DAR ES SALAAM

MAKING CITIES RESILIENT ASSESSMENT

This report gives an overview of how resilient Dar es Salaam city is to disaster risk, and how the city council used the HFA-LGSAT self-assessment tool to generate this information.

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Special thanks go to the technical team that helped to prepare the Dar es Salaam City Environment Outlook 2011. The information from the environment outlook has contributed to this report by building a profile on hazards and vulnerability risk of the city. (Lead Expert, Prof. Paul. S. Maro).

FOREWORD

Many Cities in Africa are experiencing economic growth. This trend is characterized by distribution of wealth mainly found in urban centres. On the other hand, urban population and migration to cities are growing and as a result increasing vulnerability to disasters. More people are living in high disaster risk areas due to underlying factors such as urban poverty, governance issues, weak institutional frameworks and a lack of technical and operational resources for disaster risk management in Africa. Many Cities in Africa exhibit economies that are prone to disaster shocks. The question remains, how do we invest in disaster risk reduction and resilience building to safeguard the development gains achieved by vulnerable cities.

In addition, Africa will also suffer adverse impacts of climate change. Currently there is very minimal achievements' in adapting to emerging trends and challenges as a result of climate-related hazards. This is associated with increased intensity and frequency of extreme weather conditions. Cities such as Dar es Salaam, located along the Indian Ocean coast may be affected by sea level rises, coastal erosion, river and coastal flooding that may bring disruption to sewers and drains affecting some parts of the city's infrastructure, and in others it may increase the risk of salt water intrusion into fresh water aquifers. As many countries and regions in Africa, Dar es Salaam's food security depends on rain-fed agriculture. Variation in rainfall precipitation may cause drought that could affect the food security of the city. Currently climate change is often becoming visible in Dar es Salaam through households experiencing water supply shortages. This is due to variation of river source runoff that feeds into the water supply system of the city.

Integrating disaster risk reduction for sustainable development is a key factor contributing to how Dar es Salaam city adapts to climate change. The guiding questions to effectively build resilience are:

- Why is Dar es Salaam city at risk?
- What must we do to assess how resilient Dar es Salaam city is?
- How do we involve strategic partners and the community to address this risk?
- How do we communicate achievements and best practice?
- How do we sustain and protect Dar es Salaam's development gains?

The response to these questions is addressed by the UNISDR Making Cities Resilient Campaign which takes into account the (*Hyogo Framework of Action (2005-2015), Africa Strategy and Programme of Action,* and *the Africa Ministerial Declaration that was endorsed by Heads of States*). The priority areas articulated in principle by the Hyogo Framework of Action are operationalized through the opportunity for cities to engage in the Making Cities Resilient Campaign. This campaign is therefore aimed at enabling cities to safeguard their development gains and build more disaster resilient communities.

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ABBREVIATIONS AND ACRONYMS:

ALAT: Association of Local Authorities for Tanzania.

DCC: Dar es Salaam City Council.

DCEO: Dar es Salaam City Environment Outlook.

DMD: Disaster Management Department.

DRM: Disaster Risk Management.

DRR: Disaster Risk Reduction.

HFA: Hyogo Frame work of Action.

JICA: Japan International Cooperation Agency.

LGSAT: Local Government Self-Assessment Tool.

MCR: Making Cities Resilient.

PMO: Prime Minister's Office.

SCI: Sustainable Cities International.

SWOT: Strength, Weakness, Opportunity and Threat.

UPC: Urban Planning Committee.

URT: United Republic of Tanzania.

TCC: Technical coordinating Committee.

CHAPTER 1:

1. BACKGROUND:

Population growth trend:

In 2009, for the first time, Africa's total population exceeded one billion, 395 million (or almost 40 per cent) of which lived in urban areas. While it took 27 years for the continent to double from 500 million to one billion people, the additional 500 million will only take 17 years. Africa's population will be expected to reach the two billion mark around 2050, 60 per cent of whom will be living in cities. Given the current trend, Africa should prepare for a total population increase of about 60 per cent between 2010 and 2050, with the urban population tripling to 1.23 billion, (UN Habitat and UNEP, 2010). Increased climate extremes and related disaster impacts will "push" populations in rural areas living under harsh conditions to move to urban areas; additionally other studies also show that half increase in cities population's is generated within Cities themselves.

Economic growth trend:

The Gross National Product of African countries is generated predominantly by urban cities. Growth in urban cities is usually characterized by increased capacities which contribute to the country's GDP. The result of widespread urbanization is the increase in demand for basic products and services, which creates opportunities for economic investment. The location of more capital invested in cities therefore emphasizes the role of these cities as engines of economic growth and social development.

Increase in disaster risk exposure:

The rapid population increase in urban cities has stretched most cities' capacity to provide services to most people living in slums and marginal informal settlements, which are more exposed and often located in high disaster risk areas such as flood plains and high seismic risk areas.

The risk associated with disasters threatens to wipe out the development gains made by the urbanization trend taking place in many African cities. Disasters impact fragile rapidly growing economies, livelihoods and socio-economic gains in a profoundly negative manner. Therefore the role of Local Government together with its strategic partners has been recognised as a key factor in building the resilience of cities against disasters. In recognition of this UNISDR and its partners have initiated a global campaign, (Making Cities Resilient Campaign – My city is getting ready). The campaign focuses on urban risk issues, safer schools and hospitals, and aims to empower communities, local authorities and their strategic alliances to manage and reduce disaster risk by using a 'Ten Essentials' framework tool that highlights thematic areas and actions to make a city resilient to disaster. The campaign provides an

opportunity for Local Government and city managers to integrate risk reduction as a pillar for formulating city local development plans.

1.2. RATIONALE:

UNISDR has conducted a pilot study of 3 African Cities realizing effective advocacy aimed at raising awareness and promoting a systematic approach to building city resilience. What has emerged from the feedback received from the assessments carried out are summarised as such.

- Pilot African cities display very little knowledge of Disaster Risk Reduction (DRR) and resilience building integrated into city planning. This has established that there is a need for further DRR training required by Town Councils. Secondly, there is currently no effective/accountable DRR resource mobilisation systems allocated to Town councils.
- Response's from City Mayor's illustrates increased political will to get involved in the making Cities Resilient Campaign, however by consensus it has been established that there is a lack of effective policy and institutional frameworks to successfully implement resilience building initiatives at local level.
- There is lack of clear resilience building ownership of roles and understanding of their mandates reflected in the pilot study, In addition it was established that there is great need to improve synergy by fostering future collaboration, through including strategic partners and other stakeholders in resilience building fora. More often than not there is disconnect between national and local authorities in communicating disaster risk reduction issues.
- More importantly there was a request by Dar Es Salaam city council for support to formulate a strategy and plan of action to implement the Ten Essential framework for resilience building. It is also evident that there is a need for further training on campaign priority areas and inform cities on entry points to the campaign. This report will therefore go a long way to operationalize the campaign and support Dar Es Salaam city council (DCC) to integrate disaster risk reduction into local government plans in order to become more resilient to disasters.

1.3. OVERALL ASSESSMENT OF DAR ES SALAAM CITY RESILIENCE:

The overall view is that Dar es Salaam city is not very resilient to disasters. The system in place is very reactive in nature due to budgetary constraints, lack of technical capacity tailored to address disaster risk reduction and the general attitude of its public. The level of unplanned housing coupled with dynamic pressure from population increase has created high vulnerability to disaster in the city. There is destruction of flood protection and buffers by the public in search of land for construction and sustainable livelihood. However there are by laws that need to be enforced more effectively that may result in changing poor land use activities taking place. On the positive side there is good political will demonstrated by the Mayor of the City and the City planner. They are committed to instituting and implementing the systems necessary to bring about change using the MCR campaign platform.

1.4. AIM & STRUCTURE OF THE REPORT:

This report aims to inform on how the City of Dar es Salaam is resilient to disasters. This report is pivoted on the Ten essential priority areas and HFA-LGSAT that supports cities to improve their resilience to disasters. The report will also inform the technical team that is formulating a strategy and plan of action for Dar Es Salaam city on the feedback received from the MCR campaign training workshop that was carried out in Dar Es salaam.

The structure of this report consists of seven chapters. The first chapter includes the background and rationale of the study, overall assessment of the Dar Es Salaam city council and aims of the report. Chapter2 highlights the objectives of the report and Dar Es Salaam response to the Making Cities Resilient campaign and the ten essential framework. It is then followed by chapter3 which explores the profile of Dar Es Salaam city with regards to geography of the city, population and socio-economic environment, impact of climate change on the city and finally reviews literature provided on hazard, risk and vulnerability of the city. Chapter4 illustrates the methodology used to collect data, how the data was collected and appropriateness of the HFA-LGSAT in Dar Es Salaam context. Chapter5 presents the data collected and Chapter6 is the analysis of the results, more importantly it highlights key outcomes presented in the data analysis. Chapter7 presents the main recommendations and conclusions of the assessment. It also suggests actions for operationalizing the MCR campaign further.

The references provide the list of sources that were used to prepare this report. The appendix also provides a list of the tools used to prepare this report; in addition it also consists of evidence that this consultative forum actually took place facilitated by Dar Es Salaam city council (DCC).

CHAPTER 2:

2.1. INTRODUCTION:

This chapter highlights the objectives of the report and gives an overview of Dar Es Salaam city's reception to the Making Cities resilient campaign putting emphasis on the use of the Ten essentials and HFA-LGSAT tool.

2.2. OBJECTIVES:

There are five main objectives of the Dar Es Salaam resilience assessment report highlighted as follows;

- To inform Dar Es Salaam city on how they rated themselves using the HFA-LGSAT tool.
- To inform Dar Es Salaam city council (DCC) on the benefits of using the HFA-LGSAT tool.
- To provide Dar Es Salaam city's strategic plan technical formulation team with baseline information to build on.
- To support integration of the Ten essentials through (DCC) technical departments.
- To provide a tool that Dar Es Salaam city council can use to advocate for the MCR campaign.

2.3. DAR ES SALAAM CITY'S RESPONSE TO THE (MCR) CAMPAIGN:

The Making Cities Resilient campaign has been well received in Dar Es Salaam. Through this campaign the Mayor of Dar Es Salaam has shown strong political will and commitment to make his city more resilient to disasters. The Mayor together with ALAT secretariat and other stakeholders, requested through the MCR campaign, for UNISDR ROAF to train technical staff members on the use of the Ten essentials and HFA-LGSAT.

The consultation forum was fully represented by focal persons from Dar Es Salaam city council (DCC) and focal persons from the three municipalities that make up Dar Es Salaam city, namely (Ilala, Temeke and Kinondoni) The forum was also attended by the Dar Es Salaam Prime Minister's Office – Disaster Management Department (PMO-DMD). In addition the forum involved various stake-holders such as campaign partners Plan International Tanzania, Fire services, Ardhi University, Sustainable Cities (NGO) and the focal person representing the Association of Local Authorities of Tanzania (ALAT) secretariat.

The Ten essentials and HFA-LGSAT training workshop was welcomed by the forum with the view that the consultative forum will drive the agenda for integrating disaster risk reduction through all levels of planning.

CHAPTER 3:

3.1. INTRODUCTION:

This chapter gives an overview of Dar Es Salaam city's profile. This involves providing information on the geo physical characteristics of the city and highlighting the various hazards that impact the city based on existing literature. The chapter seeks to explore Dar Es Salaam's socio-economic environment to inform on the status of vulnerability of the population to disaster risk.

