INFLUENCE OF RISK GOVERNANCE ON DISASTER RISK MANAGEMENT IN COMMUNITIES: THE KENYA RED CROSS SOCIETY

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DECLARATION

I declare that this thesis is my original work and has not been submitted elsewhere for examination, award of degree or publication. Where other people's work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi.

Signature …… Date ……

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L50/82113/2012

This thesis is submitted for examination with my approval as research supervisor

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DEDICATION

I dedicate my dissertation work to my family especially my mother, my sister and my brothers all of whom have never left my side and are very special and whose words of encouragement and push for tenacity ring in my ears.

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ABBREVIATIONS AND ACRONYMS

UNDP	United Nations Development Programme
ECIS	Commonwealth of Independent States
DRG	Disaster Risk Governance
DRM	Disaster Risk Management
KRCS	Kenya Red Cross Society
UNISDR	United Nations Office for Disaster Risk Reduction
SPSS	Statistical Program for Social Sciences
IRGC	International Risk Governance Council

ABSTRACT

This study sought to analyze the influence of risk governance on disaster risk management at Kenya Red Cross Society. Specific objectives were to examine the influence of stakeholders' involvement on disaster risk management at Kenya Red Cross Society, to explore the influence of risk assessment on disaster risk management at Kenya Red Cross Society, to investigate the influence of risk visualization on disaster risk management at Kenya Red Cross Society and to assess the influence of risk communication on disaster risk management at Kenya Red Cross Society This study used the descriptive survey design. The target population for this study was the Kenya Red Cross Society (KRCS) staff in which case, the employees in this organization were surveyed. Respondents were the members of KRCS national council. Non-probability sampling technique was used where purposive sampling was applied to select the respondents in the study. A sample of 102 respondents was selected through stratified random sampling where the strata were the various departments at Kenya Red Cross Society. In this regard, the six main departments (Administration, Human Resource, Finance, Corporate Planning, Operations and ICT) were the strata. Hence, 17 respondents were selected from each department. Primary data was collected using a questionnaire that was administered to the selected staffs at Kenya Red Cross Society through drop and pick method. Statistical Program for Social Sciences (SPSS) version 22 was used in data analysis. Quantitative data was analyzed through descriptive statistics of percentages, means, standard deviations and frequencies. Qualitative data was analysed through content analysis. In this regard, the researcher organized the qualitative data into themes in accordance to the study objectives. The study found that there is quite a high level of stakeholders' involvement in disaster risk management at KRCS. In particular, it is inferred that KRCS largely engage the general public, local authorities and community leaders in disaster risk management. It is also deduced that risk assessment affects disaster risk management to a great extent in the organization. This is mostly attributed to: single-risk assessments in KRCS that determine the likelihood and consequences from a particular hazard; conducting risk assessments on the vulnerability of different groups to a particular disaster as well as risk assessments on the consequences of a disaster event or hazard and the associated likelihood of its occurrence. Drawing from the study findings, the researcher recommends that KRCS should ensure that they conduct balanced assessment of epidemiological, environmental and socio-economic drivers of risk. This will greatly help in ensuring a complex and more informative risk assessment for improved disaster risk management.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

The concept of risk governance has evolved over the last decade. The United Nations Development Programme (UNDP) recognizes governance as a key unresolved issue in both the configuration and the reduction of disaster risk (UNDP, 2015). Risk governance has been used to describe the translation of the substance and core principles of governance to the context of risk and risk-related decision-making, where governance is understood to describe the multitude of actors and processes that lead to collective binding decisions (van Asselt & Renn, 2011).Other related concepts are disaster governance and disaster risk governance. Disaster governance arrangements are shaped by forces such as globalization, world-system dynamics, social inequality, and socio-demographic trends and nested within and influenced by overarching societal governance systems (Tierney, 2012).Disaster risk governance on the other hand refers to the way in which the public authorities, civil servants, media, private sector, and civil society coordinate at community, national and regional levels in order to manage and reduce disaster and climate related risks (UNDP, 2013).

With the aim of protecting development investments and ultimately building people's resilience, UNDP has recommended strengthening of disaster risk governance (DRG) for the past two decades a cornerstone to understand, reduce and manage risks especially in disaster risk management (DRM) projects. However, in their analysis of 916 UNDP country level projects between 2005 and 2012, there were variations in the adherence or implementation of DRG in different regions. The highest proportion of DRG projects was in Asia/Pacific (38%), followed by Latin America and the Caribbean [LAC] (27 percent), Africa (15%), Europe and Commonwealth of Independent States [ECIS] (12%) and Arab States (8%) (UNDP, 2015).

Similarly, the total project budgets and expenditures were analyzed for all projects with a significant DRG component. The regional breakdown of these budgets and expenditures followed a similar pattern to that of the number of DRG projects, with the highest proportion of budget and expenditure in Asia/Pacific (65% of budget and 64%of

expenditure), LAC (21% of both budget and expenditure), Africa (9% of both budget and expenditure), ECIS (3% of budget and 4% of expenditure) and Arab States (2% of both budget and expenditure) (UNDP, 2015).However, the variation in disaster risk management (DRM) effectiveness in the case of the UNDP assessed projects aforementioned was not established. There is also limited research in the Kenyan context projects examining the relationship between risk governance and DRM. As such, it is difficult to solidly describe how risk governance influences DRM in Kenya specifically due to the dearth of studies in this area. It is against this backdrop therefore, that this study seeks to examine influence of risk governance on disaster risk management focusing on the Kenya Red Cross Society (KRCS).

KRCS is a humanitarian relief organization created in 1965 through an Act of Parliament, Cap 256 of the Laws of Kenya. As a voluntary organization, the Society operates through a network of eight Regions and 64 Branches spread throughout the country. At the national level, there is a Council, which is the highest policy making organ of the Society and is led by a Governor. The Governor is assisted by First and Second Deputy Governors. The Council consists of elected members and two representatives from each of the 64 Branches. The Council elects a National Executive Committee (NEC), which is mandated to provide supervision to the management. The NEC appoints the Society's Secretary General, who directs the Secretariat staff. The Secretariat assists the Branches to develop their humanitarian programmes. This institutional arrangement is manifested in two distinct structures within the Society: the Management and Governance. The Governance is the policy-making organ while the Management implements the policies and decisions of the Governance both at Headquarter and Branches (Kenya Red Cross Society, 2017).

1.2 Statement of the Problem

Disaster risk governance has emerged in recent years as a potential avenue for risk reduction. However, the 2011 United Nations Office for Disaster Risk Reduction (UNISDR) Global Assessment Report (UNISDR, 2011) concluded that aside from reducing disaster mortality, existing risk governance capacities and arrangements generally fail to achieve their aims. This coupled with escalating losses driven by

increases in exposure and vulnerability reveals shortcoming in current disaster risk management. Such failures in governance structures point to the need for reflecting on the range of planning frameworks, institutions, policy framework and administrative and regulatory mechanisms for managing risks.

Visible in times of crises, risk governance is rarely seen as part of everyday public or private functions such as planning, social welfare, investments or fiscal responsibilities. Disaster risk governance has traditionally been fragmented between local, state, and national entities and between sectors, and compartmentalized in highly variable bureaucratic structures. Risk governance is mostly viewed through the lens of disaster or emergency management departments and agencies (Gall, Cutter& Nguyen, 2014).As such, the Kenya Red Cross Society is a typical case for reflecting on the association between risk governance and DRM.As auxiliary to the National and County Governments, KRCS is on a mission to work with communities, volunteers and partners to ensure they prepare for and respond to humanitarian and development needs. However, limited research examined risk governance at KRCS and the associated effect on its disaster risk management. This study therefore sought to analyze the influence of risk governance on disaster risk management at Kenya Red Cross Society.

1.3 Purpose of the Study

The purpose of the study was to investigate the influence of risk governance on disaster risk management at Kenya Red Cross Society.

1.4 Objectives

The study sought to achieve the following objectives:

1) To examine the influence of stakeholders' involvement on disaster risk management at Kenya Red Cross Society
2) To explore the influence of risk assessment on disaster risk management at Kenya Red Cross Society
3) To investigate the influence of risk visualization on disaster risk management at Kenya Red Cross Society

4) To assess the influence of risk communication on disaster risk management at Kenya Red Cross Society

1.5 Research Questions

The following research questions guided the study:

1) What is the influence of stakeholders' involvement on disaster risk management at Kenya Red Cross Society?
2) How does risk assessment affect disaster risk management at Kenya Red Cross Society?
3) What effect does risk visualization has on disaster risk management at Kenya Red Cross Society?
4) To what extent does risk communication affect disaster risk management at Kenya Red Cross Society?

1.6 Significance of the Study

This study is highly important to KRCS and other humanitarian organizations by informing them on the effect of risk governance aspects on disaster risk management. This may be vital to the organizations in that it will facilitate their cognizance of their weak and strong risk governance areas. By appreciating the findings of the study, the organization(s) can then implement new or improve on the existing risk governance to enhance disaster risk management.

