

# **How can oil tanker fire disasters in Kenya be mitigated through community based disaster management approaches?**



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## **Abstract**

Kenya faces regular oil tanker fire disasters that claim the lives of many and leave many more badly injured. This happens when oil tankers are involved in road accidents and the oil that they are carrying leaks. This often draws huge crowds that scramble to scoop the leaking oil, resulting in big fire explosions that cause many deaths and injuries. The overall view that emerged from the literature review, interviews with victims, families of the affected victims, representatives of Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs) and focus group discussions revealed that the response from the emergency services has always been poor. They are known to always lack the capacity to adequately deal with the oil tanker accidents, resulting in their escalation into fire disasters.

While conducting research for this dissertation, it also emerged that people ignore official advice not to siphon oil and are willing to risk their lives in the process of scooping oil when this act has led to the death of many in the past. This has been blamed on poverty. Despite many past oil tanker fire disasters, there seems to be no effective strategy in place in Kenya to prevent the risk of a re-occurrence. The 2009 National Policy for Disaster Management for Kenya (NPDMMK) states that disaster response costs the government and other stakeholders more than would otherwise be the case if sufficient efforts had been put in place for effective disaster management.

Experts increasingly acknowledge that there is a need not only to respond to disasters, but also to undertake disaster risk reduction (DRR) initiatives to prepare for any future disasters (Twigg and Benson, 2007). DRR is highly cost-effective. It has been argued that one US dollar invested in DRR saves four US dollars used in response and recovery efforts (United Nations International Strategy for Disaster Reduction, UNISDR, 2005). Trobe and Davis (2005) and Blaikie et al. (1994) believe that community-based disaster preparedness is one of the most effective strategies that can be used for long term, sustainable risk reduction.

In Kenya, it is well known that local populations are normally first to arrive at the scene of oil tanker accidents and fire disasters before the emergency services arrive. In addition, oil tanker fire disasters take place mostly in rural areas far from emergency services that are mostly located in urban areas. This makes it impossible for the emergency services to respond to the disasters in a timely manner. Community based emergency approaches and responses to oil tanker fire disasters are therefore necessary.

As Gachigi (2009) argues, disaster mitigation using government and institutional

interventions alone is insufficient because they pay little attention to addressing the community dynamics, perceptions or priorities, and the aim of Community Based Disaster Management (CBDM) is to reduce vulnerabilities and strengthen people's capacities to cope with hazards. In order to reduce the damage caused by oil tanker fire disasters in Kenya, it is essential to enhance the capacity of local communities to deal with them. It is crucial to motivate individuals to understand their own disaster risk and to take action against such risk as it is the people at the community or village level who suffer its adverse effects (Shaw and Okazaki 2004).

This dissertation examines how oil tanker fire disasters in Kenya can be mitigated through CBDM approaches. It suggests that approaches such as local level emergency services and integrating oil tanker fire DRR in local NGOs and CBOs development programmes should be considered. The research shows that poverty is a major factor in pushing people into putting their lives at risk in order to siphon oil from tankers whenever they are involved in accidents. A livelihood centred approach to DRR is therefore necessary if oil tanker fire disasters in Kenya are to be mitigated. The dissertation concludes that since the response by the emergency services to oil tanker fire disasters in Kenya is ineffective, CBDM approaches would provide a better solution.

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I would also like to thank all the volunteers who were willing to participate in focus group discussions about the topic of the dissertation. Finally, the author is grateful to her family for their moral support.

## **Acronyms**

AU – African Union

CBO – Community Based Organization

CBDM – Community Based Disaster Management

CBDRR – Community Based Disaster Risk Reduction

DFID – Department for International Development

DRR – Disaster Risk Reduction

DRRS – Disaster Risk Reduction through School

GDP – Gross Domestic Product

GSU – General Service Unit

HFA – Hyogo Framework of Action

HIV/AIDS – Human Immuno-Deficiency Virus/Acquired Immuno Deficiency Syndrome

IDNDR – International Decade of Natural Disaster Reduction

IFRC – International Federation of the Red Cross

MDGs – Millennium Development Goals

NEMA – National Environmental Management Agency

NGO – Non Governmental Organization

NPDMK - National Policy for Disaster Management for Kenya

OLCAP – Organization of Local Communities against Poverty

PAR – Pressure and Release model

PWD – People with Disability

RAL – Resilience and Livelihoods

UNDP – United Nations Development Programme

UNICEF – United Nations Children’s Fund

UNISDR – United Nations International Strategy for Disaster Reduction

VCA – Vulnerability and Capacity Assessment

VHF – Very High Frequency

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## **Chapter One: Introduction**

In January 2009, around 150 people died and more than 200 were injured in Sachangw'an village, Molo district in Kenya, when an overturned oil tanker that they were trying to siphon oil from caught fire and exploded (Mkawale, 2009). Sadly, this was not the first time that such a disaster had happened in Kenya, nor was it the last. Five months later in June 2009, 4 people died and 44 were injured when another oil tanker they were siphoning oil from exploded near Kapsoit trading centre in Kericho (Mutai and Njoroge, 2009). This was again repeated in September 2011, when four people died and 37 were injured in Busia, when an overturned petrol tanker exploded into flames while residents were siphoning fuel, a few days after nearly 120 people had died from a fire at a pipeline fuel spill in a slum in the capital, Nairobi (Reuters, 2011). In all of these disasters, there were reports that residents had refused to heed warnings from police officers to keep off the oil tankers after they overturned. Many of those killed in the fire disasters had hoped to sell the petrol on the black market to help them buy basic needs.

Many petroleum products are transported on Kenyan roads destined for the local market and the Great Lakes region including Uganda, Tanzania, Rwanda, Burundi, Southern Sudan, Eastern Democratic Republic of Congo and Ethiopia. These products come in through Kenya's largest port, Mombasa, which is one of the regional gateways. The products are then refined at the Kenya Petroleum Refineries Ltd, in Changamwe, Mombasa. Although some petroleum products are transported through the Kenya Pipeline system to the domestic market and neighbouring countries, the pipeline's capacity is still small and therefore, petroleum tankers are also used. When these oil tankers ply the Kenyan roads, they cause road damage and fire disasters when they overturn and explode killing many people.

According to Panyako (2010:13), when Kenya gained independence, the railway system run efficiently and was the main means of transport for petroleum products from Mombasa to upcountry depots and neighbouring countries. Oil tanker trucks were only used to deliver products to service stations within close proximity to depots, limiting the exposure of people to highly flammable products and damage to the roads. The extension of the Kenya pipeline to Nairobi also made fuel readily accessible from the capital, Nairobi (ibid).

However, the collapse of the East African Community in the late 1970s drastically changed the way petroleum products were transported in the region. The railway network collapsed due to inefficiency and lack of maintenance. This made it difficult to efficiently

transport oil by rail, leaving road transport as the only feasible option for oil transportation. Many road transport operators opted for higher pay loads with the aim of minimizing operation cost and maintaining favourable rates with the final consumers. This led to overloading of tankers. The rationale behind this was that only one driver with a fixed Mileage and salary would be able to haul twice the recommended volume and hence a saving. Besides posing stability dangers, the huge tankers also caused road dilapidation as trucks were overloaded beyond pavement design capacity. As a consequence, road maintenance became expensive and unsafe for motoring. Implementation of axle load however has seen an end to this although some corrupt officials from oil depots, revenue authorities and the police manning weigh Bridges still allow some overloaded tankers through check points (Petroleum Insight, 2010: 13).

The overall view that emerged from the literature review, interviews with victims of former oil tanker disasters, families of the affected victims, police officers, CBO and NGO representatives and focus groups undertaken for this dissertation reveal that the response from the emergency services has always been poor. They are known to always lack the capacity to adequately deal with the oil tanker accidents resulting in their escalation into fire disasters. There also seems to be ignorance on the part of local people regarding the dangers of siphoning oil from tankers. Despite the many past oil tanker fire disasters, there seems to be no success in preventing a re-occurrence. Although there seems to be a paradigm shift in the government's focus from disaster rescue and relief, to a prevention and preparedness approach (as seen in the NPDMK), this is yet to translate into actions, especially with regard to oil tanker fire disasters.

The NPDMK (2009) states that disaster response costs the government and other stakeholders more than would otherwise be the case if sufficient efforts had been put in place for effective disaster management. Furthermore, experts increasingly acknowledge that there is a need not only to respond to disasters, but to also undertake DRR initiatives to prepare for any future disasters (Twigg and Benson, 2007). Trobe and Davis (2005) and Blaikie et al. (1994) believe that community based disaster preparedness is one of the most effective strategies that can be used for long term, sustainable risk reduction or mitigation.

This dissertation explores how community based approaches to disaster management can mitigate the impact of oil tanker fire disasters in Kenya. I chose to focus on oil tanker fire disasters because they seem to be a big challenge and of a regular occurrence in Kenya, causing huge damage and loss of life.

As we shall see later, there are many causes of oil tanker fire disasters in Kenya, including careless and inexperienced oil tanker drivers, incompetent emergency services and poor road network. However, it is important to note here that this dissertation focuses on community mitigation and not on other ways of mitigating oil tanker fire disasters such as the government ensuring that oil tanker truck drivers are well trained and experienced, as this is beyond the scope of this dissertation.

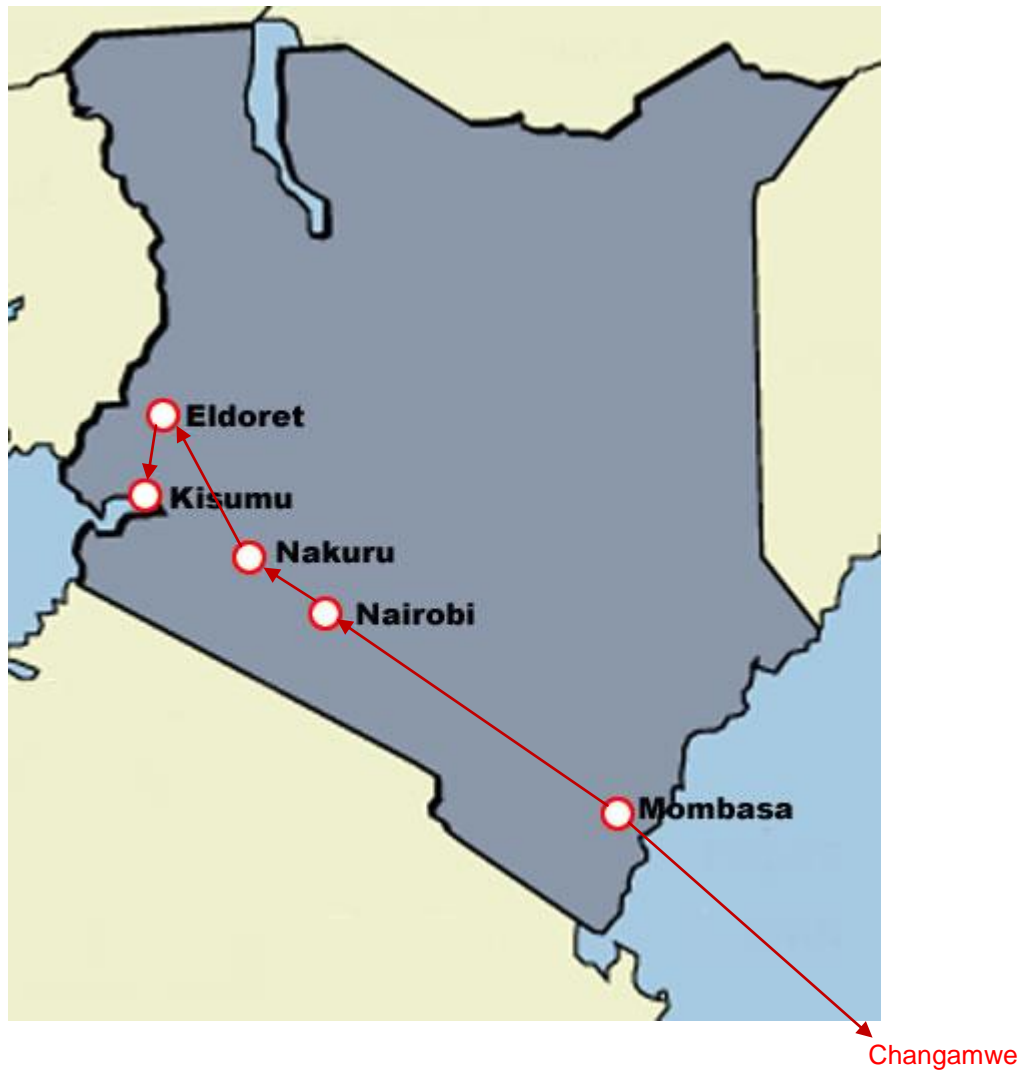


Figure 1: A map of Kenya showing the Kenya pipeline system which transports oil from Changamwe, Mombasa to the Kenyan market

Source: Kenya Pipeline Company Ltd, 2012.



Figure 2: A map of Kenya showing Changamwe (where petroleum products are refined) and some of the neighbouring countries where the products are destined for  
 Source: Google images

### **A brief overview of how oil tanker fire disasters occur in Kenya**

Transporting oil using tankers is common in Kenya. Some of this oil is for the local market while some is destined for neighbouring countries. Sometimes when oil tankers are transporting oil, they are involved in road accidents. The most common accidents occur when the oil tankers overturn due to different reasons, such as badly maintained roads, over speeding, inexperienced drivers, overloading leading to huge tankers becoming unstable and sabotage. The overturned oil tankers will then start spilling the oil and this normally attracts crowds of people that live along or near highways used by tankers. The crowds will use all manner of containers to siphon oil from the tankers.