3.2. GEOGRAPHY, POPULATION & SOCIO-ECONOMIC ENVIRONMENT:

Geography of Dar Es Salaam City:

Dar es Salaam City is located in the eastern part of Tanzania mainland between latitudes 6°36‟ and 7°0‟ South and longitudes 39°0 and 33°33‟ East (Figure 1.1). It is bounded by the Indian Ocean on the east and the Coast Region on the other sides. Dar es Salaam City is the administrative and economic hub of Tanzania, although Dodoma Municipality has been designated as the national capital. It has a total of 7 Constituencies, 10 Divisions, 76 Wards and 447 sub wards. There are four Local Government Authorities which are the City Council and the three Municipal Councils of Ilala, Kinondoni and Temeke, (Vice President's Office, 2011)

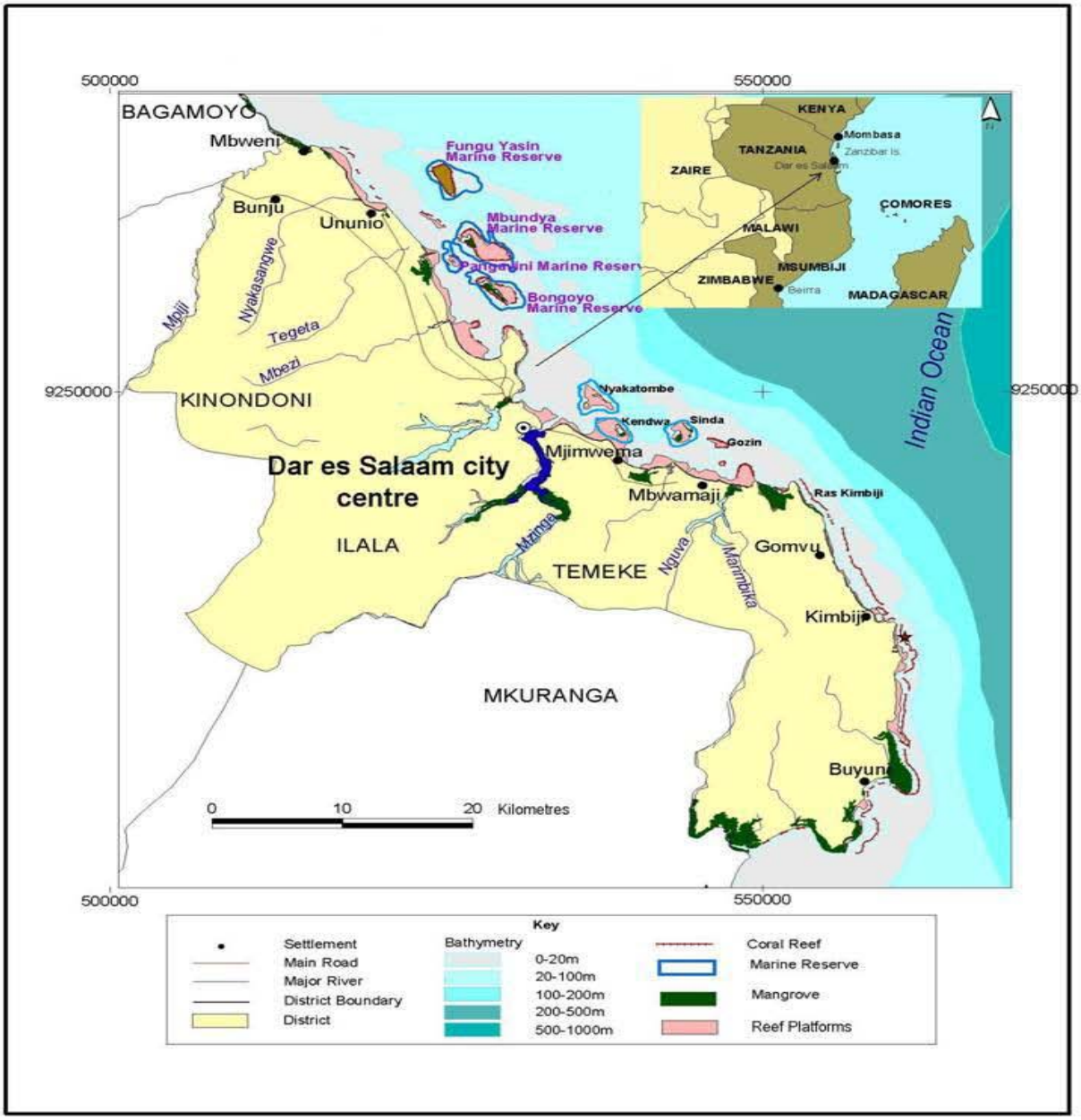

Figure 1 (Source; Vice President's office, 2011) Map of Dare Es Salaam city showing municipalities.

The City has four distinct landforms which are: shoreline and beach which is immediately abutting the sea, comprising sand dunes and tidal swamps; coastal plain extending between the Pugu hills and shore land, overlain with clay bound Pleistocene with fairly uniform relief lying between 15 and 35m above sea level and slopes of less than 3%, and extends 8 km to the west of the City. The coastal plain narrows to 2km at Kawe in the north before widening to 8kms at the Mpiji River, and varies between 5-8kms in width to the southwest where the relief is more irregular gradually merging into the more elevated

headwaters of Mzinga River. A few ponds are found in this landform where rich clay soils and zero gradient impede natural drainage (Vice President's office, 2011)

Dar Es Salaam also has Inland alluvial plains that originate from the Pugu hills to the east and dissect the coastal plain in a series of steep-sided U-shaped valleys, culminating in creeks and mangrove swamps before entering the Indian Ocean. The alluvial plains are found along Kizinga and Mzinga Rivers.

Population and socio-economic trend of Dar Es Salaam City:

Dar es Salaam city is the main engine of economic development of Tanzania, it is the main administrative, industrial, commercial market and trading point, educational, cultural and trading centre of Tanzania. Tanzania's main harbour resides in Dar es Salaam.

Dar es Salaam City is one of the fastest growing cities in Sub Saharan Africa. Dar es Salaam City has experienced continued population growth over the past decades. Population and Housing Censuses indicate that the population of Dar es Salaam City increased from 356,286 in 1967 to 843,090 in 1978 and rose to 1,360,865 in 1988. According to the 2002 Population and Housing Census, Dar es Salaam City population has increased to 2,487,288 representing the increase of annual average growth rate of 4.3 percent (URT, 2002)

This rapid urbanization trend has been as a result of improved services such as opportunities for education, markets and employment. However population increase within Dar es Salaam city itself is attributed to higher birth rates coupled with increased mortality rate due to opportunities for better health. Therefore migration is not the only factor increasing the population in Dar es Salaam.

Dar es Salaam city houses the main manufacturing industry in Tanzania as it is strategically located where the main port or harbor is. Thus it is the main trading point in Tanzania. It also has various economic activities going on such as mining, fishing, urban agriculture and livestock, construction, finance and insurance, forestry and tourism.

Pressure as a result of rapid urbanization:

The rapid urbanization of the City has far overstretched the already provided urban infrastructure and services. The expansion of the City has not coped with the provision of the necessary infrastructures and social services including roads, transport, water systems, sanitation, educational facilities and health services. Most of infrastructures were made to meet the demand of the then existing small population. To date, the increased demand for food, water, access, serviced land, sanitary management of solid and liquid wastes remained largely unmet resulting in various environmental hazards, (Vice President's Office, 2011)

3.3. CLIMATE CHANGE:

Impact of climate change:

The wider global climate change trends are greatly reflected in Tanzania's climate. Research on previous climate trends indicates that temperature has been increasing over time and is projected to increase further, impacting negatively on human livelihoods. Increase in temperature has resulted in increased water scarcity a result of increased evapotranspiration. There has been an increased uncertainty of rainfall incidence, change in rainfall distribution regimes specifically onset and cessation of rainfall seasons, an increase in intensity and frequency of floods and droughts, as well as a rise in the sea level. Deteriorating water quality and quantity, loss of biodiversity, declining agricultural productivity and increased health risks due to climate change, are no longer potential threats but rather threats that have already struck the country (Yanda *et al.*, 2006; Shemsanga *et al.*, 2010). Studies show that in Tanzania mean annual temperatures and average daily temperatures will rise by between 2°C and 4°C by 2075 as a direct consequence of climate change (URT, 2003).

Regardless of her low level of development, Tanzania has its contribution to global warming. The major ways in which Tanzania contributes to climate change include deforestation, large animal herds with accompanied overgrazing, mining activities, air pollution especially from industries and vehicles, land use changes, and waste management especially poor solid waste collection and disposal mechanisms (Shemsanga *et al.*, 2010).

In terms of impacts to the society, the named El Niño episodes were significant because they were accompanied by heavy socio-economic losses. These episodes resulted in nationwide power rationing and blackout, food shortages and sky rocketing prices, and massive losses of livestock and agricultural crops (Paavola, 2003). Consequently, the government had to introduce emergency food aid in many parts of the country. Most importantly, the El Niño resulted in widespread diseases namely malaria, diarrhea and cholera which added economic hardships to the government and families. Moreover, there were widespread infrastructural, human settlements, livelihood and other property damages all of which overwhelmed the country and its people (URT, 2003).

Climate change adaptation in Dar es Salaam city:

Several initiatives have been initiated in an effort to address climate change-related problems in Dar es Salaam. Such efforts include mitigating greenhouse gas emissions. For instance, in the transport sector, the Government started to phase-out leaded fuel in 2005. Efforts are also underway to reduce the sulphur content in the fuel. Further, the use of natural gas, which is a relatively pollution free energy source for powering vehicles, is being explored. Additionally, in the energy sector, electricity generation project from methane produced from Vinguguti solid waste dumpsite is being implemented. This project will reduce emission of methane gas into the atmosphere, thereby reducing global warming.

Other initiatives for reducing greenhouse gas emissions include promotion of the use of alternative fuel for improved cooking stoves, briquettes from agricultural wastes and saw dust, solar photovoltaic and thermal technologies, and use of liquefied petroleum gas. A total of 16 industries have switched to natural gas from Songosongo, including the Tanzania Portland Cement Factory. The use of natural gas is being promoted by the Government for reduction of air pollution, and consequently reducing greenhouse gas emission, (Vice President's office, 2011)

3.4. HAZARD, RISK & VULNERABILITY PROFILE:

Seventy percent of the population of Dar es Salaam lives in unplanned settlements; and fifty percent of the residents of these informal settlements live on an average income of less than US$1/day (Ndezi, 2009). This fact is an important starting point for discussing the city's vulnerability to climate change, and the strategies for adapting to this. There are large numbers of people, living in poor quality housing, frequently on land that is exposed to a variety of hazards, who are socially, economically and environmentally vulnerable. The city also has severe shortfalls in its sanitation systems: estimates suggest that approximately 93 per cent of urban residents rely on pit latrines of various types, 5 per cent have access to septic tanks or sewerage, and the remaining 2 per cent have no formal excreta disposal facility (Chaggu et al, 2002). Adaptive responses need to take these issues into account if they are to respond to the threats posed by climate change – and to meet the needs of low-income urban residents, (Dodman et al, 2011)

According to Dodman et al., (Dodman et al, 2011), Sea level rise due to climate change is a serious global threat: with rises of 1–3 meters in this century being anticipated (Dasgupta et al, 2007). On the East African coast, sea-level rise will increase flooding with potential adaptation costs of up to 10 per cent of GDP (Boko et al, 2007). Within the coastal zones of Dar es Salaam city, a rise in sea level of one meter would aggravate the already existing ecological problems through increased rates of coastal erosion, more persistent flooding, loss of wetlands, increased salinization of groundwater and soil as well as greater influx of diverse pollutants. This subsidence is exacerbated by human activities, including destruction of coral reefs for fishing, sand extraction for construction, lime manufacture from coral rocks, removal of salt pans, and the cutting of poles from mangroves (Ibe and Awosika, 1991). The projected subsidence rates are 15 cm to 95 cm by 2100 and a sea level rise of 50 cm would inundate 2,000 square km of land in Tanzania (Elasha-Osman, 2006).

Dar es Salaam is mainly affected by flooding as we have seen in the past, instances of excessive rainfall in the region, even though the amount of rainfall is erratic and varies due to the impact of climate change on temperatures along the Indian Ocean coast. Flooding is normally accompanied by drought which causes scarcity of water in the city resulting in long spells with people carrying out adaptive activities such as drilling bore-holes, transporting water for sale, women and girls queuing for hours at water points. This is also exacerbated by poor water supply system in Dar es Salaam.

Health workers in Dar es Salaam have also warned of cholera and related dangerous diseases after water shortages which forced many of the city's 3.2 million residents to use rivers and ponds for ablutions. There have been reports where water shortages resulted in disruptions to supplies in three-quarters of Dar es Salaam. The high density suburbs of Ubungo, Manzese, Sinza, Kawe, Buguruni and Temeke, as well as the central business district had been particularly hard hit, with thousands of residents drinking untreated water from boreholes and streams, (Dodman et al, 2011)

Various city newspapers reported that the heavy rainfall in early March 2008 caused substantial losses both socially and economically, including damage to smaller bridges and roads, flooding of homes, and the deaths of several children, (Dodman et al, 2011). The impact of these hazards is mostly experienced in areas where there are informal settlements that are categorized as poor areas as shown in the Figure below.