The Kenyan government (that is, both National and County governments) being key policymakers may also benefit from the findings. By acquainting themselves with the discussions and findings of this study, the policymakers may be able to implement effective policies to ensure effective risk governance for enhanced disaster risk management.

The study is also relevant to future researchers as it contributes literature vital for future research. Those who may be interested in doing research concerning risk governance and disaster risk management may be able to build their literature base by referring to this study. Furthermore, the study may inspire future researchers to carry out more studies to improve on the findings of this study or to verify them.

1.7 Delimitation of the Study

The study focused principally on the influence of risk governance on disaster risk management. In particular, the study examined the effect of stakeholders' involvement, risk assessment, risk visualization as well as risk communication on disaster risk management. The study was conducted at Kenya Red Cross Society where it mainly covered sampled employees in the organization.

1.8 Limitation of the Study

The findings of this study cannot be generalized to all organizations because of the differences in the context in which they operate in terms of legal, financial and other dimensions. As such, there could be variations in the findings from what has been established in studies of other contexts. Moreover, since the study was carried on a limited sample, the generalization of the findings to any other organization may be limited.

1.9 Assumptions of the Study

The study assumed that respondents were available and had requisite information as regards the influence of risk governance on disaster risk management. The study also assumed that the respondents gave accurate information and that the study would be completed within the stipulated period of time.

1.10 Definitions of Significant Terms

Disaster: Refers to a serious disruption of a community or society causing widespread human, material, economic and environmental losses which exceed the ability of the affected community/society to cope using its own resources.

Governance: Refers to Kenya Red Cross Society's system of values, policies and institutions by which the organization manages its economic, political and social affairs through interaction among the state, civil society and the private sector.

Disaster governance: This entails the interrelated sets of norms, organizational and institutional actors, and practices (spanning pre-disaster, trans-

disaster, and post-disaster periods) that are designed by Kenya Red Cross Society to reduce the impacts and losses associated with disasters.

Risk governance: Refers to the translation of the substance and core principles of governance to the context of risk and risk-related decision-making.

Disaster risk management: Refers to the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities by the Kenya Red Cross Society in order to lessen the adverse impacts of hazards and the possibility of disaster

Stakeholders' involvement: Refers to extent to which the Kenya Red Cross Society accommodates participation of interest groups (such as representatives of locally affected communities, national or local government authorities, politicians, civil society organizations and businesses) in the planning or decision-making process.

Risk assessment: This is the systematic process used by Kenya Red Cross Society in evaluating the potential risks that may be involved in a projected activity or undertaking.

Risk visualization: This refers to the Kenya Red Cross Society's systematic use of graphics (such as interactive charts, visual metaphors and mapping techniques) to augment the quality of risk along the entire risk management cycle.

Risk communication: Refers to the process used by Kenya Red Cross Society during interaction and exchange of information and opinions among individuals, groups and institutions to help everyone understand the risks to which they are exposed and encourage them to participate in minimizing or preventing these risks.

1.11 Organization of the Study

The concept of risk governance has evolved over the last decade. With the aim of protecting development investments and ultimately building people's resilience, UNDP has recommended strengthening of disaster risk governance. The 2011 Global Assessment Report (UNISDR, 2011) concluded that aside from reducing disaster mortality, existing risk governance capacities and arrangements generally fail to achieve their aims. There is limited research examining risk governance at KRCS and the associated effect on its disaster risk management. This study therefore seeks to analyze the influence of risk governance on disaster risk management at Kenya Red Cross Society.

For this study, Chapter One provides information on the background to the study, the problem statement, and objectives of the study, delimitations & limitations and the significance of the study as well as definition of key terms. Chapter Two focuses on relevant literature. It provides a theoretical framework for the study and review empirical literature in relation to the concepts examined in this study.

Chapter Three describes the research methodology, the design, target population, sampling techniques and procedures, data collection procedures and ethical issues that were observed during the study. Chapter Four presents the findings, analysis and interpretation of data gathered based on the research questions that guided the study. Chapter Five presents the summary of the findings, conclusions and recommendations based on the data analyzed in the chapter four.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The literature dwells on previous studies that have been undertaken related to risk governance and disaster risk management. It looked at the risk governance and disaster risk management from world, regional as well as the local perspectives. The chapter contains the theoretical frameworks related to risk governance and disaster risk management; review of literature on stakeholders' involvement in risk management, risk assessment, risk visualization, risk communication and disaster risk management. A conceptual framework is also developed to guide the study. In addition, it explores disaster risk management globally, regionally and locally. This chapter presents a review of literature mainly on risk governance and disaster risk management concepts. The chapter is organized into sections including, the application of international risk governance council framework on disaster risk management, theoretical framework, conceptual framework, knowledge gaps, and summary of the reviewed literature.

2.2 The Application of International Risk Governance Council Framework on Disaster Risk Management

The risk governance framework proposed by the International Risk Governance Council (IRGC) has been developed after careful review of experience with risk analysis in a variety of contexts. It addresses the issues of poor stakeholder engagement and lack of inter-disciplinarily and thereby provides a platform that should allow the development of more effective control and prevention policies (Aven & Renn 2010; Renn et al. 2011; Roodenrijs et al. 2014). Key elements of the IRGC framework, which complement the traditional risk analysis approach are risk framing and risk evaluation and I have derived the independent variables for the study based on Figure 2.1. The framing involves defining the system context including its socio-economic dimension and explicit identification of risk managers, assessors and other stakeholders. It has to produce the Terms of Reference for the risk assessment, including identification of appropriate risk assessment methods and also result in defining a strategy for stakeholder involvement during the risk assessment and management decision making process (Ely et al., 2009). The risk evaluation deals with the interpretation of the outcomes of the risk assessment,

and therefore provides the basis for the development of the risk management strategy. Risk evaluation will be informed by the risk assessment outcomes, but recognizes that other considerations such as the wider socio-economic or political context may be as important when deciding on risk management action (Renn & Dreyer, 2009).

Figure 2.1, it illustrates the interplay between risk management, stakeholders' involvement, risk assessment, risk visualization and evaluation as well as risk communication.

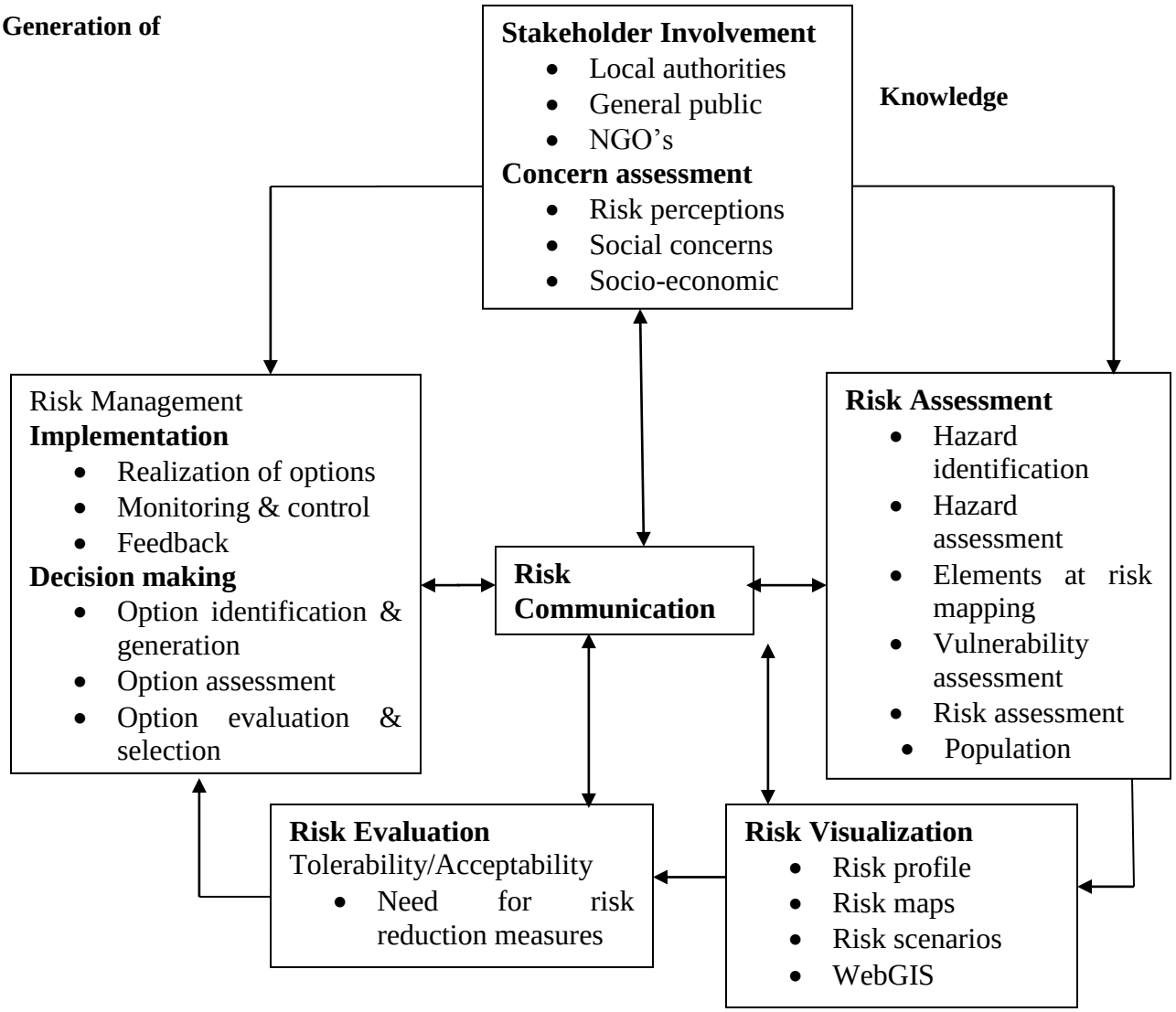
Figure 2.1: IRGC Risk Governance Framework