This is well illustrated in a short documentary titled ‘Fuel and bullets’ (NTV, 2011), where in this instance, the emergency services took a while to respond to an oil tanker accident and people freely siphoned oil until the police arrived at the scene and managed to disperse the crowd using force, by firing live bullets into the crowd and injuring two people. Other times the police arrive at the scene of oil tanker accidents and are unable to control and prevent the crowd from siphoning oil and putting their lives in danger, or arrive at the scene

too late to prevent siphoning of oil. In such instances, fires break out and people are injured and others burned to death as a short documentary titled ‘The fuel curse: Death toll in Busia tanker tragedy hits 8’ (NTVKenya, 2011) shows.

DATE	PLACE	CASUALTIES
13/07/1998	Sidindi, Ugenya	33 dead (Oloo, 2010).
31/01/2009	Sachangw’an, Molo	More than 140 dead, at least 238 injured ((International Federation of the Red Cross, IFRC, 2009)
18/06/2009	Kapkokyek, Kericho	4 dead, 47 injured (Oloo, 2010)
07/02/2010	Sachangw’an	2 dead, 1 injured (Daily Nation, 2010)
21/06/2010	Ugunja trading centre, Ugenya District.	1 dead (Oloo, 2010)
20/09/2011	Suo, Busia	8 dead, 37 injured, 15 with severe 3 <sup>rd</sup> degree burns (NTVKenya, 2011)

Table 1: Statistics on some past oil tanker fire disasters in Kenya

## **1.1 Aim of the dissertation**

The aim of the dissertation is to explore how CBDM approaches can mitigate oil tanker fire disasters in Kenya. To do this, the following questions will be addressed:

- (i) What are the causes of oil tanker fire disasters in Kenya?
- (ii) What is the response of the emergency services to oil tanker fire disasters in Kenya?
- (iii) Is this response adequate and what are the failings?
- (iv) What CBDM approaches can be used and how can they provide a better solution to mitigate the effects of oil tanker fire disasters in Kenya?

## **Why is the research relevant?**

The response to oil tanker fire disasters by the Kenyan government, emergency services and other organizations has mainly been reactive and mostly deals with helping the injured and families of the deceased rather than reducing the risk of these disasters from happening again (sprogrammes, 2012). While conducting my literature review, I found out that currently there is little, if any, research that has been carried out on mitigating oil tanker fire disasters in Kenya. Moreover, although a large number of parallel research studies have been done in the general area of CBDM approaches (Shaw and Okazaki, 2004 and Maskrey, 1989), most deal with natural disasters such as floods and earthquakes. None specifically deals with using CBDM approaches to mitigate oil tanker fire disasters in Kenya. This research will therefore try to bridge this gap.



Figure 3: A petrol tanker goes up in flames. Source: Wachira, 2010.

## **1.2 Structure of the dissertation**

The dissertation begins with an introduction which describes the methodology used in the research, limitations of the research and definition of terms, in chapter one. Chapter two then provides a theoretical understanding of disasters. Included in this discussion are the four phases of the disaster management cycle and how well the Kenyan government has used this in dealing with oil tanker fire disasters. The move in thinking from responding to disasters to DRR and later to CBDM is also discussed. Chapter three examines the profile of Kenya. The geographic and climatic conditions of the country are explained, followed by the socio-economic conditions. Finally, an overview of disasters in Kenya is discussed.

The causes and current response to oil tanker fire disasters in Kenya are critically assessed in chapter four. A case study of the Sachangw'an oil tanker fire disaster, the worst in the history of Kenya, in addition to information from interviews, questionnaires and focus groups is discussed. Chapter five proposes a better solution to dealing with the problem of oil tanker fire disasters in Kenya through CBDM approaches. This is based on the fact that the current response is inadequate and the local population is normally the first to arrive at the scene of these oil tanker accidents and fire disasters before the emergency services arrive. These approaches include the use of local or community level emergency services, integrating oil tanker fire DRR in CBOs and local NGOs development programs and planning to ensure sustainability and finally, using a livelihood centred approach to reduce hazards and vulnerability to oil tanker fires in Kenya. The final section gives recommendations on mitigating oil tanker fire disasters in Kenya using CBDM approaches and then concludes the research.

### **1.3. Methodology**

This section outlines the methodology used in the research. Sampling, data collection, processing and analysis methods are discussed. Both primary and secondary data collection methods were used in the research. Triangulation, where the researcher used several sources of information, was used in the research to back up statements, confirm them and achieve a high level of accuracy.

Secondary data collection methods involved a review of literature, including books, journals, newspapers, internet sites and reports relevant to the research subject area. A review of how community based approaches to disaster management have been applied in other locations was also assessed with a view to applying it in this case. I used keywords to search for information on oil tanker fire disasters on the Oxford Brookes library catalogue and on Google Scholar. Words such as ‘oil tanker fire disasters in Kenya’ and ‘mitigating oil tanker fire disasters in Kenya’ were used. These searches mostly produced information from newspapers and news sites detailing reports on oil tanker accidents and fire disasters that have taken place in Kenya. My search found very little information, if any, on what was being done or could be done to mitigate oil tanker fire disasters in Kenya.

Qualitative methods including focus group discussions and key informant interviews were also used. I used qualitative methods because of their humanistic nature as they focus on the personal, subjective, and experiential basis of knowledge and practice. Qualitative methods are also holistic because they seek to situate the meaning of particular behaviours and ways of doing things in a given context, as opposed to isolating these as a quantitative researcher would (Kielmann, Cataldo and Seeley, 2011).

In order to find out the causes and gauge the response to oil tanker fire disasters in Kenya, a case study of the Sachangw’an oil tanker fire disaster was carried out. I chose to focus on Sachangw’an village as this is where the worst ever oil tanker fire disaster in Kenya occurred in 2009. For that, semi-structured questionnaires were handed out and focus group meetings conducted with those directly and indirectly affected by the disaster.

The researcher, who is Kenyan by birth, spent one week in Sachangw’an village from July the 2<sup>nd</sup> 2012 to July the 8<sup>th</sup> 2012. The researcher was able to introduce herself as a student and assured respondents that the research was purely for academic purposes. The researcher’s student identity card was also used to confirm this. Semi-structured questionnaires (appendix A) were handed out to twenty people (12 men and 8 women) in



Sachangw'an village. The researcher went around the village and randomly selected whichever house that was open, with members available and willing to take part in the research. 10 questionnaires were handed out during the day and the other 10 in the evening in order to make sure that everyone was represented and that no one who would have liked to fill a questionnaire was missed out because they were out at work, market etc.

Both open format and closed format questions were used. Only one questionnaire was handed out to every household to ensure that the questionnaire findings were representative across the community. The questionnaires were in English and this suited most respondents who could read and write in the language. Two respondents could only read and write Kiswahili and so the researcher translated the questions from English to Kiswahili and the respondent's answers from Kiswahili to English. Some of the demographics are tabulated below:

Demographic	Frequency	Percentage (%)
<b>Age</b>		
18 – 30	5	25
31 – 40	10	50
41 – 50	4	20
51 – 60	1	5
Over 60	0	0
<b>Sex</b>		
Male	12	60
Female	8	40

Table 2: Demographics for questionnaire respondents

Two focus group discussions were held. The researcher went around the village and randomly selected whichever house that was open, with members available and willing to take part in the focus group discussion. The two focus group discussions were well representative of the village, with a total of 12 people participating in both, including women, men, elderly people, young people (orphaned by the Sachangw'an disaster), a widow who lost her husband to the disaster and one man who was left disabled by the oil tanker fire

disaster. Interview guides (appendix B) were used here and open-ended questions employed. The length of focus group discussions was an hour for the first focus group discussion and an hour and a half for the second one. The structure of the discussions was round table with the researcher asking questions and allowing any respondent who wished to answer to do so. The researcher conducted one focus group discussion during the day and another one in the evening in order to make sure that everyone was represented and that no one who would have liked to participate in the discussions was missed out because they were out at work. Demographics for the focus group discussions are tabulated below:

Demographics	Frequency	Percentage (%)
<b>Age</b>		
16 – 30	2	17
31 – 40	5	42
41 – 50	3	25
51 – 60	1	8
61 – 70	1	8
<b>Sex</b>		
Male	5	42
Female	7	58

Table 3: Demographic information for focus group discussion participants

To complement the focus groups, semi-structured interviews were also conducted with key informants. The purpose of using semi-structured interviews was that they were flexible and allowed new questions to be brought up during the interview. Purposive sampling was used in selecting the key informants. The key informants were selected on the basis of their role and knowledge in disaster response, DRR and CBDM. A qualitative approach to the interviews was also used (Chambers, 2008).

Interviews were held with a Senior fire brigade officer (interview guide in appendix D), a Senior police officer (interview guide in appendix C), a local government official of Sachangw’an village (interview guide in appendix F) and an OLCAP NGO manager involved in disaster programmes in Kenya (interview guide in appendix E). Each was approached with a cover letter giving a brief background of my research topic and outlining my research questions. Many agreed to meet with me for an interview lasting 30 minutes. However, after

meeting, the interviews lasted considerably longer, ranging from forty minutes to one hour. As agreed with most of the interviewees, they remain anonymous. The table below shows a list of the interviewees.

Name	Profession	How they were contacted
Anne Mumu	Programmes manager, OLCAP	Cover letter
Anonymous	A senior police officer	Cover letter
Anonymous	A senior fire brigade officer	Cover letter
Anonymous	A local government official for Sachangw'an village	Cover letter

Table 4: A list of interviewees

The data that was collected was tabulated into charts and tables for interpretation. This data was then analysed, compared and linked together and common themes identified. These themes have been used throughout the paper to answer the research questions.

#### **1.4. Limitations of the research**

One limitation to the research was red tape and bureaucracy. At first, it was a challenge to get interviews from the emergency services, such as the police service and fire brigade, on how they have responded to oil tanker fire disasters in the past. This is because they have been criticised in the past for being slow and unprepared when called upon. I was referred from one office to another. However, after assuring the officers that the research was purely for educational purposes and that they would remain anonymous, they agreed to be interviewed by myself. Another limitation was that relevant data on oil tanker fire disasters in Kenya was scanty, mainly available in the form of news reports.

Since scooping oil from overturned tankers is illegal according to the Kenyan law (National Council for Law Reporting, 2009: 94), people were not willing to talk about the subject at first. I had to convince the people that the research was purely for educational purposes and that they would remain anonymous before they agreed to take part in the focus group discussions. The short time available of one week to carry out research in the field was another limitation. This meant that only a small location, Sachangw'an, where the worst oil tanker fire disaster in Kenya occurred, could be studied. If there was more time, more depth could have been achieved.

The final limitation to the research method was that not all respondents understood English and the national language, Swahili, had to be used sometimes and material translated from English to Swahili and vice versa. Not all Swahili words have an equivalent English translation and some expressions and information may have been lost in translation.

## **1.5. Definition of terms**

There are some terms that will be used throughout the text. They are defined below:

### **Community**

People living in one geographical area who are exposed to common hazards due to their location (Abarguez and Murshed, 2004: 8).

### **Community based approach**

A method of education and public awareness in disaster management in which community members are involved in the planning and implementation of the awareness programmes (UNISDR, 2012).

### **Disaster**

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 (UNISDR, 2012).

### **DRR**

The broad development and application of policies, strategies and practices to reduce vulnerabilities and disaster risks throughout society through prevention, mitigation and preparedness (Twigg, 2004: 13).

### **Disaster Preparedness**

The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions (UNISDR, 2012).

### **Emergency services**

The set of specialized agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations, including agencies such as civil protection authorities, police force, fire brigade, ambulance, paramedic and emergency medicine services, Red Cross and Red Crescent societies, and specialized emergency units

such as electricity, transportation and communications (UNISDR, 2012).

### **Hazard**

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2012).

### **Livelihood**

A livelihood comprises the capabilities, assets and activities needed for a means of living, and is sustainable when it can cope with and recover from shocks and stresses, maintain or enhance its capabilities and assets and provide sustainable opportunities for the next generation (Chambers and Conway, 1992).

### **Risk**

The likelihood of a specific hazard occurring and its probable consequences for people and property (Twigg, 2004: 13).

### **Mitigation**

The lessening or limitation of the adverse impacts of hazards and related disasters. The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions (UNISDR, 2012).

### **Vulnerability**

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Vulnerability varies significantly within a community and over time (UNISDR, 2012).

## **Chapter Two: Theoretical understanding of disasters**

Chapter two examines the theoretical understanding of disasters. The move in thinking from responding to disasters to DRR and later to CBDM will be assessed.

Natural and man-made hazards have been on a steady increase in the world today. Vulnerability to these hazards has also increased due to population growth, rising poverty, armed conflict and other underlying developmental issues (Schipper and Pelling, 2006). Until the 1970s, disasters were viewed mostly in scientific terms, i.e. relating to their natural characteristics (Hewitt, 1983) and ways of predicting and even stopping their occurrence were sought. However, social scientists theorised that hazards (especially natural ones) were not just physical events needing technological solutions, but a synthesis between human actions and natural occurrences. It was put forward that, while hazards are natural, disasters are not, and socio-economic factors were crucial in understanding the effects of natural hazards on human populations (ibid.).

### **The Emergence of DRR**

DRR, also known as mitigation, is the systematic development and application of policies, strategies and practices to minimize vulnerabilities, hazards and the unfolding of disaster impacts throughout a society, in the broad context of sustainable development (United Nations Development Programme, UNDP, 2004). The concept of risk reduction emerged due to the recognition of the possibility of preventing disaster, rather than only responding to it.