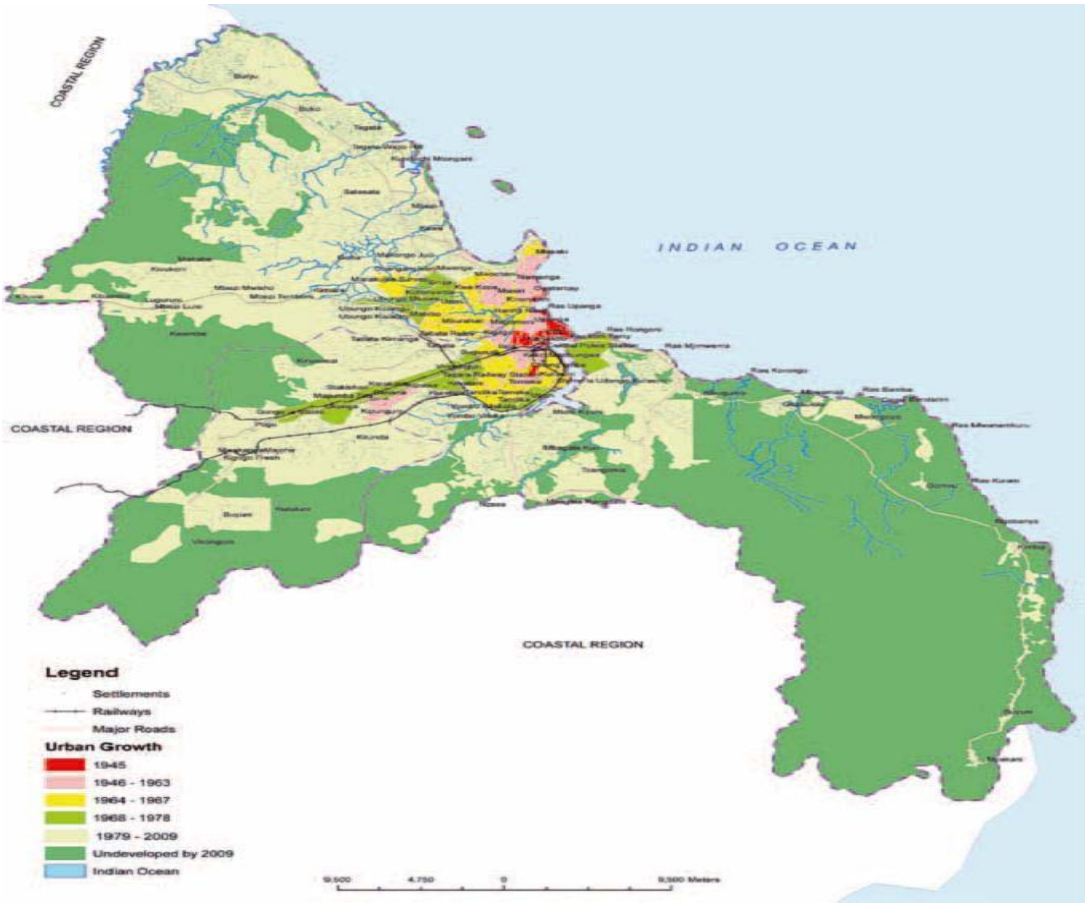

Figure 2 (Source; UN HABITAT, 2011) Map of Dar es Salaam Urban Growth, 1945-2009.

This can also be seen in greater detail from an aerial view on google maps below. The maps show many unplanned settlements and construction along Mzinga creek all the way to the coast. The topography of Dar Es Salaam's coastal plain narrows to 2km at Kawe in the north before widening to 8kms at the Mpiji River, and varies between 5-8kms in width to the southwest where the relief is more irregular gradually

merging into the more elevated headwaters of Mzinga River, (Vice President's office, 2011). These unplanned settlements along the narrow stretch of Mpiji River are vulnerable to flooding.

Unplanned settlements such as Mbagala and jangwani area along the Msimbazi River are most prone to flooding. Msasani located in the lowland area of Dar es Salaam has most of the runoff from drainage systems going through to the ocean. This was once a rice field however due to urbanization has been converted into unplanned settlements constituting flood risk.

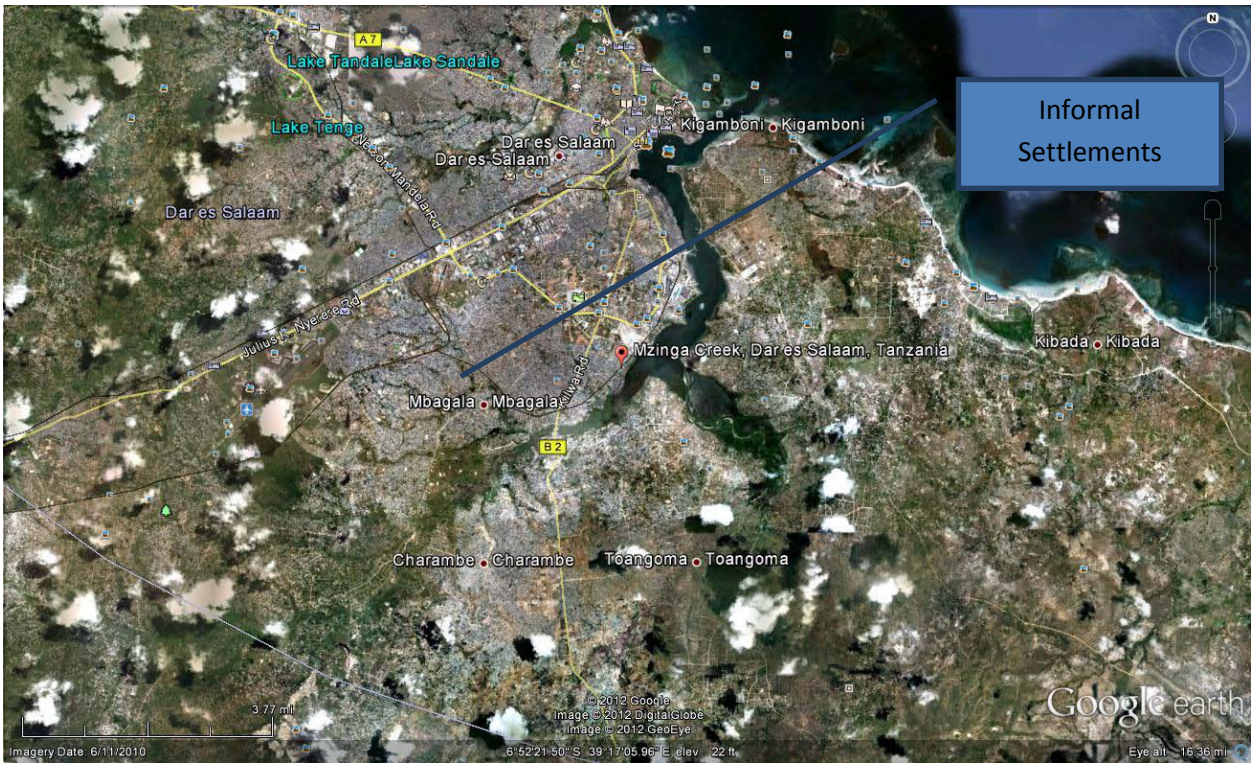

Figure 3 (Source; Google Maps, 2011) Dar es Salaam aerial view of settlement areas.

CHAPTER 4:

4.1. INTRODUCTION:

This chapter gives an overview of the methodology used for collecting data. It informs on the HFA-LGSAT used as a tool to derive data and the approach used to acquire the quantitative data. It also illustrates the tools used to acquire the qualitative data.

4.2. METHODOLOGY:

A combined methodology was adopted using both qualitative and quantitative methods reflecting the current structure of the 10 Essentials framework as outlined in UNISDR's DRAFT Handbook for local government leaders (which has both qualitative questions and a quantitative ranking system).

4.3. SAMPLE SELECTION:

Dar es Salaam city has signed up to the Making Cities Resilient campaign (my city is getting ready). They requested UNISDR Regional Office for Africa to send a representative to deliver a session on resilience building and integrating disaster risk reduction into local level planning during the private sector, public partnership meeting facilitated by Association of Local Authorities of Tanzania, (ALAT) secretariat in Mwanza, Tanzania. As a result, Dar es Salaam city requested UNISDR Regional office for Africa to support them to formulate a strategy and plan of action to build resilience against disasters. This was to be undertaken through a training and consultative forum that consisted of Dar Es Salaam city council (DCC), Temeke Municipality, Kinondoni Municipality and Ilal Municipality. This forum was also attended by non-governmental key stakeholders such as Plan International Tanzania, Sustainable Cities International, academia (Ardhi University), fire services, and other stakeholders.

4.4. DATA COLLECTION TOOLS:

Data collection was carried out using a questionnaire based on the 10 Essentials (HFA-LGSAT) and a ranking sheet asking respondents to rank city readiness according to the 10 Essentials. The questionnaires were administered by way of consultative focus group meetings. Qualitative data was further probed by the use of the SWOT analysis. This exercise was used to highlight the strengths, weaknesses, opportunities and threats that DCC and its strategic partners encountered with regard to disaster risk reduction. More profoundly the technical personnel in the forum were allowed to develop strategic interventions per essential priority area that would guide the analysis of the data collection and develop key recommendations to meet challenges for resilience building.

The questionnaire was developed based on the 10 essentials framework and the DRAFT Resilient Cities handbook document, where each essential had been further refined and discussed in more detail. The questionnaire was also developed with consideration of the Tanzanian context. To provide access for clarification of what each essential represented, a hand's on and 'face to face' consultation process was

therefore recognised as important to ensure that the 10 essentials would be presented in a way that local government officials would understand and relate to.

A questionnaire with ranked responses was administered based on the 10 Essential questionnaire with few modifications to ensure it was expressed in its most simple form while retaining the essence of the ranking in the handbook. A rank system of one to five was adopted but presented to participants as referring to minor or least and 5 referring to highest.

The simplest ordinal skill is a ranking system. Unlike nominal data, it has no objective distance between any two given points. Since it uses parametric statistics such as median and mode, it is therefore set on a subjective skill. Thus, in order to derive an overall perception, the ranking results were supported by qualitative data to provide useful information that would verify the data collected.

The ranking scale provide to the respondents was according to the following scale;

1- Least or minor
2- Less than Satisfactory
3- Satisfactory
4- More than Satisfactory
5- Highest Comprehensive level

See Appendix (B) for Questionnaire and Ranking sheet

CHAPTER 5:

5.1. INTRODUCTION:

This chapter presents the data as collected from the consultative forum reflecting the rate of resilience as per the Ten essentials. The data collected will be analyzed in the next chapter.

5.2. RESULTS:

The results are a reflection of a sample of 22 participants. The consultative forum could probably have involved a wider audience; however it is a significant representation of the overall perception within the council and its immediate key stakeholders. The results present the overall perception of the forum in a pie chart and investigate specific responses to each question using the bar graphs to query deviation from the general popular consensus. The pie charts provide an overall view of the response provided per essential.

Essential 1:

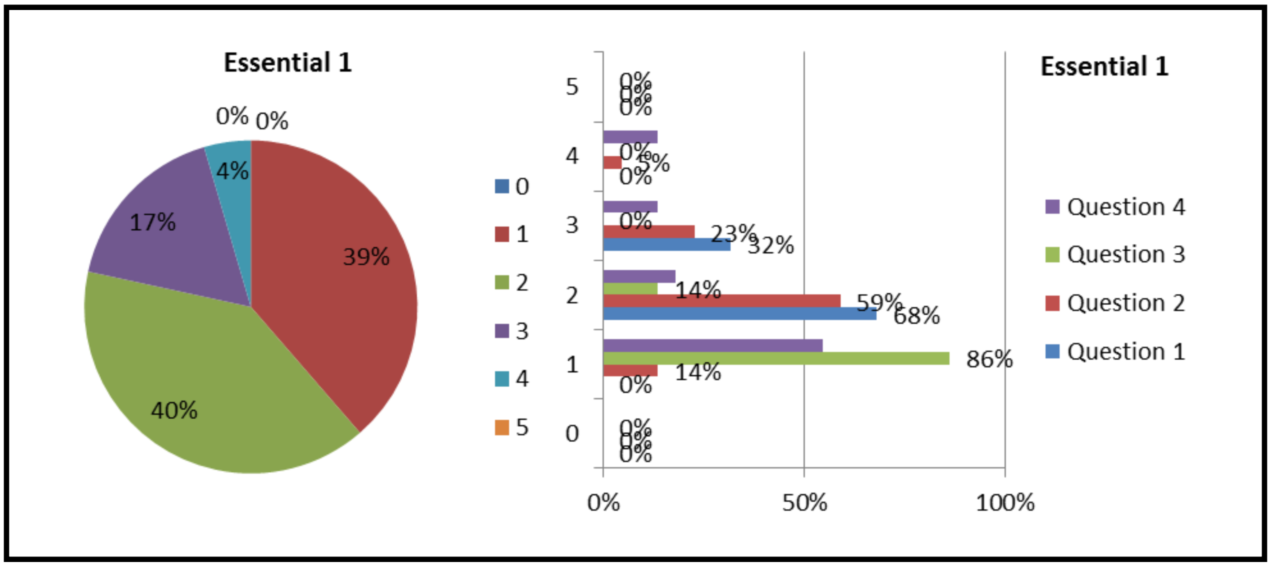

Table 1: showing participant responses to questions related to Essential 1.

Overall perception:

This essential had four questions that measured the council's ability to put in place organization and coordination to clarify everyone's roles and responsibilities. The ranking results show that 40% of the respondents in Dar es Salaam perceive that the town has made some achievements but are incomplete with limited capacity, 39% of the respondents believe that there is very little capacity with regard to institutional framework in place for disaster risk reduction with minor achievements. 17% of the

respondents believe that Dar es Salaam has some institutional commitment but progress is not comprehensive. 4% believe that achievements has been attained but with recognised deficiency in operational resources.

Anomalies:

The data in essential 1 presents an inconsistency. 68% of the participants stated that local government does not support vulnerable groups to actively participate in DRR. 32% of the respondents believe that local authority has satisfactorily involved vulnerable groups to reduce risk but progress has not been comprehensive or substantive. Therefore question 3 does not provide conclusive interpretation and thus will be explored further using a SWOT analysis in the next chapter.

