

URBAN DISASTER MITIGATION AND ENVIRONMENTAL IMPACT ASSESSMENT OF URBANISATION IN UGANDA

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ABSTRACT

This paper focuses on Uganda's experience towards handling Urban Disasters related to: Earthquake, Floods, Lack of adequate water and environmental protection and Urban Fires.

Uganda's population is the third fastest growing in the world and there is evidence of rapid urbanization especially in the major cities. It is estimated that within 50 years, Uganda will become the 20th most populated country in the world (Population Reference Bureau, 2003). Uganda is an earthquake prone area mostly along the rift valley region.

Uganda is well-endowed with water. There is great abuse of the water catchments and this could lead to lack of adequate sanitation and environmental problems. The National Environmental Management Authority (NEMA) has taken a stride in protecting wetlands out of developments hence reducing on the abuse of the water catchments and at the same time avoids problems of liquefaction during future earthquakes, flood susceptibility measures and protecting buffer zones.

The Ministry of Works, Housing and Communication (MWH&C) together with the Uganda National Bureau of Standards (UNBS) are in final stages of producing a National Building Code incorporating the seismic sub-code.

The main task is sensitization of the masses on procedures of building and on this, the Ministry of Information together with the Ministry of Disaster Preparedness have worked out a programme to sensitize the local people through District Local Governments.

The Ministry of Internal Affairs together with that of Disaster Preparedness are responsible for mitigation of fires in a few urban cities or towns.

1. INTRODUCTION

Cities play a vital role in social and economic development in all countries. Urbanization builds diversified and dynamic economies which

raise productivity, create jobs and wealth, provide essential services, and absorb population growth.

Africa is currently the least urbanized continent, yet experiences the highest rates of urbanization. In Uganda, all the gazetted city, municipality, towns and trading centers with a population of more than 2,000 persons are categorized as urban areas. Urbanization in Uganda has generally increased with some areas originally trading centers becoming townships or town councils (United Nations Development Programme, 2001).

About 20% of Uganda's Population live in the urban areas. It is projected that by 2025 more than two-thirds of Uganda's population will live in urban areas (Ismail, Richard, Joan, 1997).

Uganda is undergoing rapid industrialization and employing new technologies whose immediate and long term impacts and behavior are largely unknown (United Nations Development Programme, 1998). There are very many existing and potential crises and disasters which threaten to negate many of the development gains made over the last decade. Disasters disrupt the productivity capacity of people, destroy the infrastructure and resources, divert the planned use of meager resources and so interrupt programmes and retard the pace of development. The Government of Uganda is therefore committed to creating and promoting a disaster management system that safeguards against disasters and ensure continued productive capacity of the people.

1.1 Migration and population growth

Consider an example of Kampala City. The internal birth rates account for only 31% and the rest are due to urbanization migration (John Van Nostroud, 1993). Generally in Uganda, as the population continues to grow rapidly, the urban health care amenities available have remained inelastic.

Table 1: Population Growth of Kampala City

Yr	1911	1948	1959	1965	1969	1980	1991
Pop.	2,850	24,198	46,735	108,000	330,700	458,500	774,241

Source: Kampala Urban study (1993)

According to the National Population Census provisional results of September 2002, Kampala city has a population of 2.0 million during day time and 1.5 million during night time. The annual growth rate is estimated at 3.82%.

2. URBAN DISASTERS IN UGANDA

Uganda's experience in urban disasters has been in the following areas though there are other disasters such as famine, wars, landslides that strike in the rural areas.

2.1 Earthquakes

According to available seismic records, many parts of western and central Uganda are prone to the recurrence of strong earthquakes. This poses an eminent risk both on the population and the private and public assets in these areas. An earthquake of Magnitude, M 6.7 is so far the highest recorded as indicated in table 2. Frequent tremor occurrences are an indication that Uganda is seismically active.

