it is the **implementation of a sound development programme.**

Operational Phase

The implementation of proposed risk reduction plans will take place during the operational phase. Each proposed risk reduction plan much be submitted as a project proposal (including detailed budget) to be implemented on a local municipal level (see Appendix B for example to be completed). For this, the proposed Municipal Disaster Management Advisory Committee / Forum (MDMAC / F) will facilitate the process. It is the main responsibility of each line department to implement all risk reduction plans. Hence, risk reduction plans must be integrated with the Integrated Development Planning Process (IDP) at a local municipal level to be approved and implemented by local municipalities.

Appendix A summarises examples of risk reduction strategies, and Appendix B is an example of a standardised proforma to be used to implement proposed disaster risk reduction projects.

Recommendations for IDP

The following recommendations can be made for the IDP of UDM:

1. Integrate disaster risk reduction strategies into development initiatives.
2. Align disaster risk reduction with IDP.
3. Align disaster risk reduction with SDF.
4. Determine roles and responsibilities of each line department.
5. Identify appropriate risk reduction projects and programmes at tactical level.
6. Execute a detailed disaster risk assessment for each local municipality to identify appropriate risk reduction projects, plans and programmes.
7. Draft capital budget for risk reduction projects
8. Assist local municipalities to implement disaster risk reduction projects and programmes.
9. Implement the proposed disaster risk reduction strategies at local municipal level.
10. Review and update disaster management plans annually.

Appendix A: Examples of disaster risk reduction strategies

Flood
• Flood proofing and elevation
• Diverting flood water through dams and reservoirs
• Dikes
• Levees
• Flood walls
• Channel alterations
• High flow diversions
• Storm water management
• Coast- or river-line protection
• Watershed management
• Integrated water resource management
• Regulations
• Development and redevelopment policies
• Safe citing in flood prone areas

Winds and Cyclones
• Safe citing in cyclone/storm wind prone areas
• Shelter plantation
• Improving drainage
• Resistant house designs and construction of cyclone shelters

Epidemics
• Surveillance and warning
• Preventive measures
• Strengthening institutional infrastructure
• Awareness
• Training / education of the public to assist
• Report illness and live a healthy life

Road Accidents
• Enforcement of existing provisions of transport related Acts /and other regulations
• Strengthening institutional capability
• Strengthening road infrastructure
• Recommending new regulations
• Effective communication with the TRAC organisation and early warning to the public using the freeways should be prioritised.

Fires
• Fire fighting services available to areas outside the local municipal limits
• Improve fire fighting capabilities
• Improving co-ordination between municipal fire services and industrial safety departments
• Establishment of special burns wards and clarifying the roles and responsibilities of district administration, police, fire services and medical services
• Awareness of the hazards of the coal mine areas
• Prevention of spontaneous combustion is an all-important task for all involved.

Hazmat
• All industrial concentrations should be encouraged to establish associations for management of industrial accidents and to establish toxin centres wherever required.
• Industries involved in the production or transportation of inflammable, hazardous and toxic materials should have a mandatory responsibility for preparing an off-site plan.
• Upgrading of data management and safety procedures

Security
• All types of crime should be combated as an integrated effort.
• Community awareness programmes should include anti-crime and crime reporting programmes / mechanisms.
• Access to police and telecommunication facilities to report crime should be established.
• Partnerships between community and business should be encouraged and implemented
• The access to and support of the judicial system should be part of the awareness and education programmes.

Poverty
• Poverty as a contributing factor to vulnerability profiles needs to be addressed on a multi-sectoral level.
• Basic needs, e.g. infrastructure (roads, storm water management, electricity ect) , water services and sanitation will play a fundamental role in poverty alleviation programmes.
• Job creation.
• Best practices to become self sufficient.

Appendix B: Example of a Summary for Disaster Risk Reduction Project Proposal

SUMMARY FOR RISK REDUCTION PROJECTS

Project Name	
Hazard / Risk / Threat to be addressed	
Risk Control	Terminate Tolerate Treat
Line Department Responsibility	
Major Activities	

Activity	Time Frame
1.	
2.	
3.	
4.	
5.	
6.	

Cost to Reduce Risk	
Level of Acceptable Risk	
Benefit of Risk Reduction measure	
Cost / benefit ratio	
Remarks	