Essential 2:

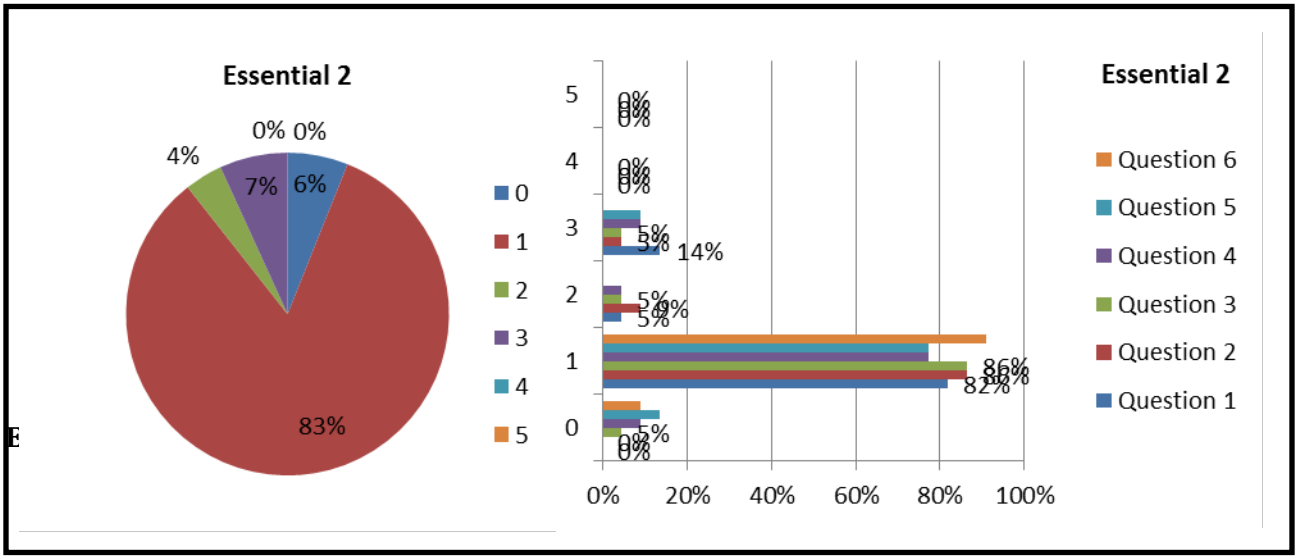

Table 2: showing participant responses to questions related to Essential 2

Overall perception:

This essential had six questions that measured the council's ability to assign a budget and provide incentives for homeowners, low-income families and the private sector to invest in risk reduction. The ranking results show that 83% of the respondents in Dar es Salaam perceive that the town has made minor achievements and there are very few signs of planning to improve the situation. 7% of the respondents believe that there is some commitment but progress is not substantive. 6% of the respondents believe substantial achievement has been attained with some recognised deficiencies in operational capacities. 4% of the respondents believe that Dar es Salaam's commitment and capacities are limited.

Anomalies:

The data in essential 2 presents no inconsistencies. In consensus majority of the participants ranked all the questions with a scale of 1. With regard to this essential they stated that the achievements are minor with few signs of planning or forward action to improve the situation.

Essential 3:

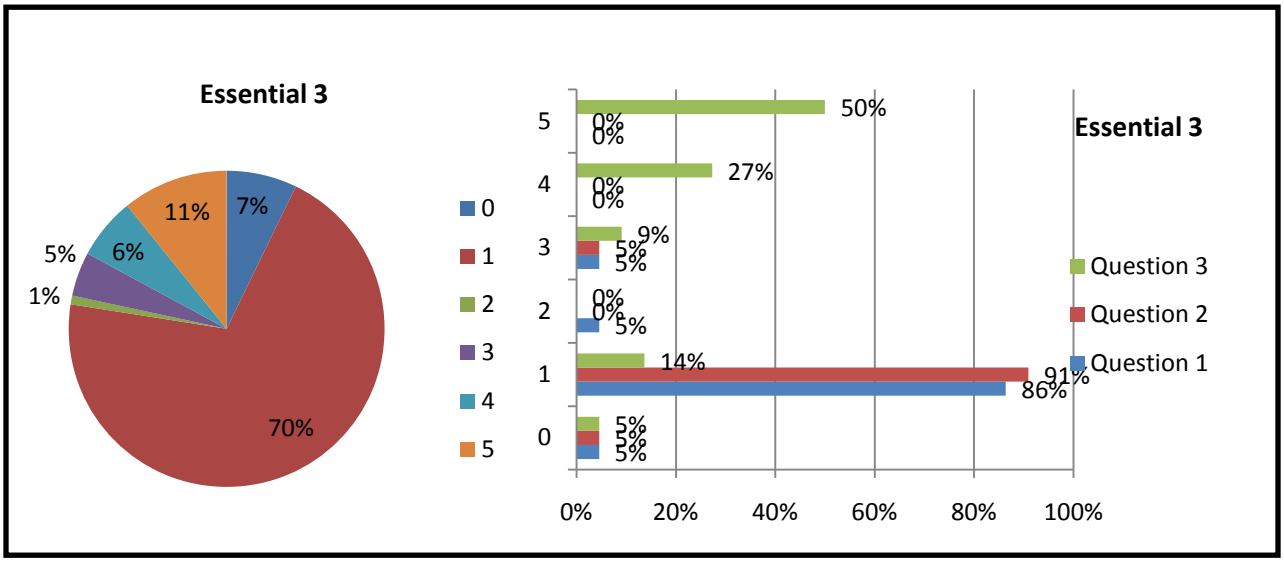

Table 3: showing participant responses to questions related to Essential 3.

Overall perception:

This essential had five questions that measured the council's capacity to update data on hazards and vulnerabilities, prepare and share risk assessments. The ranking results show that 70% of the respondents in Dar es Salaam perceive that the town has made very minor achievement with few signs of planning to improve the situation. 11% of the respondents believe that Dar es Salaam has done exemplary well and comprehensive achievement has been attained. 7% of the respondent's did not have any information 6% of the respondents perceived Dar es Salaam to have made substantial achievement related to essential 3. 5% of the respondents believe there is some institutional commitment but progress is not comprehensive and ranked it on a scale of 3.

Anomalies:

The data in essential 3 presents an inconsistency. 91% of the participants stated that local government does not conduct vulnerability assessment for vulnerable development sectors. 86% of the participants stated that the local government risk assessments are not regularly updated. Then we have a deviation for responses for question 3 whereby 50% of participants ranked a scale of 5 stating the local government regularly communicates hazard trends and early warning information comprehensively,

another 27% ranked 4 stating there is substantial achievement. This indicates that there is a need to investigate further through the SWOT analysis the responses for essential 3

Essential 4:

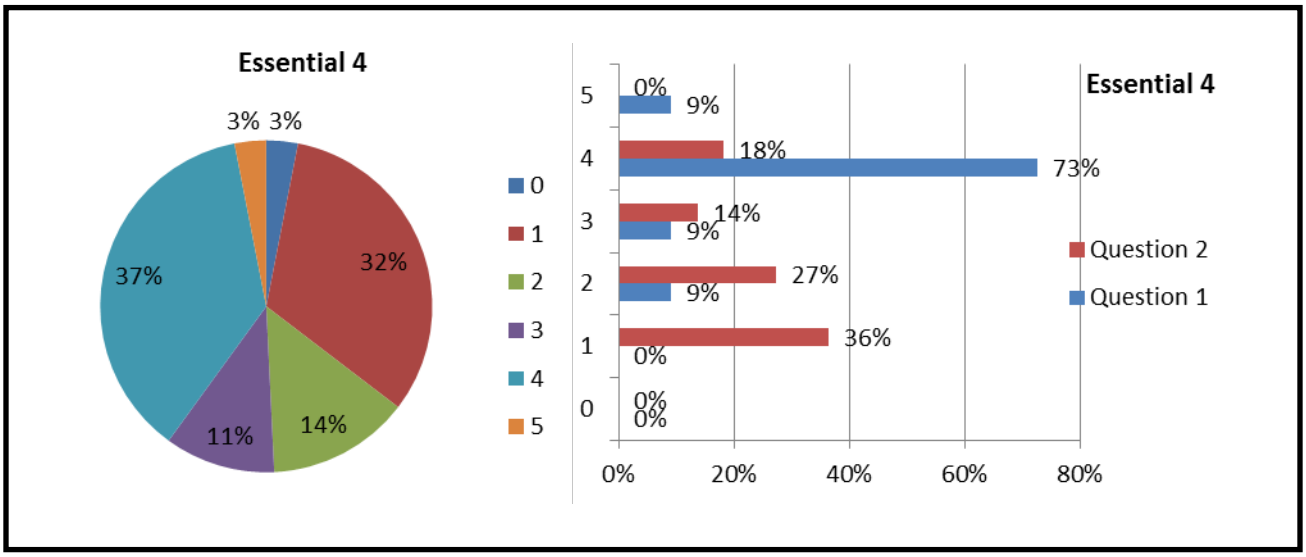

Table 4: showing participant responses to questions related to Essential 4.

Overall perception:

This essential had three questions that measured the council's ability to invest in and maintain risk reducing infra-structure such as storm drainage. The ranking results show that 37% of the respondents in Dar es Salaam perceive that the town has made some substantial achievements with some recognised deficiency in operational resources. 32% of the respondents stated that the achievements are minor and there few signs of planning or forward action to improve the situation. 14% of the participant's stated that achievements have been made but are incomplete with limited capacity, 11% of the respondents believe that there is some commitment to achieving DRR but progress is not substantial. 3% of the respondents believe that Dar es Salaam is exemplary and ranked a scale of 5 while another 3% stated that there is some institutional commitment but capacities are limited.

Anomalies:

The data in essential 4 presents an inconsistency. 79% of the participants who responded to question 1 of essential 4 had the view that the local government land use policies and planning regulations for housing and development take account of current and projected disaster risk giving a ranking scale of 4. For question2 analysing how adequately critical public facilities and infra-structure located in high-risk areas are assessed for all hazard risks and safety, 27% of the participants provided in consensus a rank of 2 and 36% provided a rank 1. Therefore this does not provide conclusive interpretation and thus will be explored further using a SWOT analysis in the next chapter.

Essential 5:

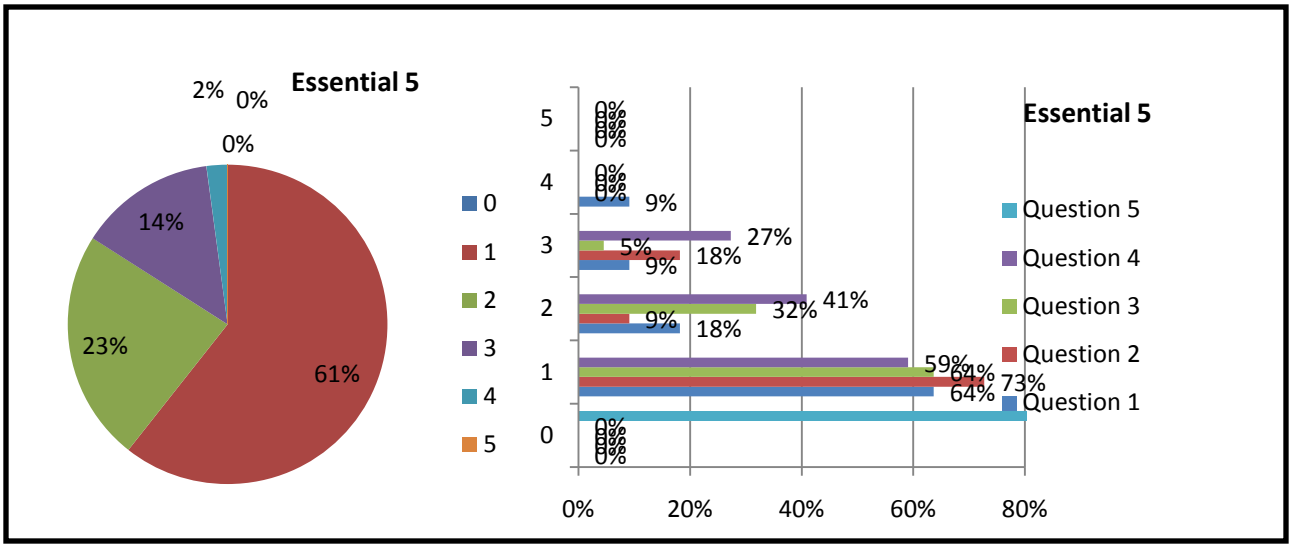

Table 5: showing participant responses to questions related to Essential 5

Overall perception:

This essential had four questions that measured the council's ability to assess the safety of schools and health facilities and upgrade these as necessary. The ranking results show that 63% of the respondents in Dar es Salaam perceive that the town has made minor achievements with few signs of planning forward action to improve the situation. 23% of the respondents believe that improvements are planned but with limited commitment and capacity. 14% of the respondents believe that Dar es Salaam has some institutional commitment but progress is not comprehensive. 2% believe that achievements has been attained but with recognised deficiency in commitment and operational resources.

Anomalies:

The data in essential 5 did not present any inconsistencies. The responses provided by the participant through consensus were very much demonstrating the same trend. Responses for question 1 indicating to what extent local schools and hospitals and health facilities receive special attention for all hazard risk, a ranking scale of 1 was given by 64% of the participants. Responses for question 2 indicating how safe schools and hospitals are during disasters and their ability to remain operational, 79% of the participants gave a ranking scale of 1. Responses for question 3 indicating to what degree local government implements special programmes to assess compliance of school and hospital safety to all weather risk, 64% participants gave a ranking scale of 1. Responses for question 4 indicating how far regular disaster preparedness drills undertaken in schools, hospitals and health facilities, 54% of the participants gave a ranking scale of 1. Therefore the trend by consensus was similar for all the questions.