Management Part: **Assessment**

Part:

Decision Making Section

Generation of



Adapted from: IRGC (2005)

The risk governance effort starts with a pre-assessment phase, which aims to identify certain issues of stakeholders and environmental indicators that could help practitioners to characterize what can be considered as risk. Pre-assessment clarifies the various perspectives on a risk, defines the issue to be looked at and forms the baseline for how a risk is assessed and managed. Crucially, it captures and brings to the open: the variety of issues that stakeholders and society may associate with a certain risk (and the related opportunities); and existing indicators, routines and conventions that may help narrow down what is to be addressed as the risk, as well as the manner in which it should be addressed (IRGC, 2005).

The second phase is Risk Appraisal, with the target of making decisions on how to reduce, contain and establish the knowledge base on whether to accept or not the occurrence of risk and its possible consequences. The Risk assessment process included here is set to identify the source of a possible risk, quantify the probability of its occurrence and its possible impact. Main tasks in risk assessment are the hazard identification and estimation, the exposure and vulnerability assessment and risk estimation (Renn, 2005). Risk appraisal develops and synthesizes the knowledge base for the decision on whether or not a risk should be taken and, if so, how the risk can possibly be reduced or contained (IRGC, 2005).

Tolerability and acceptability judgment phase follows where risk and its consequences are actually characterized as acceptable and/or tolerable or not, then argumentation on the need of risk prevention and mitigation measures is provided to decision makers. In other words, the phase is about characterization and evaluation. IRGC's inclusion of this element is deliberately intended to ensure that the evidence based on scientific facts is combined with a thorough understanding of societal values when making the sometimes controversial judgment of whether or not a risk is "acceptable" (risk reduction is considered unnecessary), "tolerable" (to be pursued because of its benefits and if subject to appropriate risk reduction measures) or, in extreme cases, "intolerable" and, if so, to be avoided (IRGC, 2005).

The last phase in the framework is risk management. All tolerable risks will need appropriate and adequate risk management. This phase involves the generation, evaluation and selection of the appropriate measures based on the knowledge base established on Risk Appraisal. Based on the development of a range of options and a consideration of the most appropriate of them, risk management decision are taken and put into practice. This phase ends with the actual implementation of these measures and the monitoring of the performance of these against real life situations. It could entail reviewing the decision if necessary (IRGC, 2005).

The framework also includes a moderating aspect in the risk governance process, that is, communication. Communication is of the utmost importance. It enables stakeholders and civil society to understand the risk itself. It also allows them to recognize their role in the risk governance process and, through being deliberately two-way, gives them a voice in it. Once the risk management decision is made, communication should explain the rationale for the decision and allow people to make informed choices about the risk and its management, including their own responsibilities. Effective communication is the key to creating trust in risk management (IRGC, 2005).

There are various elements of risk governance expounded in literature that can potentially determine the level of risk management. However, this study mainly draws on four main elements expounded in the International Risk Governance Council (IRGC) framework (IRGC, 2005). These include stakeholder's involvement, risk assessment, risk visualization and risk communication as discussed in sections 2.2.1 through 2.2.4.

2.2.1 Stakeholders' Involvement and Disaster Risk Management

The importance of stakeholder involvement is widely recognized and considered essential to disaster governance (IPCC 2012; UNISDR 2005; UNISDR 2011). The peer-reviewed literature supports this finding extensively (Boyer-Villemaire et al. 2014; Pelling 2011; Warner 2008). Early on UNISDR published guidelines for the establishment of national platforms for disaster risk reduction to serve as "advocates of disaster risk reduction" and "provide coordination, analysis and advice on areas of priority requiring concerted action through a coordinated and participatory process" (UNISDR 2007,4). Since 2005, regional platforms have formed for Africa, the Americas, Asia, Arab States, Europe, and the

Pacific region (PreventionWeb, 2014a), as well as 80 national multi-stakeholder platforms (PreventionWeb, 2014b) with some of the latter being government-led while others are not. Non-governmental entities play a viable role particularly at the international and local levels (Djalante, 2012).

A second characteristic is cooperation and collaboration at a variety of scales. For example, the distribution of government functions (e.g., administrative, managerial, regulatory) across a variety of state and non-state actors facilitates vertical as well as horizontal disaster risk management and creates local capacities, establishes trust, and enhances cooperation (Boyer-Villemaire et al. 2014; Djalante et al. 2011; Tompkins et al. 2008).Flexibility is the third major characteristic. The creation of ad-hoc groups and networks, community self-organization, or the adjustment of policies, regulations, etc. are widely perceived as essential and important components of disaster governance (Cosens 2013; Hilde 2012; van Koppen et al. 2010). Conclusions on the beneficial effects of flexible governance structures are largely drawn from disaster response and recovery experiences (Aldrich 2010; Goldstein 2008; Samaratunge et al. 2012; Shaw and Goda 2004; Tompkins et al, 2008).

In the risk management process, the following must be put into consideration: Who are the stakeholders? How do their views affect the definition and framing of the problem? What are the current legal/regulatory systems and how do they potentially affect the problem? What is the organizational capability of the relevant governments, international organizations, businesses and people involved? (IRGC, 2005).Latin America and the Caribbean is perhaps the global region where many of the most significant and pioneering investigations concerning the understanding of risk construction have been undertaken. Colombia, for example, is with no doubt a leader in the development of policy and legal frameworks that facilitate a holistic, multi-sectoral approach to DRR and DRM, although such novel advance has not been fully implemented in practice yet throughout the region (Carreño et al. 2007).

In Africa, there have been efforts to engage diverse stakeholders in risk management. The strategic interventions to simultaneously advance disaster risk knowledge as well build skilled disaster risk science/management capacity include the purposive expansion and

mobilization of African higher education academic programs in the field. Not only does this grow contextually relevant risk knowledge for improved planning and DRM – it also offers a springboard for enhancing human capability for risk science and risk management practice. A 2013 survey indicated at least 17 disaster risk-related academic programs on offer across the continent (Holloway, 2014), with (from 2011-2013) as many as 160 undergraduate students registered alone at Bahir Dar University, Ethiopia, and 80 postgraduate students at Madagascar's University of Antananarivo (Holloway et al. 2014). While these developments are encouraging however, they should not detract from the urgency to address a much wider range of skilled human resource shortfalls in the applied disaster risk sciences, including those in the agricultural, climate, engineering and health domains.

In Kenya, different stakeholders' engagement is mainly visible in disaster response activities. This sees various groups such as the defense forces, police service, Kenya Red Cross Society among others provide assistance to maintain life, improve health and support the morale of the affected people. It involves interventions taken during or immediately after a disaster. For example, during flash floods when the rivers burst their banks, people's houses are washed away and emergency services of the Kenya Armed Forces and the Kenya Red Cross Society are mobilized to deliver food supplies and to rescue stranded families (Wafula, 2004).

2.2.2 Risk Assessment and Disaster Risk Management

Risk Assessment is defined by the UNISDR terminology (UNISDR, 2009) as a methodology to determine the nature and extent of risk by analyzing the potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihood and the environment on which they depend. Hence, risk assessment combines a characterization of the hazards with the level and extent of exposure with an assessment of differentials in vulnerability (and its converse – capacity) providing a calculated estimate of the risk of disaster in terms of impacts and their probability. A risk assessment can be single-risk or multi-risk assessment. Single-risk assessments determine the singular risk (i.e. likelihood and consequences) from one particular hazard (e.g. flood) or one particular type of hazard

(e.g. flooding) occurring in a particular geographic area during a given period of time. Multi-risk assessments determine the total risk from several hazards, taking into account possible hazards and vulnerability interactions: occurring at the same time or shortly following each other, because they are dependent of one another or because they are caused by the same triggering event or hazard; or threatening the same elements at risk (vulnerable/ exposed elements) without chronological coincidence (European Commission, 2010).

