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The disaster profile of Kenia

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Letter from the editors

The *Emergency and Disaster Reports* is a journal edited by the Unit for Research in Emergency and Disaster of the Department of Medicine of the University of Oviedo aimed to introduce research papers, monographic reviews and technical reports related to the fields of Medicine and Public Health in the contexts of emergency and disaster. Both situations are events that can deeply affect the health, the economy, the environment and the development of the affected populations.

The topics covered by the journal include a wide range of issues related to the different dimensions of the phenomena of emergency and disaster, ranging from the study of the risk factors, patterns of frequency and distribution, characteristics, impacts, prevention, preparedness, mitigation, response, humanitarian aid, standards of intervention, operative research, recovery, rehabilitation, resilience and policies, strategies and actions to address these phenomena from a risk reduction approach. In the last thirty years has been substantial progress in the above mentioned areas in part thanks to a better scientific knowledge of the subject. The aim of the journal is to contribute to this progress facilitating the dissemination of the results of research in this field.

This third issue of 2015 of *Emergency and Disaster Reports* is dedicated to Kenya and the report seeks to highlight the country disaster profile. It will outline the individual disasters with significant impact on people, wealth and infrastructure along the Kenyan history in the past half-decade. These disasters will include floods, droughts, fires, landslides, earthquakes, tsunamis, hailstorms, terrorist's attacks, traffic accidents, disease outbreaks and political or tribal clashes.

Kenya is a country within the East African region. It is bordered by Somalia and the Indian Ocean to the East, Uganda to the west, Tanzania to the south and Southern Sudan to the North West, and Ethiopia to the north. It also sits within the sub Saharan region of Africa that is generally the group of countries south of the Sahara Desert and is largely homogenous in their economies. The Kenyan data will therefore give a reflection of the scenario in other countries within this region.

The report will also highlight the main disasters that have happened in Kenya in the last 50 years (1963 – 2013) as well as their impact on the health, environment, economy and the development of the populations affected.

The main disaster risk factors present in Kenya and the contribution of each one to the general risk of disaster. Also highlighted are some of the disaster prevention and response strategies implemented by the countries' authorities and the structure and characteristics of the emergency and disaster response system in the country.

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Monographic issue

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Table of Contents

1.0. Background	6
1.1. The Study Area	7
1.2. Introduction	7
1.3. Country Profile	9
2.0. The Kenya Natural Hazard Profile	10
2.1. Drought	11
2.1.1. Notable Impacts of Drought in Kenya	13
2.1.2.1. Social factors	14
2.1.2.2. Economic Factors Increasing Vulnerability	15
2.1.2.5. Poor Social Protection Culture/Inadequacy/Illiteracy	16
2.1.2.6. Policy Failures	16
2.2. Floods	16
2.2.1. Vulnerability Factors	18
2.2.2. Impacts of Floods in Kenya	18
2.3. Landslides	19
2.3.1. Vulnerability Factors to Landslides	19
2.3.1.1. Anthropogenic Activities and Topographical Factors	19
2.3.2. Impacts of Landslides in Kenya	20
2.4. Epidemics in Kenya	20
2.4.1. The Kenya HIV/AIDS Epidemic	21
2.4.1.1. Impacts of the HIV/AIDS Epidemic	21
2.4.2. Outbreak of Aflatoxin Poisoning	22
3.1. Technological Disasters and Other Man Made Events in Kenya	22
4.1. Present Disaster Prevention and Response Strategies	26
4.1.1. Institutional Framework - National Disaster Management System	26
4.1.2. The National (Disaster) Operations Center	28
4.1.4. Why More Emphasis on the FM Radio as an EWS Tool by KMD?	29
4.1.5. The RANET Radio	30
4.1.6. The Ministry of Special Programmes	30
4.1.7. The National Disaster Management Executive Committee (NDMEC)	30
4.1.8. The National Disaster Coordination Committee (NDCC)	31
4.1.9. The Provincial Disaster (Management) Committee (PDC)	31
4.2.0. The District Disaster (Management) Committee (DDC)	31
4.2.1. The Kenya Food Security Committee	31
4.2.2. The UN Agencies	31
4.2.3. Other Agencies	31

5.1. The Structure and Characteristics of the Emergency and Disaster Response Systems in Kenya	32
5.1.1. Recommendations in the Draft National Policy for Disaster Management in Kenya (2009) (6).....	33
6.1. Discussion	35
7.1. Existing Gaps and Challenges	38
7.1.1. Inadequate Policy, Legal and Institutional Frameworks.....	38
7.1.2. Inadequate Finances, Human Resources and Equipment.....	39
7.1.4. Lack of Advocacy and Community Involvement.....	40
7.1.5. Inadequate Integration and Co-Ordination.....	41
8.1. Conclusions	41
9.1. Recommendations	42
10.1. Bibliography	42

1.0. Background

The burden of disasters both natural and technological has hitherto been with the human kind for centuries now. These disasters date back to the Stone Age periods during the early man's existence to today's industrial era. Disasters are defined by the United Nations Office for Disaster Risk Reduction (UNISDR) as "A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources" (1).

The calamities classified as either natural or man-influenced depending on the causes continue to cause tremendous damage and losses globally to humans. The staggering social, economic and even development effects during and post-disasters are enormous and in some cases overwhelming warranting external interventions by the humanitarian agencies and neighboring or developed governments (2, 3).

The preponderance of these disasters either occurring naturally or artificially have however been aggravated by certain activities of man. Human activities have generally predisposed him and his surrounding to some of the most fatal catastrophes in history. (2)

The distribution of disasters is global. It is however critical to note that the countries or regions worst hit are the low and middle income countries. These countries normally have the heaviest casualties in terms of the human deaths and injuries, animal losses and death and environmental damage. They have characteristically very limited capacity to adequately prepare, prevent and respond in the event of a disaster. In addition these countries do have several needs and priorities both in the health sector and other development areas. (4)

This report seeks to highlight the country disaster profile of Kenya. It will outline the individual disasters with significant impact on people, wealth and infrastructure along the Kenyan history in the past half-decade. These disasters will include floods, droughts, fires, landslides, earthquakes, tsunamis, hailstorms, terrorist's attacks, traffic accidents, disease outbreaks and political or tribal clashes.

Kenya is a country within the East African region. It is bordered by Somalia and the Indian Ocean to the East, Uganda to the west, Tanzania to the south and Southern Sudan to the North West, and Ethiopia to the north. It also sits within the sub Saharan region of Africa that is generally the group of countries south of the Sahara Desert and is largely homogenous in their economies. The Kenyan data will therefore give a reflection of the scenario in other countries within this region.

The report will also highlight the main disasters that have happened in Kenya in the last 50 years (1963 – 2013) as well as their impact on the health, environment, economy and the development of the populations affected. The main disaster risk factors present in Kenya and the contribution of each one to the general risk of disaster. Also highlighted are some of the disaster prevention and response strategies implemented by the countries' authorities and the structure and characteristics of the emergency and disaster response system in the country.

1.1. The Study Area

The study covered the region within the administrative and political boundary of Kenya. It is divided into 47 administrative divisions called counties in a devolved tier system based on its recently passed constitution of 2010 (Figure 1).



Figure 1: Administrative divisions of Kenya

This area is home to about 44 million people, of diverse ethnic and racial origins. The countries' economy has been improving albeit with several social and political challenges. Most of the population segments live in the rural areas (70%) with about 30 % in the urban areas. This is however rapidly changing due to the high rural to urban migration. The poverty headcount stands at 47% according to the World Bank report of 2011. The Kenyan GDP is at US\$20.6billion and the average per capita income US\$780 (Atlas method, World Bank 2011). (5)

1.2. Introduction

Kenya has a complicated disaster profile dominated by natural and technological disasters. Generally, some of these include droughts, fire, floods, terrorism, technological accidents, diseases and epidemics. These have adverse socio economic, health and political impacts on the country. Like in most developing countries, disasters in Kenya disrupt people's livelihoods, destroy the infrastructure, divert planned use of resources, interrupt economic activities and retard development. Kenya has

experienced a rise in the frequency of disasters over the past two decades. Most people have been affected, property and public utilities damaged, causing a general rise in the rate of economic losses. Disasters have become one of the main obstacles to achieving sustainable development in the country. For instance, the 1999 – 2001, drought was the worst in the last 100 years. The drought affected several parts of the country, including the highly productive and agriculturally rich regions of the country. At its peak in late 2000, 4.5 million people across most parts of the country had lost their livelihood and coping strategies. These people had to depend entirely on relief food. The government and other stakeholders spent approximately USD 340 million in responding to this drought. The huge expenditures prompted the government to strategize on how to establish an effective Disaster Management system. (6)

There are different levels and types of vulnerabilities evident in the country. These vulnerability factors have significantly doubled in the last two decades, making Kenyans and the systems more susceptible to disaster risks. Generally, communities within Kenya are predisposed to these types of disasters by a synergy of factors. Some of these factors include poverty, aridity, unplanned and informal settlements, and poor construction practices for residence and public buildings. The factors listed above interact with the natural hazards in different dimensions and settings to step up the vulnerability index of the country. More so, the impact of emerging concerns such as climatic change phenomena cannot be avoided. It is important to indicate that the effect of climatic change perhaps poses an extremely high disaster risk to the entire Kenyan society.

According to the Ministry of Planning and National Development, Kenya's population momentarily rose to 38.6 million towards the end of 2008. Consequently, there has been an increasing rate of growth of up to 43 million according to the latest census statistics. The Kenyan population, growing at a steady rate of approximately 2.4% and largely dominated by the youth (over 60% of the total population are the under 25) is a recipe for pure vulnerability considering the present socio economic and political conditions. Certain surveys have also revealed that approximately over 57% of the Kenyans still live below the poverty line. Other notable factors compromising the resilience of the nation include massive unemployment, the HIV and AIDS scourge and the economy, which largely relies on the rain-fed agriculture. (7)

Analysis of the basic demographics of the country reveals that the population structure disposes the country to high level of vulnerability to disasters. For several years, Kenya has somehow managed to survive some of the worst disasters without a proper system for disaster management and coordination. But this is due to the courtesy of the international groups and development partners. Particularly, this is depicted with reference to the 1999-2001 droughts in which around 4.5 million persons were affected. In such periods of drought, the Arid and Semi-Arid areas of the country are adversely affected, with pastoralist inhabitants losing around 60-70% of their livestock. A complex string of emergencies usually arise due to such drought conditions due to the inter-community fights for the diminishing green pasture and water resources for the livestock. The situation causes a synergy of complex vulnerabilities, usually evident amongst the nomadic communities occupying the northern part of Kenya, towards the horn of Africa. (8)

1.3. Country Profile

Kenya, a country located at the horn of Africa, and lie across the equator in the East-Central Africa. It is right on the coast of the Indian Ocean and borders Somalia to the east, Ethiopia to the north, Tanzania to the south, Uganda to the west and Sudan to the northwest.