Historically, international and national concern and attention has tended to come after disaster events, rather than preparing for disasters (such as oil tanker fires in Kenya) before they occur. Whilst preparedness has been encouraged, intentional activities to reduce the impact of disasters have been comparatively rare. There has lately been a paradigm shift in development and donor communities' approaches. The progressive approach considers that both the hazard and people's vulnerability are the cause of disaster. Much more emphasis is now focused on DRR which tries to reduce vulnerability and thereby the risk of disasters as an integral part of poverty reduction. Since many people in rural Kenya (where many oil tanker fire disasters occur) are poor, they are very vulnerable to oil tanker fires due to the need to siphon oil and sell it for basic needs. Though there is as yet little concrete evidence of the cost benefit of DRR over post-disaster humanitarian aid, it has been estimated that

every \$1 spent on disaster reduction saves \$3 in terms of the reduced impact of disasters (Department for International Development, DFID, 2006).

The change in how the international community treated disasters started in the 1990s in the United Nations' International Decade of Natural Disaster Reduction (IDNDR). The United Nations and others embarked on a journey to find out ways in which the effects of natural disasters could be lessened using scientific means. This thinking took a turn in 1994 during the Yokohama Conference, which took place just after Japan's devastating Kobe earthquake, where the world realised that they needed to incorporate the socio-economic aspects in their treatment of disasters (Bollin and Hidajat, 2006). After this conference, a more holistic view of disaster management was put into practice, and ratified in Kobe, Japan in 2005 at the World Conference of Disaster Reduction. The Kobe conference produced the Hyogo Framework of Action (HFA), a 10 year strategy to reduce the impacts of disasters (Twigg, 2004).

According to the HFA, while natural hazards may not be prevented, human-induced hazards such as oil tanker spills and fires in Kenya can be prevented and stopped from becoming disasters. The HFA viewed DRR as the most efficient way to reduce the impacts of hazards and saw the need to integrate DRR within the development context (McEntire, 2004). As Anderson (1995) states, if countries like Kenya are to mitigate disasters such as oil tanker fire disasters, they must be able to assess and identify vulnerabilities in order to design timely, affordable and effective strategies for reducing the negative effects of disasters. The success of the risk reduction approach depends on the development of accurate risk assessment. Risk assessment is in turn dependent on the application of suitable research and monitoring tools that can sense when risks are changing, in relation to what and for whom (Collins, 2009: 42).

UNDP (2004) advocates for the adoption of the DRR approach to all phases of disaster management and associated activities. It views disasters as an opportunity for risk reduction and development. DRR is deemed important as it would help reduce the exposure of society to the damaging effects of hazards. In the long term, it also helps use of scarce resources for development needs of the poor and vulnerable. According to UNISDR (2012), DRR is a conceptual framework of elements that would help minimize vulnerabilities and disaster risks throughout a society, avoid (prevention) or limit (mitigation and preparedness) the adverse impacts of hazards.

As Maskrey (1989: 2-3) states, disasters are characteristics not of hazards, but of socio-economic and political structures and processes. Vulnerability is consequent not on



hazard but on particular social, economic and political processes. Disaster is an extreme situation which results from these processes. This political economy approach provides an analysis capable of addressing social process, organisation and change. Research shows that large numbers of people on the social and territorial periphery of the global economic and political system are disabled by unequal economic relationships which do not allow them access to the basic resources, such as land, food and shelter, necessary to stay alive. These groups of people often suffer disaster. Vulnerable conditions are far more prevalent in the Third World than in the First World. If the origins and causes of vulnerability lie in social and economic and political forces beyond people's control, then any attempt at reducing vulnerability must involve empowering people, if it is to be effective (ibid.).

Blaikie et al. (1994) have come up with the Pressure and Release (PAR) model to help in understanding the relationship between disaster occurrence and people's vulnerability to hazards. As the model illustrates, a disaster occurs when two opposing forces meet, with processes generating vulnerability on one side, and physical exposure to a hazard on the other.

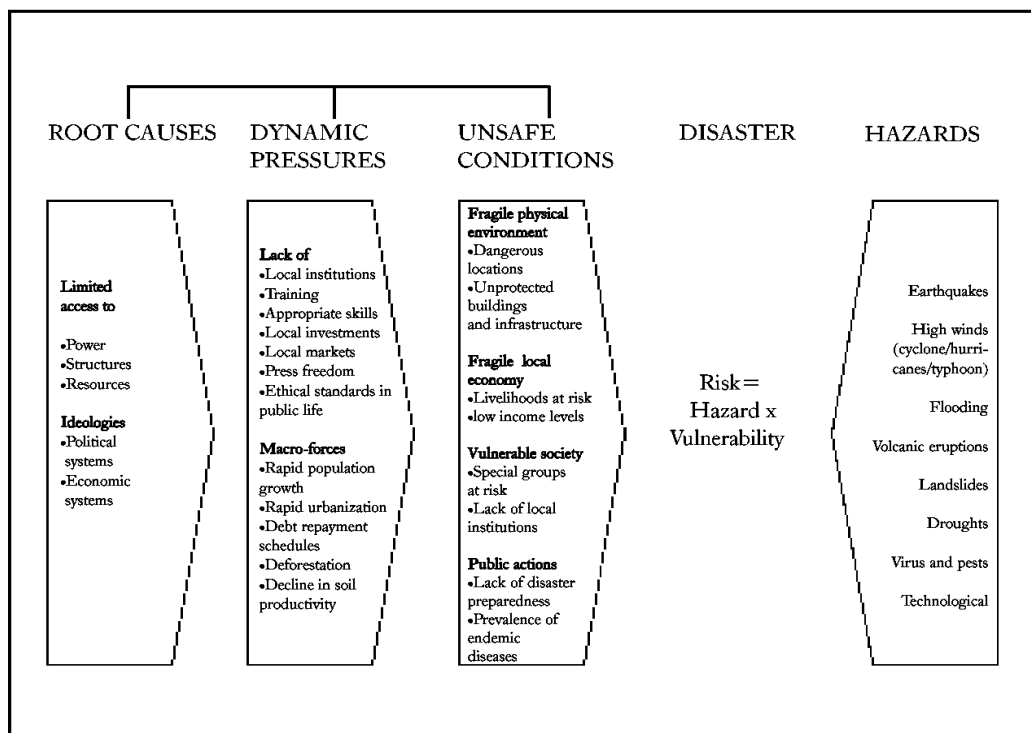


Figure 4: PAR model. Source: Blaikie et al., 1994

Using the above model, we can conclude that lack of access to adequate structures, living and being in dangerous locations, low income levels and lack of disaster preparedness contribute to people being vulnerable to oil tanker fire disasters in Kenya.

The HFA places DRR firmly at the centre of development activities as disasters are having a negative impact on attaining the Millennium Development Goals (MDGs), and this recognition provides further incentives for adopting a more holistic approach to development and disasters. Advances made in past poverty reduction programmes can be reversed by the impact of known hazards if there is no proper DRR planning & management. Therefore it is now imperative for all countries, especially Kenya, and drivers of development programmes to re-think their development approaches in terms of DRR (Practical Action Southern Africa, 2011). With the shifting of paradigms from reactive emergency management to DRR, there is more stress on proactive pre-disaster interventions, which are usually categorized as prevention, mitigation, and preparedness (UNISDR, 2012).

The next section analyses the disaster management cycle and how well the Kenyan government has used this in dealing with oil tanker fire disasters.



**Figure 5: The Disaster Management Cycle (Warfield, 2005)**

As Warfield (2005) states, disaster management aims to reduce or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The Disaster management cycle has four phases namely; preparedness, response, recovery and mitigation. The four phases do not always occur in isolation or in any precise order as they often overlap and the length of each phase

greatly depends on the severity of the disaster. Disaster management is therefore an ongoing process by which different stakeholders reduce the impact of disasters by planning for them, reacting during and immediately following a disaster, and taking steps to recover after a disaster has occurred (ibid.).

Although all phases in the disaster management cycle need to be taken seriously to result in greater preparedness, better warnings, reduced vulnerability and the prevention of disasters next time round, this does not seem to have been the case in relation to oil tanker fire disasters in Kenya. The response phase seems to be the preferred phase in dealing with these disasters. This is because lessons from previous oil tanker fire disasters have not been learned and used to prepare for future disasters. The complete disaster management cycle includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure. This does not seem to be the case in relation to oil tanker fire disasters in Kenya.

The mitigation and preparedness phases take place before a disaster occurs. This is where the required changes are made in anticipation of a disaster event. Developmental considerations play a key role in contributing to the mitigation and preparation of a community to effectively confront a disaster. There is a greater need for effective oil tanker fire DRR in Kenya today. This is because over the past few years, there has been a substantial increase in these fire disasters, the number of people affected by them and the subsequent economic losses. This can be attributed to socio-economic changes, poor governance and poverty. Response and recovery phases take place when a disaster occurs and different actors such as humanitarian organizations become involved.

## **Mitigation**

Mitigation activities reduce the effects of unavoidable disasters or eliminate the probability of disaster occurrence. Mitigation measures include public education, building codes, using building regulations and safety codes, and vulnerability analysis updates. For mitigation to be successful, appropriate measures need to be incorporated into national and regional development planning. This includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure. Availability of information on hazards, emergency risks and the countermeasures to be taken is also crucial if mitigation is to be effective (Ibid.). My

research seemed to conclude that mitigation of oil tanker fire disasters in Kenya seems a long way to becoming a reality unless CBDM approaches are introduced.

### **Preparedness**

According to Warfield (ibid.), emergency preparedness programs are intended to help individuals, governments and organizations achieve a satisfactory level of readiness to respond to any emergency situation. This can be done through strengthening the technical and managerial capacity of governments, organizations, and communities and can be implemented by having response mechanisms and procedures, rehearsals, developing long-term and short-term strategies, public education and building early warning systems. Preparedness can also take the form of ensuring that strategic reserves of food, equipment, water, medicines and other essentials are maintained in cases of national or local catastrophes.

During the preparedness phase, governments, organizations, and individuals develop plans to save lives, minimize disaster damage, and enhance disaster response operations. Preparedness measures include preparedness plans such as evacuation plans, warning systems, emergency communications systems, resource inventories and public information and education. As with mitigations efforts, preparedness actions depend on the incorporation of appropriate measures in national and regional development plans and on accurate information on disasters and its use by all actors involved (ibid.). Preparing for oil tanker fire disasters in Kenya is poor and those responsible seem to always be caught unawares when these fire disasters occur.

### **Response**

Emergency response is aimed at providing immediate assistance to preserve life and improve the health condition of the affected people. This may range from providing food, medicine, temporary shelter, transport to those affected by a disaster and repairs to damaged infrastructure. The focus in the response phase is on meeting the basic needs of the people until more permanent and sustainable solutions can be found. Humanitarian organizations are often strongly present in this phase of the disaster management cycle. Experienced leaders, trained personnel, adequate transport and logistic support, appropriate communications, and guidelines for working in emergencies are required for effective response (ibid.). The initial response to oil tanker fires by the emergency services in Kenya is inadequate and always leads to fire disasters that could have been prevented.

## **Recovery**

After the emergency period has ended, the affected population can start restoring their lives and vital infrastructure. There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. There will be many opportunities during the recovery period to enhance prevention and increase preparedness, thus reducing vulnerability. Ideally, there should be a smooth transition from recovery to on-going development. Recovery activities continue until all systems return to normal or better. Recovery measures include returning vital life-support systems such as health, temporary housing, reconstruction and education to minimum operating standards (Ibid.).

After the occurrence of oil tanker fire disasters in Kenya, the recovery phase mainly puts emphasis on helping families of the dead to bury their relatives and ensuring that those injured are treated in hospital. Not much is done to reduce the vulnerability of those affected by the disaster through livelihoods which would provide basic needs for them and reduce the likelihood of them risking their lives to siphon oil from overturned tankers.

## **Dealing with oil tanker fire disasters in Kenya**

As we saw earlier, the four phases in disaster management are to be followed to successfully deal with any kind of disaster. However, when it comes to oil tanker fire disasters in Kenya, the top down approach has been employed and puts emphasis on the response phase as the preferred way of dealing with the disasters. In addition, even the response to oil tanker fire disasters is inadequate. There seems to be a lack of preparedness in dealing with oil tanker fire disasters in Kenya. The main ways that such disasters have been dealt with in the past range from politicians visiting the scenes of the disasters, calls for foreign aid, a declaration of days of mourning, the blame game, promises to take action, and finally, business as usual. After the Sachangw'an oil tanker fire disaster, while visiting victims in hospital, even Raila Odinga, Kenya's Prime Minister admitted that 'there was no response by any disaster team because there is no such team.' (tvnz, 2009).

This top-down approach, as Maskrey (1989: 87) notes, does little to reduce the level of vulnerability faced by the poor majority, such as those affected by oil tanker fire disasters in Kenya. Instead it has often served the interests of rich and powerful groups and even led to the political promotion of individuals, who, after an oil tanker fire disaster occurs, will arrive at the scene and donate food, clothing and medical supplies to the injured and relatives of the dead and blame other politicians for the disaster in order to appease the people and be

assured of votes come next election time. For these politicians and government officials, disaster management is motivated more by political and economic self-interest than by humanitarian motives.

The top-down approach is characterized by inefficiency because it is centrally controlled, planned and implemented, unable to take into account the variability of local needs and conditions and fails to meet its goals and targets in many cases. The ineffectiveness of top down mitigation programmes in Kenya can be attributed to the failure to recognize and work through CBOs. This makes it impossible to tap the biggest resource available for disaster mitigation, people themselves and their organizations, with their own intimate knowledge of local conditions and culture. Implementing DRR programmes becomes impossible because authority is not vested in people themselves, their leaders and organizations. Without the participation of CBOs in the design and organization of training programmes, these can fall into a social vacuum (Ibid: 76-78).

The Kenyan government and other organizations have clearly failed Kenyans in dealing with oil tanker fire disasters. Since it is the poor people that suffer the consequences of oil tanker fire disasters, CBDM approaches seem like the next best way to successfully deal with these disasters.