Table 2: Major Earthquakes in Uganda Vs Damage

Date		Time		Location		M	Damage
Year	Mon	Day	Hr	Min	Lat	Long	
1945	03	18	08	01	00.0	32.0	6.0 5 deaths, 8 injuries, some houses destroyed
1966	03	20	01	14	0.81	29.9	6.7 157 deaths, 1323 injuries, 6752 huts, houses damaged or destroyed est. at £1 million
1994	02	05	23	34	0.59	30.0	6.0 8 deaths, 2693 buildings damaged or destroyed est. at US\$60 million

Source: Loupekine (1996), Maasha (1975), UNESCO (1978) and National Disaster Committee Report (1994).

The building performance in the previous earthquakes stood at 69.8% failure in walls, 34.2% in floors, 33.0% foundations and 31.7% in roofs (The National Earthquake Task Force, 2003). There were relatively low casualties as compared to earthquakes of similar magnitudes in other cities of the world. This is because there was less developed infrastructure and low population density at that time. However, the potential for earthquake disaster is increasing due to urban drift and population growth and rapid growing industrialization



Some of the High-rise structures in Kampala City - a need for disaster preparedness

The Government of Uganda, through the MWH&C has embarked on providing an effective solution to the need for earthquake resistant shelter for the communities and institutions in the prone areas. A National Task Force has been set up to come up with the seismic code for Uganda and this

will form part of the National Building Code with the UNBS as the coordinating agency. Meanwhile, a manual has been put in place to guide in construction of earthquake resistant single storey houses.

In this manual some of the guidelines mentioned are:

- Site selection criteria, to go for gentle sloping land and avoid swampy or hilly areas.
- Type of building plans.
- All foundations to be on firm ground.
- A ground beam to be fixed as well as columns and ring beam.
- Light roofing material is encouraged.

During walling, hoop-iron is used every 2-3 courses to act as discontinuities for cracks should they arise. In the past, houses were put up without guidance (The National Earthquake Task Force, 2002).

The Ministry of Disaster Preparedness and Refugees is to offer responses towards mitigation of the effects of earthquakes while the Ministry of Information is to aid in information dissemination.

2.2 Urban floods

In Ugandan urban areas, floods are becoming a menace due to poor drainage planning. The increase in urbanization has caused an equal increase in the surface runoff. Many structures are being put up and people are encroaching water catchments. Uganda relatively experiences rainfall almost throughout the year. In Kampala city, the problem of flooding is being addressed through the Nakivubo Channel Rehabilitation Project funded by World Bank. The project will improve on the drainage pattern in the city hence reduce on health risk, cause to property damage, road congestion and disruption to public services and water pollution. The 19mUS\$ project is expected to be completed by the end of 2003.

2.3 Lack of adequate safe water and environmental protection

Increasing trends of urbanization have led to among other things, the waste management problem getting out of hand. In Uganda today, laws exists to ensure sound environmental care. Articles 39 of the Constitution indicate that every person has a right to a clean environment. The national environment statute, 1995, vests responsibility for waste management to those who generate it. The “polluter pays” principle provided in the statute states that the breach of this duty may lead to fines and heavy clean-up cost, besides loss of reputation (Government of Uganda, 1995). The water statute is also in place that protects Ugandan waters against pollution and misuse.

Environmental effects of poor sanitation are a health hazard to the public through spread of communicable diseases such as diarrhea, dysentery and cholera. Due to high poverty levels, the majority of the urban population in Uganda cannot afford to boil there drinking water because of high energy costs leading to exposure to water-related illnesses. Some use charcoal as the main source of energy for cooking and this directly depletes forests which is an environmental concern.

Protected shallow wells and springs in the urban areas are often contaminated with high levels of faecal material due to dense population

hence a danger to human health. The Government of Uganda, through the Local Government Development Programme is now extending piped water to peri-urban areas and erecting public standpipes. The piped water is treated and safe for drinking.