The northern part of Kenya is mostly arid and semi-arid land (ASAL). However, its southwest corner lies on the fertile Lake Victoria Basin. A length of the eastern depression of the Great Rift Valley divides western highlands from those that rise from the lowland coastal strip. Kenya's landscape covers a total of 583 000 sq. km¹² and is grouped into geographical zones including; the Savannah Lands covering most of the arid and semi- arid areas, the Coastal Margin, the Rift Valley, the Highlands and the Lake Victoria Basin. The coast line is approximately 536 KM in length.

The rainy seasons are predominately experienced in the months of April-June and October, sometimes up to early December. The Kenyan coast remains hot and humid throughout the year. The coast is always tempered by strong onshore breezes. The lowlands are hot and dry and the highlands (including Nairobi) are more temperate and cool at night. (9, 10, 11)

Table 1: Demographic Characteristics and Other Key Indicators (9)

Demo/Indicator	Figure
Total Population	43,013,341
Age Structure	0-14 Years: 42.5%
	15-24 Years: 19.1%
	25-54 Years: 32.1%
	55-64 Years: 3.6%
	65 Years and over: 2.7%
Population Growth Rate	2.444%
Birth Rate	31.93 births/1,000 population
Death Rate	7.26 deaths/1,000 population
Infant Mortality Rate	43.61 deaths/1,000 live births
Life Expectancy at Birth	total population: 63.07 years
Total Fertility Rate	3.98 children born/woman
HIV/AIDS - adult prevalence rate	6.3%
HIV/AIDS - people living with HIV/AIDS	1.5 million
HIV/AIDS - deaths	80,000 (2009 est.)
Maternal mortality rate	360 deaths/100,000 live births
Hospital bed density	1.4 beds/1,000 population
Physicians density	0.14 physicians/1,000 population (2002)

2.0. The Kenya Natural Hazard Profile

Kenya experiences a number of natural hazards. As indicated before, some of the prevalent natural hazards in Kenya include those related to weather such as floods, droughts, landslides, lightening/thunderstorms, wild fires, and strong winds. Some other potential types of hazards eminent in Kenya may include HIV/AIDS and conflict. These hazards have increased in their numbers, frequency of occurrence and complexity in the past decades. Consequently, the level of their interaction and destruction has become more severe. There has been a general increases in mortality and morbidity rates due to these hazards. The loss of livelihoods, domesticated animals, destruction of infrastructure, and socio-economic degradation are among the several other effects that have been noted in varying magnitudes.

Indeed Kenya is a highly vulnerable and exposed region to several disaster crises which are being exacerbated by climate variability and change. These crises have derailed societal development and negatively influenced the achievement of the Millennium Development Goals (MDGs) and Kenya Vision 2030. Between 1993-2010 the international database on disasters showed that 73 disaster events (covering drought, epidemics, flood, landslide and a tsunami) occurred and affected a cumulative total of over 48 million people (averaging 2.9 million people annually). During this period, a total of 5,825 people (averaging 342 people annually) died (EM-DAT, 2012). (12)

The number of people affected by these disasters is gradually increasing. For instance, over the last decade, the impact of drought has increased from an average of 1.5 million to 4.5 million people affected annually (ISDR, 2010). The 2011 Post Disaster Needs Assessment (PDNA) conducted by the Government of Kenya with support of the UN and the World Bank, showed that drought episodes during 2008-2011 resulted in USD 2.1 billion worth of damages and losses to the economy of Kenya, with 85% occurring in the main livelihood sectors of livestock and agriculture. To deal with this great loss, the Government of Kenya re-allocated almost KSH11billion to save lives and livelihoods. Similarly, it is estimated that annual country wide flood losses exceed KSH 100 million with an equivalent amount spent on emergency response (World Bank 2004).

The Government of Kenya is, therefore, challenged to increase its capacity and expertise to attain the set objectives of the MDGs and Vision 2030. Recent initiatives include the creation of a thematic working group on Emergency and Disaster Response to mainstream DRR into vision 2030 and the Medium Term Plan (MTP) II. In September 2011, the Government of Kenya also drafted a ten-year strategy for ending recurrent drought emergencies in Kenya. The strategy paper was presented during an international conference, “The summit on the Horn of Africa Crisis” with the theme “Ending Drought Emergencies: A commitment to sustainable solutions”.

However, much of the efforts to reduce disaster risk in Kenya are fragmented among different stakeholders within the Government, UN, NGOs and academia. This leaves much opportunity for developing multi-sectoral/ multi-disciplinary approaches. It is in this regard that the national symposium aims to provide a venue for promoting integrative partnerships toward convergence of ideas for holistic solutions to reduce the impacts of disaster on the lives and livelihoods of the people of Kenya. This report therefore takes a look at a few disasters and their impacts over the last 50 years.

2.1. Drought

Approximately eighty percent of Kenya's territory is arid and semi-arid lands; or ASALs. About 20 percent of Kenya's population lives in these ASALs. In the past three and a half decades at least nine severe droughts have taken place in Kenya. This has adversely affected an increasing number of people. For example, the 1975 drought affected a total of 16,000 people, while the droughts of 1999/2001 and 2004/2006 affected 4.4 and 3.5 million people respectively throughout Kenya, including those living outside the pastoralist areas. (13)

Although droughts have always occurred at five or six year intervals, in recent decades they have happened more frequently and are more intensive. (14) Approximately 70 % of Kenya's land mass is affected by drought. This covers most parts of Rift Valley, North Eastern, Eastern provinces and coast province. These zones are categorized under as arid and semi-arid lands. Kenya spans over an approximate area of 582, 644 sq kilometers of which less than 3% of the total is forest. Strikingly, around 75% of Kenya's total population depends on agriculture as a major source of their livelihood. (15)

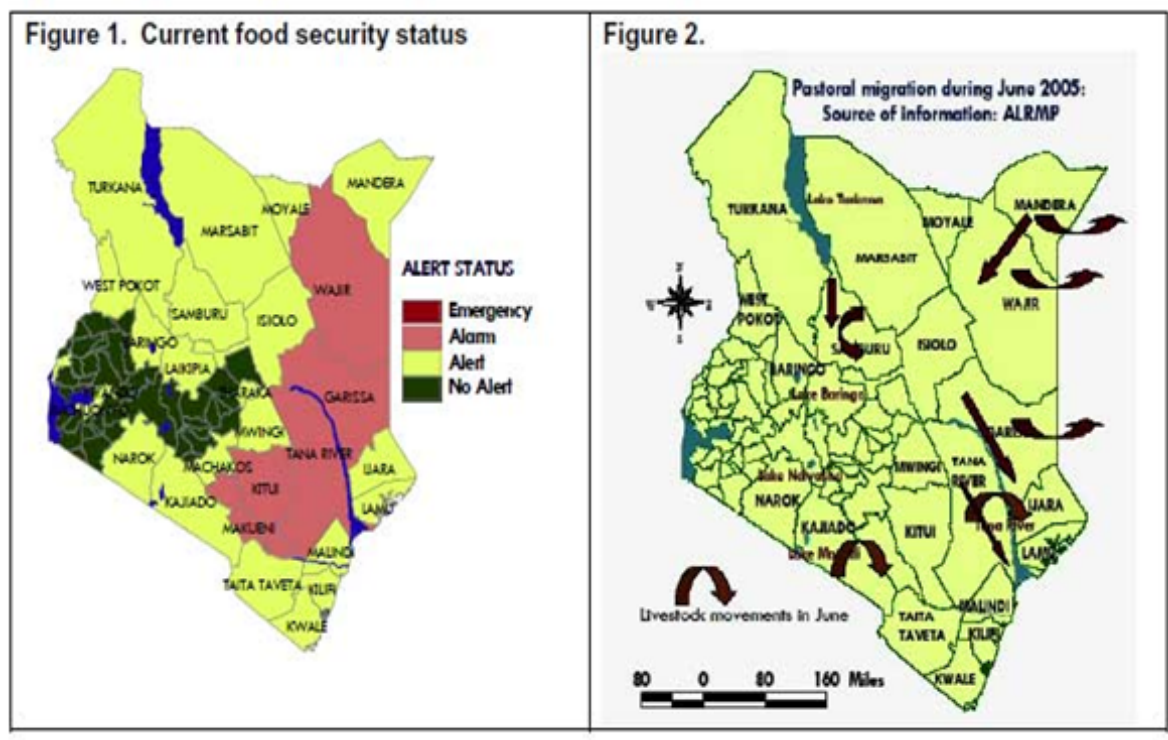


Figure 1: Areas Prone to Drought in Kenya

Agriculture in Kenya mainly relies on availability of rainfall. Due to the vast areas prone to drought, Kenya's vulnerability to food insecurity is highest among the pastoralists and small-scale agriculturalists in the arid and semi-arid lands (ASALs) of the country. Extreme weather and climate changes influence the entire economy that is widely reliant on agricultural products such as the cash crops, food crops and animals. In most cases, drought events completely cut off the subsistence agricultural practices mostly undertaken in the rural areas. (16) Such events also cut off the supply chain of

agricultural products to the already congested urban centers. The linkages lead to a multi-connected status of vulnerabilities within all aspects of life.

Table 2: Chronology of Drought Incidences in Kenya Since 1893

Date	Region	Remarks
1883	Coast Province	Worst famine in 30 Years
1889-1890	Coast Province	One year of drought and famine
1894-1895	Coast Province	Information not available
1896-1900	Countrywide	Failure of three consecutive rainy seasons, human deaths
1907-1911	L. Victoria, Machakos, Kitui and Coastal Regions	Minor food shortages
1913-1919	Eastern and Coastal regions	Impacts exacerbated by warfare
1921	Rift Valley, Central and Coast Provinces	Local food shortages, Crop and Livestock losses (50% in Baringo District)
1925	Northern Rift Valley and Central Province	Heavy loss of livestock, Lorain swamp dried up and deaths occurred
1938-1939	Countrywide	Food shortages, about 200 deaths reported
1942-1944 1947-1950	Central, Coast, Eastern, Nyanza, Western and Rift Valley Provinces	Very severe in Coast
1952-1955	Eastern Province, South/North of Rift Valley Province	Droughts followed by floods, cattle mortality at about 70-80% in Maasai land
1960-1961	Widespread	Rains about 50% long-term mean, Nairobi water shortage, Wildlife death in the Nairobi National Park.
1972	Most of Kenya	Human and Livestock death in the Northern districts, Maasai cattle losses about 80%
1973-1974	Eastern, Central, Northern regions	Crop production paralyzed
1974-1976	Central, Eastern, Western, coast	Famine in eastern province Water shortages, migration of people and livestock. Large food deficits
1980	Eastern province	
1981-1983	Countrywide	Severe food shortages in Eastern province, less in central province
1984	Central, Rift Valley, Eastern and North Eastern	Moderately Severe in Eastern Province, Relief food imported.
1987	Eastern and Central	4.7 million people dependent on relief power and water rationing
1992-1994	Northern, Central, Eastern Provinces	
1999-2000	Countrywide except west and coastal belt	

(Gathara (1995), as modified by UNEP and GOK (Dec 2000), Devastating Drought in Kenya: Environmental Impacts and Responses, p 18, Nairobi, Kenya.)

The arid and semi-arid lands are occupied by 30 % of the country's total human population. However, these ASAL areas are characterized by uncertainty of rainfall, high evapo-transpiration rates, low organic matter levels and poor infrastructure.