Changing the focus from response to emphasis on preparedness and mitigation strategies has sometimes worked effectively in some types of disasters in Kenya, such as droughts. Hazard and vulnerability analysis has been used to empower people to make informed choices which reduce the risks to which their assets and livelihoods are exposed. For example, being aware of the likely impacts of future droughts, farmers have been able to make informed decisions as to the number and type of livestock to keep, what crops to grow, and to plan appropriate strategies to reduce their losses and protect their livelihood systems (Practical Action, 2011: 17). This approach needs to be used in mitigating oil tanker fire disasters.

### **The emergence of community based disaster risk reduction (CBDRR)**

Disaster management practice in the past predominantly employed a top-down strategy. There was an assumption that risk constitutes simple exposure to natural hazards. However, organizations working with poor communities observed that apart from the occurrence of hazards and people's proximity and exposure to them, people also suffered because of prevailing socio-economic and political conditions that made them vulnerable to

hazards. They realized that natural hazards were often inevitable but disasters were not. This insight led to an emphasis on detailed analysis of their situation by communities at risk, which led to the formal development of an approach now known as CBDRR. Practice of CBDRR emerged in the 1970s and was eventually formalized and widely promoted in the 1980s through the creation of national and international networks of NGOs and civil society organizations involved in grassroots activities (Wisner, Gaillard and Kelman, 2012: 713).

The main aim of CBDM is to minimize human suffering, reduce vulnerabilities and increase capacities of vulnerable groups and communities to cope with, prevent or minimize loss and damage to life, property and the environment. Through CBDM, vulnerable groups and communities in Kenya can be transformed to disaster resilient communities, which can withstand and recover from stresses and shocks caused by oil tanker fires. Before communities can be mobilized for disaster mitigation, they first have to get organized.

### **CBDRR practice**

CBDRR consists of self-developed, culturally and socially acceptable, economically and politically feasible ways of coping with and avoiding crises related to hazards (Maskrey, 1989). It enhances local resources and provides access to outside resources and technical means for dealing with disaster risk without perpetuating a cycle of dependency. According to Wisner, Gaillard and Kelman (2012: 714), CBDRR relies on three crucial principles: people's participation and empowerment, development-oriented activities and a multi-stakeholder approach.

For CBDRR to be successful in mitigating oil tanker fire disasters in Kenya, people in the community must be empowered and allowed to participate in activities that aim to reduce the fire disasters. In practice, community-based activities must put the needs of everyone in the community into consideration and must not have a bias or favour one group over another within a community, be it the local elite who may want to protect themselves or the poor and most vulnerable. This can be done by community organizations winning the support of the less vulnerable in order to help the poorest by integrating DRR with development activities that benefit all. People also need to be empowered through education and awareness programmes that deal with their level of exposure to oil tanker fire hazards. This empowerment should lead to ownership of activities, processes and outcomes. In essence, the intention of CBDRR should not be merely projects and programmes that are located in a community, but risk reduction measures that are managed by the people themselves in a community. The process may have been facilitated by outside agencies, but the local people

are the prime movers in reducing disaster risk in their community (ibid.: 715).

Beyond people's participation, CBDRR generally takes place in the context of development-oriented actions. In this respect, interventions do not simply seek relief from disasters, neither do actions merely pursue a vicious cycle of restoration of normal conditions present before disasters. These pre-existing socio-economic and political conditions produce the vulnerability that forms part of the equation that results in disasters (such as oil tanker fire disasters in Kenya) in the first place (Wisner et al., 2004). CBDRR aims to address the root causes of vulnerabilities and increase the communities' capacities. The short and medium-term goal is to minimize human, property and environmental losses, limit social and economic disruption and enjoy the benefits of a secure and safe environment. For this purpose, development is considered both a means and an end. By the government providing basic services like water supply, health care and education to communities, this contributes to improving people's everyday life while reducing their vulnerability in facing hazards. CBDRR in Kenya should also strengthen people's livelihoods and make them more sustainable, resistant and diverse, to avoid the temptation of siphoning oil to meet basic needs (Wisner, Gaillard and Kelman, 2012: 716).

Implementation of community based oil tanker fire DRR in Kenya requires a multi-stakeholder approach to succeed. This requires the support of local and national governments. Since local government often provides basic services to communities and primary assistance in time of disaster, it is crucial that local authorities are involved in both the assessment of the vulnerabilities and needs of communities. In addition, a directive approach from the top by government is necessary to enforce laws and regulations that protect the natural environment, promote public health and oppose discriminatory practices – without which people's vulnerability to hazards usually increases. Decision and policy makers should welcome the CBDRR successes and provide support mechanisms to scale up, such as investing in the communities' social resources, local DRR planning (such as having local fire officers in Kenya), appropriate management structures, and implementation and co-ordination mechanisms (ibid.). One Kenyan law (already in place) that the government will have to enforce will be arresting people who siphon oil or who steal goods from vehicles involved in accidents as this is an unlawful offence in the country. At the moment this practice goes on unabated and contributes to oil tanker fire disasters. CBOs and NGOs in Kenya need to create awareness among communities all over the country on the need to obey the law and not siphon oil.



## **Issues and challenges in CBDRR**

CBDRR has some limitations that have to be addressed. First, some CBDRR initiatives fall short of the ideal as they are simply located in a community, but the process and outcomes are not owned by the community. If mitigating oil tanker fire disasters in Kenya is to be successful, the CBDRR approaches must be initiated and owned by the local communities themselves. There are also challenges related to funding and sustainability. Many CBDRR initiatives depend on external funding, which in many cases is short-term, yet CBDRR often requires more time than the usual project cycle to succeed.

On human resources, there is a danger that CBDRR projects are too dependent on external facilitators' expertise. NGO workers who implement the projects often fail to adequately empower members of the community with skills and resources which would enable them to ensure the sustainability of CBDRR plans and actions on their own. It also takes a tremendous effort for mitigation and preparedness actions to be fully integrated in the daily lives of the people who are responsible for protecting themselves and ensuring their community's safety.

The other challenge is that participation and empowerment are concepts that are easier to promote than to implement. For people to take part in any undertaking that will advance their interests they need to understand entirely the disaster issues in order to participate fully and facilitating this process is a strenuous task for CBDRR facilitators. Community organization leaders may also change in accordance with political turnover, thus leading to difficulties in ensuring project sustainability (Wisner, Gaillard and Kelman, 2012: 720-21).

Accountability is also a crucial issue. Accountability in many DRR projects is still towards the donors, the source of the money. CBDRR designers and implementers sometimes fail to account to the communities whose plight they articulate in the proposals. Successful CBDRR of oil tanker fires in Kenya requires accountability to the communities on how much money is raised, how much goes to the project and how much goes to the facilitating agency. Responsible accounting is necessary and transparency is essential in all CBDRR operations (Twigg, 1999 – 2000).

Although there are challenges to CBDRR as mentioned earlier, these can and should be dealt with to make CBDRR more efficient.

## Chapter Three: Country Profile: Kenya

### Introduction

This chapter provides a profile of Kenya. The geographic and climatic conditions of the country are outlined, followed by the socio-economic conditions. Finally, an overview of disasters in Kenya is discussed.



Figure 6: A map of Kenya. Source: Google images

### 3.1 Geography and climate

Kenya is located in East Africa and has a total area of 580, 367 square kilometers. It has a coastline totalling 536 kilometres and borders Ethiopia, Somalia, South Sudan, Tanzania and Uganda. It also borders the Indian Ocean between Somalia and Tanzania. The climate varies from tropical along the coast to arid in the North East of the country. The terrain is also varied and comprises low plain rises to central highlands divided by the Great Rift Valley. The country is grouped into geographical zones that include 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 country has a population of around 44 million people (Central Intelligence Agency, 2012).

The climate varies depending on the region, but it's generally sunny, dry and not too

hot for most of the year in Kenya despite being situated on the equator. The main rainy seasons are from March to May and November to December but the amount of rainfall varies year to year (goafrica, 2012).

### **3.2 Socio-economic conditions**

Disasters should not be seen on their own. Poverty plays a huge part here, as the poorer the people are, the less resilient to hazards they will be. It is necessary to understand the current socio-economic conditions which make people in Kenya more vulnerable to hazards such as oil spills than they otherwise would.

Kenya is classified as a low-income country with a Gross Domestic Product (GDP) per capita of \$1,808 (ranked 35<sup>th</sup> out of 182 countries in the world). The country had a GDP growth of 5% in 2011. However this does not mean a reduction in poverty as the growth does not trickle down to the poor. The country also has a huge public debt, 48.9% of GDP in 2011 (World Bank 2012). The Human Development Report for Kenya states that the country has 19.7% of the total population living below \$1.25 PPP per day (UNDP, 2012) and almost 40% living on less than \$2 a day (ibid.). Population growth was 2.6% in 2009 and the life expectancy is 57 years. Unemployment rates in Kenya were 40% in 2009.

Kenya is the regional hub for trade and finance in East Africa but has been hampered by corruption and by reliance upon several primary goods whose prices have remained low. Corruption and lack of fiscal reform led to the IMF suspending Kenya's Enhanced Structural Adjustment Program in 1997. A severe drought compounded Kenya's problems, causing water and energy rationing and reducing agricultural output between 1999 and 2000. A new opposition government took over in December 2002, ending Daniel Arap Moi's 24-year-old reign. The country then faced huge economic problems and the new government made some early progress in rooting out corruption and encouraging donor support. However, the government was rocked by high-level corruption scandals in 2005 and 2006 which led to the IMF delaying loans in 2006 pending action by the government on corruption. The international financial institutions and donors have since resumed lending, despite little action on the government's part to deal with corruption. Post-election violence in early 2008, coupled with the effects of the global financial crisis on remittance and exports, reduced GDP growth to 2.2% in 2008, down from 7% the previous year (goafrica, 2012).

### **3.3 Overview of disasters in Kenya**

According to the NPDMK (2009: 9), Kenya is disaster prone, with the most common disasters experienced triggered by hydro-meteorological, seismic and environmental processes leading to hazards such as floods, droughts, landslides, lightning and earthquakes. Poorly managed agricultural and environmental practices including overgrazing, deforestation, irrigation and mining of natural resources have left fragile eco-systems even more vulnerable. Climate change is exacerbating these hazards, increasing their variability and scale of impact. Human induced disasters such as transportation accidents, fires (such as oil tanker fire disasters, wild fires, building fires, supermarket fires, slum fires and dormitory fires), civil unrest and conflicts, terrorism and industrial accidents are also frequent. Kenya is also at risk to outbreaks of diseases. In addition to periodic or seasonal outbreaks of endemic diseases such as cholera, malaria, meningitis and typhoid, Human Immuno-Deficiency Virus/Acquired Immuno Deficiency Syndrome (HIV/AIDS) has remained at national crisis levels since shortly after its 1999 emergence. With regional and global transportation hubs in both Mombasa and Nairobi, the vibrant tourism, international business and humanitarian organisations headquartered there, Kenya is particularly vulnerable to growing global threats caused by other pandemics including Avian Flu and H1N1 virus (ibid.).

Poverty, explosive population growth and rural migration to urban areas in Kenya have increased vulnerability and put communities at greater risk from disaster and jeopardised development goals. Poverty reduces the ability of a community to be self-sustaining; disasters erode assets and undermine the resilience of social economic systems. Disaster management is therefore a vital component of the societal efforts towards improvement of its livelihoods. The increasing frequencies, complexity, scope and severity of destruction left in the wake of disasters (especially oil tanker fire disasters) have resulted in more serious consequences. Concerted efforts towards the prevention of these disasters and implementation of measures to address their impact on communities are crucial for stability and development (ibid.).

In spite of all the efforts towards disaster management from the Government of Kenya, approaches are still top-down, with authorities like the National Environmental Management Authority (NEMA) and the Police Force enforcing rules and meting out penalties against those seen to have violated rules in relation to hazards. The focus is also still on post disaster response. The declaration of a disaster in Kenya still comes from central government, yet communities are the ones that are at the front line, suffering the immediate

impacts of disasters. Ideally the disaster declaration process should be bottom-up whereby an empowered community leadership informs district authorities who in turn pass information through the provincial to national authorities.

## **Chapter Four: research findings - causes and current Response to oil tanker fire disasters in Kenya**

### **Introduction**

This chapter assesses the causes of oil tanker fire disasters in Kenya and the response by the emergency services. Findings from focus group discussions, semi-structured questionnaires and interviews with different people (victims, relatives of victims, representatives of the emergency services and NGOs) are used here.

The findings from data collected from the 20 questionnaires that were handed out revealed that 100 % of the respondents had been affected in one way or another by oil tanker fire disasters. 85% of the respondents revealed that they had been involved in siphoning oil from tankers involved in road accidents and 60% had witnessed an oil tanker fire disaster.

### **4.1 Causes of oil tanker fire disasters in Kenya**

Oil tanker fire disasters in Kenya can be attributed to a number of reasons. The first is the slow, poor and inadequate response by the emergency services (the police, fire fighters and ambulance crew). Secondly, ignorance on the part of local people plays a big role in the fire disasters. Poverty and poor road infrastructure also contribute to the disasters. The causes are discussed in detail below.

#### **(i). Poor response from emergency services**

##### **(a) The fire brigade**

100% of the questionnaire respondents felt that there was a poor response from the emergency services, including the fire brigade, as they always arrived at the scenes of oil tanker accidents too late to prevent fires from breaking out and killing many people. Although I could not find statistics on frequency of late arrivals, this is well documented in different news stories related to different oil tanker fire disasters. For example, it is said that the fire brigade responded to the 2009 Sachangw'an oil tanker fire disaster an hour and a half after the fire had started (Opalo, 2009). Oloo (2010) also states that after an oil tanker fire broke out at Ugunja trading centre in Ugenya District, a fire engine from Kisumu, 73 kilometres away, arrived at the scene an hour later and managed to put out the fire in 20 minutes.