To improve disaster risk reduction, risk assessments should provide for advances in risk management, defined (UNISDR, 2009) as the systematic approach and practice of managing uncertainty to minimize potential harm and loss. Disaster risk management then follows as implementation of policies, processes and actions to prevent new risk, reduce existing disaster risk, and manage residual risk, all of which contribute to the strengthening of resilience. In risk assessment, risks are perceived as the combination of the consequences of an event or hazard and the associated likelihood of its occurrence. Consequences are the negative effects of a disaster expressed in terms of human impacts, economic and environmental impacts, and political/social impacts. In situations where the likelihood of occurrence of a hazard of certain intensity can be quantified, it is referred to as 'probability of occurrence.' When the extent of the impacts is independent of the probability of occurrence of the hazard, which is often the case for purely natural hazards, such as earthquakes or storms, risk can be expressed algebraically as (European Commission, 2010):

Risk = hazard impact * probability of occurrence.

Where the size of the impact influences the likelihood of occurrence, i.e. where the two terms are not independent of each other, the risk cannot be expressed simply as a product of two terms but must be expressed as a functional relationship. Likewise, where the impacts are dependent on preparedness or preventive behaviour, such as timely evacuation, there are advantages in expressing the impact indicator in a more differentiated manner. In particular in the analysis of natural hazards, impacts are often expressed in terms of vulnerability and exposure. Vulnerability V is defined as the

characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Exposure E is the totality of people, property, systems, or other elements present in hazard zones that are thereby subject to potential losses (UNISDR, 2009).

$$\text{Risk} = f(p*E*V)$$

The equation means that Risk is a function of the probability of occurrence of a hazard, the exposure (total value of all elements at risk), and the vulnerability (specific impact on exposure). Depending on the particular risk analyzed, the measurement of risk can be carried out with a greater number of different variables and factors, depending inter alia on the complexity of the chain of impacts, the number of impact factors considered, and the requisite level of precision. Generally, the complexity of the modeling and the quantification of factors can be increased as long as this also improves certainty. Hence, when quantitative models and additional variables and factors increase complexity without at the same time improving certainty (in terms of reliability, prediction and robustness) the use of more qualitative assessments and expert opinions will in principle be the better choice, also from the point of view of resource efficiency and level of transparency (European Commission, 2010).

From a global perspective, the developed countries are more advanced in risk assessments. For instance, Canadian research on disasters is focused on the geophysical processes that produce the hazards. In addition to the basic science on earthquakes, marine geological hazards, floods, landslides, and forest fires, the research also include monitoring of these geophysical processes as well as the provision of information to the public and decision makers such as susceptibility maps through Natural Resources Canada. Integrated disaster risk research is primarily focused on climate change and adaptation, and disaster resilience in cities and in rural remote communities, although some important research on vulnerability in Canada has been done. Large disaster events prompt extensive case study research. In the aftermath of Hurricane Katrina, for example, there was a significant increase in research publications across all disciplines, each

putting their own perspective on the event and its impact ranging from engineering to the public health consequences of the disaster (ICSU-ISSC, 2015).

Across the African continent, hydro-meteorological events are key factors in triggering intensive disasters and crisis across all scales - illustrated by powerful weather systems like Cyclone Eline that traversed 2,000 km across southern Africa, adversely affecting five million people in seven countries (Reason & Keibel, 2004, Holloway et al. 2013). It is also underlined by the 2010 West/Central Africa flood emergency that extended across 17 countries, including Liberia, Sierra Leone, Senegal, Cameroon and Chad. Such wide area events are juxtaposed against highly localized and often unreported instances of realized extensive risks, such as drought (Namibia 2013), severe storms (Rwanda, 2011), wildfires (Benin, 2013), earthquakes (Malawi, 2009) or locust infestations (Madagascar, 2013). Diverging from the experience of other continents, Africa also faces significant and recurrent risks of escalating communicable disease outbreaks, particularly cholera and measles, but also including viral hemorrhagic fevers (such as Marburg and Ebola). The trans-boundary character of the region's epidemic risk profile is illustrated by the scale of the 2008-2009 southern Africa cholera outbreak – which resulted in 156,000 cases and 4,686 deaths (UNOCHA 2009), and Africa Ebola outbreak – which results in 14,408 cases and 5176 deaths according to WHO on 14 November 2014 (ICSU-ISSC, 2015).

Kenya is a particularly disaster prone country and the disaster risks often affect the most vulnerable people disproportionately (Mortimore, 2009).Most common disasters experienced in Kenya are triggered by hydro-meteorological and environmental processes leading to hazards such as floods and drought. Poorly managed agricultural and environmental practices have left fragile ecosystems even more vulnerable. Climate change is exacerbating these hazards, increasing their variability and scale of impact. Human induced disasters such as accidents, fires, civil unrest and conflicts, terrorism and industrial accidents are also frequent (Akali, 2013).Many of the urban dwellers are settled in informal settlements that are vulnerable to hazards such as fires, floods, landslides, diseases and conflict (GoK, 2010).

2.2.3 Risk Visualization and Disaster Risk Management

Visualization of risk is a one of the important processes in risk governance. Better interpretation of risk information by the emergency managers or by the public (both during early warning or long –term risk awareness programs) highly depends on risk visualization. Since risk is a spatially varying phenomenon, Geographic Information Systems (GIS) technology is now the standard tool for the production and presentation of risk information. There are several forms of risk visualization including: Statistical information per administrative unit (country, county/province, municipality, or neighborhood; Risk curves (such as: Loss Exceedance curve for economic risk or; F-N curves for societal population risk); Maps (which shows the spatial variation of risk over an area-risk classes in high, moderate and low); Web-GIS applications (allows the user to combine different types of information, and display information such as hazard maps of individual hazard types); Animations (shows the spatial and temporal distribution of hazards and risk-for instance, flood animations showing the development of a flood over time, where the flood height, and water velocity are shown per time step as a movie file) (van Westen & Kingma, 2009).

Risk visualization is mainly defined by risk scenarios. A risk scenario is a representation of one single-risk or multi-risk situation leading to significant impacts, selected for the purpose of assessing in more detail a particular type of risk for which it is representative, or constitutes an informative example or illustration. Risk scenarios are a plausible description of how the future may develop. Scenario building is mainly based on experiences from the past, but also events and impacts which have so far not occurred should be considered. Scenarios should be based on a coherent and internally consistent set of assumptions about key relationships and driving forces (European Commission, 2010).

For risk assessments on a high level of aggregation, such as national risk assessments, it is a fundamental issue which scenarios are chosen, as this will determine how useful the risk assessment will be to depict reality. Compared to the vast universe of situations (of risks and their varying degrees of intensities) that are indeed possible in reality, only a limited number of scenarios can be selected. National risk assessments have attempted to

deal with the selection issue by making reference to some standard, such as a "reasonable worst case", or another benchmark. However, the remaining uncertainties in this approach are immense. The usefulness of comparing national risk assessments will vitally depend on some common understanding on how scenarios are built. In practice, risk scenarios are often built having in mind certain levels of impacts. These levels are also referred to as protection levels and can be defined e.g. in terms of (prevented) casualties. Other terms of reference may include the probability of a certain hazard exceeding a certain threshold level and this suddenly boosting the impacts, e.g. the breaking of a dyke, or wind stress exceeding certain design standards, etc. (European Commission, 2010).

From a global outlook, risk visualization is a critical concern in disaster risk management. For instance, in Latin America and the Caribbean regions, regional institutional efforts include the establishment of regional offices or networks, such as the Coordination Centre for Natural Disaster Prevention in Central America (CEPREDENAC), the Caribbean Disaster Emergency Management Agency (CDEMA), the Andean Committee for Disaster Prevention and Response (CAPRADE), the Regional InterAgency Coordination Task Force for Risk, Emergency and Disasters (REDLAC), among others. While these regional offices coordinate and undertake relevant actions with an emphasis on preparedness for response and relief, and occasionally promote disaster risk reduction, real substantive work is still pending on the side of development actors with a view to avoiding constructing risk and reducing it widely. It is essential to understand the underlying causes that create risk conditions when increasing exposure of population and infrastructure in hazard prone areas (ICSU-ISSC, 2015).

Africa is characterized by a diverse and dynamic disaster risk profile in which large-scale emergencies are increasingly attributed to a combination of complex and inter-related circumstances (UNOCHA, 2011) than individual, identifiable shocks. Insidious smaller-scale risks are also important to consider as these can accumulate and become serious challenges. Smaller-scale and larger-scale risks occur across multiple scales, from highly localized landslides (e.g. in 2012 in Uganda) to complex, protracted, trans-boundary processes - underlined by the 2011-2012 Horn of Africa emergency and its effects on 13

million people as well as the 2012 Sahel food and nutrition crisis with an estimated 18.7 million people at-risk (ICSU-ISSC, 2015).