The incidents of droughts in Kenya occur through a cyclic pattern. Generally, the main droughts are projected to occur after each decade while the minor droughts are experienced after a time span of three or four years. In the past, Kenya has experienced remarkable food shortage because of the droughts that have occurred out of lack of adequate rainfall. These were mainly noted in 1928,1933-34,1937, 1939,1942-44, 1947, 1951, 1952-55, 1957-58, 1984-85, and 1999-2000. The 1983-84 drought and the 1999-2000 ones are the most severe. They resulted in the loss of human life and livestock and general high levels of unprecedented economic losses. After the El Nino induced rains of 1997 and 1998, the several parts of the country have suffered prolonged drought periods in resulting into famine and the complex public health challenges. Kenya only has two main rainy seasons, (April-May, October-November). The extreme climate and weather conditions are associated with anomalies in the general circulations of the seasonal northward and southward movement of the Inter-tropical Convergence Zone (ITCZ). (17, 18)

Areas mostly affected by drought in Kenya include the Eastern, Coast, North Eastern and parts of Rift Valley, Provinces. The specific districts include Baringo, Laikipia, Turkana, Samburu, Narok and Kajiado in Rift Valley, Marsabit and Isiolo in Eastern province, Mandera, Garissa and Wajir in North Eastern and Tana River, Kilifi, Kwale and Taitaveta in Coast Province. Drought causes pressure on the limited pastures and water resources relied on by the communities inhabiting the specific districts. This natural event at times leads to human clashes along tribes in the scramble for grazing or watering points particularly among the pastoralist communities. (19)

Some of the factors causing severity of drought in Kenya include: (1) Lack of adequate water storage capacity, (2) Increased deforestation from activities such as charcoal burning, clearing forests for agriculture, logging without replacing trees, and frequent forest fires (3) Poor management of catchments areas, (4) Use of inappropriate soil conservation practices, (5) Poor agricultural practices increasing rate of soil erosion, which in turn silts up dams and pans usually, used as dry weather water reservoirs, (6) Lack of policy for managing water and drought, and (7) Inequitable distribution of water resources. (20)

2.1.1. Notable Impacts of Drought in Kenya

- Loss of livelihoods
- Paralyzed economic activities
- Poor health leading to vulnerability to diseases
- Increased mortality and morbidity rates, generally, and especially for the Under U5MR, the aged and other vulnerable groups
- General poverty
- Overall dependence on relief supplies from the Government of Kenya and World Food Programme among other donors.

- Increased vulnerability to complex emergencies- conflicts due to diminished water, pasture and food resources, political conflicts, and invasion by other communities from the neighborhood
- Migration and displacement of families into areas with food supplies or relief foods.
- Malnutrition causing ill-health
- Price hikes for commodities like cereals and food products while prices of livestock go lower because they are emaciated and unhealthy.
- Lack of social amenities like water, food and sanitation services
- Livestock diseases like foot and mouth, lumpy skin disease and black quarter tend to increase during the drought seasons.
- Low yields or no yields from agricultural activities due to low moisture content in the soil.

2.1.2. Factors Increasing Vulnerability to Drought

2.1.2.1. Social Factors

Certain social issues influence the community's capacity to access information concerning natural hazards, disasters and other potential risks that might be eminent with time. For instance, cultural practices, taboos, indigenous beliefs and other social constructions play significant roles under this category. It is also vital to note that insecurity and other native mechanisms of coping influence the community's vulnerability to natural disasters. These elements, particularly with reference to insecurity, have been reportedly incurred in the Northeastern, Eastern and Rift Valley provinces of Kenya. Insecurity is commonly mentioned in the three provinces resulting from cattle rustling, ethnic clashes and conflicts as people fight over grazing land. These issues increase their vulnerability to natural hazards specifically drought.

Observably, most conflict cases tend to rise during drought and famine periods. People attack their neighbors to steal animals and other livestock. Moreover, there is competition to access pastureland especially at the border areas with Ethiopia, Sudan and Uganda. As the communities get increasingly threatened by their neighbors, they tend to move away to more secure zones which may not have pasture, food and water. Such migratory movements still renders them more vulnerable. Other social issues include literacy levels, perception of risk emanating from natural hazards, effects of traditions and beliefs etc. Indicatively, all these affect the manner in which these people respond to the drought hazard.

Generally, the level of knowledge and understanding of hazards has been low in drought prone areas as compared to other parts of the country. The harsh weather conditions compounded by traditions and beliefs form a major setback on educational achievement. Girls and women are more disadvantaged as they are expected to play the traditional role of being housewives and homemakers rather than pursue education. They also take care of the homesteads as the men go out in search of pasture, and water for animals. This increases their vulnerability. (21)

2.1.2.2. Economic Factors Increasing Vulnerability

Generally, the aftermath of disasters may push more people below the poverty line or impoverish further the existing poor people. These outcomes are usually evident due to injuries, displacements, property damage and loss of livelihoods. A majority of communities within the ASAL regions of Kenya are purely reliant on pastoralism. Some also depend on agriculture as a source of their livelihood. Notably, all these livelihood activities depend on rainfall for water and pasture. Increase in food prices, fluctuation in animal prices, depletion of the basic food reserves minus replacement and deterioration in health are some of the economic parameters that increase vulnerabilities within the affected communities.

Poor infrastructure including impassable roads, poor telecommunication lines and inaccessibility of some regions hampers the transportation of food to these regions either for commercial purposes or relief aid. In addition, lack of proper communication system also hampers action in terms of response to distress calls, poor publicity and inability to air the plight of the people. Animals are sensitive to drought conditions. They become more susceptible to Tsetse flies infestation and foot and mouth diseases. These category of animal diseases are very prevalent within drought conditions. The situation highly necessitates for the intervention of veterinary medicines. However, such services remain unaffordable and in mostly not accessible by these pastoralists. (22)

2.1.2.3. Physical Factors

Most of the physical assets of those living in drought prone areas in Kenya are generally exposed to more physical hazards. Therefore, they are more vulnerable in this sense. In the arid/semiarid lands the most important physical assets are crops and livestock. These suffer the impact of severe climate conditions causing them to die. Severe malnutrition occurs in animals. Apart from this, they also have a higher probability contracting infectious diseases such as foot and mouth disease, which spreads very fast in case of overcrowded conditions. As mentioned earlier, an extensive part of Kenya's land (over 70%) is drought prone. It is evident that it is impossible for the affected communities to migrate beyond the affected regions. This situation causes most of them to succumb to the impact of drought.

2.1.2.4. Environmental Factors

Severe environmental degradation has had a great impact in increasing the vulnerability to natural disasters in Kenya. Urbanization, increased development, extension of agricultural land into forests and logging of trees for charcoal are some of the leading activities causing environmental degradation in Kenya. Wild fires as a result are a common occurrence in the arid ASALS due to the high temperatures experienced during the drought season.

2.1.2.5. Poor Social Protection Culture/Inadequacy/Illiteracy

It is evident that a significant percentage of Kenyans do not have any insurance. The lack of insurance and social protection culture in Kenya is owed to various social, political and economic factors. It may also be argued that a significant proportion of the population remain largely marginalized. As a result, they have limited or no access to proper education. They remain illiterate of existing opportunities and advantages of social protection. The government has also failed to consistently urge and advocate for social protection within marginalized groups. Cultural beliefs and individual factors such as mistrust have also played a crucial role in this process.

Occasionally when disaster strikes, there is usual high economic losses associated with property damage, livestock deaths and reduced crop yield capacities. These situations are exacerbated by the fact that most of the affected persons usually do not have the necessary insurance for their property or even lives. There are few legal insurance companies within the country. However, even the few that are available are mostly located within major cities in Kenya. They mostly target the middle class employees and workers thus alienating the common rural population. Resources limitations have compromised the capacity of the Government of Kenya to offer incentives and proper packages for social protection, even to the highly vulnerable communities.

2.1.2.6. Policy Failures

There are limited or none-existent policies regarding the management of such disaster in the country. The policies that exist are not comprehensively implemented due to resources inadequacies. Persistent change in the governance systems and merging of ministries make it hard for comprehensive development and adoption of policies. There is also a great concern with regards to corruption, diversion and embezzlement of the little available funds by government staff and politicians. This has negative impacts on the allocated resources and drought resilience programs.

Other important factors that increase vulnerability to drought hazard may include lack of political goodwill, accountability, lack of resources, technological capacity for advanced farming systems, chronic marginalization of certain regions and communities, corruption, and poor governance. Notably, an analysis of these impeding factors narrow down to leadership challenges in the wide context of the developing world. Proper leadership would enhance equitable resource allocation, distribution and transparent justification by all personalities involved within specific projects. (23)

2.2. Floods

Many factors and conditions contribute to the occurrence of floods in Kenya. The country has in the past experienced flash floods, river floods and coastal floods. In some cases, the human interference with watersheds, drainage basins, riparian zones and flood plains may cause floods. Floods have occurred in the river basins even with normal rains because of excess surface water runoff occasioned by deforestation, poor cultivation methods and land degradation upstream.

Kenya is affected by floods following torrential rainfall. These force thousands of people living in the lowlands to move to higher grounds. The people affected are mostly in Western, Nyanza provinces and Tana River district. However slum dwellers in towns like Nairobi who have erected informal structures near rivers are not spared.

The record of the flood disasters in Kenya identifies the worst floods recorded in 1961-62 and 1997-98, the latter ones being the most intense, most widespread and the most severe. During 1997-98, the flooding was associated with the El Nino phenomenon. El Niño is a disruption of the ocean-atmosphere system in the tropical Pacific having important consequences for weather around the globe. It may cause increased rainfall in some areas and drought in others thus changing the normal weather pattern. (23)