The general inefficiency of fire fighters in Kenya is also documented in many places

such as in a short documentary titled ‘If You Live In Kenya Never Call The Fire Department’ (Masterkc, 2011) where fire fighters could not put out a fire in a residential area due to insufficient water. They called for backup from another fire department, which arrived at the scene, but their fire engine caught fire and the army had to be called to put out the fire, both in the fire engine and in the residential houses.

According to Mkawale (2012), there are only 535 trained fire fighters in 26 major towns and only 30 operational fire engines across Kenya. There is also a lack of water hydrants as some have been vandalized while others have been blocked by illegally constructed buildings where the hydrants once stood. He also notes that fire stations are neglected as only 25% of the requested funds have been allocated for fire fighting equipment in Kenya in the 2012/2013 budget.

My interview with a senior fire officer who asked to remain anonymous revealed that in addition to arriving at the scene of the oil tanker accidents when fires have already started, the fire brigade officers are always ill equipped to adequately deal with the fires, as they will have insufficient water and inadequate firefighting equipment. This officer revealed that there are few fire engines available to respond to fires and that these are rarely serviced and so do not work when they are needed. In addition, fire fighting officers are mainly located in major towns and it takes them a long time to respond to oil tanker spills and fires that occur in remote areas far away from major towns. As we saw earlier, oil tanker fire disasters occur in many different locations all over Kenya. If we had local fire fighters trained and ready to respond to fires in villages all over Kenya, oil tanker fire disasters could be mitigated or even prevented.

There are also few adequately trained fire officers to deal with emergencies. Some fire fighters have been known to get to the scene of a fire and then struggle to operate the fire engine equipment, as the picture below shows. In addition to fire fighting personnel not being trained on how to use the fire fighting equipment, it is claimed that they have failed to conduct drills and ensure that their fire-fighting equipment is in working condition (Kaberia, 2012).



Figure 7: Fire fighters allegedly struggling to operate a new fire engine in Nairobi

Source: Kaberia, 2012.

### **(b) The police**

When oil tankers are involved in accidents, many times as in other kinds of disasters, the police do not respond as fast as they should. This is because many of the accidents occur in rural areas far away from police stations and so it takes the police a while to get to the scene. The oil that the tankers are carrying starts spilling. Sometimes this is accidental, but as my interview with a senior police officer who asked to remain anonymous revealed, sabotage is also to blame at other times. He blamed ‘some corrupt oil tanker drivers for selling some of the oil that they are transporting and intentionally causing the accidents to cover this up’ (interview, 2012). This often draws huge crowds that scramble to scoop the oil resulting in accidental fires and many deaths and injuries. In addition to arriving at the scene of the tanker accidents too late, the police often lack the capacity to deal with the accidents and huge crowds as when they get to the scene, they are normally not well coordinated. This leads to them being overwhelmed by the situation and the huge crowds at the scene.

The senior police officer (ibid.) confirmed this to be true and gave the reasons for police incompetence. First, he revealed that the police force does not have enough vehicles to respond to emergency situations. The few vehicles available are normally assigned to serve numerous police stations and are also not regularly serviced. Some are out of use due to mechanical problems. Furthermore, these vehicles are based in police posts located in town centres and so when an oil tanker emergency arises far from a town centre, it takes a while for a police vehicle to become available that could transport police officers to the scene of the oil tanker accident. As the senior police officer explained, after a vehicle becomes available, the police also face logistical problems such as inadequate fuel allocations for patrols and emergency response.



This means that sometimes a vehicle could be available but there is no fuel to get the vehicle to the scene of the oil tanker accident. By the time the police finally get to the scene of an emergency, they are normally too late to be of any assistance. The senior police officer (ibid.) gave an example by stating that:

Recently my station received a phone call to attend to an accident involving an oil tanker that had overturned 20 kilometers away and was spilling oil. My officers could not respond to this as quickly as they would have liked as the only vehicle available for use at the station had responded to a robbery incident and had to pursue the robbers for quite a long distance. By the time officers were finally dispatched to the scene an hour later, all the oil from the tanker had already been siphoned. It was by sheer luck that no fire broke out as it would have been a worse scenario.

The Police communication network is also poor. The senior police officer explained that the very high frequency (VHF) radios and telephones at police posts and stations are not always serviced and so communication during emergency situations is sometimes hampered. The number of police officers at police posts and station level is also small and so only few are able to respond to emergency situations and because of this, they are unable to deal with huge rowdy crowds at the scenes of oil tanker fires (ibid.).

The other reason for the police not responding effectively to oil tanker fire disasters is that, as the senior police officer explained, they do not get training in disaster management and therefore do not know what to do, or how to respond when they get to scenes of oil tanker accidents. He revealed that the police service has no trained personnel or experts to combat oil tanker fire disasters at station level (ibid.). The Police are also not insured against fire or their lives and hence not motivated in dealing with emergencies that may put their lives in danger. The senior police officer (ibid.) noted that:

In the past, some police officers have died when fires erupted while trying to move rowdy crowds from scenes of oil tanker accidents, such as in Sachangw'an where two police officers were burnt to death. This has demoralised police officers such that they are not willing to put their lives in danger when they get to the scene of oil tanker accidents.

The senior police officer told of a recent incident in Kisumu town (ntv, 2011) where police officers were forced to use live bullets to disperse crowds that were dangerously siphoning oil from an overturned oil tanker and ended up shooting two people. These views were confirmed in my interview with a local government official of Sachangw'an village (interview, 2012) who agreed that:

The police officers lack the capacity to deal with oil tanker fire disasters due to

unavailability of response vehicles, lack of disaster response training and lack of enough police officers to control rowdy crowds intending to siphon oil from overturned tankers.

### **(c) Ambulance crew**

The ambulances are mainly located in hospitals in major towns and take a while to respond to oil tanker fire emergencies that mostly occur in remote areas far away from towns. Air ambulances which could respond more quickly are not available. According to Musau (2011), the ministry of medical services in Kenya does not have a single operational air ambulance in the country. In addition, the assistant minister for medical services admitted recently in parliament that the only air ambulance his ministry had (donated by the German government) was redeployed to the ministry of internal security for use by the police (ibid.). With this kind of situation, it becomes impossible for ambulance crew to provide the necessary emergency services needed to mitigate oil tanker fire disasters in Kenya.

This lack of capacity combined with the slow and inadequate response to oil tanker accidents and spills turns them into disasters that could have been prevented. Although there seems to be a national policy on preventing disasters in Kenya, this does not seem to translate into practice. Hence, the same mistakes are repeated over and over again leading to loss of life and injuries.

### **(ii) Ignorance**

Findings from the questionnaire respondents revealed that 90% of respondents only became aware of the risks involved in siphoning oil once the fire killed many people in Sachangw'an village. Discussions with community focus groups for this dissertation also revealed that ignorance has also contributed hugely to the oil tanker fire disasters. People are unaware of the dangers of approaching and siphoning oil from overturned oil tankers. One young man claimed that 'some of the oil tanker fires have been started by people who approach the scenes of the leaking oil tankers while smoking cigarettes and then proceed to discard the burning butts at the scene, hence igniting the oil' (Focus group discussion, 2012).

Such people are ignorant of how dangerous oil spills are and require education and awareness on this. There also seems to be ignorance on the dangers of siphoning oil from overturned tankers as people are not aware that the heat generated by the engine or the

vehicle could start a fire. As one man in the focus group discussion (ibid.) put it:

I narrowly escaped death during the Sachangw'an fire disaster because I had travelled to a nearby town. We in the village are used to helping ourselves to anything from vehicles that always overturn in this area as it is a black spot. We had never had a problem doing this before, nor did we know the dangers involved in siphoning spilling oil from tankers, until the big fire disaster hit.

My research also revealed that people were ignorant of the law that says that it is against the law to siphon oil or take items from vehicles involved in accidents, which is a common practice in Kenya. According to the Kenyan law, Penal Code Chapter 63, it is an offence to siphon oil. The law states that it is a theft offence:

If the thing is stolen from any kind of vessel or vehicle or place of deposit used for the conveyance or custody of goods in transit from one place to another; If the thing is stolen from a vessel which is in distress or wrecked or stranded ( National Council for Law Reporting, 2009: 94).

However, this law does not seem to be enforced by the police and courts as people are never arrested and charged in court for siphoning oil. This has led to people assuming that it is okay to take items from vehicles involved in accidents or siphon oil from overturned tankers.

Many children have been among those injured or killed in the oil tanker fires mainly because ignorance and curiosity makes them rush to accident scenes to see what is happening. The children need to be educated on the need for avoiding oil tanker accident scenes.



**Figure 8: People siphoning oil at the scene of an overturned oil tanker**

**Source: Google images**

### **(iii). Poverty**

Poverty is another reason why people risk their lives to siphon oil from oil tankers when they are aware of the dangers involved in doing so. Some people are pushed to siphon oil for their own personal use or to sell it to get money to buy basic needs such as food. If people had safer livelihoods, they would not be so vulnerable as to indulge in dangerous acts to earn a living and survive. 100% of the questionnaire respondents felt that poverty was a major cause and that a livelihood programme could help deal with the poverty that makes people risk their lives to siphon oil despite the dangers involved.

One woman, a single mother in the focus group discussion told how ‘despite knowing the dangers of siphoning oil and having witnessed people die in the past while siphoning oil, I would still be tempted to siphon oil as I have six children to take care of single-handedly with no steady job or regular source of income’ (Focus group discussion, 2012). What this woman needs is a job that would help her provide for her family and reduce her vulnerability. A livelihood centred approach to mitigating these disasters is therefore necessary.

Due to the high unemployment figures in Kenya, many youths are tempted to siphon oil from tankers when they overturn. One young man in the focus group discussion told me that he was employed by another man to transport people and goods on a motorcycle and was paid a certain percentage of what he made on a daily basis. He revealed that he had siphoned oil in the past to power the motorcycle and earn some extra money for himself. ‘It is difficult to get a job here after school. Am lucky I have something to help me meet my basic needs but the wages are meagre, and the temptation to siphon oil from overturned tankers to increase my wages is high’ (ibid.).

After the Sachangw’an oil tanker fire disaster, while visiting victims in hospital, even Raila Odinga, Kenya’s Prime Minister blamed poverty for the fire disaster, stating that:

The image of poor Kenyans dying as they scrambled in the road for fuel under darkness on Saturday was an indictment of the state of the nation. Poverty is pushing our people into doing desperate things just to get through one more day (tvnz, 2009).



Figure 9: People at the scene of an oil tanker that later caught fire in Ugunja trading centre in Ugenya District. Source: Oloo, 2010.

#### **(iv). Poor road infrastructure**

40% of the questionnaire respondents felt that poorly maintained roads contributed to the oil tanker fire disasters. Many roads in Kenya are poorly maintained and this makes it easy for oil tankers to overturn or be involved in accidents. In some areas, there are also no road signs warning drivers of black spot areas, like Sachangw'an, located in Molo, near Nakuru. The senior police officer I interviewed also claimed that overloading of the oil tankers is another problem that is exacerbated by corrupt officials at oil depots, revenue authorities and weigh bridges who take bribes to allow overloaded tankers through the check points. This leads to destruction of roads and oil tanker accidents that eventually turn into disasters. According to the senior police officer, 'corruption in the oil transport sector is endemic and requires a lot of effort to stem it' (Interview, 2012).

The oil tanker drivers also drive for long distances and become exhausted as fuel depots are far from major towns. Some do not take enough rest due to pressure to deliver the oil as quickly as possible, leading to oil tanker accidents that turn into fire disasters. Kenya does not have an effective monitoring system that requires oil tanker drivers to drive for a certain maximum number of hours per day in order to make sure that they do not overwork themselves. Some of the accidents are also caused by careless drivers.

## **4.2 Current Response to oil tanker fire disasters in Kenya**

The current response seems to be a reactive post-disaster response instead of a proactive, pre-disaster preparedness and mitigation response. The Kenya Red Cross (2009: 14) tends to agree when it states that there is an ‘emphasis on response against prevention in DRR in Kenya’. It seems that many people still think of disasters as accidents or events which cannot be anticipated. This has resulted in a focus on responding to the immediate needs created by a disaster rather than preventing or reducing its effects. Lessons are normally not learned from previous disasters. Whenever we have oil tanker fire disasters in Kenya, the government always promises to put in place measures to prevent such disasters from happening again but after a while, things go back to normal and no effort is made to come up with risk management plans. As ‘The Standard’ newspaper correctly states, after horrific oil tanker fire disasters, the Kenyan government officials talk tough but with time, the country goes back to the usual way of doing things until the next disaster occurs (The Standard, 2011).

To next section assesses the response to oil tanker fire disasters in Kenya using a case study of the Sachangw’an oil tanker fire disaster.

### **A case study of the Sachangw’an oil tanker fire disaster**

Sachangw’an is a remote village in Molo, Kenya. It is classified as a notorious black spot (as many road accidents happen here) along the Nakuru-Eldoret road.



Figure 10: A map of Kenya showing the location of Sachangw’an village

Source: Google images

The area is a major oil tanker truck route for oil being transported to neighbouring countries like Uganda, Tanzania and Burundi. According to Obiria (2012), the road in the area is sharp and steep and requires drivers to slow down while driving through the spot. However, the many accidents that have occurred here have been attributed to over speeding and overtaking in the very delicate area. Many drivers do not adhere to the 30km speed limit and try to overtake near the foot of the Mukinyai slopes, which is very dangerous and is to be avoided. Truck drivers (including oil tanker drivers) are also known to illegally park their vehicles on the road, blocking the clear view of the stretch from both sides and affecting other drivers resulting in accidents.