NEMA together with the department of Wetlands Inspection Division, both under the Ministry of Lands, Water and Environment are in final stages of gazetting urban wetlands as protected areas for purification of water. Currently, wetlands in urban centers are being encroached on and the law dictates that they have to be gazetted first before any enforcement is done. For the already gazetted ones, houses have been razed. It is important to note that developments in wetlands:

- are a great risk to water pollution leading to inadequate safe water.
- are susceptible to flooding hence causing death through collapse or water-related illnesses.
- have high-risk level of liquefaction potential during future earthquakes.

During an earthquake, low-level wetlands can act as buffer zones hence should be protected.

As a result of increasing industrialization to counter the increase in urbanization, incidences of technological disasters are expected to increase. There is a variety of installations in Uganda and over 80% are located in urban areas. Improper discharge of industrial waste lead to environmental contamination of air, water and land.

The European Union is funding urban water projects in the Kampala city and three Mid-Western towns in Uganda. The projects main objective is to provide improved, reliable and sustainable water and sanitation facilities of the urban and peri-urban populations in those areas. In Kampala, the expected result is to maintain an output of 35,000m³/day (European Union, 2003).

2.4 Urban Fires

Over the past few years, fire outbreaks in urban markets have become a common new threat to the Country. Property worth millions has been lost and one notable characteristic of these fires is that they are electrical and are a result of human fault and happen mostly at night. For urban buildings, access for fire fighting is a must and to prevent fire spreading, at least 3m are often left between most urban buildings.

Table 3: Fire Responses in Kampala City

Year	2000	2001	2002	As at 17/7/2003
Responses to fires	646	600	631	355

Table 3 indicates that there is high potential for urban fires. The fire fighting brigade carries out training of staff for industries and hotels. The brigade lacks adequate fire fighting equipment and this limits the areas of

operation. Currently operations cover only seven out of over seventy towns in Uganda.

It is also important to note that fuel stations can be a great potential for major fire outbreaks in cities. Currently in Uganda, due to high rates of urbanization, there is equal increase of vehicles in the urban areas and this triggers increase in fuel stations. The fuel stations have in turn reduced on the buffer zones hence reducing room for escape during future earthquakes.

3. EXISTING INSTITUTIONAL RESPONSE TO DISASTERS AND DISASTER MANAGEMENT PLANNING

The Government of Uganda is managing disaster situation through the Department of Disaster Preparedness and Refugees in the Office of the Prime Minister. The department is the principal agency in Uganda for the management of disasters and coordinates and supervises all activities of the Government and other stakeholders in the field of disaster management. Figure 1 shows how the Ministry has set-up District Disaster Committees that not only operate in urban centers but also in rural areas.