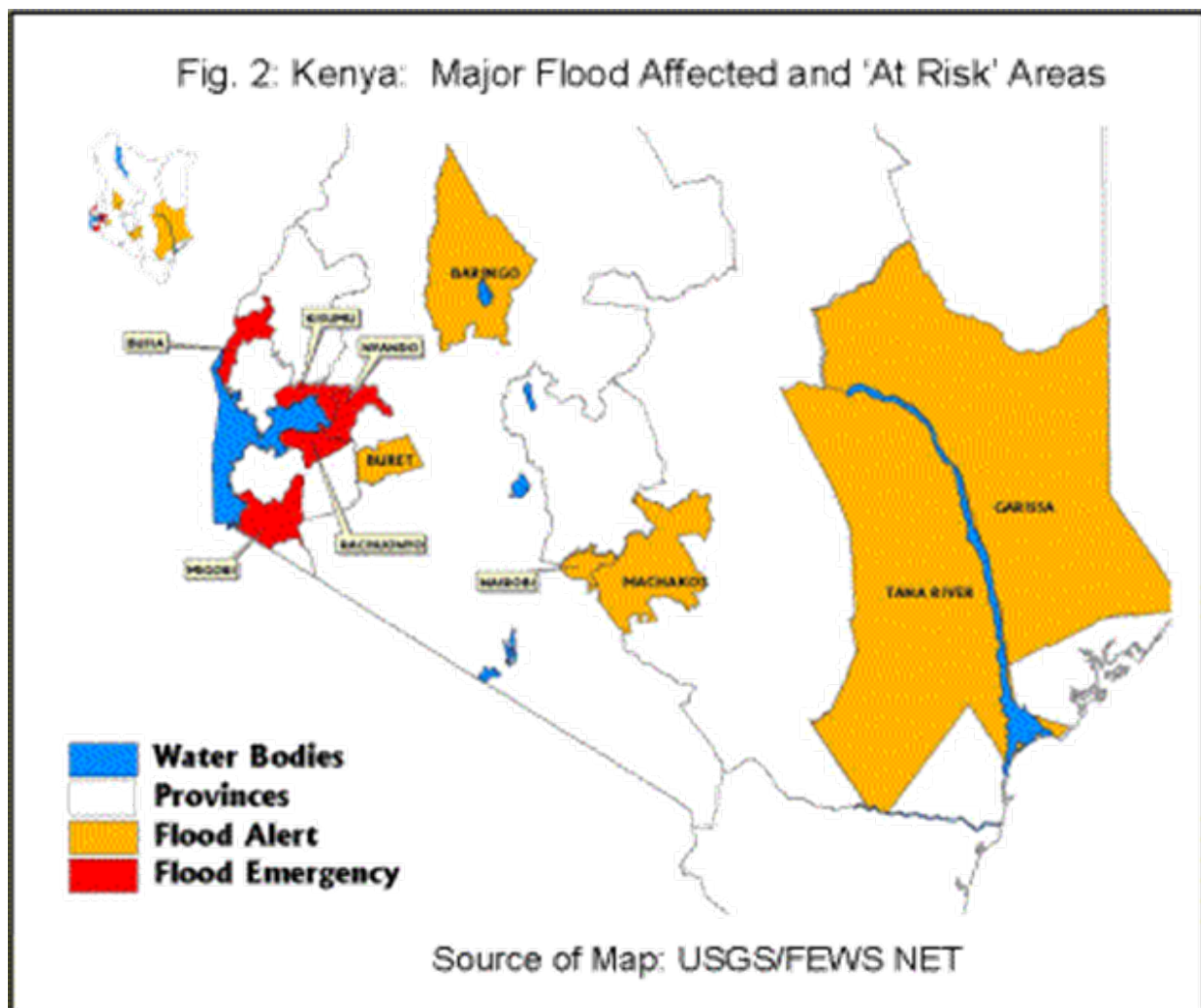


Figure 2: Areas Prone to Floods in Kenya

Several regions in Kenya experience river floods. Most of these floods are slow onset. Additionally, they are very predictable. Certain geographical locations experience more severe floods than others. Some of such examples include the Kano plains in Nyando

District and Nyatike in Migori District, Nyanza Province. Budalangi in Western Province also fall under this category.

The floods experienced in the highlighted regions result from the overflow of river Nzoia and the lower parts of Tana River. Some regions experiencing constant annual flooding include Nyanza Province (Kano plains, Nyakach area, Rachuonyo and Migori), Western Province (Budalangi), Coast Province (Kilifi, Kwale and the Tana River Basin), North Eastern province (Garissa, Wajir, and Ijara) and Urban Centres such as Nairobi, Nakuru, Mombasa, Kisumu. The lower parts of the Tana River District also experience floods annually. (24, 25)

Table 3: The Recent History of Floods in Kenya

Year	Area affected	Number of people affected
2003	Nyanza, Busia, Tana River	170,000
2002	Nyanza, Busia, Tana River	150,000
1997/98	Widespread 1982 Nyanza	1.5 million
1985	Nyanza, Western Province, Tana River	10,000
1982	Nyanza 4,000	4,000

2.2.1. Vulnerability Factors

- Settlement patterns- There are unrestricted settlement within riparian zones and in the floodplains.
- Poor agricultural practices such as cultivation along the slopes near the potential floodplains. This leads to severe erosion and destruction of the trees within the major catchment zones.
- Most local communities are not aware of the potential hazards of floods.
- Substandard building and construction materials. There are several non-resistant structures and building foundations. These have no capacity to withstand the strength of running waters.
- High risk infrastructure may also be attributed to increased vulnerability

2.2.2. Impacts of Floods in Kenya

- Structural damage to buildings, roads, rails, communication lines and several other property and public utilities such as hospitals, schools...

- Destruction of land and natural resources areas in general causing severe erosion, development of storm water gullies that make agricultural activities such as cultivation impossible.
- Increased rate and mortality and morbidity rates amongst the population, including their animals. These either occur through direct or indirect causes such as drowning and injuries from displaced boulders, falling buildings, trees and others.
- Potential disease outbreaks. This is mostly common with water related and other hygiene and sanitation diseases such as malaria, cholera, dysentery etc.
- Contamination of wells and ground water. This is very dangerous since wells and ground waters are the main sources of potable water for most Kenyan rural communities.
- Loss of harvests and crops in farms, loss of food stocks, supplies and produce from farms.
- Generally, floods have negative impacts on people, assets, and livelihoods. They result into several losses in Kenya since they have become perennial and seem to weaken the communities' ability to cope each time they hit. This has been evident especially in parts of Western Province, Nyanza Province and Tana River area. Among the impacts are: - Loss of livelihoods including destruction of crops, death of farm animals, loss of fishing equipment, loss of other working equipment. Destruction of settlements and houses, Destruction of infrastructure mainly roads, telecommunication lines, power lines, Erosion of productive layers of the soil rendering the soil less productive and Loss of food reserves

2.3. Landslides

This natural phenomenon refers to the downward movement of soil and rocks resulting from naturally occurring vibrations, changes in water content, removal of lateral support, loading with weight and weathering or human manipulation of water courses and the composition of the slope. In Kenya landslides and mudslides occur mostly during the rainy season. They are accelerated by flooding. Some parts of the country affected by landslides include western, Nyanza and north Rift Valley Provinces.

The highly vulnerable regions in the last few years are: - Murang'a District in Central Province, Kirinyaga, Nyeri, parts of Meru. These are areas around the Mount Kenya region. Other vulnerable areas include Kisii highlands and Mombasa Island. These are areas with annual rainfall of over 1200 mm and steep slopes. Some specialists observe that mudslides have become more common in Kenya because so many forests have been cleared to make way for farmland. People have cut trees to cultivate, and the soil gets loose. (26)

2.3.1. Vulnerability Factors to Landslides

2.3.1.1. Anthropogenic Activities and Topographical Factors

This stands as the most important factor. The challenge is experienced in most parts of Mount Kenya region; people have expanded their agricultural land to create room for their farm crops. This deforestation means that trees can no longer stop the earth from sliding down hillsides. When this happens many people are buried with the sliding mud. In Murang'a district there are reports of whole families being buried in the long rains of April and May in 2002 and 2003.

In addition to the influence of topography, landslides are aggravated by human activities, such as deforestation, cultivation and construction, which destabilize the already fragile slopes. Other vulnerability factors to landslides include: (1) Population pressure and settlements built on steep slopes of the Aberdares and Mt. Kenya, softer soils and cliff tops which then succumb to gravity when the soil becomes too wet to hold together, (2) Settlements built at the base of steep slopes, on mouths of streams from mountain valleys, (3) Exploitation of the environment for economic reasons, (4) Construction of roads, communication lines in mountain areas, (5) Environmental degradation, (6) Buildings with weak foundations (7) Buried pipelines and brittle pipes, (8) Lack of enforcement of the physical planning act allowing people to build in high-risk areas of the province, (9) Ignorance resulting from lack of understanding of the hazard itself.

2.3.2. Impacts of Landslides in Kenya

Landslides have both social and economic impacts. Some of these include loss of life, agricultural land and crops as well as destruction of infrastructure. Landslides result in destruction of life and property. They may bury or sink buildings, rubble and boulders moved to block roads, railways, and lines of communication or waterways. Landslides also render agricultural land unproductive.

2.4. Epidemics in Kenya

Epidemic events in Kenya recorded in the CRED EM-DAT as from May/1964 to Mar/2013 include- Bacterial Infectious Diseases, Parasitic Infectious Diseases, Bacterial Infectious Diseases(Cholera), Viral Infectious Diseases(Rift Valley fever), --(Cholera), --, Viral Infectious Diseases(Visceral leishmaniasis (Kala-Azar), Bacterial Infectious Diseases(Typhoid fever), -- (Aflatoxicosis), Bacterial Infectious Diseases (Meningococcal disease), Viral Infectious Diseases, Parasitic Infectious Diseases (Dysentery), Viral Infectious Diseases (Measles). Most of these epidemics are experienced within regions curbed with a series of complex emergencies involving conflicts, chronic marginalization, drought and poor life coping skills among several other factors. (27)

Kenya is a host to the biggest refugee camp in the world, Daadab, whose major occupants are people are refugees from the war-torn Somalis. Apart from the Daadab refugee camp that is located in the horn of Africa, Kakuma is another refugee camp located in the bed of the Rift Valley, hosting majorly refugees from South Sudan. The health implication of these camps with regards to epidemic outbreak and transmission into the general Kenyan population is yet to be verified. However, the situation increases the vulnerability of various aspects of the country to disasters.

2.4.1. The Kenya HIV/AIDS Epidemic

HIV represents one of the greatest public health challenges confronting the Kenyan people. It was and still remains one of the leading cause's death and tremendous morbidities within the populations. The economic and social impacts on the individuals, households and national economies are significant.

A review of the most recent data underscores the epidemic's continuing threat but also demonstrates the extraordinary impact of the programmes and policies put in place to address HIV. Since Kenya recorded its first case of HIV in 1984, the AIDS epidemic has evolved to become one of the central impediments to national health, wellbeing and development.

AIDS has deepened poverty; slowed economic growth; reduced life expectancy; worsened other infectious diseases; and visited particular ills on affected households, with the harshest effects experienced by women and children. An estimated 49,126 people died of AIDS-related causes in 2011, slightly more than one-third the annual numbers who died in 2002–2004. Various social factors – such as gender inequality, sexual violence, and anti-HIV stigma – increase HIV risk and vulnerability. (28)

2.4.1.1. Impacts of the HIV/AIDS Epidemic

The epidemic has claimed the lives of at least 1.7 million people in Kenya since it was discovered. In 2011, an estimated 49,126 people in Kenya died of AIDS-related causes. The AIDS death toll in 2010 represents a nearly two-thirds drop from the peak in AIDS deaths in 2002–2004, when an estimated 130, 000 people died each year. Peak mortality followed peak HIV incidence in Kenya by roughly a decade, which one would expect given the roughly 10-year life expectancy of a newly infected individual in the pre-ART era. The epidemic continues to have far-reaching social, economic, health and population effects.

In addition to the harms directly inflicted on HIV-infected individuals and the households in which they live, AIDS has had indirect effects that are nevertheless real and substantial on communities and the whole of society. HIV infection results in severe economic consequences for affected households. One out of nine households in Kenya has been affected by AIDS, with the head of household having HIV in more than three out of four AIDS- affected households (NASCOP, 2009). The epidemic has resulted in a sharp deterioration of basic health indicators. According to the Kenya Demographic and Health (29)

Surveys, between 1998 and 2003, the adult mortality rate (ages 15–49) rose by 40% for women and by 30% among men. With a large number of newborns newly infected each year, the epidemic has also increased mortality among children under five. In 2011, an estimated 1.1 million children in Kenya had lost one or both parents to AIDS. Kenyan children with one or more HIV-infected parents are significantly less likely than other children to be in school, more likely to be underweight, and less likely to receive basic medical care.