The Sachangw'an fire disaster happened on 31st January 2009. It involved an oil tanker truck that was carrying 50,000 litres of petrol from Kenya Pipeline Nakuru depot to Juba, Southern Sudan. The tanker is said to have overturned, spilling its load. This attracted large crowds of people from the surrounding communities and villages who assembled at the scene, some with jerry cans and other plastic containers, and who proceeded to collect fuel that was spilling from the wreckage into a trench, while others stood by watching what was unfolding. Traffic police arrived at the scene to assess the accident and control the crowd (Kenya Red Cross, 2009: 10). As a young man in the focus group discussion revealed, 'traffic police officers arrived at the scene before the fire started and pleaded with people to leave the scene and stop siphoning the oil but people refused to listen to them' (focus group discussion, 2012).

It is reported that a big fire explosion occurred more than an hour after the accident had happened, while people were still scrambling for spilling oil, and consumed everything in its way. It is alleged that the cause of the fire was static electricity or someone who approached the tanker while smoking a cigarette and then discarded the butt at the scene hence igniting the oil and causing the explosion. A middle aged woman participating in the focus group discussion (ibid.) and who lost her husband in the fire disaster said that 'it took the fire fighters more than an hour to arrive at the scene of the raging fire and by the time they arrived, it was too late for my late husband and others.' As the nearest Molo town does not have any fire engines, fire fighters from Nakuru Municipal council, 70 kilometres away had to attend to the fire (Kenya Red Cross, 2009).



Figure 11: A picture of one of the carriages on fire at the disaster scene

Source: Google images



Figure 12: Firemen from the Nakuru Municipal Council douse the flames

Source: Mkawale, 2009





Figure 13: The wreckage of the oil truck  
Source: Google images

The effect of the fire disaster was too enormous in terms of death, injury, loss of property and in testing the effectiveness of the Kenyan emergency response system. More than 140 people died and at least 238 were injured (IFRC, 2009). 89 bodies were burnt beyond recognition and had to be buried in a mass grave near the scene of the disaster. Others died while being treated in hospital (ibid).

One middle aged man in the focus group discussions (2012) and who witnessed the disaster unfold claimed that the General Service Unit (GSU) personnel (one of the emergency response agencies in Kenya) arrived at the scene of the accident even before the fire started, but they were ill equipped, outnumbered and could not manage to control the rowdy crowd that had already gathered at the scene of the accident and siphoning oil from the tanker. The GSU had to call for back up from other response agencies that arrived too late, were equally ill equipped and not well coordinated to effectively prevent the full effects of the fire disaster. When the fire brigade finally arrived and put out the fire, many had already been burnt beyond recognition and many more badly injured. IFRC (2009) is in agreement with the middle aged man's statement above and state that there is a need for building the capacity of the emergency services in Kenya in order to perform better.



Figure 14: A hospital overwhelmed by the Sachangw'an fire disaster and victims being attended to on the floor of the hospital. Source: Reuters, 2009.

After the disaster, the Prime Minister, Raila Odinga visited the scene and victims of the blaze in hospital and decried the lack of disaster preparedness in the country (Reuters, 2009). Kenya's President, Mwai Kibaki, declared one week of national mourning and cut short a trip to the African Union (AU) summit in Ethiopia and returned to Kenya to attend to the situation. He also established a Fire Victims Fund to assist in payment of medical bills and offer humanitarian assistance to the victims of the tragedy. Calls were also made to government leaders to have in place a disaster management policy and its operational plan. No effort seems to have been made to look into the real causes of the disaster, the failings and how this could be avoided in future (sprogrammes, 2012).

An editorial in the 'Daily Nation' newspaper stated that 'the disaster once again exposed the level of disaster unpreparedness across the country. Watching top government officials making frantic efforts to get the injured to hospitals in Nakuru and Molo was a study in logistical deficiency.' (tvnz, 2009).



Figure 15: President Mwai Kibaki visiting a burnt victim of the Sachangw'an fire disaster in hospital. Source: Google images.



Figure 16: Kenya Red Cross Society personnel recovering bodies at the Sachangw'an fire disaster scene. Source: IFRC, 2009.

As Shaw and Okazaki (2004) argue, the most important time for learning from a disaster response is while the events are fresh in the minds of those affected and those involved in the response. An organized evaluation of what went well, what failed and gaps in the response must be conducted immediately after the disaster. From this information the disaster management approach can be strengthened to prepare for the next disaster. It seems that the Kenyan government and other agencies missed the chance of using this disaster to better prepare for future ones. Putting disaster lessons in place is a long process and involves many people and disaster managers in Kenya will need to be proactive, persistent and patient if they are to see that the changes needed are made.

It emerged from the focus group discussions (2012) that not all those killed and badly burned were siphoning oil from the overturned fuel tanker. Many were bystanders and spectators eager to see what was happening. One woman lost her 12 year old boy and another man had his 13 year old son badly burned and disabled for life, yet the two were only spectators. One young woman also lost her husband (the bread winner of the family) who went to the scene on the fateful day to see what had taken place. This calls for education and awareness among people about the need to evacuate scenes of oil tanker accidents and spills as there is always a high likelihood of a fire breaking out.

Although a Kenya National Disaster Response Plan (2008) has been drafted, this does not seem to translate into actions that would help in oil tanker fire DRR. Moreover when one reads the plan, it seems to deal with responding to disasters only, rather than preventing them. As UNISDR (2005) proposes, governments have the primary responsibility to protect their people and property from hazards by incorporating DRR in national policy, consistent with their capacities and the resources available to them. Kenya, like many other developing countries, is yet to implement effective national disaster management systems and this means that the country remains dependent on other organizations to provide assistance in times of disaster. The Kenya Red Cross, for example, responded to the Sachangwa'n disaster by evacuating the injured to hospitals and removing bodies to mortuaries.

The current response by the emergency services to oil tanker fire disasters in Kenya is inadequate and a better solution is needed. Alternative means of transporting oil through the Kenya pipeline has not solved the problem as more than 100 people died in an oil pipeline explosion in Mukuru Sinai slum in Nairobi that was blamed on people siphoning spilling fuel from a burst pipeline (American Broadcasting Company, 2011). CBDM approaches therefore seem like the best solution to oil tanker fire disasters in Kenya.

## **Chapter Five: Using CBDM approaches to address oil tanker fire disasters in Kenya**

Disaster mitigation using government and institutional interventions alone is insufficient because they pay little attention to addressing the community dynamics, perceptions or priorities (Gachigi, 2009). Therefore, as Blaikie et al. (1994) state, community based disaster preparedness is one of the most effective strategies that can be used for long term, sustainable DRR, such as that of oil tanker fire disasters in Kenya.

Oil tanker fire disasters occur in many areas in Kenya and it is the local population that is normally first at the scene before the emergency services arrive. It therefore makes sense to build the capacity of local communities, enhance their skills and traditional coping mechanisms to mitigate losses resulting from the oil tanker fire disasters. It is crucial to motivate individuals to understand their own disaster risk and to take action against such risk as it is the people at the community or village level who suffer its adverse effects (Shaw and Okazaki, 2004).

Evidence shows that community participation before, during, and after a disaster can greatly reduce the overall mortality as well as improve the use of resources (Hopkins et al., 2012). Community organization is the single most important factor in hazard mitigation and vulnerability reduction. Community based hazard mitigation is above all a gradual bottom-up process of changing the social, political and economic relationships between marginal groups and the state (Maskrey, 1989: 57). Communities in Kenya need to be prepared for oil tanker fire disasters as these can strike anywhere regardless of location and culture, and the communities (assisted by CBOs and local NGOs) are able to react immediately and stay long after outside agencies have come and gone (Gachigi, 2009: 10).

There are a number of CBDM approaches that can be used to mitigate the impact of oil tanker fire disasters in Kenya. This chapter will assess the use of local or community level emergency services; integrating oil tanker fire DRR in CBO and local NGOs development programmes to ensure sustainability; and finally, using a livelihood centered approach to DRR.

## **5.1 Using community level emergency services in oil tanker fire disaster preparedness and response**

In any country or community, the emergency services are the first external line of response in a disaster, following initial efforts by those affected by disaster. In poor countries such as Kenya, these fire fighters, police officers and paramedics are often operating in dangerous situations with minimal training and inadequate equipment (Fire Rescue Development Program, 2012). Local level emergency services, including fire fighters and disaster response volunteers, therefore have a great ability to reduce the impact of major disasters, as well as increase the general day-to-day safety and security of a community (Allen, 2006).

While national disaster planning is important, organizations at the community level need to be supported as they are the ones that actually provide help to affected populations to prepare and respond to emergencies. Since national planning is somewhat inadequate in mitigating oil tanker fire disasters in Kenya, effective planning at the community level can protect people and their property against oil tanker fire disasters. There is a need to update, train and implement disaster plans in local communities in order to effectively mitigate the effects of oil tanker fire disasters.

A quick and robust community response is the key to saving lives and property in oil tanker fires in Kenya. As a senior fire officer in Kenya concluded in our interview, ‘the emergency services in the country are mostly located in cities and towns and therefore fire fighters have to travel a long distance to respond to disasters in rural or remote areas. They also lack the capacity to successfully respond to oil tanker fires’ (Interview, 2012). However, improved capacity of local emergency services would mean that fewer everyday crises become disasters and that less lives are lost (Pelling and Wisner, 2008). If local emergency services in Kenya are prepared, they will be able to respond to oil tanker accidents and fires appropriately and only call in reinforcements and additional aid as and when deemed necessary to prevent massive loss of life and property.

Community level emergency services requires a collective response from a wide ranging number of partnerships and organizations for it to be efficient and effective (Twigg and Benson, 2007). As Anne Mumu, the project manager of OLCAP, an NGO working with local communities in Kenya, concluded in our interview, ‘several members of local communities in Kenya are interested in supporting oil tanker fire disaster preparedness and

activities in Kenya and CBOs and NGOs should take advantage of this' (Interview, 2012). Such people include the business sector, school teachers and school children, women and youth groups, public and private health services, first aid and volunteer groups, such as the national Red Cross and Red Crescent and religious groups such as churches and mosques.

The national Red Cross and Red Crescent Societies in Kenya run disaster mitigation activities that address the risks posed to communities. This is mainly done through a network of disaster response volunteers recruited from the local communities and who understand the context of their environment. However, my research could not find any evidence or information to suggest that the Kenya Red Cross was involved in oil tanker DRR. This is an area where they could help train people from local communities in Kenya as emergency officers, to work as volunteers, so that they can prepare for and respond to oil tanker accidents and fires to prevent them from escalating into disasters. This is because the organization already has an extensive presence at the community level and is probably in the best position to help communities both prepare for and respond to oil tanker fire disasters.

Fire management committees at village and ward levels need to be set up, in order to promote awareness of oil tanker fire hazards and to incorporate fire disaster management into community level plans and actions on the ground. Community development workers need to be trained in oil tanker fire DRR, livelihoods and vulnerability and Capacity Assessments (VCAs). This can be done by NGOs and disaster organizations such as Practical Action. The community development workers should conduct VCAs with community members and carry out DRR awareness raising campaigns throughout the country, and the data collected used in preparing ward-level disaster management plans, which will be essential in preparing Community Disaster Preparedness Plans. These plans could then be used in structuring government policies related to disaster management (Practical Action, 2011: 19).

Local communities in Kenya should be helped to develop plans based on the participatory appraisal of risks, strengths and vulnerabilities related to oil tanker fire hazards as this offers the best strategy to mitigate the disasters at the community level. Local fire risk reduction officers and community volunteers should be trained (with the help of NGOs and fire departments near communities) on effective oil tanker fire disaster response. This will empower people, help them build resilience and improve their ability to respond to and recover quickly from these disasters. Increasing resilience is thus the most powerful way to reduce vulnerability and recovery times and thus, limit secondary damage and avoid further human loss (IFRC, 2012).

As Anne Mumu stated in our interview, ‘NGOs and CBOs in Kenya could use groups that already exist in the community to support and develop community fire officers and disaster management officers’ (Interview, 2012). People are organized into different community groups in many parts of the country, such as women self help groups, youth groups, voluntary groups and faith based groups (Gachigi, 2009). Local volunteer fire brigades should be created from these groups and their capacity built to help them prepare for, cope and reduce vulnerability to oil tanker fire disasters. Disaster preparedness and response committees could also be developed and volunteers used to train people from every vulnerable community on evacuating scenes of oil tanker accidents, dangers of siphoning oil from overturned tankers, first aid, dealing with oil spills and basic search and rescue.

A gender conscious approach is necessary when implementing oil tanker CBDM in Kenya. Women should especially be involved in the planning, consultation and decision making process. Women participate actively in community social networking and can mobilize people on a large scale to address their most pressing needs. This kind of community organizing is essential for disaster preparedness and mitigation. Hence, their representation in the community task forces and disaster management committees is a must. Women’s experiences can also contribute to the process of assessing vulnerabilities and capacities and identifying measures that could strengthen their capacity (SEEDS, 2009:64).

International Federation of the Red Cross and Red Crescent Societies (2010) tend to agree when they call for a gender sensitive approach to DRR by arguing that while CBDM focuses on both men and women, greater emphasis should be placed on addressing the needs of women. This, they add, is because it is recognised that women more often than men carry additional disadvantages due to gender. These disadvantages can be amplified within some communities and cultures, especially when women are single, divorced, widowed or childless.

Although keeping away from the overturned tankers is the best solution to avoiding oil tanker fire deaths and injury, my research revealed that some poor people are willing to put their lives in danger in order to siphon oil and sell it for basic needs. It may therefore be unrealistic and difficult for community disaster volunteers to prevent people from siphoning oil once tankers overturn and start spilling oil. As we shall see later, a livelihood centered approach to DRR may be the best solution in this case. If people have jobs that enable them to acquire assets and meet their needs, they will not be tempted to put their lives at risk through siphoning oil.