Essential 6:

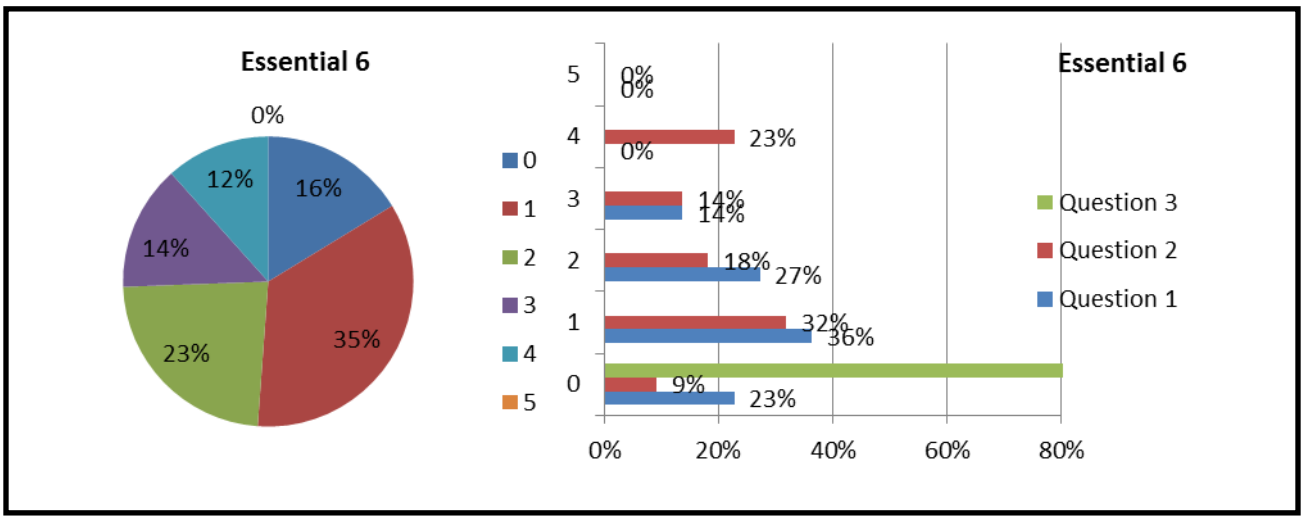

Table 6: showing participant responses to questions related to Essential 6.

Overall perception:

This essential had two questions that measured the council's ability to enforce risk-compliant building regulations and land use planning, identify safe land for low income citizens. The ranking results show that 35% of the respondents in Dar es Salaam perceive that the town has made very minor achievement with few signs of planning to improve the situation, 23% of the respondents believe that achievements have been made but are incomplete with limited commitment and capacity. 16% of the respondents did not know while 12% of the participants perceived that there is some institutional commitment but progress is not comprehensive or substantial.

Anomalies:

The data in essential 6 does not presents an inconsistency. The responses from the participants demonstrated varied ranking scales. There isn't a specific trend realised in their response, thus we cannot derive an anomaly for any specific question.

Essential 7:

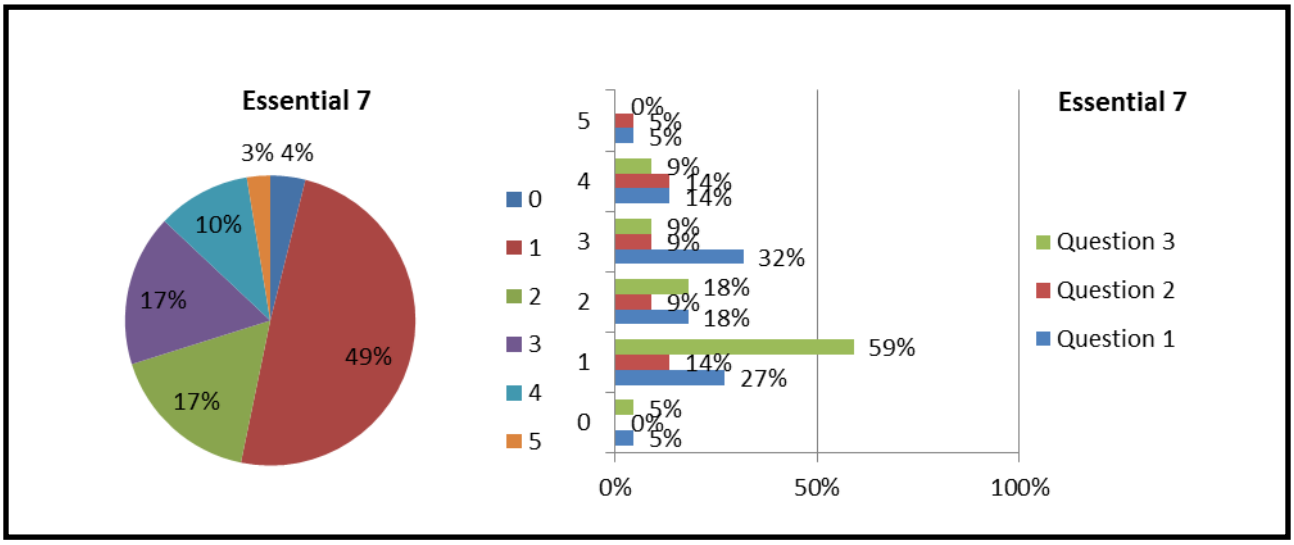

Table 7: showing participant responses to questions related to Essential 7.

Overall perception:

This essential had four questions that measured the council's ability to ensure education programmes and training on disaster risk reduction is in place in schools. The ranking results show that 49% of the respondents in Dar es Salaam perceive that the town has made minor achievements and there are few signs of planning or forward action to improve the situation. 17% of the respondents believe that Dar es Salaam has some institutional commitment but progress is not comprehensive. 17% of the participants perceive that there exists some achievement with limited commitment and capacity, 10% of the respondents believe that there is substantial achievement but with some recognised deficiencies. 4% of the participants did not know while 3% believe that achievements attained are exemplary and ranked a scale of 5.

Anomalies:

The data in essential 7 does not presents an inconsistency. The responses from the participants demonstrated varied ranking scales. There isn't a specific trend realised in their response, thus we cannot derive an anomaly for any specific question.

Essential 8:

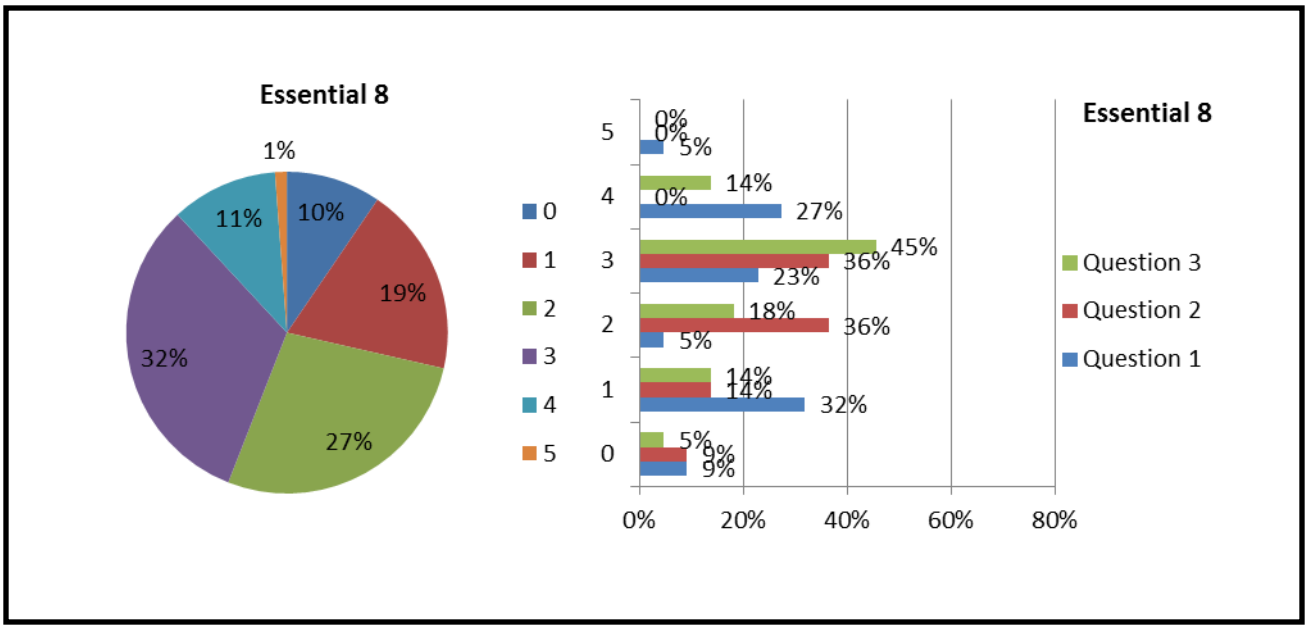

Table 8: showing participant responses to questions related to Essential 8.

Overall perception:

This essential had four questions that measured the council's ability to put protect ecosystems and natural buffers to mitigate hazards, and adapt to climate change. The ranking results show that 27% of the respondents in Dar es Salaam perceive that the town has made some achievements but are incomplete with limited capacity, 32% of the respondents believe that there is some institutional commitment but progress is not comprehensive. 19% of the participants believe that there are very minor achievements with few signs of planning or forward action to improve the situation. 11% believe there is some substantial achievement attained but with recognised deficiencies in commitment, financial resources or operational resources. 10% of the participants did not know or did not answer this essential, while 1% perceived that local council had comprehensive achievement with commitment and capacities to sustain efforts at all levels.

Anomalies:

The data in essential 8 does not presents an inconsistency. The responses from the participants demonstrated varied ranking scales. There isn't a specific trend realized in their response, thus we cannot derive an anomaly for any specific question.

Essential 9:

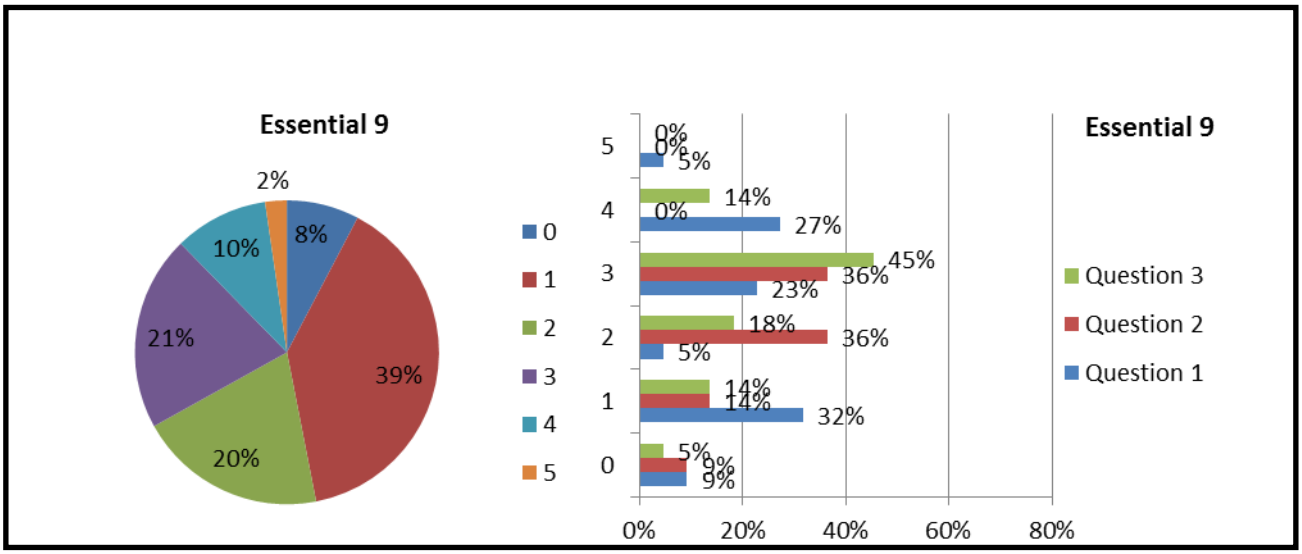

Table 9: showing participant responses to questions related to Essential 9.

Overall perception:

This essential had six questions that measured the council's ability to install early warning systems and emergency management capacities. The ranking results show that 39% of the respondents in Dar Es Salaam perceive that the town has made minor achievements with few signs of planning or forward action to improve the situation, 21% of the respondents believe that Dar Es Salaam has some institutional commitment but progress is not comprehensive, 20% of the respondents believe that achievements with recognised deficiency in financial resources or operational capacities. 08% of the respondents did not know or answer this section, while 2% believe that achievements attained are exemplary and ranked a scale of 5.

Anomalies:

The data in essential 9 does not presents an inconsistency. The responses from the participants demonstrated varied ranking scales. There isn't a specific trend realized in their response, thus we cannot derive an anomaly for any specific question.