2.4.2. Outbreak of Aflatoxin Poisoning

Aflatoxin cases have been reported from Central and Eastern Provinces of Kenya in 1981 and 2004. The 2004 outbreak resulted from widespread aflatoxin contamination of locally grown maize, which occurred during storage of the maize under damp conditions. Aflatoxin poisoning may continue to be a public health problem until culturally appropriate storage methods for dry maize are implemented by the local population. As of July 20, a total of 317 cases had been reported, with 125 deaths (CFR = 39%).

Aflatoxins are a group of metabolic products formed by two species of fungus, *Aspergillus flavus* and *A. parasiticus*, in several agricultural commodities, including corn or maize. Exposure to aflatoxins occurs primarily through ingestion of contaminated foods and can cause hepatic and gastrointestinal injury and have immunosuppressive, teratogenic, and oncogenic effects. Severe, acute liver injury with high morbidity and mortality has been associated with high-dose exposures to aflatoxins.

The remoteness of villages in the affected districts in Kenya and the large geographic area involved rendered case finding limited to medical facilities. In addition, because some persons might not have been able to reach health-care facilities for diagnosis and treatment, the true magnitude of this outbreak is likely to be considerably greater than reported. An outbreak of acute aflatoxicosis (20 cases; CFR = 60%) was reported previously in Makueni district, Eastern Province, Kenya, in 1981. (30)

3.1. Technological Disasters and Other Man Made Events in Kenya

Technological and other manmade disasters have caused significant losses in the recent past. However, due to limited documentation, the socio economic and health impacts of such disasters have not been analyzed. Traffic accidents, structural failures, industrial incidents and terrorist attacks continue to occur spontaneously in the country. Other complex disasters characterized with civil unrests, political massacre and massive human rights violation from militant groups have also been noted.

The events have negative impacts on victims and the affected populations. Some of these may include emotional and mental complications, loss of life, disability, property damage and economic losses among others. The government has initiated various interventions to help in curbing the increasing rates of occurrence of technological disasters in Kenya. Most of these interventions are conducted by various assigned government ministries and agencies. For instance, the Ministry of Roads and Transport works collaboratively with other stakeholders including the Traffic Police and the Kenya Red Cross to monitor road safety.

Table 4: Summary of Major Disasters in Kenya in the Last Two Decades Years (31)

Event	Trend	No of Events	of Killed	Total Affected	Damage (000 \$D)
Drought	Drought	12	196	43450000	1500
	ave. per event		16.3	3620833.3	125
Earthquake (seismic activity)	Earthquake (ground shaking)	1		-	-
	ave. per event			-	-
	Tsunami	1	1	-	100000
	ave. per event		1	-	100000
Epidemic	Unspecified	4	1273	22538	-
	ave. per event		318.3	5634.5	-
	Bacterial Infectious Diseases	17	1402	48528	-
	ave. per event		82.5	2854.6	-
	Parasitic Infectious Diseases	5	1595	6807533	-
	ave. per event		319	1361506.6	-
	Viral Infectious Diseases	5	514	3396	-
	ave. per event		102.8	679.2	-
	Unspecified	4	1273	22538	-
	ave. per event		32.6	137314.3	3121.4
Flood	Flash flood	6	100	48000	500
	ave. per event		16.7	8000	83.3
	General flood	28	795	1565953	38
	ave. per event		28.4	55926.9	1.4
Mass movement wet	Landslide	4	56	26	-
	ave. per event		14	6.5	-
Storm	Local storm	1	50	-	-
	ave. per event		50	-	-
Flood	Unspecified	7	228	961200	21850
	ave. per event		32.6	137314.3	3121.4
	Flash flood	6	100	48000	500
	ave. per event		16.7	8000	83.3
	General flood	28	795	1565953	38
	ave. per event		28.4	55926.9	1.4
Mass movement wet	Landslide	4	56	26	-
	ave. per event		14	6.5	-
Storm	Local storm	1	50	-	-
	ave. per event		50	-	-

Flood	Unspecified	7	228	961200	21850
	ave. per event		32.6	137314.3	3121.4
	Flash flood	6	100	48000	500
	ave. per event		16.7	8000	83.3
	General flood	28	795	1565953	38
	ave. per event		28.4	55926.9	1.4
Mass movement wet	Landslide	4	56	26	-
	ave. per event		14	6.5	-
Storm	Local storm	1	50	-	-
	ave. per event		50	-	-

Created on: Nov-5-2013. - Data version: v12.07
Source: "EM-DAT: The OFDA/CRED International Disaster Database
www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium"

Table 5: Natural Disasters in Kenya from 1980 – 2010

Number of Events	79
No of people killed	6,066
Average killed per year	196
No of people affected	48,004,436
Average affected per year	1,548,530
Economic Damage (US\$ X 1,000)	112,338
Economic Damage per year (US\$ X 1,000)	3,624

Source of data: "EM-DAT: The OFDA/CRED International Disaster Database"

Table 6: Some of the Technological/Manmade Disasters in Kenya in the Recent Past

Date	Root Cause	Impact	Remarks
31 January 2009	Oil spill from an overturned fuel truck	Mortality cases- 113, Critical injuries- over 200 Considerable environmental damage	Likely causes; static electricity, accidentally discharged cigarette
June 2009	Oil tanker fire	Mortality cases-4, Critical injuries- 50	Victims were siphoning fuel from the overturned fuel tanker
28 January 2009	Fire inside Nakumatt Nairobi town supermarket	Mortality cases-30, Several injuries and missing persons	Likely from power systems default in the building
12 September 2011	Kenya Pipeline Company Fire outbreak in one of the Eastlands estates of Nairobi (Sinai Case)	Mortality cases- over 100, Several injuries, Massive property damage	The state owned Kenya Pipeline Company had one of its fuel tank with a massive leak
November 2012	Baragoi Massacre- Ethnic clashes between the Samburu and Turkana tribes	Mortality cases-46 including the police force, several injuries	Characterized with situations in complex emergencies
1980	Garissa massacre of ethnic Somali residents by the Kenyan government in the Garissa District, NEP.	Mortality cases- over 3000,	Complex emergency situation propelled by political interests
3 March 1959	Hola massacre conducted by the British Colonial Imperialist soldiers on detained Mau Mau freedom fighters	Mortality cases- 11, over 23 hospitalized injuries	Led to the closure of all colonial detention camps in Kenya
25 October 1969	Kisumu town killing of native ethnic Luo	Several deaths and injuries	Political differences
12 May 1929	Mass murder at a farm near Kitale town	Mortality cases- 12, 1 injury	Conducted by one person
21 April 2009	Maathira Massacre	Mortality cases-29, 3 injuries	Conducted in Central Province by Militant group, 'Mungiki'
2012-2013	Tana Delta District conflicts between the Orma and Pokomo tribes	Mortality cases- 118, over 13500 IDPs, over 30,000 people affected, 50% of these were the most commonly vulnerable groups.	Complex emergency situation
12 July 2005	Kenya-Turbi City massacre	Mortality cases- over 60, several injuries	Feuding clans in the Marsabit District of Northern Kenya. Complex emergency
10 February 1984	Wagalla massacre of ethnic Somalis by Kenya security forces in Wajir District, NEP	Mortality cases- over 5000 male deaths	Conducted by Kenyan security forces, political, complex emergency
2007-2008	Kenya Post Election Violence	Mortality cases- 800-1500 persons killed, several injuries and	Political difference, complex emergency situations

		massive damage, economic losses, 180,000- 250,000 IDPs	property huge losses,
1 March 1975 Nairobi Bombing Incident	Bombing in a Nairobi bus	Killed 30 people	Terrorist attack
New Year Eve, 1980	Norfolk Hotel Bombing	Killed 20, injured 80 people	Terrorist attack
August 7, 1998 US Embassy Bombing	US Embassy Bombing	Killed 200 people, injured thousands	Terrorist attack
November 25, 2002 Kikambala Bombing	An attempt missile attack on an Israeli plane, consequent blast on Kikambala Hotel when the Israeli tourists were checking in	3 killed, 80 injured.	Terrorist attack
2011/2012	According to the US Embassy, in the past 2011/2012, there have been 17 grenade /explosive device attacks	Killed 48 people and around 200 injured, property damage	Affected locations include North Eastern Province (Dadaab, Wajir, and Garissa), Nairobi and Mombasa.
September 21, 2013 Westgate Shopping Mall Attacks	Westgate Shopping Mall Attacks- held on hostage	Killed over 70 People and over 200 injured	Terrorist attack
Personal compilation from different sources*):			

4.1. Present Disaster Prevention and Response Strategies

4.1.1. Institutional Framework - National Disaster Management System

Disaster management in Kenya is coordinated by National Disaster Operations Center. It oversees the disasters prevention, planning, mitigation, and response. The center was established on 21st January 1998 following the adverse effects of El Nino rains. It is the focal point for coordinating emergencies and disasters in the country. Officers drawn from various ministries/departments of the government run it on a 24-hour basis.

The Ministries responsible for Agriculture and Rural Development, Natural Resources and Environment, Trade and Industry, Health, Roads and Public Works, Transport and Communication, Information, Finance and Planning, Education and Energy are involved in disaster management. Kenya has existing institutions dealing with disaster related activities. However, they do not work within a coordinated policy framework. A recent policy outlines an efficient, flexible and coordinated system for managing disasters, in order to minimize losses and resulting disruptions on the population, economy and environment. (6)

Most of the disaster response initiatives in Kenya have tended to be *ad hoc*, uncoordinated and short-term measures, mainly in the form of emergency relief services to the worst affected areas. These responses have not been sustainable as they have dealt with outward symptoms and paid little attention to the underlying causes of the problem. For example provision of temporary shelter to displaced families and the procurement and distribution of relief supplies to the affected populations, establishment of Famine Relief Committees, and appeals to donors for humanitarian assistance. However, disaster and environmental management ought to integrate disaster preparedness measures and recovery operations into ongoing development programs for sustainability. (19)

The recent passed constitution forms the main spring board for a coordinated system of disaster management. It provides a critical opportunity for humanitarian and development partners to participate in this process and help shape strategic planning. In addition, the formation of the county structures in line with Kenya's new constitution is giving impetus to coordinated engagement at the sub-national level. Partners are also making sustained efforts to align with other national policies and initiatives such as the Ending Drought Emergencies campaign, the newly passed IDP bill and policy, and the draft disaster risk management policy.

The 2011-2013 Kenya Emergency Humanitarian Response Plan and multi-year strategy has also provided the opportunity and mechanism for stakeholders to not only plan responses to immediate acute needs, but also integrate resilience in humanitarian programming. This has helped build national and local capacity for emergency preparedness and response. 2013 marks the end of the multi-year strategy and the transition to longer-term programming through the engagement of development frameworks. (32)

The 2013 Emergency Humanitarian Response Plan comprises 116 projects from more than 50 organizations. It requests US\$743 million for humanitarian action. In the pursuit of reducing vulnerabilities to risks, the Government has formulated this National Policy on Disaster Management to institutionalize mechanisms for addressing disasters. Recent disaster events, the successive Reports of the Inter-governmental Panel Climate Change (IPCC), the recent Climate Change Conference, and a recent comprehensive environmental reconnaissance survey over the whole country have all stressed the central role of Climate Change in any sustainable planned and integrated National Strategy for Disaster Management.