NGOs working in the disaster sector in Kenya need to align their work with local disaster response personnel and organizations to improve links and mutual understanding of the work being done. As Practical Action Southern Africa (2011: 78-79) state, local plans and committees should also be linked to regional and national institutions, plans and policies. Training courses should be given by disaster planning institutions and NGOs to complement and extend specific technical assistance, and to enable CBOs to become more self-reliant in the face of future disasters. The training modules could be produced as manuals and audiovisuals, and could cover topics such as evacuation, dealing with oil tanker spills and fires, first aid etc.

Implementation of community based programmes requires coordination between CBOs and the municipalities or local government in order to negotiate with central government agencies for resources and machinery. Workshops could be held for local people, including school children, to encourage them to participate more actively in oil tanker DRR. Disaster mitigation courses could also be developed for students and radio programmes broadcast weekly, to help CBOs in the most affected areas in communicating with and educating the community about oil tanker fire disasters and the dangers of siphoning oil.

Participatory rural appraisal should be used to facilitate the generation of local community knowledge in solving oil tanker fire disasters (Chambers, 1997). Participatory mapping exercises, transect walks, seasonal calendars, activity profiles and daily routines, time lines, local oral histories, Venn diagrams, wealth ranking, matrices, inventories, profiling, folklore, songs and poetry, attitude surveys, survey of practice and belief, key informant, focus group and community interviews should be used to gather information on past oil tanker fire disasters, thus raising community awareness and perhaps providing pointers on how to mitigate them (Collins, 2009: 182-183).

Volunteers can form groups which will be available and very useful in times of preparing for and responding to oil tanker fire disasters. Improved training and equipment should be provided for local emergency services. The role CBOs and NGOs can play in increasing the involvement and strengthening the capacities of local emergency services in disaster preparedness, risk reduction and response is by creating a partnership with disaster response institutions such as Firefighters Without Borders who would train communities on various life saving disciplines and emergency preparedness principles. In addition to teaching people valuable skills, they can also teach them to be instructors so that they may go back to the community and provide training to others. Topics could include first aid, hazardous

materials, technical rescue, small engine/pump maintenance, fire fighting, containing oil spills and disaster preparedness. People in the community need to be trained as in almost all cases, it is the civilians who are tasked with treating the injured and sick before an ambulance or fire truck arrives on the scene (Firefighters Without Borders, 2012).

Volunteer emergency services should make people aware of the risk of oil tanker fire disasters through the use of early warning signs (such as church bells known by everyone in a certain location) that would be used to warn people to keep away from a certain area whenever there is an oil spill and a risk of a fire from a tanker. As Firefighters Without Borders (ibid.) states, preventing the fire from happening in the first place is a proactive approach for community safety. Some fire departments in Kenya do not have the resources to deal effectively with oil tanker fire emergencies, so a strong public education and fire prevention program is a key program that is needed to mitigate these fire disasters. As Anne Mumu stated in our interview (2012):

In addition to creating local emergency services, public education programs are essential in the villages in Kenya as you find that the nearest fire engine could be many miles away and services a very large area and some areas do not even have a fire engine.

It is critical that readiness in preventing and responding to oil tanker fire disasters be assessed regularly through a variety of approaches such as monthly emergency simulation drills. Risk maps can serve as useful tools for educating the community on the risks of oil tanker fire hazards and for identifying the appropriate preventive actions that can reduce the impact of this particular disaster. Risk maps can also be used for monitoring the high-risk areas, such as those close to major roads and highways used by oil tankers and black spots where oil tanker accidents and fires often occur (Hopkins et al., 2012).

For community emergency services to be effective in oil tanker fire disaster preparedness in Kenya, they require political will and support from the local and national government. Local leaders are aware of the devastation caused by oil tanker fire disasters in their locations such as loss of life, property and injury. They should therefore support the formation and use of local emergency services in their area. Gaining the support of local government is of paramount importance in ensuring ongoing support for development and DRR initiatives (Practical Action, 2011).

## **5.2 Integrating/Mainstreaming oil tanker fire DRR in CBOs and local NGOs development programmes and planning to ensure sustainability**

Since the late 1990s, there has been increasing recognition of the need to mainstream DRR into development. This has led to the adoption of related measures to reduce vulnerability and treat risk reduction as an integral part of the development process rather than as an end in itself. This shift in perspective from a previously widely entrenched view of disasters as unpredictable, unavoidable events to be dealt with by emergency specialists has, in part, reflected increasing understanding of disasters as unresolved problems of development (Maskrey, 1989).

As Practical Action (2011: 6) states, despite irrefutable evidence that mitigation activities can reduce the negative impacts of disasters, developing countries are reluctant to spend money to limit the impacts of an event that might only occur at some point in the future, if ever. Linking DRR approaches to development can overcome this issue. DRR and development cannot be separated. Disasters put development at risk and development without considering future disaster risks can aggravate disaster risks. Hazards such as oil tanker spills in Kenya turn into disasters where there is a low level of physical and social development. DRR should therefore be an integral part of development processes, to reduce potential losses and ensure that development gains are sustainable at the local, national and regional level. Mainstreaming oil tanker fire DRR into local and national development planning is therefore crucial (ibid.).

As oil tanker fire disasters in Kenya seem to be a huge problem, CBOs and local NGOs can help mitigate the problem by mainstreaming it into their development programmes. Since locally based NGOs and CBOs with a permanent presence in an area will have built up trust, confidence and friendship between local people and their leaders, they are able to mainstream oil tanker fire disaster mitigation into all development programmes that they carry out (Maskrey, 1989: 60). Some disaster NGOs and the Red Cross and Red Crescent National Societies (part of the national disaster response agency in Kenya) have effective links with communities which governments seldom achieve. They can therefore use these advantages to mobilize and facilitate communities to respond to and mitigate the effects of oil tanker fire disasters in Kenya.

When implementing health, education, livelihood, and other development programmes, CBOs and NGOs could educate and provide public awareness on oil tanker fire

DRR. This education and awareness could include the dangers of siphoning oil from or being in close proximity to overturned tankers, how to respond to oil tanker accidents and fires to prevent them from escalating into disasters, first aid administration and evacuating the scenes of oil tanker oil spills. This information can be spread through community meetings and CBOs local radio programmes.

CBO and local NGO development programmes must strive to integrate all phases of disaster and different development sectors (such as housing, agriculture, infrastructure etc) without losing the specificity of skills of the organisation. The integration of mitigation with other tasks which CBOs and NGOs face is key to ensuring that the stimulus provided by the disaster carries over into long term development activity, which can reduce vulnerability. The local residents must be made aware on how they could effectively participate in preparing for an oil tanker fire disaster, mitigate potential impacts of the disaster and the recovery process after the disaster, through education and public awareness programmes at the local community level. NGOs and CBOs should also conduct advocacy campaigns to press the Kenyan government, from local to national levels regarding policies and issues that affect the local safety of people in relation to oil tankers such as poor roads, overloading of oil tankers and lax laws related to siphoning of oil, that form a barrier to preventing oil tanker fire disasters.

Past oil tanker fire disasters have claimed the lives of many children and left others badly injured. The DRR training should also focus specifically on safety education for children to teach them on valuable skills in mitigating oil tanker fire disasters. This awareness program could be facilitated by local NGOs and CBOs in schools using disaster awareness days to explain the risk posed by overturned oil tankers. It could also be done in the after school clubs, in churches (Sunday school), in mosques or other religious places.

As Shiwaku et al. (2007) and Shiwaku and Shaw (2008) correctly point out, even though disaster and development education can help facilitate people to build awareness of contemporary threats and opportunities, it has been surprisingly absent in the curricula of most school education, save for optional tertiary level studies in Kenya. Disaster education arguably empowers people to address adversity. Meanwhile, the absence of education encourages vulnerability. By not understanding the underlying origins of many types of disasters, or best practice in avoidance, mitigation and response, future generations are put at more risk. Collins (2009: 181) tends to agree when he argues that whilst the education system is an excellent way to promote DRR, many people will only ever be engaged with the subject in the context of community life beyond formalized education systems. As Izadkhan

and Mahmood (2005) add, there is a need for the spread of initiatives in community based disaster reduction beyond schools.

Children are a powerful force of change and can be major players in creating awareness on DRR, such as that of oil tanker fires, in the community (SEEDS, 2010: 19). Organizations such as United Nations Children's Fund (UNICEF), UNISDR, UNDP, the Swedish International Development agency, Japan International Cooperation Agency and several NGOs are supporting disaster reduction campaigns in the context of schools (Brinceno, 2008). UNICEF and UNISDR also provide some basic learning materials for children, including a board game called 'Riskland'. One example of NGO activity in this field is that of Action Aid, which has managed a 'DRR through Schools' (DRRS) project in Nepal (Collins, 2009: 182). Local NGOs and CBOs in Kenya could approach Action Aid and request them to initiate a similar oil tanker fire DRR project in local communities' schools in Kenya.

As Maskrey (1989: 40) argues, instead of dealing only with the effects of hazards, mitigation must also address the underlying causes of vulnerability. In addition to physical measures such as reinforcing buildings or raising dykes, mitigation must become a developmental activity which focuses on factors such as land ownership, wealth distribution, rapid urbanization, and the destruction of natural resources and seeks to address the real causes of poverty and underdevelopment.

Changes in vulnerability are influenced by development. There is a need to understand the relationship between vulnerability and human needs, and how these can be addressed by building resilience to disaster. Using a disaster and development approach, it is appropriate to consider disaster not as 'natural' but as a function of development. A disaster is recognized as the consequence of there being insufficient development of a means to avoiding human crisis, or as an aspect of development itself having been the cause of the crisis. Disaster occurs through exposure to an adverse hazard with inadequate forms of protection. However, in as much as a disaster might be part of nature, the process of human development has not adapted sufficiently to avoid crisis (ibid.).

The vulnerability, resilience or wellbeing approaches to disaster reduction extend beyond a sole concern with being exposed to disastrous events, to people's socio-economic status, knowledge, attitudes, physical and mental wellbeing. It is argued that there are real development choices to be made in terms of disaster prevention, including the chance to shape human behavior (such as oil siphoning) and the institutions that govern. There are options to pursue a combined disaster reduction and sustainable development agenda, such

that those with this understanding gain the required optimism concerning what could be achieved (Collins, 2009:13-15).

Mitigating oil tanker fire disasters through CBDM approaches should evolve gradually over time both in scale and depth. It should start with a small area (especially where oil tanker fire disasters frequently occur and where people are very vulnerable) and then this can be gradually expanded into other parts of the country as CBOs and local NGOs built up knowledge of the areas they work in and problems they face.

Disaster can become an effective stimulus for development when mitigation is under the control of local community organizations. The strengthening of community organization, the development of alternative solutions to the disaster problem and the appropriation of technologies for mitigation enables CBOs to move gradually from small ad hoc measures to mitigate specific risks towards obtaining substantial commitments from the state to permanently reducing vulnerability (Maskrey, 1989: 61). Studies show the advantages of community based disaster mitigation over conventional top down programmes. As Gachigi (2009: 11) states, sustainable development can reduce vulnerability by addressing the root causes of disasters and the lack of access to economic and political tools.

### **5.3 A livelihood centered approach to DRR**

As we saw earlier, poverty is a major factor that pushes people to risk their lives in order to siphon oil in Kenya. A livelihood centered approach is therefore necessary in mitigating oil tanker fire disasters in Kenya. People need to be enabled to safely acquire physical and economic assets to reduce hazards and vulnerability to oil tanker fires. Community groups can be used by the vulnerable to mobilize savings and give credit to their members in micro-finance schemes. The credit can then be used to initiate small scale enterprises to enable poor people gain assets that will help reduce their vulnerability to future oil tanker fire disasters (ibid.).

According to Practical Action Southern Africa (2011), there is a shift in focus from tackling hazards to reducing socio-economic vulnerability, as past research shows that secure and sustainable livelihoods can reduce both poverty and susceptibility to disasters. To prevent or reduce the impact of oil tanker fire disasters in Kenya, vulnerability has to be reduced. This is because the links between disasters and poverty are clear. Poor people tend to be the worst affected because their capacity to cope with the impacts of hazards and recover from their effects are constrained by their lack of access to resources. They are vulnerable as they are often not well represented in decision-making and are therefore disenfranchised. Disasters are rarely one-off events, but more often the result of deep-rooted long-term failures of development. Poor people's vulnerability is exacerbated by being forced to live in insecure and fragile places, with minimal services and inadequate infrastructure (ibid.).

DRR of oil tanker fires is therefore not just about physical structures, but includes livelihood interventions. Safe livelihoods need to be provided to people in Kenya to prevent the need to engage in dangerous activities such as siphoning oil to sell it for basic needs. Development, disaster preparedness, and mitigation processes need to adopt a livelihood centered approach to disaster management. There is a need for community level activities which reduce the impact of particular hazards by increasing livelihood opportunities, increasing resilience, reducing vulnerability, while fostering preparedness to deal with the oil tanker fire hazard and its aftermath.

The level of vulnerability of an individual or community to a particular hazard is determined by how weak or strong their livelihoods are, what occupational activities they are engaged in, the range of assets they have access to for pursuing their livelihood strategy and

the strength and support of the social networks and institutions that they are part of or which have influence over them. Vulnerable people in Kenya need to be empowered to diversify their livelihoods in order to reduce their vulnerability (Roux, 2011). For example, small scale farmers need to have another source of income such as small businesses so that in case of rain failure and poor harvests, they are not left to suffer and do not become vulnerable to engaging in dangerous acts such as oil siphoning to make a living. The Resilience and Livelihoods (RAL) model identifies five groups of assets; financial, natural, social, human and physical, which are needed to reduce the vulnerability of a community. These assets are essential for improving access to resources, and for reducing vulnerability by acting as a 'buffer' between shocks and stresses, and people (Sanderson, 2009: 55-56).