Essential 10:

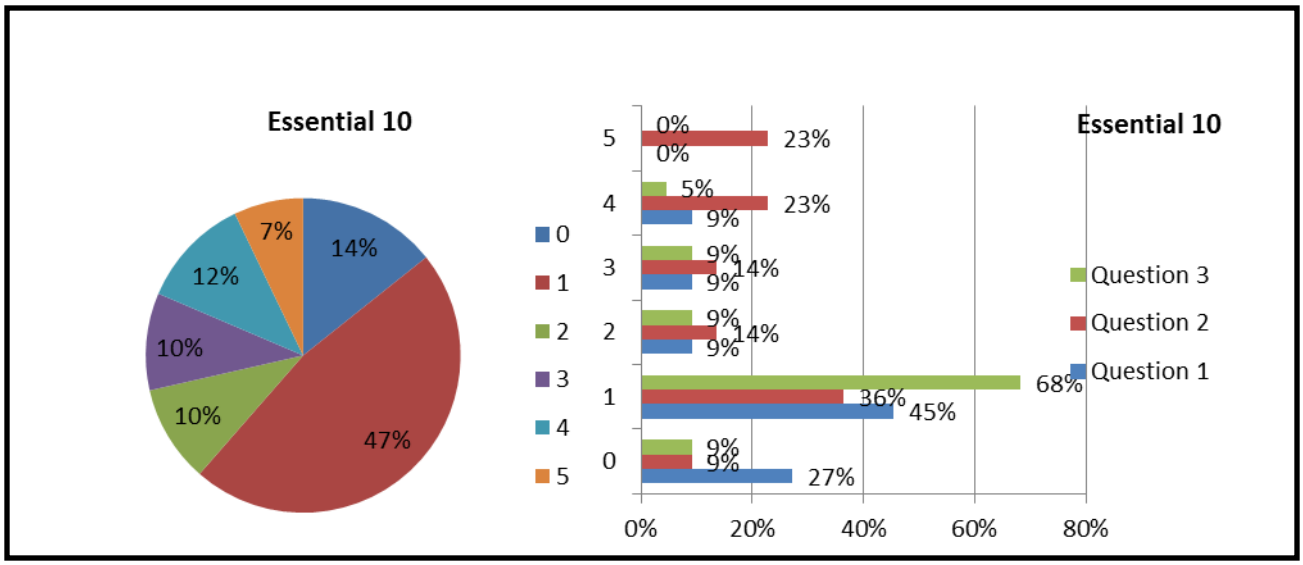

Table 10: showing participant responses to questions related to Essential 10.

Overall perception:

This essential had three questions that measured the council's ability during disaster recovery, ensure that the needs of the survivors are placed at the centre of reconstruction with support for them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods. The ranking results show that 47% of the respondents in Dar es Salaam perceive that the town has made minor achievements with few signs of planning or forward action to improve the situation. 12% of the participants did not know, 10% of the respondents believe that Dar Es Salaam has some institutional commitment but progress is not comprehensive or substantial while another 10% perceived Dar Es Salaam to have substantial achievement but with recognised deficiency in financial resources and operational capacities, and 7% believed the achievements are exemplary and ranked a scale of 5.

Anomalies:

The data in essential 10 presents an inconsistency. 68% of the participants responded to question 3 which investigates to what degree the local governments contingency plan for recovery and reconstruction includes needs assessments and livelihoods rehabilitation, the respondents ranked a scale of 1, however when responding to question 2 which investigates how well the disaster risk reduction measures are integrated into post-disaster recovery and reconstruction, including needs assessments and livelihoods rehabilitation, 23% of the respondents ranked a scale of 4. Therefore this does not provide conclusive interpretation and thus will be explored further using a SWOT analysis in the next chapter.

CHAPTER 6:

6.1. INTRODUCTION:

This chapter gives an analysis of the qualitative data collected from the consultative forum as per the Ten essentials.

6.2. DISCUSSION ANALYSIS:

The results are a reflection of a group consisting of 23 participants. In large the data derived from the consultative forum has demonstrated common trends in response, however there are some anomalies that were shown in the previous chapter. This will be addressed when discussing results in this chapter. This chapter seeks to get justification of results through the SWOT analysis that was done by the consultative forum.

Essential 1:

Dar Es Salaam city council (DCC) does not have the institutional framework to effectively carry out DRR. The data collected indicates that the council does not have an official mandate specific to disaster risk management however they have been involved in humanitarian response during past flooding events. The information captured in the SWOT indicates that the council has been receiving instruction from higher levels of government administration on what to do regarding disaster and thus they have been very reactive rather than proactive. There is currently no city council strategy and plan of action that integrates DRR into local government plans, however they are in the process of formulating one. There exists an overall national response strategy.

Coordination mechanism during response has been very limited but there are strategic partners such as the Red Cross National society, who as first responders are always on the scene supported by St Johns ambulance during disaster onslaught. Local government does support vulnerable groups living in informal settlement to relocate from hazard prone areas but this is small scale due to the fact that 70% of Dar es Salaam consists of informal settlements.

At National level there is a disaster focal point in every ministry. There are also regional disaster committees who work with local authorities to respond to disaster. This committee is normally chaired by the District Commissioner and it consists of members of the security committee thus its configuration is not balanced and mutes other stakeholders such as international NGO's. However, the Government is trying to improve the focal point system but currently they are agriculture based looking at food security issues rather than urban risk and resilience building to all hazards. There also exists a unit in the Prime

Minister's Office that was set up by an ACT of parliament in 1990 ACT number 9. This unit does relief activities. This ACT is currently being reviewed to incorporate Disaster Risk Reduction.

Essential 2:

Dar Es Salaam city council does not have a budget for disaster risk reduction thus they are unable to provide incentives for homeowners, low-income families, communities, businesses and public sector to invest in reducing risks they face. However they do tap into the national relief fund which will be reviewed to transition into a national disaster management fund.

Dar es Salaam city council does not have Micro finance, cash aid, soft loans and lone guarantee schemes available specific to affected households to restart their livelihood because they do not have a disaster risk reduction fund or budget allocated for this. However, Tanzania as a country remains one of the poorest countries in Africa with a GDP per capita of US$300 which is far less than the average US$ 500 for most African countries. In response the Government set up a micro-finance policy which targets low income citizens and vulnerable groups.

Dar es Salaam city has therefore gained through this policy and provides a host of cooperative societies and SACCO that support people affected by disaster to recover. There has been a lot of effort by Dar es Salaam Community Bank and other Microfinance institutions in ensuring access to wider financial services by the poor on a sustainable basis. Like any other clients, the poor need access to an array of financial services beyond credit. These services include savings, loans, insurance, and transaction services such as money transfer.

Dar es Salaam Community bank has extended community loans to build bore holes in order to provide clean drinking water to face the challenge of cholera outbreaks after the onslaught of floods. They have also provided loans to vulnerable groups for housing and acquisition of land.

A community based organization (CBO) namely Mtakuja Development Association approached the bank for a loan to drill deep wells for providing safe water to about five thousand people in Mbagala. DCB provided the association with a loan of Tshs 4 million in August 2004. The association sells the water to the residents of the community. Residents are happy to have access to safe water, the project is sustainable since people pay for use of service and no free donor money was involved. The association fully repaid its loans on time and the community continues to enjoy access to safe water. (E.P Mwawa, 2005)

Therefore the council may not have funds specific for DRR but they do have strategic partners who are already working with CBO's and the community to restart and sustain livelihoods of disaster affected populations in Dar es Salaam.

Essential 3:

Dar Es Salaam city council has not carried out hazard risk and vulnerability mapping exercise for the city, however through the consultative forum it was established that at National level the Vice President's Office had carried out an environmental audit of Dar Es Salaam together with Ardhi University, University of Dar Es Salaam, National Environment Management Council, Temeke Municipal council and Kinondoni Municipal council. Information captured in this report is to be used to map out hazard risks and vulnerability in Dar Es Salaam. In addition the Prime Minister's Office focal representative informed the consultative forum that they had carried out a risk vulnerability assessment of 3 pilot districts. The first report that is just concluded is attributed to Chamwene which is a drought prone area. Chamwene was given priority due to interest shown by the World Food Programme in drought prone areas that are getting worse. The Prime Minister's Office indicated that they have also targeted Dar es Salaam for this exercise.

Dar es Salaam city does not have any disaster loss database that will support them to plan to mitigate impact of future disaster when they occur. They also do not have a formal communication strategy to inform the community of hazard trends; however they do have informal indigenous systems that are very effective. This involves community leaders, councilors and on occasion the media. The Prime Minister's Office informed the consultative forum that they are currently developing a communication strategy that will involve all local authorities. Dar es Salaam city council is developing a strategy and plan of action which will integrate disaster risk reduction into all levels and sectors within the council. The strategic plan will address all this issues.

Essential 4:

Dar Es Salaam city is shown by the results in chapter 5 to have made some achievements with regard to investing and maintaining flood risk infra-structure such as drainage systems. However this can still be improved according to the rest of the respondents. Dar Es Salaam covers a very large area and in terms of maintaining culverts and clearing drainages, it has experienced various challenges.

One challenge is the rapid growth of informal settlements that are unplanned therefore due to a lack of access to main sewers; the households dump their waste into storm water drains that clog up causing flooding when it rains. Challenges facing the council are quoted below as major sources of deficiency in maintenance of drainage systems caused by illegal dumping by petty traders, households, illegal garbage collectors and small scale industry.

"Acquisition of land suitable for solid waste disposal in the city of Dar es Salaam has been a major concern of the city council. To date the Dar es Salaam city council (DCC) has not been able to secure appropriate sites for solid waste disposal or properly manage existing disposal sites. Since 1961, the DCC has used over six "dump sites" and all of them were located adjacent to the residential areas, (Kassim,

2006). These were Tabata 1961-1991, Mbagala 1992, Vingunguti, 1992, Mtoni 2001 – 2007, Kigogo, 2007-2010 and Pugu-Kinyamwezi dumpsite, located about 30km from the city Centre is currently being used as the inly dump site whereby all the collected solid wastes are dumped, leveled and covered by soil from time to time. The dumpsite is located about 100m from the residential area and it is poorly managed. Informal dumpsites are also found in various parts of the city including along river valleys, (Vice Presidents Office, 2011).

Figure 4: (Source; Vice President's Office, 2011) Disposal of solid waste in a river.

Therefore we can see that the council is doing some work but the results in chapter 5 indicate that much more has to be done to effectively enforce bylaws that will prohibit Dar es Salaam's population from polluting and dumping waste into drainage systems that increases the risk of flooding.

In addition the sewerage system of Dar es Salaam is a collection of small independent drainage areas rather than a fully integrated network. The system is composed of separate systems with a combination of gravity and pumped flows, comprising approximately 170km of 100 to 1000 mm diameter pipes covering a total area of almost 1700ha with adequate access manholes. These sewers discharge their effluent into oxidation ponds, streams and directly into the sea. About 10% of the population is served by sewers and the coverage is only limited to some areas. The existing sewerage system is served by 15 pumping station. 9 systems discharging into waste stabilization ponds and the remaining which discharge directly into the Indian ocean through a sea outfall, (Vice President's office, 2011)

Therefore we find that more than often when it floods there is raw sewerage and untreated waste that is exposed to informal settlements arising from the poor sewerage disposal system in Dar Es Salaam. The data collected in chapter 5 supports the argument that much more has to be done to address the waste disposal and maintenance of drainage systems to reduce the risk of flood disaster.

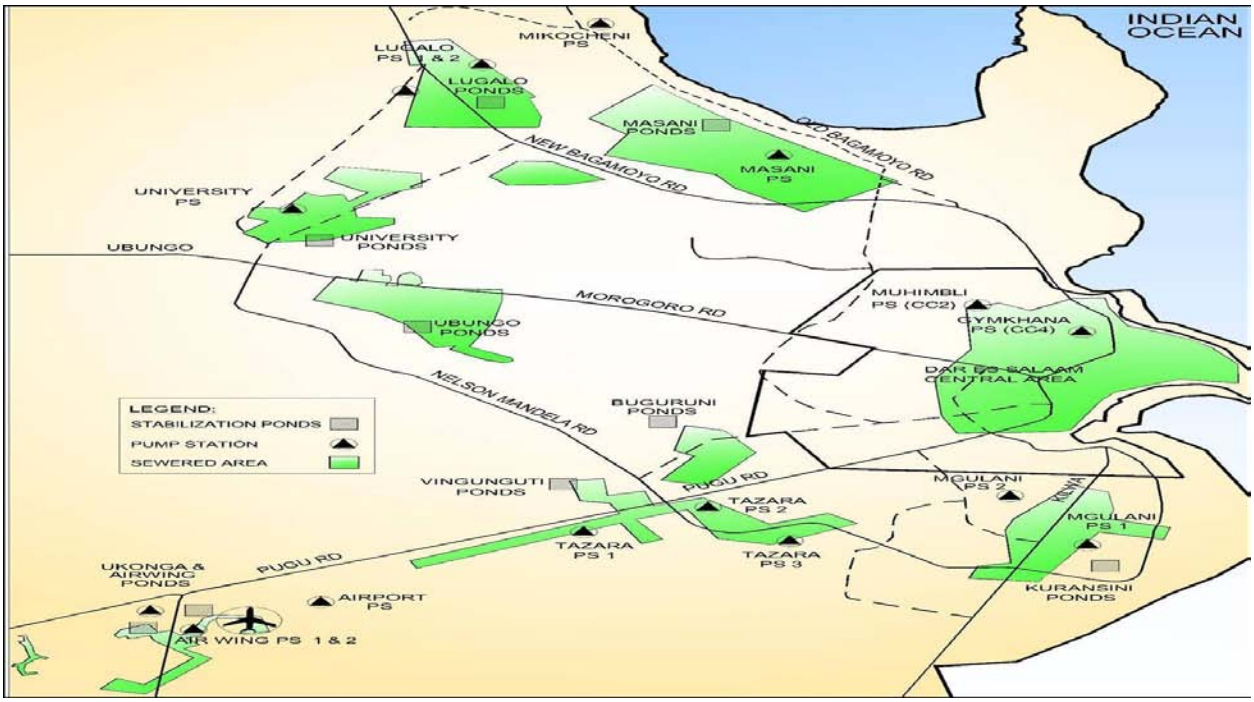

Figure 5: (Source; Vice President's Office, 2011) Map showing sewerage facilities at Dar es Salaam City.