In Kenya, Mortimore (2009) posits that drought and floods are the main natural hazards that impact most severely on the Kenyan population. According to GoK (2012), conflicts and industrial accidents impact various households and communities in varying degrees. Massive deforestation in search of settlement and agricultural land is leading to unsustainable use of the forest recourses that leads to increased risks to droughts, floods and erosion (Mortimore, 2009). In the past few years, various cities in our country have experienced fires in which property worth millions of shillings was destroyed. Regrettably, Kenyan lives are lost sometimes. These cities have one fire station each. Flooding is another source of anxiety. The most notable is the El – Nino flooding which is most pronounced in Nairobi City (Wafula, 2004).

2.2.4 Risk Communication and Disaster Risk Management

Risk Communication (RC) is a component of risk governance and is defined as an interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management. Risk information communication (often used interchangeably with early warning) is one of the key priorities for risk reduction. Effective risk communication needs collaborative and participatory approaches within the different levels (especially local level) and actors of Disaster Risk Management (DRM) during planning and decision making related to DRR (UN/ISDR, 2005). Risk communication system needs detailed information about hazard characteristics and vulnerability for effective prognoses and preparedness. However, this kind of information is often lacking in many countries that limits the capabilities for effective DRM (Sarun, 2011).

During risk information communication, it is important not only the proper information distribution and communication to the citizens, but the information receiving from the public about the hazards can play an important role in disaster management and risk reduction as well. It is widely recognized that information and communications

technology (ICT), plays an important role in establishing effective linkage between various actors that enables risk reduction. Participatory Geographic information System (PGIS) is one of the well-known methods that were developed from participatory approaches combined with different ICT tools to gather Local (Spatial) Knowledge (LSK) for effective communication linkages between communities at risk and higher level government in the various stages of disaster management (mitigation, preparedness, response and recovery). Disaster communication and early warning have strong relationship to each other. One of the major objectives of the disaster communication is to give an early warning about the disaster risk in a particular area. Early warning helps to reduce economic losses and mitigate the number of injuries or deaths from a disaster, by providing information that allows individuals and communities to protect their lives and property. This information empowers people to take action when disasters close to happening (Sarun, 2011).

Risk communication focusing on the imminent threat of an extreme event is referred to as a warning and is meant to produce an appropriate emergency response (van Westen & Kingma, 2009).On the other hand, risk communication program can also focus on the long-term potential for such events to happen, and is then called a hazard awareness program, intended to produce long-term hazard adjustments (van Westen & Kingma, 2009). Such awareness programs are communicating the risk information to the public not in case of imminent threat but in general, which reduces the risk in long-term perspective. Risk communication can be done in a variety of manners and at different levels. The main differentiation is between risk communication at the national level, using mass media campaigns, and risk communication at the local level, where more focused measures can be used.

Risk communication is usually aimed for: making people aware of the risk in their neighbourhood; improving their knowledge on possible disasters and how they could be prepared; changing their attitude towards disaster preparation; and changing eventually their behavior. Various risk communication tools are used. In addition to the radio and mobile phones, the internet has an increasing popularity (for the ones who has access to the electricity and computer) for disaster risk information communication, because of its

potential of information management. In the field of disaster management, among others, the web based technologies (Web 2.0, Google Earth, OpenStreetMap) and other social networks (Twitter, YouTube, Blogs, Wikipedia, Facebook) are already widely used for communication the risk information (Lagmay, 2009; Subedi, 2010; White et al., 2010). Van Westen and Kingma (2009) summarized the tool/channels used for risk communication (during early warning or hazard awareness) as illustrated in Table 2.1.

Table 2.1: Tools used in Risk Communication

Tools/Channels	**Risk Communication**	
	Early warning	**Hazard Awareness**
Mass Media (TV, Radio, newspaper)	x	x
Electronic Media (WWW, SMS, MMS)	x	x
Audio-visual (video, audio, multi-media, animation, photographs, model, map, slide show, artwork, graph, curves,)	x	x
Postal (direct mailing)		x
Stand-Alone print (billboard, poster, banner, warning sign, flood water level)		x
Face-to face (meeting, seminar, workshop, conference, march, exhibition, demonstration, training, exchange visit, planning)		x
Distributor print (leaflet, pamphlet, brochure, booklet, guideline, case study, newsletter, journal, research paper, report)		x
Folk Media (story, drama, dance, song, puppet, music, street entertainment)		x
People (community leader, volunteer, project worker, head of women's group)	X	x

Source: Van Westen and Kingma (2009)

There are many success stories of managing the disasters in the 21st century through effective risk communication. An example is the Indian Tsunami Early Warning System (ITEWS).Soon after the 2004 tsunami, India took up establishing of a modern tsunami warning center and ITEWS was commissioned by August 2007, and has been operating un-interrupted since then (Gupta & Gahalaut 2013). A special feature of ITEWS is placing ocean bottom pressure recorders in the immediate vicinity of the seismic zones causing tsunamis, and is capable of giving accurate tsunami advisories within 10 minutes of the occurrence of an undersea earthquake of M 6.5 or larger anywhere in the Indian

Ocean. Occurrence of an undersea earthquake is a necessary but not sufficient condition for a tsunami to occur. However, whether an earthquake has generated a tsunami or not, can be assessed, by locating suitable ocean bottom pressure recorders and nearby tide gauges. These are in position in the ITEWSenabling it to provide true advisories. For example, a magnitude M=8.5 earthquake occurred on 11 April 2012 in the Indian Ocean close to the epicenter of the 2004 Aceh-Sumatera M=9.3 earthquake. The ITEWS detected this earthquake within about 4 min of its occurrence and issued the necessary first advisory (no threat of a tsunami) within 8 minutes from the origin of the earthquake. Timely advisories avoided unnecessary panic and evacuation (ICSU-ISSC, 2015).

Earthquake Early Warning in Japan is another example. Earthquake early warning is the rapid detection of an earthquake underway and estimation of sever shaking and issuance of warning in the area likely to experience damaging shaking (Allen, 2011). Started by the Japan Railways in early 1960s, a sophisticated fully operational system was established following the 1995 Kobe earthquake (Okada et al. 2004). It keeps on getting upgraded and operates all over Japan. It was extremely successful during the 2011 Tohoku earthquake (Sinha, 2011), and timely warning of the forthcoming severe shaking saved numerous human lives (ICSU-ISSC, 2015).

In the African region however, the imperative to accelerate the development of African risk knowledge capabilities was underlined during the 5th African Regional Platform, with the Summary Statement (UNISDR, 2014) calling for improved sub-regional climate information and multi-hazard early warning systems. Similarly, the continent's higher education institutions were acknowledged to be crucial resources for advancing risk knowledge, research and skilled capacity in managing current and future risks (ICSU-ISSC, 2015).In Kenya, the Director of the National Disaster Operations Centre (NDOC) is authorized to mobilize procedures to respond and recover from the effects of disaster emergencies or the imminent threat of a disaster emergency. This is undertaken through a set of four phases - Alert, Standby, Activation and Stand Down/activation of recovery (Akali, 2013).

2.2.5 Disaster Risk Management

According to the internationally agreed glossary of basic terms related to disaster management, the disaster can be defined as a serious disruption of the functioning of the society, causing the widespread of human, material or environmental losses which exceed the ability of the affected society to cope using only its own resources. Disasters are often classified according to their causes (natural or manmade). The natural disaster happens when the natural, extreme phenomenon negatively effects the exposed vulnerable population. Disaster causes humanitarian (life loss, injuries, physiological post disaster affect) economic (direct loss –damages to buildings, infrastructure such as transport, energy, water, and agricultural assets; indirect loss - resulted physical damage to firms and households; and macroeconomic – total impact on Gross Domestic Product (GDP), consumption and inflation) and ecological effects (damages to arable land, forest and ecosystem) (Mechler, 2004).

Disaster Risk Management (DRM) can be seen within a broad context of Disaster Risk Reduction (DRR) that includes different activities involving public administration, strengthening organizational and institutional development, implementing policies, strategies and coping capacities of the society to reduce negative effects of hazards (UN/ISDR, 2004a). DRM as well involves mitigation measures such as structural -that are related to physical risk management measures (E.g. Construction of dams and artificial levees, flood walls, channel improvements/modifications, etc.) and non-structural - that are associated with limited uses of hazardous areas based on legal and regulatory measures (spatial planning) (van Westen & Kingma, 2009).Usually, DRM includes number of activities made before, during and after the disaster. In disaster management three stages can be recognized: The pre-disaster, disaster and post-disaster stages. Respectively, different activities and measures needed to deal with disaster risk or disaster impact management are farther divided into three categories: risk management that usually involves: Mitigation, prevention, preparedness, risk assessment, prediction and early warning; relief/response and rehabilitation/reconstruction that in combination is usually called a crisis management (van Westen & Kingma, 2009).