The policy emphasizes preparedness on the part of the Government, communities and other stakeholders in Disaster Risk Reduction activities. In this regard, the policy aims at the establishment and strengthening of Disaster Management institutions, partnerships, networking and main streaming Disaster Risk Reduction in the development process so as to strengthen the resilience of vulnerable groups to cope with potential disasters.

Ministry of State for Special Programmes in the Office of President coordinates Disaster Risk Reduction initiatives within a unified policy framework in a proactive manner at all levels. Disaster Risk Management encompasses a full continuum from preparedness, relief and rehabilitation, mitigation and prevention. The aim is to increase and sustain resilience of vulnerable communities to hazards through diversification of their livelihoods and coping mechanisms. This entails a shift from the short term relief

responses to development. The Policy will go a long way in preserving life and minimizing suffering by providing sufficient and timely early warning information on potential hazards that may result to disasters. It will also aim at alleviating suffering by providing timely and appropriate response mechanisms for disaster victims.

There are other existing strategies aimed at coping up with specialized types of disasters in Kenya. For instance, Kenya's response to HIV is guided by a strategic plan that aims to harmonize and align the HIV-related activities of diverse partners and stakeholders. Coordinated by the National AIDS Control Council, the HIV response builds on the robust engagement of civil society and people living with HIV. The National AIDS and STI Control Programme within the Ministries of Health administer the bulk of HIV-related services in Kenya.

The country has developed a series of performance indicators to drive progress and promote accountability in the response. Knowledge of HIV status is the cornerstone of Kenya's response to the epidemic. In 2010, more than 5.7 million people were tested for HIV through a combination of channels, including testing centers, provider-initiated counselling and testing in health settings, and time-limited campaigns.

4.1.2. The National (Disaster) Operations Center

The government of Kenya formulated a National Policy on Disaster Management and disaster risk reduction. This policy aims at addressing the increasing incidences and emergence of disasters. Currently, the Ministry of Special Programmes in the Office of the President is charged with the management of disasters in Kenya. The ministry has various mandate, some of which include; Special Programme policies, Arid and Semi-Arid Lands Resource Management Projects (ALRMP), Coordination of Disaster Risk Reduction Programmes, Coordination of campaign against HIV/AIDS and Disaster and emergency response coordination.

The entrance of the present new government and the devolved system of governance is a great challenge. This is because new ministries have been established, some merged and responsibilities changed. This might cause a great stir in the management and coordination of disaster activities since additional county units have been created. However, there is a single national disaster operations center, managed as an agency at the national level.

The National Disaster Operations Centre, (NOC) was established on 21 January 1998 following the adverse effects of El Nino rains. Its main purpose is to coordinate disaster management in the country. It is manned by officers drawn from various Ministries/Departments of the Government. The center operates on a 24/7 basis.

Some of its activities include the coordination of all disaster activities, before, during and after occurrence and informing all stakeholders of the national disaster contingency plans. Apart from this, it is also mandated to make key decisions for the National Disaster Coordination Committee (NDCC), initiate projects and ensure that specific roles are transmitted and carried out by the Ministries and Departments to whom they are directed. They prepare all the inventories for national resources, organize for the clearance of relief activities from outside the country, prepare media programmes for

public information and conduct an annual evaluation of projects geared towards disaster management, mitigation and control. (33, 34)

It is a requirement for the National Disaster Operations Centre to issue daily situation reports to all allied stakeholders and participate in active decision making to prioritize relief action during emergencies within different regions of the country.

The directorate of National Disaster Operations Center, (NOC), has played a significant role in managing natural disasters in the country. For example, it has intervened in drought situations by initiating disaster management through established channels. It has also participated in formulation of strategies for management of drought disasters. It has employed a strategy based on humanitarian principles and principles of Civil – Military Coordination (CMCoord) within the drought stricken Northern regions part of Kenya. It managed to deploy three On Site Disaster Coordination Teams to Wajir, Mandera, Marsabit and Moyale districts for humanitarian activities, coordinated relief supplies through Road and Air movement and collaborated with NGOs and international communities.

4.1.3. The Kenya Meteorological Department

The Kenya Meteorological Department, (KMD) is a public service in the Ministry of Environment, Water and Mineral Resources. The KMD is responsible for the organization and operational management of meteorological services in Kenya. It also monitors, generates and issues advisories, alerts and warnings to the general public regarding imminent events associated with natural disasters.

The present governance system has created 47 counties in Kenya. According to the KMD public service structure, each County is led by a County Meteorological Officer or Meteorologist. The officer from KMD is a key personality in the County Disaster Management committee. This committee is comprised of technical persons and representatives from different government ministries, the provincial administration, other development partners within the County, Red Cross officials, representatives of the community based organizations, and politicians among several others.

The police force also forms a critical component of this vital committee. KMD is in the process of coming up with an integrated solution of Alerts production and dissemination. The Regional specialized Meteorological Center (RSMC) helps the KMD to monitor and issue EWS communications related to meteorological, Tsunami & Seismic EWS, Flood, EWS in the Health Sector as well as EWS in Agriculture and Food Security. (36)

4.1.4. Why More Emphasis on FM Radio as an EWS Tool by KMD?

According to KMD, the level of media exposure as indicated by the 2009 population census in Kenya as generally increased. The 2009 population census indicated that about 74% of Kenyans are exposed to information from radio sources, 63% of the population have access to mobile phones while 28% and 3.6% are able to access TV

news and computers respectively. It is for this reason that the community alerts and warnings through RANET radios have become important tools in the EWS.

4.1.5. The RANET Radio

RANET is a global project aimed at making weather, climate, and related information more accessible to remote and resource poor populations to aid day-to-day resource decisions and prepare against natural hazards. The program combines innovative technologies with appropriate applications and partnerships at the community level to ensure that the networks created serve the entirety of community information needs and are therefore more sustainable.

The KMD is at the grassroots and full implementation of the RANET project within all areas of Kenya. The Radio is chosen as a medium of communication with the people because it is the widely used by the Kenyan population. RANET began its first pilot activities in Africa. With support from the USAID Office of Foreign Disaster Assistance, the African Centre of Meteorological Applications for Development (ACMAD) began demonstrations and program development in six African countries: Chad, Kenya, Mozambique, Niger, Senegal, and Zambia.

Apart from RANET approach, the KMD also targets the recently explosive mobile communication networks in Kenya. The 2009 census indicates that approximately 63% of Kenyans have access to mobile phones. Following these observations, there is an on-going discussion on the capability to send warnings to individual mobile phones in pre-selected areas or zones of utmost concern.

4.1.6. The Ministry of Special Programmes

This is an executive arm of government established and charged with responsibility of coordinating disaster and emergency interventions. The executive has mandated the Minister in the office of the President for Special Programmes to implement measures and plans for disaster management in consultation with other organs of Government. These measures are carried out within the prevailing legal framework and government policies and guidelines.

4.1.7. The National Disaster Management Executive Committee (NDMEC)

This committee was established with a specific role to design programmes aimed at disaster intervention in the country. It is the highest institution in disaster systems and falls under the Cabinet Office. It is chaired by a Cabinet Minister and has members drawn from Government ministries.

4.1.8. The National Disaster Coordination Committee (NDCC)

This is the next top level organ in disaster management. The National Disaster Coordination Committee is chaired by the Permanent Secretary, Special Programmes.

4.1.9. The Provincial Disaster (Management) Committee (PDC)

This is charged with all disaster issues in the province. It is chaired by the Provincial Commissioner (PC) to manage disasters in their respective administrative boundaries. However, this system is bound to change courtesy of the new constitutional dispensation in the country. It is most likely that the role shall be taken by the County Governors or County Commissioners of every unit.

4.2.0. The District Disaster (Management) Committee (DDC)

This is chaired by the District Commissioner (DC) to manage disasters in their respective boundaries. The need for participation of local representatives is eminent at this level. Members of this committee include technical representatives at the district level and the security teams.

4.2.1. The Kenya Food Security Committee

The committee operates through assistance of a cluster system composed of the government and various development partners. The Ministry of Agriculture, the Arid and Semi-Arid Resource Management Project, World Food Programme, FEWSNET and USAID collect data monthly on key agricultural, livestock, economic, social and climatic indicators to generate reports for Kenya food Security Coordination System. This data is critical for decision making and prioritizing various interventions.

4.2.2. The UN Agencies

The United Nations Development Programme (UNDP) has been responsible for coordinating the interventions of all UN agencies towards disaster situations in Kenya. These roles have been executed under the umbrella of the United Nations Disaster Management Team (UNDMT).

The team is composed of: The United Nations Development Programme (UNDP), The United Nations High Commission for Refugees (UNHCR), The World Food Programme (WFP), Food and Agriculture Organization (FAO), World Health Organization (WHO), United Nations Children Fund (UNICEF), United Nations Office in Nairobi (UNON), Office for Coordination of Humanitarian Affairs (OCHA), World Bank and , United Nations Fund for Women (UNIFEM). (6, 34)

4.2.3. Other Agencies

Several independent agencies are involved in disaster management in Kenya. These bodies work in coordination with the national disaster management system. Some of these include; the Kenya Red Cross, St Johns Ambulance, ICRC, IFRC, AMREF, among others. It is important to highlight the critical role that the UN agencies and other humanitarian organizations have played in disaster prevention and response initiatives in Kenya.

5.1. The Structure and Characteristics of the Emergency and Disaster Response Systems in Kenya

The present disaster management and coordination system in Kenya is barely theoretical. This is noticeably from the manner in which the relevant state agencies have responded and managed specific disasters in the recent past. The recent establishment of the county government system possesses another great challenge. It shall be the responsibility of various county authorities to ensure they establish and implement appropriate programs meant to prevent and manage disasters and emergency situations.

The county governments have barely lasted for one year since their institution. Therefore, it might be technical to obtain appropriate information on how each county manages its disaster operations. A lot of reforms within various sectors are currently undertaken with an aim of promoting self-reliance and improved life standards for all. There is an urgent need for awareness creation and initiating targeted advocacies within all the forty seven counties in Kenya. The national government perhaps has the most crucial role in ensuring that disaster programs and structures are properly addressed and implemented. It basically has the responsibility as an oversight and resource authority. (6, 32)

The disaster prevention and response strategies implemented by the government of Kenya must reflect the core principles of effective disaster management. For instance, there must be an effective Disaster Early Warning, Information and Prediction System. Early warning systems are important for all types of catastrophic events. The local communities must be able to access information regarding foreseen incidents or events within their localities.

The Ministry of Environment becomes a key player in ensuring that early warning systems for natural incidents are well established and made available to the communities. Nonetheless, the importance of collaborations and linkages with all relevant stakeholders is eminent. Maximum community engagement and participation must also be considered as a critical tool for enhancing awareness, preparedness and resilience to various forms of disasters.