Figure 6: (Source; Vice Presidents Office, 2011) Outfall at Ocean Road Beach

A significant amount of rain water enters the storm drainage and sewers during the rainy season resulting in flooding because of the solid waste that has clogged the system. "The commonly water logged areas include Buguruni Daya swamp, Buguruni Malapa, Mgoha and Mkenda, Mchikichini primary

school, Kigogo Primary School, Mzimuni Primary School, Matumbi area, Kurasini, Mtoni near equator bar, Msasani area, Mwananyamala, Kigogo bar, Mbagala, Kinondoni „A‟, Kino ndoni „B‟ and Kinondoni Shamba”, (Vice President’s Office, 2011)

“Areas within the Outskirts of the City which are frequently flooded include DCC Magomeni, Keko Magurumbasi, Chang‟ombe Machinjioni, Ukonga, Majumbasita, Mwananyamala Ursino, Mwananyamala Msisiri, Msasani Bonde la Mpunga, Kilimahewa, TSPCA Alykhan Road, Buguruni moto, Kipawa kwa Gedo, Tabata and Kipawa Viwandani”, (Vice President’s Office, 2011).

“Those within the City centre include Bibi Titi/Morogoro Road, Msimbazi Street, Msimbazi Kamata, Co cabs area, Pamba Road, Ohio Street, Charambe (International School). These areas are served by small conduit drainages most of which are blocked up by solid waste and are also too small for the storm water. Most of the storm water ends up into the Ocean through rivers and streams crossing the city”, (Vice President’s Office, 2011)

The sewerage network is overwhelmed and sewage is found overflowing in different parts of the city. Drainages are found filled with garbage making them fail to carry the flows and overflows to the environment. Foul water pipes from households, commercial establishments and industrial effluents are indiscriminately connected into rivers and streams causing pollution. Pit latrines and septic tanks are threatening the groundwater with faecal pollution. See figure below;

Figure 7: (Source; Vice President’s Office, 2011) …open sewer near shoppers’ plaza

Essential 5:

The data provided by respondents is discussed in this chapter with common perception. The trend developed in chapter 5 was homogenous to most of the participants. They information shows that there is minor achievement with regard to how disaster risk reduction is integrated through schools in Dar es Salaam. Information provided by the consultative forum indicates that there are no schools located in hazard prone areas. However the Vice President's Office indicates that Mchikichini primary school, Kigogo Primary School and Mzimuni Primary Schools are water logged during floods.

In addition there has not been any assessment done that can indicate how safe schools and hospitals are when flooding occurs. The council does enforce safety of schools with regard to fire. Schools and hospitals in Dar es Salaam are required to have fire extinguishers and are expected to conduct fire response drills. There is a system for checking whether schools and hospitals are in compliance with building codes when they are carrying out expansion and structural changes, they are required to get authorization from the city council planning department.

In addition to this, there is no capacity assessment to find out how hospitals are equipped to respond to disaster. There is no inventory that informs on how many ALS certified ambulance are in Dar es Salaam, how many Intensive care Unit beds are in hospitals, what food and water is stocked for emergencies. There is also no indication as to how schools respond when flooding occurs, with no specific awareness drills.

Essential 6:

The data provided in chapter 5 indicates that enough is not being done to apply and enforce realistic, risk complaint building regulations and land use planning principles. The bylaws exist but are not being enforced effectively. In addition the community also is partly to blame as they disregard the laws being enforced by the council. The council has put substantial effort to upgrade informal settlement but the challenge remains undaunted due to increase in population and unplanned housing emerging everywhere. Thus the problem associated with this is mainly waste disposal and sewerage as mentioned in essential 4.

Informal settlements and unplanned housing has forced many people to engage in urban agriculture and charcoal burning for livelihoods. The people become squatters and erode the land as a source of livelihood thus creating more runoff when the flooding occurs. They also engage in mining sand and rocks for housing construction to earn a living. This contributes to salinity of the land as ground water is affected.

More profoundly we can see that poor land-use planning exposes Dar es Salaam vulnerable populations to the risk of flood hazards with negative health and socio-economic implications. It also affects the ability to dispose waste as people dispose raw sewage into the already polluted natural river drainage systems.

In 2006, the Government issued an order for stopping of quarrying activities at Kunduchi Stone Quarry (Malele, 2009). This is because quarrying activities at Kunduchi were responsible for land degradation and impairment of natural landscape. However, quarrying activities have resumed albeit at a smaller scale compared to the situation prior to the ban. A large part of the abandoned area of quarries has been converted into residential areas with construction of residential buildings picking pace despite the fact that the Government has outlawed the practice. The total number of houses in the quarry is estimated to be 300. The estimated total population staying in the area was about 1,500 people (Malele, 2009).

Figure 8: (Source; Vice President's Office) Map showing resurfacing of stone quarry at Kunduchi

Figure 9: (Source; Vice President's Office) Map of unplanned settlement in Kunduchi stone quarry

Essential 7:

The data provided in chapter 5 indicates that Dar es Salaam city does not have effective awareness systems targeting hazard prone areas in the city. The information is not transferred to the community through education programmes in schools or for the general public. The only form of training being carried out is first aid in schools. This needs to be scaled up to involve disaster risk reduction integrated into school's curriculum.

The Dar es Salaam councilors who are in constant communication with community elders and the general community are not trained in disaster risk reduction. The councilors are a tool that can effectively raise awareness of disaster risk in the city among locals and even public and private sector; they can become disaster risk reduction champions. However, at National level the Prime Minister's office is preparing a communication strategy which will bolster disaster risk reduction awareness efforts in Dar es Salaam city.

Evacuation drills are frequently carried out by the city council in partnership with fire services. This is one area that the council has done well. The fire safety awareness has been a success. It is important that they carry out drills for other hazards as well as fire.

Essential 8:

The Dar es Salaam City contains a variety of aquatic resources of both marine and freshwater ecosystems. The marine ecosystems include coral reefs, sea grass beds, mangrove forests, estuaries and sandy beaches. Freshwater ecosystems include both surface waters (rivers and streams) and sub-surface water resources. In past years, aquatic ecosystems were endowed with a great diversity and abundance of aquatic life. However, during recent decades, these ecosystems have become partially to severely degradation by various human activities such as overexploitation of resources, habitat degradation and pollution. These activities have led to loss of habitats, disruption of the ecological balance of ecosystems, reduction in biodiversity, and decrease in available natural resources which are key to human life and socio-economic development. (Vice President's office, 2011)

Mangrove forests are recognized as critical coastal habitats with great ecological and socio-economic value. They serve as valuable nursery, feeding and breeding areas for a variety of animals including the commercially important shrimp, crab and fish species hence very important in as far as fisheries is concerned. Coastlines throughout the world are facing serious problems of coastal erosion. Mangroves are buffers between the land and the sea; they protect shorelines from damaging storm and hurricane winds, waves, and floods. Mangroves also help prevent erosion by stabilizing sediments with their tangled root systems. They maintain water quality and clarity, filtering pollutants and trapping sediments originating from land. (Vice President's Office, 2011)

Figure 9: (Source; Vice President's Office) Map showing mangrove forest at Kunduchi area

Dar es Salaam has mapped out all the natural buffers and eco systems that mitigate the impact of flood hazard in the city. The mangroves and coastal aquifers have to a great extent reduced the risk of flooding. However in some areas there is construction of unplanned housing in wetlands that result in flooding. These settlements are erected without consent from the city council and are constantly under threat of destruction.

Dar es Salaam through the National Environment management council has put effort to address the issue of citizen's destruction of wetlands for construction of housing. Dar Es Salaam city council entered a contract with ward executive officers, sub-ward chairmen and primary head teachers to protect all open spaces from invasion hindering encroachment by land developers. The council has also been involved in rehabilitation of coastal areas together with working groups.

Moreover, the working group that dealt with the rehabilitation of Oysterbay beach reviewed and prepared a land use plan, secured its formal approval by the Urban Planning Committee (UPC) of the DCC through the SDP Technical coordinating Committee (TCC) and succeeded in implementing some elements of the proposal. Implementation entailed construction of short concrete poles to prevent vehicles from entering the beach. On the issue of urban agriculture, the working group collaborated with a team of researchers funded by the IDRC to prepare a database on the potential agricultural land around the City. The group also raised community awareness on home gardening and the use of domestic garbage for composting, and promoted urban afforestation and beautification by planting trees (JICA, 2008).

The city has also carried a campaign to grow more trees that beautify the environment and also absorb some of the rainfall precipitation. This is a major challenge as many unemployed people living in informal settlements use charcoal for cooking and thus cut down trees for domestic use and for sale. However it still remains that waste disposal in the drainage systems are the main source of flooding.

Figure 10: (Source; Vice Presidents Office) Map showing dumping of waste at Mlalakuwa stream

The data generated from the consultative forum indicates that the council is carrying out some activities together with civil societies, private sector and Community based organizations to restore, protect and manage eco-systems and natural buffers, but this process has by far much more to achieve.

Essential 9:

Dar es Salaam local authority does not have adequate early warning systems in place. The city receives disaster early warning data through the media. This is not translated into a process that includes early warning information that is understood by all city inhabitants and transformed into early action to mitigate against the disaster impact.

Dar es Salaam has a disaster response committee and is in the process of formulating a disaster Centre. This will be done by integrating its requisition through a city strategic plan. This will allocate budget from council to set it up. There are no earmarked evacuation centers where emergency drills are carried out, however, if there were to be a disaster schools will be used to distribute relief food.

Funds available for disaster response are facilitated by national level government through the disaster relief fund. This is reactive in nature and thus it is very difficult for Dar es Salaam city to formulate contingency plans to mitigate against disaster impact.

Essential 10:

Dar es Salaam City does not have a disaster recovery and reconstruction plan that addresses safe guarding of livelihood. Disaster response is normally categorized by construction of temporal accommodation using tarpaulin tents in camps. This set up is supported for as long as the disaster onslaught exists thereafter the victims are not supported to integrate back into the society.

The city council does not have monetary resources to sustain recovery programmes for disaster affected populations. However Dar es Salaam city has various strategic partners such as civil society who provide psycho-social support or counseling to disaster survivors. These services are provided to the public on a voluntary or humanitarian scheme.

Needs assessments are normally carried out by the city council but this targets immediate emergency response and does not integrate early recovery programming in its approach. It will help the community build back better and sustain livelihoods if early recovery is implemented.

CHAPTER 7:

7.1. INTRODUCTION:

This chapter provides conclusions and main recommendations for the study based on the ten essentials.

7.2. CONCLUSION & MAIN RECCOMENDATION:

The conclusions derived from this study reveals that Dar es Salaam city does not have an institutional framework that integrates disaster risk reduction into local governemnt plans and activities. There is not one focal person whose role is specific to executing disaster risk reduction activities within the council. However, the council is carrying out various activities that unconsciously add to building up resilience of the general population towards disaster risk. There is a disaster committee but very weak in implementing risk reduction measures due to a lack of resources and technical capacity.

Dar es Salaam city does not have specific financial incentives to invigorate citizens to initiate disaster risk reduction activities. The only available budget is facilitated by the national relief budget which has to be endorsed at national level for use at local government level. Therefore the council does not have access to funding for disaster risk reduction activities and will have to dig deep into the currently overstretched council budget to allocate funding for DRR.

The city council does not have any form of disaster database and therefore do not have access to information relating to disaster loss and vulnerability mapping. However there are organizations within Dar es Salaam that do have this information which the council can tap into. There are also organizations such as UNISDR Regional Office for Africa that are able to work with Dar es Salaam city to build a disaster loss database through DESINVENTER. The city does not have a communication strategy but this is currently being captured by the Prime Minister's Office.

The state of Dar Es Salaam's drainage system is probably the main challenge that affects the city. The drainage system has to undergo major upgrading if it is to reduce the risk of flooding. The strategic plan that is currently being formulated is going to capture this. Dar es Salaam city is reaching out to strategic partners to address this issue. Waste management is also a main concern affecting the city due to continuous creation of unplanned settlements.