The vulnerability of human civilizations to natural hazards worldwide is growing due to the proliferation of high-risk objects, clustering of populations, and destabilization of large cities. Experience with extreme natural events in the past contributes to our understanding of effective DRM (including risk assessment, disaster prevention/mitigation and preparedness). Based on the experience and lessons from the past disasters, it is evident that the severity of the impacts of natural events depends significantly on the magnitude of the natural events, the level of vulnerability and exposure to the hazards. A lack of recovery capabilities will magnify the impacts. A typical example is the impact of shallow earthquake of magnitude Mw7.0 that took place in Haiti on 12 January 2010, 17 km to the south-west of Port-au-Prince, the capital of Haiti. The aftermath involved 222,570 deaths, 3,700,000 of total affected people, and USD 8 billion in damage. Geoscientists expected a strong earthquake to occur in this part of Haiti as significant elastic strain has been accumulated in the lithosphere since the last major earthquake (Manaker et al. 2008; Calais et al. 2010). Regardless of the low frequency of seismic activity in that particular region of Haiti, social conditions determined the magnitude of the disaster. The high vulnerability of population related to extreme poverty and deficiencies in basic health care and education, land degradation, deterioration of the environment, and high rates of deforestation, in addition to elevated levels of corruption, irresponsibility, inequity, and inequality, and lack of earthquake-resistant design in buildings and coordinated disaster response played a significant role in shaping the disaster (ICSU-ISSC, 2015).

Economically developed countries can withstand natural hazard events of moderate magnitude because of low vulnerability with respect to these events and high resilience of society, although highest exposure, but not those of high magnitude (ICSU-ISSC, 2015).For instance, the 2002 floods in Europe, the 2005 Hurricane Katrina in USA or the 2011 Great East Japan earthquake. Meanwhile in less developed countries even smaller magnitude events can generate a large disaster (like the earthquake tragedy in Haiti in 2010 or drought events in African countries) (IPCC, 2012).Within the U.S contexts, there is increased attention to monitoring and measurement, the development and use of advanced modeling techniques, enhanced spatial information, and the mining of big data and social media for volunteered geographic information. However, much of the research

portfolio in the U.S. remains disciplinary or multi-disciplinary but not integrated research (ICSU-ISSC, 2015).

Asia and the Pacific region have suffered more losses from disasters compared to other regions in the world (UNDP 2013). In 2013 alone, 19 million of the 22 million people displaced by floods, typhoons, and earthquakes came from Asia. Typhoon Haiyan displaced 4.1 million, a million more than in Africa, the Americas, Europe and Oceania combined (Onita 2014). This trend is expected to continue for the next decades with demographic growth and socio-economic expansion in the region. Out of ten worst disasters of the 21st century, caused by natural events, seven occurred in Asia and the Pacific region (human lives lost are given in the parentheses) (ICSU-ISSC, 2015):

1) The Indian Ocean earthquake and tsunami, 26 December 2004 (~230,000);
2) Cyclone Nargis, 2 May 2008 (~146,000);
3) The Kashmir earthquake, 8 October 2005 (~80,000);
4) The Sichuan (China) earthquake, 12 May 2008 (69,197);
5) The Bam (Iran) earthquake, 26 December 2003 (~43,000);
6) The Great East Japan earthquake and tsunami, 11 March 2011 (~18,400). This is rated as the most expensive disaster ever occurred with estimated financial losses of between USD 200 and 300 billion
7) The Bhuj (India) earthquake, 26 January 2001 (19,727).
8) The Russian heat wave in 2010 (~56,000) had also claimed human lives in Japan, Mongolia and Kazakhstan.

In Africa, with greater climate variability, advancing urban population growth, rising continental mobility and increasing global interconnectedness, many African countries now find themselves facing new risk configurations with poorly developed national and sub-national DRM capacity (Holloway et al. 2013; Tall et al. 2013). In this context, access to relevant and robust disaster risk knowledge (Boyd et al. 2013; Jacks and Davidson 2010) represents an acknowledged precondition for strengthening national, sub-national and trans-boundary risk management capability. This priority is now explicitly reflected in efforts to strengthen resilience to food insecurity in the Greater Horn of Africa (Frankenberger et al. 2012) as well as in Sahelian countries currently

facing multiple and complex pressures (UNOCHA 2014). Access to accurate climate information also constitutes a core element for the AU's African Risk Capacity (ARC) initiative, introduced in 2012, that aims to strengthen Member State food security through improved management of climate variability and extremes (ICSU-ISSC, 2015).

In the Kenyan case in particular, the government has put in place multi-sectoral systems, tools and mechanisms to ensure disaster preparedness and timely response. Kenya has prepared a draft National Disaster Management Policy. The overall goal of the Policy is to establish and maintain an efficient, effective and coordinated system for managing disasters, in order to minimize loss of life, resulting disruptions on population, economy and environment (Mortimore, 2009). The draft policy has adopted a multi-sectoral and multidimensional approach to disaster management where all the relevant Government Ministries and Departments, Agencies, non- Governmental Organizations, Civil Society organizations and International Partners are incorporated (GoK, 2008). The draft policy recommends innovative strategic options including National Disaster Strategic Plans, Strategic stockpiles of food items to add to the Strategic Grain Reserves, Disaster Trust Funds and District Contingency Funds, the Government of Kenya Fund and insurance initiatives. All these constitute disaster preparedness strategies. However, Kenya lacks modern research approach with outcomes that have disaster management plan to alleviate natural disasters (Akali, 2013).

2.3 Theoretical Framework

This study will be based on the Community Engagement Theory of Disaster Management.

2.3.1 Community Engagement Theory

This theory was advanced by Paton (2008). The theory suggests that interpretive process at the person level (outcome expectancy) interact with social (community participation, collective efficacy) and societal relationship (empowerment, trust) factors to predict preparedness in times of disaster (Paton, 2008).Paton (2008) proposed that a crucial interpretive process concerns people's beliefs regarding the hazard intensity and magnitude of hazard events and the amenability of such hazards to mitigation through individual action. This interpretive process is captured by the Outcome Expectancy

concept. Using the outcome expectancy concept to frame understanding of this interpretive process, the theory proposes that people will be disinclined to act if they believe that hazards are too catastrophic for personal action to make a difference to their safety or if they are highly fatalistic and possess external control beliefs. If, on the other hand, people believe that personal action can influence personal safety, people are motivated to start the preparedness process. However, believing individual action can be effective does not necessarily mean knowing what actions to perform or how to perform them. To get such information, people turn to others (Paton, 2008).

Faced with complex and uncertain events, when they do not possess all the information they need themselves, peoples' perception of risk and how they might mitigate it, is influenced by information from others who share their interests and values (Paton et al. 2006; Paton, Büergelt & Prior, 2008). Thus levels of community participation will influence the availability of a social context in which people can formulate risk beliefs and actions. Discussion with other community members can increase the ability of people to collaborate to determine what consequences they could face, work out what would be an effective response, and then consider what information and resources they require to enact their mitigation strategies. One construct that encapsulates community members' ability to identify needs and formulate questions is collective efficacy. Collective efficacy is a measure of co-operation and assistance available within a community and community members' ability to assess their capabilities and resource needs and formulate plans to use resources to confront challenging tasks and it has demonstrated its utility in collectivistic cultures (Duncan et al., 2003).

The final set of social context variables derived from postulating that, given the infrequent and complex nature of the hazard events such as landslides they may have to confront, it is possible to anticipate that community members' deliberations could identify information and resource needs that cannot be met within existing community contexts. Under these circumstances, people would turn to civic and expert sources to acquire the necessary information and resources. The significance of including measures that encapsulate the quality of the relationship between community members and civic agencies derives from the important role trust plays when people make decisions under

conditions of uncertainty. As uncertainty increases, so does the importance people attribute to their trust beliefs about, and their past experiences with, the sources of information they turn to or have to rely on (Siegrist & Cvetkovich, 2000).

Notwithstanding that Kenya is a disaster prone country with disaster risks often affecting the most vulnerable groups (Mortimore, 2009), the people's preparedness is inadequate. During disasters, rather than the people taking the responsibility to ensure their own safety, they habitually call for government help. In most cases, KRCS often intervenes to offer help. People's willingness to take responsibility for their own safety is increased, and decisions to prepare more likely, if they believe that their relationship with formal agencies is fair and empowering (agencies are perceived as trustworthy, as acting in the interest of community members) (Earle, 2004; Lion et al. 2002; Poortinga & Pidgeon, 2004). If, however, the relationship between community members and an agency is not perceived as fair and empowering, the consequence is a loss of trust in the agency (i.e., the source of information), reducing the likelihood that people will use the information provided by an agency to guide their preparing (Paton et al. 2005).

2.4 Conceptual Framework

A conceptual framework forms part of the agenda for negotiation to be scrutinized, tested, reviewed and reformed as a result of investigation and it explains the possible connections between the variables (Smyth, 2004). In this regard, Figure 2.2 illustrates the conceptual framework for the study. It hypothesizes that disaster risk management is determined by four elements of risk governance: stakeholders' involvement, risk assessment, risk visualization and risk communication. The four elements therefore will be considered as the independent variables in the study while disaster risk management will be the dependent variable.