Increased frequency and intensity of hazardous events (such as oil tanker fires) are overwhelming traditional coping strategies evolved over generations. Despite being aware of these changes, the poverty affecting communities and their lack of access to appropriate information and technologies has increased their exposure to disastrous events. Facilitating community based planning, which incorporates DRR and the promotion of appropriate technologies which strengthen and diversify livelihood options, provides opportunities to increase the resilience and reduce the poverty of resource poor communities (Practical Action, 2011).

The links between disasters and poverty are clear. All activities which strengthen livelihoods, increase resilience and reduce the vulnerability of resource poor people to hazards contribute to both risk and poverty reduction. Development and DRR are thus part of the same continuum and cannot be addressed in isolation. Mitigation should address the underlying causes of vulnerability; namely, poverty, lack of access to resources and underdevelopment. While there is no single formula for risk reduction for the poor, a livelihood centered approach to DRR should be a core component of all long-term sustainable development activities (ibid.).

Resource poor people are not passive victims waiting for disasters to strike. Through effective DRR, they can take action to protect themselves from the adverse impacts of hazards and so prevent oil tanker fire disasters. However, DRR must take a holistic approach to strengthen and protect livelihoods, as well as to manage disaster preparedness and humanitarian response. This is what Practical Action calls 'livelihoods centred disaster risk reduction' (ibid.).

Savings and credit Groups could provide capital to the poor to start small businesses that will enable people to earn a living and be discouraged from siphoning oil from tankers,



which puts their lives at risk. New income generating activities such as handicrafts, small livestock, growing vegetable and cash crops could be introduced as well. CBOs and local NGOs could approach relevant local government institutions and international NGOs for financial resources to implement the livelihood DRR plan. People could approach savings and credit institutions or build on local institutions (such as women's groups) as a basis for saving. Investment in education, especially functional literacy classes, is also important as it increases people's chances to develop their knowledge and skills in different fields, thereby creating new livelihood opportunities and reduced vulnerability for them.

People with disability (PWD) are especially vulnerable to disasters, both on account of impairment and poverty yet they are often ignored or excluded at all levels of disaster preparedness, mitigation and response. It is therefore required that the specific needs of the PWD be addressed by integrating them into the DRR process (SEEDS, 2009:68). The Kenyan government also needs to do more to assist the very vulnerable people in the country such as widows, orphans and the disabled to get livelihoods that can provide income and reduce vulnerability. Reducing vulnerability for this group of people will go a long way in mitigating oil tanker fire disasters in Kenya.

## **Chapter six: Recommendations and conclusion**

### **6.1 Recommendations**

The research highlighted issues that need to be dealt with or that need further research in order to mitigate oil tanker fire disasters in Kenya through CBDM approaches.

As we saw earlier, in Kenya it is the case that local people get to scenes of oil tanker accidents and fires before the external emergency services arrive. These local people need to be trained on emergency response to oil spills and fires, and awareness created about the dangers. People organize themselves into different community groups in many parts of Kenya, such as women self help groups, youth groups, voluntary groups and faith based groups. As my research revealed, those people interviewed are interested in supporting oil tanker fire disaster preparedness and activities in Kenya and, if this is the case wider within the country, CBOs and NGOs should take advantage of this. NGOs and CBOs in Kenya could use these groups that already exist in the community to support and develop community fire officers and disaster management officers, and their capacity built to help them prepare for, cope and reduce vulnerability to oil tanker fire disasters.

Disaster response organizations in Kenya, such as the national Red Cross and Red Crescent Societies, run disaster mitigation activities that address the risks posed to communities using a network of disaster response volunteers recruited from the local communities and who understand the context of their environment. These organizations could help train those interested people from local communities in Kenya as emergency officers, to work as volunteers, so that they can respond to oil tanker accidents and fires to prevent them from escalating into disasters. This is because the organizations already have an extensive presence at the community level and are probably in the best position to help communities both prepare for and respond to oil tanker fire disasters.

We saw earlier that many people in Kenya are ignorant of the law that states that it is an offense to siphon oil and the practice goes on unabated, as it is not enforced by the police and courts, as people are never arrested and charged in court for siphoning oil. This has led to people assuming that it is okay to take items from vehicles involved in accidents or siphon oil from overturned tankers. NGOs, CBOs and the local government need to educate Kenyans on the law that states that it is unlawful to siphon oil from tankers, whether the oil is spilling onto the ground or not. They need to be reminded that siphoning of oil could lead to their arrest and arraignment in court, and the police and courts need to enforce the law and

hopefully this will deter people from siphoning oil and putting their lives in danger.

Ignorance on the dangers of siphoning oil from tankers was also mentioned earlier as a possible cause of oil tanker fire disasters. Education and awareness programmes against the risks are needed across the country on this. Advertising campaigns using radio, television, newspapers, posters, community drama and even social media could be used to reach people with this message. National oil tanker fire disaster awareness days could also be used to create awareness, and schools could also educate pupils and students on the subject through avenues such as science clubs and oil tanker fire disaster awareness days. This is already practiced in other countries like India, where organisations such as SEEDS (2010), run DRR programmes such as a school safety initiative to protect school children and educate the local community on reducing risk. Kenya could learn from such initiatives to create awareness on oil tanker fire disasters.

From the research, it emerged that many people risked their lives to siphon oil as a kind of livelihood. If we are to mitigate oil tanker fire disasters in Kenya, there is a need to diversify the livelihood options of households so that they have other ways of earning a living other than siphoning oil from overturned tankers. The government and other organisations could also offer favourable financial credit schemes to the poor in Kenya to start small scale businesses or invest in other projects that will provide income to them.

Local communities could also use CBOs and NGOs to lobby the government and donors to support the mitigation of oil tanker fire disasters using CBDM approaches. The support could be financial or the creation of policies that favour CBDM, backed up, critically with practice: enabling the police and the emergency services with resources, such as adequate disaster response vehicles, fuel, and oil tanker DRR training for police officers, and sufficient ambulances and training for the ambulance service officials.

The short time available to carry out research meant that only a small location, Sachangw'an, where the worst oil tanker fire disaster in Kenya occurred, could be studied. If there was more time, more depth could have been achieved. Research on more case studies may be needed in other locations where oil tanker fire disasters have taken place to assess the mitigation of oil tanker fire disasters in Kenya through CBDM approaches.

Finally, there is a need to integrate and mainstream oil tanker fire DRR in CBOs and local NGOs development programmes and planning in Kenya to ensure sustainability in Kenya. This measure will reduce vulnerability and treat risk reduction as an integral part of the development process rather than as an end in itself.

## **6.2 Conclusion**

Oil tanker fire disasters in Kenya are a common occurrence and pose a real threat to the lives of many people. There are many causes of the fire disasters including lack of preparedness and poor response from the emergency services, which lack the capacity to deal with oil tanker accidents leading to fire disasters. The reality is that these oil tanker fire disasters can be mitigated and their impacts reduced.

Oil tanker disaster mitigation using government and institutional interventions alone has proved insufficient in Kenya. Therefore, community based disaster preparedness is one of the most effective strategies that can be used for long term, sustainable oil tanker DRR in the country. Oil tanker fire disasters occur in many areas in Kenya and it is the local population that is normally first to arrive at the scene before the emergency services. It therefore makes sense to build the capacity of local communities, enhance their skills and traditional coping mechanisms to mitigate losses resulting from the oil tanker fire disasters.

Using CBDM approaches to address oil tanker fire disasters in Kenya could offer a better solution. Approaches such as local level emergency services and integrating oil tanker fire DRR in local NGOs and CBOs development programmes should be considered. As we saw earlier, poor people are willing to put their lives at risk in order to siphon oil and sell it for basic needs. A livelihood centered approach to oil tanker DRR in Kenya is therefore necessary. If people have jobs that enable them to acquire assets and meet their daily needs, they will not be tempted to put their lives at risk through siphoning oil.

Community awareness campaign programmes on the dangers posed by overturned oil tankers and in siphoning oil will also need to be carried out throughout Kenya, using radio, television, newspapers, posters, community drama, social media, national awareness days and school DRR awareness programmes, could be used to reach people with this message.

Through CBDM, vulnerable groups and communities in Kenya can be transformed to disaster resilient communities, which can withstand and recover from stresses and shocks caused by oil tanker fire disasters.

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## Appendices

### Appendix A

#### **Semi-structured questionnaire for the household surveys**

1. Sex

Male            Female

2. Age

18 – 30    31 – 40            41 – 50            51 – 60            Over 60

3. Have you ever witnessed an oil tanker fire disaster?

Yes

No

If your answer was yes, please go to question 4

If your answer was no, please go to question 5

4. If your answer to question 3 was yes, what do you think caused the oil tanker fire disaster?

5. If your answer to question 3 was no, what do you think is the cause of oil tanker fire disasters in Kenya?

6. Have you ever siphoned oil from a tanker?

Yes

No

If your answer was yes, go to question 7

If your answer was no, go to question 10

7. If your answer to question 6 was yes, why did you siphon oil from the tanker?

8. Did you know the dangers of siphoning oil from a tanker?

Yes

No

9. How was the response of the emergency services? (Put a tick against all that apply)

Fast

Slow

Good

Bad

10. Do you know the dangers of being close to or siphoning oil from an oil tanker?

Yes

No

11. How is the response of the emergency services in dealing with oil tanker accidents and fires? (Put a tick against all that apply)

Fast

Slow

Good

Bad

12. Have you, your relatives or friends been directly or indirectly affected by oil tanker fire disasters?

Yes

No

13. What do you think you and your community can do to reduce the likelihood of oil tanker fire disasters happening again?

## **Appendix B**

### **A checklist of questions for focus group discussions**

1. Did you witness the Sachangw' an oil tanker fire disaster?
2. If you can remember, could you tell me what happened on the day of the disaster?
3. What do you think caused this disaster?
4. How was the response by the emergency services?
5. How did the disaster affect you?
6. How did the disaster affect the village?
7. What action do you think that the people in this village could have taken to avert the disaster?
8. What action has the village taken since the disaster to ensure that this does not happen again?
9. What community based disaster management approaches do you think you and your community can take to reduce the likelihood of an oil tanker fire disaster happening again?



## **Appendix C**

### **Interview guide for the senior police officer**

1. What do you think are the causes of oil tanker fire disasters in Kenya?
2. How is the response to oil tanker accidents and fires by the emergency services, including the police force?
3. The police have sometimes been accused of being slow to respond to oil tanker accidents and fires, which later turn into oil tanker fire disasters. Why do you think the police are sometimes slow to respond?
5. The police have sometimes been accused of being overwhelmed and not knowing what to do when they get to scenes of oil tanker accidents, like not being able to control the crowd. Why is this so?
6. Do police officers get training in disaster management issues, such as how to respond to oil spills?
7. Do police officers do any drills to prepare for emergencies like oil tanker fire disasters?
8. Do police officers get enough funding to help them adequately respond to oil tanker accidents and disasters?
9. How is the capacity of police officers in dealing with oil tanker accidents and fires, in terms of the required equipment or gear, vehicles and trained personnel?
8. What do you think the public and local communities can do to reduce oil tanker fire disasters in Kenya?
9. What do you think about community level or local emergency services where you have local/community people train as fire officers so that they can respond to oil tanker fires if and when the fire service personnel are late to arrive at the scene?

## **Appendix D**

### **Interview guide for the senior fire officer**

1. What do you think are the causes of oil tanker fire disasters in Kenya?
2. How has the response of the fire brigade to oil tanker fire disasters been?
3. The fire brigade have sometimes been accused of being slow to respond to oil tanker accidents and fires, which later turn into oil tanker fire disasters. Why do you think the fire brigade are sometimes slow to respond?
4. The fire brigade have sometimes been accused of being overwhelmed by fires when they get to scenes of oil tanker accidents and fire disasters? Why is this so?
5. Do you think that the fire brigade get the necessary training in disaster management issues, such as how to respond to oil spills and fires?
6. Do you think the fire brigade have the capacity to adequately deal with oil tanker fires in terms of the right equipment and gear?
7. What do you think the public and local communities can do to reduce oil tanker fire disasters in Kenya?
8. What are your views on mitigating oil tanker fire disasters using community level or local emergency services where you have local people train as fire officers so that they can respond to oil tanker fires and only call in back up from outside fire service personnel when it is required?

## **Appendix E**

### **Interview guide for the project manager of Organization of Local Communities Against Poverty (OLCAP)**

1. What do you think are the causes of oil tanker fire disasters in Kenya?
2. What can NGOs like OLCAP do to reduce the risk of these disasters happening again?
3. What is the role of NGOs in helping local communities to come up with ways of mitigating oil tanker fire disasters?
4. What do you think is the benefit of using community based approaches in mitigating oil tanker fire disasters in Kenya?
5. What community based approaches do you think can be used to mitigate oil tanker fire disasters in Kenya?
6. What is the role of the civil society in advocating for safe transportation of oil and other hazardous material?
7. What is the role of the civil society in lobbying the government on road construction and maintenance?

## **Appendix F**

### **Interview guide for the local government official for Sachangw'an**

1. Did you witness the Sachangw'an oil tanker fire disaster?
2. What do you think caused this disaster?
3. How was the response by the emergency services?
4. What loss did the village suffer?
5. How did the disaster affect the village?
6. What actions do you think the government could have taken to avert this disaster?
7. What action has the government and other organizations since taken to ensure that such a disaster does not happen in this area or anywhere else in Kenya again?
8. Do you think that this action has been adequate?
9. What community based disaster management approaches do you think you and your community can take to reduce the likelihood of oil tanker fire disasters happening again?