Schools and hospitals are a main focus for the city council when it comes to safety and business continuity. However the council does not have adequate resources to sustain its effort for monitoring and evaluating progress. Therefore we still have some schools that are affected by flooding but the number is small. The schools affected are as a result of being constructed on the flood riverine areas.

The council does have the bylaws to support them enforce good building codes land use plans. However this process will need a communication strategy that will involve changing the current practice of the general public. Public attitude has to change and understand the implication of building in disaster risk areas and know the consequences that they will face if they break the law.

Disaster awareness training has to be scaled up, what is currently in existence is tailored for specific drought prone areas which are rural. It has not been a priority to address urban risk and allocate resources for education and training of the public to build resilience. This can be initiated through integrating DRR into school's curriculum.

Protecting ecosystems and natural buffers in Dar es Salaam has been a major challenge with people encroaching into wetlands to build housing, destruction of mangroves for sources of wood for charcoal burning. This is affecting Dar es Salaams ability to absorb rainfall precipitation leading to high discharge of runoff leading to floods. The city has also weakened its ability to mitigate against possible tsunami events. The mangroves currently are sparsely distributed along the coastline and due to the rise in sea level, only the coral reefs can slow down the speed and impact of tsunami. The salt intrusion into underground water due to excessive mining is increasingly creating shortage of available clean drinking water for vulnerable groups. Salinity of water is also being considered by various organizations that work together with Dar es Salaam city council.

Early warning systems are not in place in Dar e Salaam at local government level. However, the council is seeking to set up an (Emergency Centre) that will be able to harness information from FEWS NET the meteorological department and other partners. This will provide a systematic approach on how early warning information is passed on to the public and shape how the public will respond to mitigate against risk of disasters.

Recovery and reconstruction is not effectively carried out. The council has a response mechanism that is supported by relief funds from national government. The recovery period does not continue to address issues of livelihood and sustainable development. After the emergency phase community based organizations play a key role in addressing issues such as generating jobs through community projects and providing psycho-social support to victims.

DRR technical skills are also lacking within council. There needs to be more training workshops on how to mainstream and integrate disaster risk reduction into local government planning. The strategy and plan of action that is currently being developed by Dar es salaam city council should also be a s consultative as possible in order to strengthen strategic partnerships with NGO's, CBO's and public / private sector to address disaster risk reduction holistically.

CHAPTER 8:

8.1. REFERENCES:

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APPENDIX A:

Dar es Salaam Workshop Pictures

APPENDIX B:

The 10 Essentials for Building Resilient Cities

Essential 1. Institutional and administrative frameworks
Put in place the organisation and coordination (frameworks) to understand and reduce disaster risk, based on the participation of citizen groups and civil society. Build local alliances and ensure that all departments understand their role in disaster risk reduction and preparedness.
Essential 2. Financing and Resources
Assign a budget for disaster risk reduction and provide incentives for homeowners, low income families, communities, business and public sector to invest in reducing the risks that they face.
Essential 3. Multi-Hazard Risk Assessment – Know Your Risk
Maintain up to date data on hazards and vulnerabilities, prepare risk assessments and use these as the basis for urban development planning and decisions. Ensure that this information and plans for improving resilience are readily available to the public and fully discussed with them.
Essential 4. Infrastructure Protection, Upgrading and Resilience
Invest in and maintain Infrastructure that reduces risk such as flood drainage, adjusted where needed to cope with climate change.
Essential 5. Protect Vital Facilities: Education and Health, (Food and Water) supplies?
Assess the safety of schools and health facilities, (food and water supplies) and upgrade these if necessary.
Essential 6. Building Regulations and Land Use Planning
Apply and enforce realistic risk compliant building regulations and land use planning principles. Identify safe land for low-income citizens and develop upgrading of informal settlements wherever feasible.
Essential 7. Training, Education and Public Awareness
Ensure education and training programs on disaster risk reduction are in place and in schools and local communities.
Essential 8. Environmental Protection and Strengthening of Ecosystems
Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
Essential 9. Effective Preparedness, Early Warning and Response
Install and develop preparedness plans, early warning systems and emergency management capacities in your city and hold regular public preparedness drills.
10. Recovery and Rebuilding Communities
After any disaster, ensure that the needs of the survivors are placed at the centre of reconstruction, with their support in the design and implementation of the recovery and response, including rebuilding homes and livelihoods.

APPENDIX C:

Dar es Salaam HFA-LGSAT Questions.

TEN ESSENTIALS	KEY QUESTIONS PER ESSENTIAL [Numbers following each question indicate references to HFA Core Indicators]	RANK 1 - 5	TOTAL RANK
ESSENTIAL 1: Put in place **organization** and **coordination** to clarify everyone's roles and responsibilities **[HFA PRIORITY 1]**	1. How well are local organizations (including local government) equipped with capacities (knowledge, experience, official mandate) for disaster risk reduction and climate change adaptation? [1.1]		
	2. To what extent do partnerships exist between communities, private sector and local authorities to reduce risk? [1.1]		
	3. How much does the local government support vulnerable local communities (particularly women, elderly, infirmed, children) to actively participate in risk reduction decision making, policy making, planning and implementation processes? [1.3]		
	4. To what extent does the local government participate in national DRR planning? [1.4]		
ESSENTIAL 2: **Assign a budget** and provide incentives for homeowners, low-income families and the private sector to invest in risk reduction **[HFA PRIORITIES 1 AND 4]**	5. To what extend does the local government have access to adequate financial resources to carry out risk reduction activities? [1.2]		
	6. To what degree does the local government allocate sufficient financial resources to carry out DRR activities, including effective disaster response and recovery? [1.2]		
	7. What is the scope of financial services (e.g. saving and credit schemes, macro and micro-insurance) available to vulnerable and marginalised households for pre-disaster times? [4.2]		
	8. To what extent are micro financing, cash aid, soft loans, loan guarantees, etc. available to affected households after disasters to restart livelihoods? [4.2]		
	9. How well established are economic incentives for investing in disaster risk reduction for households and businesses (e.g. reduced insurance premiums for households, tax holidays for businesses)? [4.3]		
	10. To what extent do local business associations, such as chambers of commerce and similar, support efforts of small enterprises for business continuity during and after disasters? [4.3		

TEN ESSENTIALS	KEY QUESTIONS PER ESSENTIAL [Numbers following each question indicate references to HFA Core Indicators]	RANK 1 - 5	TOTAL RANK
ESSENTIAL 3: Update data on hazards and vulnerabilities, **prepare** and **share risk assessments** **[HFA PRIORITIES 2 and 3 AND 4]**	11. To what degree does the local government conduct thorough disaster risk assessments for key vulnerable development sectors in your local authority? [2.1]		
	12. To what extent are these risk assessments regularly updated e.g. annually or on a bi-annual basis? [2.1]		
	13. How regularly does the local government communicate to the community information on local hazard trends and risk reduction measures (e.g. using a Risk Communications Plan), including early warnings of likely hazard impact? [3.1]		
	14. How well are local government risk assessments linked to, and supportive of, risk assessments from neighbouring local authorities and state or provincial government risk management plans? [2.4]		
	15. How well is disaster risk assessments incorporated into all relevant local development planning on a consistent basis? [2.1]		
ESSENTIAL 4: Invest in and maintain **risk reducing infrastructure**, such as **storm drainage** **[HFA PRIORITIES 4]**	16. How far do land use policies and planning regulations for housing and development infrastructure take current and projected disaster risk (including climate related risks) into account? [4.1] □ housing □ communication □ transportation □ energy		
	17. How adequately are critical public facilities and infrastructure located in high-risk areas assessed for all hazard risks and safety? [4.4]		
	18. How adequate are the measures being taken to protect critical public facilities and infrastructure from damage during disasters? [4.4]		
ESSENTIAL 5: Assess the **safety of all schools and health facilities** and upgrade these as necessary **[HFA PRIORITIES 2, 4 AND 5]**	19. To what extent have local schools, hospitals and health facilities received special attention for 'all hazard' risk assessments in your local authority? [2.1] Tick boxes: □ Schools □ Hospitals/ health facilities		
	20. How safe are all main schools, hospitals and health facilities from disasters so that they have the ability to remain operational during emergencies [2.1] Tick boxes: □ Schools □ Hospitals/ health facilities		
	21. To what degree do local government or other levels of government have special programs in place to regularly assess schools, hospitals and health facilities for maintenance, compliance with building codes, general safety, weather-related risks etc.? [4.6] Tick boxes: □ Schools □ Hospitals/ health facilities		

TEN ESSENTIALS	KEY QUESTIONS PER ESSENTIAL [Numbers following each question indicate references to HFA Core Indicators]	RANK 1 - 5	TOTAL RANK
	22. How far are regular disaster preparedness drills undertaken in schools, hospitals and health facilities? [5.2] Tick boxes: □ Schools □ Hospitals/ health facilities		
ESSENTIAL 6 : Enforce **risk-compliant building regulations** and **land use planning,** identify safe land for low-income citizens **[HFA PRIORITY 4]**	23. How well enforced are risk-sensitive land use regulations, building codes, and health and safety codes across all development zones and building types? [4.1]		
	24. How strong are existing regulations (e.g. land use plans, building codes, etc.) to support disaster risk reduction in your local authority? [4.1]		
ESSENTIAL 7: Ensure **education programmes** and **training** on disaster risk reduction are in place in schools and communities **[HFA PRIORITIES 1, 3 AND 5]**	25. How regularly does the local government conduct awareness-building or education programs on DRR and disaster preparedness for local communities? [1.3] Tick boxes: □ programs include cultural diversity issues □ programs are sensitive to gender perspectives		
	26. To what extent does the local government provide training in risk reduction for local officials and community leaders? [1.3]		
	27. To what degree do local schools and colleges include courses, education or training in disaster risk reduction (including climate-related risks) as part of the educational curriculum? [3.2]		
	28. How aware are citizens of evacuation plans or drills for evacuations when necessary? [5.2]		
ESSENTIAL 8: **Protect ecosystems** and **natural buffers** to mitigate hazards, adapt to climate change **[HFA PRIORITY 4]**	29. How well integrated are the DRR policies, strategies and implementation plans of local government into existing environmental development and natural resource management plans? [4.1]		
	30. To what degree does the local government support the restoration, protection and sustainable management of ecosystems services? [4.1] Tick appropriate boxes: □ coastal zones □ wetlands □ water resources □ river basins □ fisheries		
	31. To what degree do civil society organizations and citizens participate in the restoration, protection and sustainable management of ecosystems services? [4.1]		

TEN ESSENTIALS	KEY QUESTIONS PER ESSENTIAL [Numbers following each question indicate references to HFA Core Indicators]	RANK 1 - 5	TOTAL RANK
	32. To what degree does the private sector participate in the implementation of environmental and ecosystems management plans in your local authority? [4.1]		
ESSENTIAL 9: Install **early warning systems** and **emergency management** capacities **[HFA PRIORITIES 2 AND 5]**	33. To what degree do local institutions have access to financial reserves to support effective disaster response and early recovery? [5.3]		
	34. To what extent are early warning centres established, adequately staffed (or on-call personnel) and well resourced (power backups, equipment redundancy etc.) at all times? [2.3]		
	35. How much do warning systems allow for adequate community participation? [2.3]		
	36. To what extent does the local government have an emergency operations centre (EOC) and/or an emergency communication system? [5.2]		
	37. How regularly are training drills and rehearsals carried out with the participation of relevant government, non-governmental, local leaders and volunteers? [5.2]		
	38. How available are key resources for effective response, such as emergency supplies, emergency shelters, identified evacuation routes and contingency plans at all times? [5.2] Tick boxes: □ Stockpiles of relief supplies □ Emergency shelters □ Safe evacuation routes identified □ Contingency plan or community disaster preparedness plan for all major hazards		
ESSENTIAL 10: Ensure that the **needs and participation of the affected population** are at the centre of **reconstruction** **[HFA PRIORITIES 4 AND 5]**	39. How much access does the local government have to resources and expertise to assist victims of psycho-social (psychological, emotional) impacts of disasters? [5.3]		
	40. How well disaster risk reduction measures are integrated into post-disaster recovery and rehabilitation activities (i.e. build back better, livelihoods rehabilitation)? [4.5]		
	41. To what degree does the Contingency Plan (or similar plan) include an outline strategy for post-disaster recovery and reconstruction, including needs assessments and livelihoods rehabilitation? [5.2]		

TABLE A.2: Scoring Scale - Level of Progress

The status and level of progress in the self-assessment shall be measured on a scale of 1-5, which will help score progress over time. More guidance is available online.

LEVEL OF PROGRESS	**DESCRIPTION OF LEVEL OF PROGRESS FOR OVERALL RANKING FOR EACH QUESTION** (add narrative comments on context and challenges)	
5	Comprehensive achievement has been attained, with the commitment and capacities to sustain efforts at all levels.	
4	Substantial achievement has been attained, but with some recognised deficiencies in commitment, financial resources or operational capacities.	
3	There is some institutional commitment and capacities to achieving DRR, but progress is not comprehensive or substantial.	
2	Achievements have been made but are incomplete, and while improvements are planned, the commitment and capacities are limited.	
1	Achievements are minor and there are few signs of planning or forward action to improve the situation.	