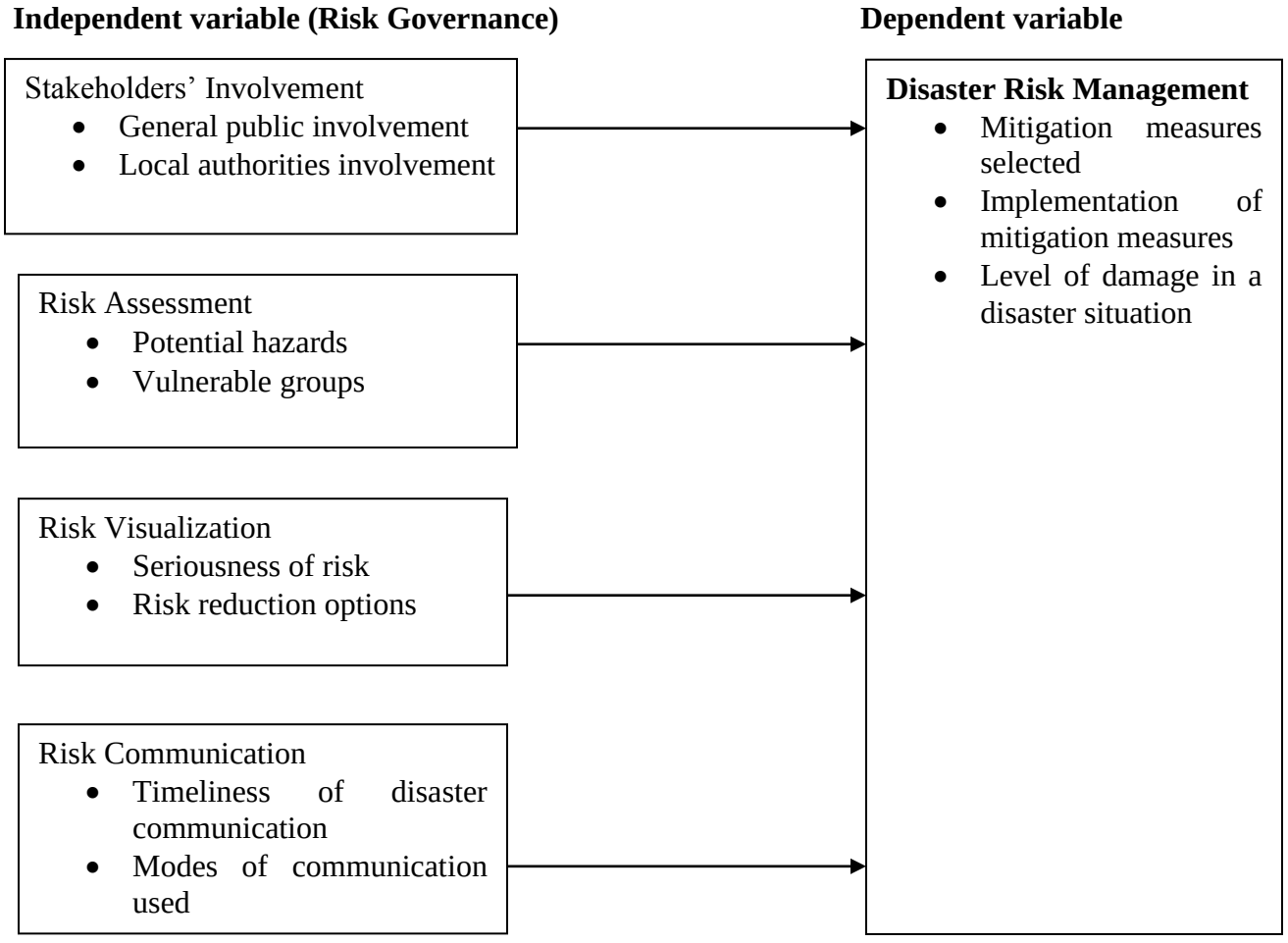


Figure 2.2: Conceptual framework

2.5 Knowledge Gaps

Table 2.2: Knowledge Gap Matrix

Author	Findings	Research Gap
IRGC (2005)	Stipulates that in the risk management process, the following must be put into consideration: a) Who are the stakeholders? How do their views affect the definition and framing of the problem? b) What are the current legal/regulatory systems and how do they potentially affect the problem? c) What is the organizational capability of the relevant governments, international organizations, businesses and people involved?	Does not describe how these considerations specifically affect disaster risk management itself. This was examined in this study by exploring in details the relationship between stakeholders' involvement and disaster risk management.
European Commission (2010a)	Expressed various useful models for risk assessment. The study further expounded that, when quantitative models and additional variables and factors increase complexity without at the same time improving certainty (in terms of reliability, prediction and robustness) the use of more qualitative assessments and expert opinions will in principle be the better choice, also from the point of view of resource efficiency and level	Did not practically apply the models to test their reliability in disaster risk management. There is need to examine whether such models are used in real cases or they are but mere academic precepts. Moreover, the extent to which experts' opinion are applied in combination with the models in disaster risk

Author	Findings	Research Gap
	of transparency	management should also be explained since the discussion divulge little on this
The European Commission (2010b)	Described the application of risk visualization. The study asserted that risk visualization is mainly defined by risk scenarios. Scenario building is mainly based on experiences from the past, but also events and impacts which have so far not occurred should be considered. Scenarios should be based on a coherent and internally consistent set of assumptions about key relationships and driving forces	Few insights are contained in the study regarding how these practically affect disaster risk management. This study sought to examine in details the effect of risk visualization on disaster risk management to highlight these insights
van Westen and Kingma (2009)	Risk communication focusing on the imminent threat of an extreme event was referred to as a warning and is meant to produce an appropriate emergency response. On the other hand, the same study also noted that risk communication program can also focus on the long-term potential for such events to happen, and is then called a hazard awareness program, intended to produce long-term hazard adjustments	Details on the circumstances under which these two perspectives are considered in disaster risk management remain scanty in this study. Again, the preparedness theory asserts that it is not information per se that determines whether or not people decide to prepare for natural hazard events.

2.6 Summary of the Reviewed Literature

The risk governance framework proposed by the International Risk Governance Council (IRGC) has been developed after careful review of experience with risk analysis in a variety of contexts. It addresses the issues of poor stakeholder engagement and lack of inter-disciplinarity and thereby provides a platform that should allow the development of more effective control and prevention policies. The importance of stakeholder involvement is widely recognized and considered essential to disaster governance. Risk assessment combines a characterization of the hazards with the level and extent of exposure with an assessment of differentials in vulnerability (and its converse – capacity) providing a calculated estimate of the risk of disaster in terms of impacts and their probability. Better interpretation of risk information by the emergency managers or by the public (both during early warning or long –term risk awareness programs) highly depends on risk visualization. Risk communication system needs detailed information about hazard characteristics and vulnerability for effective prognoses and preparedness. Disaster Risk Management includes number of activities made before, during and after the disaster. In disaster management three stages can be recognized: The pre-disaster, disaster and post-disaster stages. This study examined the influence of risk governance on disaster risk management at Kenya Red Cross Society.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains the research design, target population, sampling/respondents selection procedure, methods of data collection procedures, validity and reliability of the research instrument and methods of data analysis. Moreover, the chapter describes the operational definition of the variables. In addition, it discusses the ethical considerations adhered to in carrying out the research.

3.2 Research Design

According to Kothari (2004), a research design is the structure that directs the implementation of the research method and the subsequent analysis of collected data. Cooper and Schindler (2003) advised that the choice of the research design in a particular study should always be based on the research question and the research design chosen should guide the selection of sources and types of information in the study. In this regard, this study used the descriptive survey design. Descriptive design is appropriate because it enables the researcher to obtain information concerning the current status of the phenomena (Mugenda & Mugenda, 2003). Burns and Grove (2003) affirmed that descriptive research is designed to provide a picture of a situation as it naturally happens. Using the design can therefore help in formulation of knowledge and solutions to the existing problem. For this reason, the design is considered appropriate for this study.

3.3 Target Population

Target population according to Cooper and Schindler (2006) refers to the total collection of elements to which the researcher wishes to make inference about. In the perception of Cramer and Howitt (2004), population entails all of a particular type of entity either limited by geographical location or one or more characteristics. As such, the target population for this study was the Kenya Red Cross Society (KRCS) staff including the CEO, heads of departments and other senior and middle level management staffs who are in the council of KRCS. The KRCS national council consists of 9 elected members and two representatives from each of the 64 branches. Thus, the total population will be 137

(That is, 9 + [64x2]). Since the members of KRCS national council are based at the KRCS headquarters, the study was conducted at the headquarters and not at the branches level.

3.4 Sampling Procedure

Kothari (2004) defines sampling as the process of obtaining information about an entire population by examining only a part of it. According to (Yin, 2003) sampling is categorized into probability and non-probability sampling. Probability sampling is the type of sampling where each case, element or member of a population has an equal chance of being selected. On-probability sampling is a biased type of sampling where only elements or members of a population that meets a certain criteria are selected. Sample is set of entities drawn from a population with the aim of estimating characteristics of the population (Cramer & Howitt, 2004) while sampling techniques are the methods used for selecting a sample from the population by reducing it to a more manageable size (Saunders, Lewis & Thornhill, 2007).