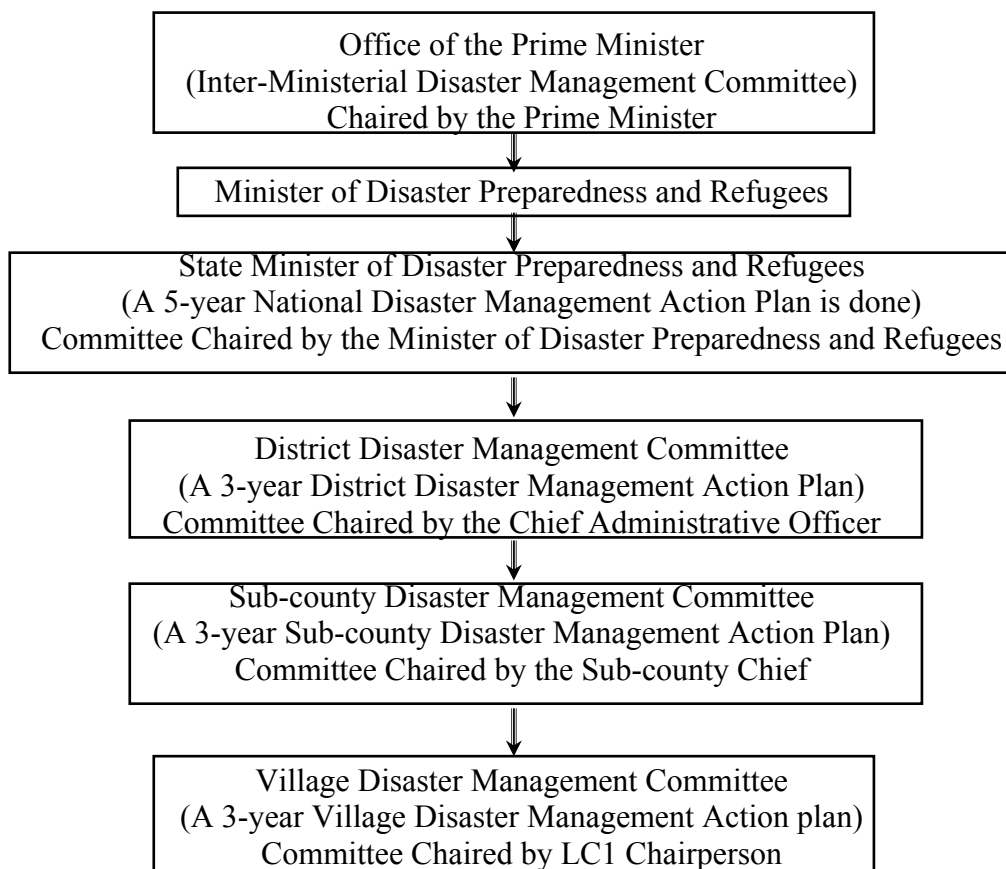


Figure 1: Existing Institutional Disaster Management Planning

3.1 Financial mechanism for disaster management

The financial responsibility vests in the hands of Government in accordance with the Sixth Schedule of the Constitution. Local Governments and other Government departments –including Water, Health, Environment and Tourism, internal Affairs and Minerals and Energy all dedicate some financial resources towards prevention and mitigation measures, often as part of their development strategies.

3.2 Roles and responsibilities

The Ministry responsible for disaster preparedness and refugees coordinates all the other ministries with respect to the disaster category.

The Ministry responsible for health handles issues concerning outbreak of diseases including malaria, diarrhea and viral infections.

The Ministry responsible for Water, lands and Environment handles community awareness of the importance of good environmental practice and the need for sustainable use of the environment in order to minimize the effects of disaster on the environment and livelihoods. The Ministry implements all this through NEMA as the coordinating body.

The Ministry responsible for Internal Affairs handles issues concerning fire outbreaks, preserves public order, safety and communication when a disaster strikes.

The Ministry responsible for Information handles the information dissemination up to the grassroots on issues concerning disaster management, mitigation measures.

The Ministry responsible for education is currently integrating disaster management into the school curriculum at all levels of education system. Education is a core issue in reducing vulnerability (Office of the Prime Minister, 2003).

4. CONCLUSIONS AND RECOMMENDATIONS

A comprehensive assessment of urban environmental conditions in Uganda should be carried out. The environmental screening should be improved and should cover issues such as; trends in urbanization (No, Population, rate of growth of large medium and small towns), economic importance of the cities and nature, magnitude and cost of urban environmental problems.

Uganda should employ advanced technologies such as use of Remote Sensing (RS), Geographical Information System (GIS) and Geographic Position System (GPS) for urban safety of infrastructures and environmental problems for sustainable development.

The Government of Uganda should prioritize finances for sensitization of the public about issues of disaster and environment related to urbanization, build human resource capacity in this area of concern and should sponsor training and research.

A comprehensive maintenance and upgrading programme for the existing infrastructure for water supply and sewerage should be introduced.

The law enforcement should be stepped up in order to achieve the standards set by government and proper land use planning should be instituted.

In case of fire fighting, there should be proper coordination between the Ministries of Internal affairs, Disaster preparedness and Information.

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