There is need to mainstream disaster management in development programming. Moreover, it is necessary to establish strong links between Early Warning and Disaster Response. This might be achieved by harmonized and standardized rapid response interventions to catastrophic events within affected populations.

Planning is an effective tool in all disaster intervention. The community must be involved in the planning process, roles be outlined and operational standards based on international or national guidelines be drawn. A comprehensive disaster management

system requires a government-led institutional framework. The framework must enable for effective coordination of the relevant stakeholders. In addition, it must also enhance mutual understanding, trust-building and teamwork for all stakeholders. This is an important consideration that must be given priority by the emerging county governments in Kenya. They should adopt and institutionalize policies that provides for and distinguish between procedures and mechanisms of response to slow - and rapid onset disasters.

The management approaches must also consider the complex disaster situations prevalent within most developing nations. However, priorities must be given to the local context. As evident in the national government of Kenya, even the county authorities must set up functional semi-autonomous agencies responsible for disaster management with oversight from the Ministry of State for Special Programmes.

The issue of financial and human resources has for long term been highlighted in the context of the developing world. An ideal disaster management system should allow for individual learning and continuous capacity building of the local and marginalized communities. Novelty and innovative practices are appropriate for sustainable development.

Therefore, policies and systems should strengthen on resilience building by encouraging innovation within communities and all stakeholders, including learning institutions. In such contexts, the over dependence on international aid during disasters can be significantly minimized and even eradicated. For example, the introduction of innovative land management practices to increase farm produce and reduce communities' vulnerability to climate change.

Appropriate information and communication technologies might be applied to step up early warning systems within communities. Sometimes, systems should also identify indigenous knowledge sources within communities and strengthen them for effective disaster risk reduction practices. The current systems do not provide for flexible financial and response procedures to facilitate appropriate, effective and timely planning and management of disaster control initiatives. It is practical to strengthen the existing disaster management strategies of vulnerable and affected communities within all geographical regions of Kenya. (2, 35, 36, 37)

5.1.1. Recommendations in the Draft National Policy for Disaster Management in Kenya (2009) (6)

- The Government shall continue to play the lead role in the strategic planning and management of DRR, as well as the responsive management of the full disaster cycle. In addition, government must play a key role in the participatory partnership between itself and development partners, international agencies, academic and research institutions, CSOs, and other bodies in equivalent efforts of DRR and DM; and, finally, government must play a key role to ensure availability of resources for DM at all levels, from government sources and from partners;
- A definite paradigm shift (in agreement with HFA, 2005), which stresses a proactive Disaster Risk Reduction (DRR approach), which stresses EWS, prevention, mitigation down to recovery;

- A complementary responsive approach for a conventional responsive Disaster Cycle Management, (including EWS, response, relief, rehabilitation, reconstruction down to recovery) to ensure appropriate remedial action where preventive proactive measures have failed;
- An operational early warning and Disaster Management information system that triggers rapid and timely response and provides regular Monitoring and Evaluation of base data for Disaster Risk Analysis, Profiling and trend analysis.
- Promoting mainstreaming of Disaster Management in the country to attain disaster awareness and environmental literacy.
- Providing effective capability for harmonized and standardized rapid response to disasters, by coordinated collaborative participation of all stakeholders at all levels
- Clearly provide for and differentiate between procedures and mechanisms of response to slow - and rapid onset disasters
- Provide for an institutional and legal framework for a semi- autonomous Disaster Management body/agency that promotes information and lesson sharing, joint planning, and decision -making among all relevant stakeholders at all levels
- Provide for flexible financial procedures that facilitate rapid and assured and revolving funding and resources for effective, appropriate and timely response to disasters.
- Provides for a well-structured participation of the society in Disaster Management, particularly, including communities, and incorporating their traditional coping strategies into the Disaster Management systems.
- Provides for appropriate consideration and resolutions of pertinent cross-cutting issues, such as special considerations for women and children, climate change, environment, and problems related to rural-urban migrations/creation of overcrowded sub-urban informal settlements- all these being a serious preparation for megascopic disasters within a few decades;
- To critically factor into the systematic DM provisions for the rapid evolution of Climate Change, its potential negative impacts, and the desired proactive, planned mitigation measures and;
- Make institutional structural provisions for an agency at national, district, divisional/community levels to strengthen bottom-up community participation in all aspects of DM, from monitoring early warnings to field operations; and for these arrangements to be effective, there is necessity for a continuous two-way flow of information and communication. At the national level, the agency will be guided by a Board of Directors composed of representatives from key ministries and other bodies; and
- Disaster Management is to be approached comprehensively at the national level and any other prioritization is at community level where specific disasters affect specific communities.

6.1. Discussion

The present Kenya situation calls for a pragmatic transformation from theoretical and policy stage disaster management system to a systemized and well-coordinated operational phase. Implementation of key issues highlighted within relevant policies is important. Apart from this, the engagement of lobby groups, civil societies, Community Based Organizations, politicians and all stakeholders in ensuring full implementation of the policy guidelines is necessary.

The institutions of learning and research are important stakeholders in ensuring continuous evidence based research, innovation, capacity building and shaping policy formulation in the field of disaster risk reduction. In general, a multi sectoral approach is appropriate, with consideration of maximum community participation. Disaster prevention, mitigation, preparedness, response, recovery and reconstruction operations must also follow specific guidelines and code of conduct. Maximum adherence to such code of conduct is mandatory in any humanitarian intervention. Therefore, all partners must be able to acquaint themselves with existing national and or international guidelines. (38)

Disaster response interventions must be dependent on reliable EWS facts. In this regard, any EWS communicated to any community or group of people must be evidenced by credible information. Above all, as indicated by the policy brief, the humanitarian imperative: The right to receive relief assistance is a fundamental humanitarian principle to be enjoyed by all citizens of Kenya regardless of race, political, colour, gender, religion or geographical considerations. There are important recommendations outlined in the Kenya National Disaster Policy Brief. For instance, it indicates that at any time, all relevant stakeholders must base the provision of disaster assistance on a thorough needs assessment of the specific affected communities or populations.

The assessment must also accompany the populations' capacities to cope with the situation. Other interesting provisions in the policy identify the need to respect cultures. According to the policy, culture and customs of those affected will be respected during provision of disaster assistance. Additionally, beneficiaries will be treated humanely and with dignity. These critical considerations must be integrated into the existing disaster management systems, both at national and county authority levels.

It is important for all disaster related programs to consider the concept of sustainability. Particularly, this may relate to the disaster risk reduction initiatives. Disaster assistance must strive to reduce future vulnerabilities to disaster as well as meeting basic needs. Stakeholders will reinforce the capacity of local communities to manage the full Disaster Cycle.

Full participation of the affected local persons is an important prerequisite. Generally, all affected persons must be involved in the design, planning, implementation, monitoring and evaluation of disaster interventions meant to benefit them. The programs must highlight appropriate measures and special care to be given to the highly vulnerable proportions of the affected populations. In Kenya, just like most developing countries, vulnerable persons may include the women, children, elderly, and the disabled, those who are immune suppressed and suffering from terminal illnesses amongst others.

In all disaster management programmes, stakeholders will take positive cognizance of gender equity. In addition, stakeholders must also ensure equity in participation and in sharing benefits across all segments of those populations affected with special considerations to the at most high risk groups. Environmental conservation is a key tool in ensuring sustainable development and reduced risk to climate change. Developmental interventions focused on increasing community resilience must consider all concepts of environmental sustainability. The negative impacts of the environment have to be reduced or eliminated. This might be attainable through observance of the no-harm principle in order to foster the sustainability of Kenya's physical and natural environment.

The government must engage all its line ministries in disaster management programmes. Each ministry is expected to initiate mechanisms to address prevention, early warning and preparedness, immediate relief, maintenance and rehabilitation. The above role must be conducted in a consultative strategy with a fundamental objective of inclusion of the local affected populations in decision making within all stages. International communities and the donors interested in assisting disaster interventions within the country must also be accorded with necessary requirements and data concerning the situation on the ground.

The provincial administration composed of the civil defense team must also be enlightened on the concept of disaster management. Their training must include some critical components of the country's disaster management systems, roles of the administration and the importance of coordination and community involvement. The local chiefs and village elders are very important personalities within the provincial administration department. Therefore, their full engagement in disaster management is mandatory. They form a basic component of the community owned resource persons who have key information regarding the various populations they manage or protect.

The police have an equally vital role in enhancing the county's internal security. This is particularly appropriate considering the present increase in certain types of manmade disasters like terrorism. The police and country's armed forces provide a rich niche for would be disaster teams such as the Search and Rescue (SAR), the Anti-terrorism and firefighting personnel. It is evident from the police and military interventions in certain past disasters in Kenya that there is need for more capacity building and advocacy within the existing national forces.

The areas of focus should be the humanitarian principles and legal considerations that bind actors. This is because the police and military intervention, especially in regions experiencing complex emergencies have always been associated with cases of humiliation, sexual abuse and potential exploitation. Enforcement of crowd control is a key role that must be performed or undertaken by the police.

In Kenya, most people are usually curious and want to be first hand witnesses on the disaster sites. This has particularly been noted by authorities when technological disasters strike. Large crowds of people accumulate around the disaster area, making it hard for evacuating team to access the casualties. Apart from the challenge of adequate access to casualties, the crowd also expose themselves to further risks or events that might arise within the disaster area. The police have the definite mandate to control such crowd. Most of the time, they may need to disperse them off. But that leaves a large

question mark concerning the need for proper sensitization and advocacy amongst populations on such matters.

There should be coherent plans and procedures for evacuation and casualty management. Certainly, the main actors here should be the Ministry of Health and several other local humanitarian actors such as the Kenya Red Cross Society, the St. John Ambulance and the African Medical Research Foundation, (AMREF). However, in terms acute emergencies, other actors willing to assist must be welcomed in a planned manner. The objective should be to ensure the mortality and morbidity rates are immensely reduced or controlled during any disastrous events. The evacuation process and all other interventions must be planned and executed with consideration of the existing national and international frameworks.

Proper conflict resolution mechanisms help to curb instances of outbreak of civil wars and disputes. The government takes a key role in initiating such programs and mediation within conflicting groups. The heterogeneity of the Kenyan society makes it vulnerable to constant civil conflicts. This is because there are 43 tribes in Kenya. The situation compounds with problems arising from limited resources, poverty, human-wildlife conflicts and sometimes cultural influences.

Most parts of the Northern region of Kenya experience long term droughts. The pastoralist's communities occupy these areas. During droughts, they are unable to get green pasture and drinking water for their animals. As a result, they end up fighting for the available land and water resources. Cattle rustling between the nomadic communities and the neighboring countries have also led to onset of complex emergencies. It is eminent from such situations that their needs to be an effective system of mechanism for conflict resolution in the country.

There is definitely a great need to employ a multi-sectoral and disciplinary strategy in disaster management in Kenya. The coordinating agencies must be able to develop a shared platform by all stakeholders and actors in the disaster field. The first step would probably be to engage all the ministries in disaster programmes within the government level. Knowledge sharing and case studies on other countries that have successfully implemented disaster management systems may be crucial. Communities must also take an active role in the process.

Community participation is a key strategy aimed at reducing vulnerabilities and ensuring locally available coping skills are utilized in an active manner. The elementary platform for disaster management is an individual. With access to considerable knowledge and awareness, the individual must be able to build up to the community. Consequently, the community forms the nation. Therefore, individuals must be empowered to know their rights and obligations as important entities in disaster management. The approach forms a critical building block for the whole society.

Some of the key government ministries and departments that must assume important responsibilities in disaster management are highlighted. These include the Department of Defense, Provincial Administration, Kenya Police Force, Ministry of Health, Ministry of Agriculture, Livestock and Rural Development, Ministry of Transport, Ministry of Environment and Natural Resources, and Ministry of Roads and Public Works. The involvement of all these ministries will help in the enhancement of information flow, liaison with other sectors and stakeholders and development of effective early warning systems.

There are some other negative factors that must be given attention in the response phase during disaster management. For example, most response mechanism remains largely uncoordinated in Kenya. A variety of elements contribute to this situation. In a broad perspective, it can be noted that there is absence of legal frameworks to empower the agencies allocated the role of disaster management. This condition creates a great constraint by limiting efficient decision procedures. The government has constantly failed to establish special funds for disasters. Most of the funds applied in disaster operations are targeted from the international community and external donors. However, such funds usually arrive late, when the disaster has almost matured to an advanced phase. The presently available ambulances are inadequate in number.

Most hospitals in Kenya lack the sufficient space to be able to handle mass casualties in a proper way during disasters. In addition, there have been reported cases of lack of appropriate equipment within the hospitals' intensive care unit, (ICU). Apart from capacity building for the various emergency response teams, there should be an active drive for acquisition of all the necessary equipment. This must be observed by both the central government and all other County authorities. In order to be prepared for urban disasters, there should be an ICU capacity improvement and advancement within major cities of Kenya. Mobile emergency medical units are critical for rapid response. These must also be availed by the aforementioned authorities. It is also worthwhile to consider upgrading of the firefighting facilities and capabilities within urban areas of Kenya.

7.1. Existing Gaps and Challenges

The first key challenge observed in the present system of disaster prevention and response in Kenya is the lack of capacity to make the system operational. It is evident that Kenya still depends on external support and operations of both local and international humanitarian organizations. The Kenya Red Cross Society has played a crucial role in disaster and emergency prevention and response. This is alongside other actors and development partners that have supported the country for a long time. The 2009 draft policy for disaster management in Kenya highlighted some of the challenges that face the prevention and response system. Some of these include:

7.1.1. Inadequate Policy, Legal and Institutional Frameworks

It is evident that Kenya has operated for several decades without a proper policy manual guide on the issues of disaster prevention and response. Lack of legal and institutional frameworks to guide such systems have only exacerbated the situation over the years. Most response and management initiatives have basically relied on *ad hoc* systems and external support from development partners, international communities and the international non-governmental agencies such as the IFRC and ICRC.

Observably, disaster response activities have been poorly coordinated, due to lack of Standard operational procedures and Disaster Emergency Operation Plans. This situation remains a challenge that has led to duplication of efforts and wasteful use of resources. It also exposes disaster victims to greater risks and slow recovery. Similarly,

in the absence of planned, coordinated action, prevention, preparedness and mitigation have not always been attained. Owing to lack of a coordinated policy framework, leading to strategic guidelines, the existing Institutional framework for Disaster Management is heavily weighted towards emergency response. Therefore, systematic approach through planned Disaster Management is rare. In addition, effective coordination, for management of non-food relief items has been particularly lacking.

The food sub-sector, so far, is the most organized in terms of emergency response. Management of other relief sub-sectors is more difficult to monitor and assess. These difficult sub-sectors include, provision of water, health, nutrition and education, as well as care for livestock and agriculture.

The number of activities, actors, and approaches in these latter sub-sectors are too many for efficiency to attain prevention and mitigation of disasters. Most of the activities are focused on immediate emergency interventions, such as water trucking and de-stocking, giving little time and adequate emphasis for long-term preventive measures and mitigation. These were critical observations made by the technical working committee for the 2009 draft national policy for disaster management in Kenya. Despite the institution of the national (disaster) operations center, (NOC) it is still apparent that most recently formed County governments have not considered the importance of this policy.

7.1.2. Inadequate Finances, Human Resources and Equipment

Lack of finance and human resources is a serious impediment in the management and operation of the disaster and emergency response systems in Kenya. Notably, all relevant agencies mandated to handle disaster issues in Kenya are confronted with limited budgetary allocation from the government. In addition there are challenges due to conditional donor support. The reality in most situations is that the amount of financial resources availed for Disaster Management is far less compared to the actual quantity required to attain successful management.

There are other unique challenges associated with proposals and funding timelines for most disaster risk reduction programs. This challenge has mostly been recorded by the local nongovernmental organizations working in this field. The turn-around time for proposals to realize money in the non-food sub-sectors is excessive. This is due to inadequate technical handling. Additionally, the cumbersome procurement processes plus the unavailability of specialized machinery hinders effective disaster management interventions in Kenya.

The 2009 draft national policy for disaster management in Kenya highlights some special challenges associated with resources. For instance, it denotes that the result of poor funding and reallocation of development funds during times of emergencies has meant that development priorities and Disaster Risk Reduction initiatives are undermined. Catastrophic events have increased in number. This makes the already little available finances to be widely spread out to several affected areas. In turn, the situation lowers the capacity of implementing partners and agencies to achieve their targets in an effective manner.

The increasing need for financial resources the Kenyan government increasingly reliant on development partners to fund Disaster Management initiatives. Considering the present crisis of global financial downturn and recession, it is unlikely that the situation might improve anytime soon. Worsening this situation is the slump in the capacity for national income. The reduction in gross national earnings in Kenya during the past few years has mainly been due to reduced exports, low tourist arrivals, incessant inflation, other complicating socio political factors and trade relations. However, the government must utilize its minimal resources and focus more on innovative approaches to increasing community resilience to disaster risks. (39, 40, 41)

7.1.3. Inadequate Information and Data

Research is important in policy formulation, analysis, implementation, monitoring and evaluation. It enhances the effectiveness and efficiency in projects. This concept is widely applicable in all development and planning sectors, including disaster and emergency management. The disaster management system in Kenya has suffered a big blow due to lack of data within some sectors. Collection of data, analysis, and storage is not uniformly adequate. However, this constraint does not apply to all sectors. This is because some sub- sectors, for example drought management has plentiful of data and relevant information.

These are currently utilized to inform most disaster risk reduction interventions within the affected populations. Nonetheless, it is important to indicate the constraints that result from lack of adequate information. Poor planning, lack of institutional memory and improvement towards best practices largely result from inadequate data and information sources for disaster management projects. The condition also has negative consequences on effective monitoring and evaluation of disaster risk trend analysis, and forecasts. (42)

7.1.4. Lack of Advocacy and Community Involvement

There is a weak link of disaster management capacities between the national government, county governments, local authorities and the general community. The linkages have grown weaker with the introduction of the County government system during this year. Another vital factor is that the widespread degradation of traditional African socialism and livelihood systems has resulted in the progressive erosion of the indigenous coping strategies. It is also clear that there is limited work done concerning community sensitization, advocacy and general awareness.

Most communities in Kenya have never been adequately informed about disaster management. Particularly, this relates to information dispersed about preparedness and coping mechanisms. The end result is an increase in susceptibility of communities and potential negative impacts of events on affected people. Some of these challenges majorly originate from system failures and can be noted in the flawed process used in the management of Internally Displaced Persons, (IDPs) of the 2007/2008 post-election violence.

7.1.5. Inadequate Integration and Co-Ordination

The Kenyan government Ministries and Departments, Agencies, NGOs and Civil Society Organizations, the Private Sector, International Development Partners and UN Agencies have pursued a wide range of strategies and programmes to prevent and respond to disaster situations. It is evident that some of these initiatives are even presently ongoing. This raises lots of concern, especially with the emerging need for multi sectoral collaboration for effective results.

The general observation is that a majority of the initiatives have been undertaken in a less consistent, inadequately planned and less harmonious manner. Most interventions are virtually always reactive and uncoordinated. Indeed, there is an urgent need for a collective and coherent policy framework. Notably, the establishment of the National Disasters Operations Centre, (NOC) in Kenya portrays the Government's devotion towards implementing comprehensive and integrated strategies for addressing disaster challenges through a proactive manner. The main focus is on the reduction of risk to communities and their vulnerabilities. It is also a learning point for the future initiatives to be carried out in the disaster field.

Policy frameworks should be developed, prepared and discussed through a broad consultative process. As outlined in the 2009 Kenya national draft policy on disaster management, inadequate Regional and International linkages Disasters often go beyond national borders. However, Governments in the horn and Eastern Africa Sub- region including Kenya do not always factor in this aspect in disaster planning and response. This has led to some interventions, particularly of cross border nature to be ineffective. For example, a livestock disease outbreak such as Rift Valley Fever, may affect more than one country in the sub-region. Without joint planning and response, a vaccination intervention against the disease may remain largely ineffective. The need for national systems to link with other regional and international organizations has not always elicited the recognition of the importance it deserves.

8.1. Conclusions

Lack of disaster preparedness has remained one of Kenya's enduring development challenges for decades. The Kenyan Government has been persistently criticized for this by its citizens and even foreign bodies. It displays a situation where despite the myriads of disasters faced by the country over years, very little lessons have been picked to aid in prevention, prediction and management of these emergencies. Every event occurring with the magnitude of disasters in Kenya presents a crisis situation that has a crippling effect on several allied sectors.

The present disaster management system is a product of consultative efforts undertaken by several stakeholders from 2009. However, there is still an apparent need to conduct research and develop more evidence based and transformative strategies. Particularly, this is in view of the weaknesses identified in the management of recent natural and technological/manmade disasters experienced in the country recently. The response systems have been uncoordinated and basically ad hoc with minimal involvement of the government authorities. The UN agencies, international organizations, the NGOs, the nongovernmental humanitarian agencies and other local relief agencies have taken the foreplay in most occasions.

9.1. Recommendations

- An integration of the present scattered emergency response system of various public agencies including the Security forces, emergency medical care/ambulance support, firefighting teams, police in charge of traffic, police emergency call arm (999), into a one coordinated and strengthened system that is managed under one roof. This will have a synergistic effect on disaster response, greater coordination, no extra or little funding and with an enhanced capacity to respond to various forms of disasters to save and preserve lives and restore human dignity.
- Collaboration and coordination are essential between scientific institutions, public authorities, private sector, media and local community leaders in order to ensure that the dissemination of information is accurate, timely, and meaningful and can result in appropriate action by an informed community.
- Strengthen national capacity and strengthen land use regulatory policies, promote disaster management culture, training, research and information dissemination and exchange, community awareness creation and preparedness.
- Formulate strategies for early warning systems and their presentation, disaster preparedness based on the best available technical and scientific knowledge and monitoring in order to secure sustainable development.

In view of the aforementioned weaknesses and challenges, the government considers it of imperative importance to provide a policy and legislative framework through which the above inadequacies and weaknesses can be addressed so that an effective disaster management system can be achieved.

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