Purposive sampling technique was used to select the sample size. It requires selecting participants who are knowledgeable about the issue in question, because of their sheer involvement and experience of the situation (Polit & Beck, 2004).In this regard, the technique is preferred to ensure that data is obtained from participants who are well informed about the research problem. Consequently, participants were KRCS staff who are members of the national council of KRCS. This is because it is the one charged with policy making, hence are likely to be more informed about the interplay between risk governance and disaster risk management in the organization. The sample size was determined using Slovin's Formula (Ariola, 2006):

$n = N / (1 + Ne^2)$

Where n, N and e are the number of samples, the total population and error tolerance respectively. In using Slovin’s formula, the error of tolerance is first determined which can range between 95% and 99% confidence level (giving a margin error of 0.05 and 0.01 respectively) (Ariola, 2006). In the current study a confidence level of 95.0% was

utilized thus the margin of error was 0.05. Thus, using Slovin's Formula, the sample size was:

$n = 137/ (1+137(0.05)^2)$ = approximately 102respondents.

The sample of 102 respondents was selected through stratified random sampling where the strata were the various departments at Kenya Red Cross Society. In this regard, the six main departments (Administration, Human Resource, Finance, Corporate Planning, Operations and ICT) were the strata. Hence, 17 respondents were selected from each department. Thus, the sample was selected as follows:

Table 3.1: Sample distribution

Department	**Number of Employees**
Administration	17
Human Resource	17
Finance	17
Corporate Planning	17
Operations	17
ICT	17
Total sample	**102**

3.5 Data Collection Instruments

The researcher used both primary and secondary data. Primary data was collected using a questionnaire that was administered to the selected staffs at Kenya Red Cross Society through drop and pick method. The questionnaire is a well-established tool within social science research for acquiring information on participant social characteristics, present and past behaviour, standards of behaviour or attitudes and their beliefs and reasons for action with respect to the topic under investigation (Bulmer,2004).The questionnaire was preferred for this study due to its ability to communicate to the respondent what is

intended and elicits desired response so as to achieve the study objectives (Chandran, 2004).Moreover, since the staffs from whom the data was collected were senior staffs that likely to have tight work schedules, it would have been difficult to have adequate time for one-on-one in depth interviews with most of them.

Thus a questionnaire is preferred by virtue that, it is possible to leave the questionnaire with the respondent to complete it on their own at their convenient time. A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms (Kothari, 2004).The questionnaire was designed by the researcher and contained close-ended questions, open-ended questions and Likert scale questions. The close-ended questions provided more structured responses to facilitate quantification of responses. The open ended questions helped to probe more information from the respondents by allowing them to express their views in their own words and understanding. The Likert questions were used to test the rating of various aspects and this helped in reducing the number of related responses in order to obtain more varied responses. Therefore, the questionnaire collected both quantitative and qualitative data.

In addition, interview guides were used to conduct in-depth interviews with the CEO and heads of departments. Further, focus group discussions were conducted with the heads of departments and other senior management staffs atKenya Red Cross Society. These helped to obtain more information to supplement that which was collected using the questionnaires.

3.6 Validity & Reliability

Validity is usually defined as the extent to which an instrument measures what it purports to measure (Kimberlin & Winterstein, 2008).According to Cavana *et al* (2001), there arethree categories of validity: face, content and construct validities. To ensure face validity, correlations between the objective and subjective items utilized in the scales will be used. For content validity to be ensured, the researcher applied expert judgement of the supervisors on the items contained in the questionnaire. Regarding the construct validity, it was assessed from the correlations of items.All evidence of validity including content and face validity contributes to the evidence of construct validity (Kimberlin & Winterstein, 2008); as such ensuring content and face validity ensured construct validity.

Reliability is the measure of degree to which a research instrument yields consistent results or data after repeated trials (Kothari, 2004).The most preferred reliability criterion in line with the literature is Cronbach Apha (Bonett, 2002) and the Alpha takes values in the range of zero (no internal consistency) to one (complete internal consistency). Therefore, Cronbach Apha methodology was used to ensure reliability of the instrument.The number of test items, item interrelatedness and dimensionality affect the value of alpha. There are different reports about the acceptable values of alpha, ranging from 0.70 to 0.95 (DeVellis, 2003). A low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs. For example if a low alpha is due to poor correlation between items then some should be revised or discarded. The easiest method to find them is to compute the correlation of each test item with the total score test; items with low correlations (approaching zero) are deleted. If alpha is too high it may suggest that some items are redundant as they are testing the same question but in a different guise. As a rule of thumb, scores in the ranges 0.5-0.6, 0.6-0.7, 0.7-0.8, and 0.8-0.9, should be considered to have an internal consistency that is poor, questionable, acceptable or good, respectively. Values above 0.9 represent excellent internal consistency, while values less than 0.5 are considered to be unacceptable (Kimberlin & Winterstein, 2008). To this extent, a value of 0.7 and above was considered acceptable for this study.

The test retest technique was also used where the same test was administered to 10 randomly selected Kenya Red Cross Society staffs who were not included in the final study. The test was repeated after one week interval and scores obtained correlated to get the coefficient of reliability. This helped ensure consistency of the data collected thus enhanced the reliability of the research instruments. According to Bulmer (2004), if the correlation coefficient of the instrument falls above +0.60; the instrument is taken to be reliable and therefore suitable for data collection.

3.7 Data Collection Procedure

The researcher administered the questionnaire individually to all respondents through drop and pick method. Respondents who were not in a position to complete and hand back the questionnaire immediately were allowed at least one day to complete it and the

researcher collected it at the agreed time which was not later than a day after administering the questionnaire. The researcher maintained a register of questionnaires administered to ensure that all questionnaires dropped to the respondents are collected. Pertaining to the secondary data, it was gathered and compiled in the form of literature review. It was sourced from published reports and other documents containing empirical studies on risk governance and disaster risk management. It was also be sourced from the company's publications, journals and information obtained from the internet and other sources considered relevant to the study as far as the issue of risk governance and disaster risk management are concerned. However, in line with professionalism and academic regulations on research work, all information from other authors/scholars was acknowledged by adequately referencing the work throughout and providing a list of references outlining all the works cited in the research report.

3.8 Methods of Data Analysis

Data analysis is a process of inspecting, cleaning, transforming and modeling data with the goal of identifying useful information, suggesting conclusions and supporting decision making (Creswell, 2009). After collecting all the data, data cleaning was done in order to determine inaccurate, incomplete or unreasonable data and then improve the quality through correction of detected errors and omissions. The data was then coded and entered into a computer specifically in a Statistical Program for Social Sciences (SPSS) version 22 that was used in data analysis.

Quantitative data on each of the variables (stakeholders' involvement, risk assessment, risk visualization, risk communication and disaster risk management) was first analyzed through descriptive statistics where the frequency, percentage, mean and standard deviation were computed for each data set relating to each variable. According to Mugenda and Mugenda (2003), descriptive statistics enable meaningful description of a distribution of scores or measurements using a few indices or statistics.

Moreover, inferential statistics were computed to analyze quantitatively the relationship between dependent variable (disaster risk management) and the independent variables (stakeholders' involvement, risk assessment, risk visualization as well as risk communication). In this regard, Pearson's Correlation analysis, regression analysis as

well as analysis of variance were computed. The regression model was expressed in the form of:

$Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where:

Y = Disaster risk management

$\beta 0$ = Constant

X_1 = Stakeholders' involvement

X_2 = Risk assessment

X_3 =Risk visualization

X_4 = Risk communication

$\beta_1 ... \beta_4$ = Regression Coefficients of four variables respectively

ε- is the error term

Findings were presented by use of tables. This was done by tallying up responses, computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives. Qualitative data relating to each of the variables was analysed through content analysis. It involved observation and detailed description of objects, items or things that comprise the study (Mugenda & Mugenda, 2003). This method makes it possible to analyze and logically group the large quantity of data and compile the rest of the study. In this regard, the researcher organized the qualitative data into themes in accordance to the study objectives.

Table 3.2: Summary of Research Objectives, Hypotheses and statistical analysis

Objective	**Hypothesis**	**Type of Analysis**	**Interpretation of Results**
Objective 1 To examine the influence of stakeholders' involvement on disaster risk management at Kenya Red Cross Society.	Hypothesis 1 There is no significant relationship between stakeholders' involvement and disaster risk management at Kenya Red Cross Society.	Simple stepwise Regression analysis $Y = \alpha_1 + \beta_1 X_1 + e_1$ Pearson's product moment Correlation coefficient (r)	Coefficient of determination R^2 =0.7 or more indicates perfect fit of regression model. ANOVA. F-Test, showing a significant and valid model at p<0.05 t-value > 1.962 shows statistical significance P-vale< 0.05 shows significant correlation between variables r=0.700 or more indicates a strong positive relationship and r=0.300 or less indicates a weak relationship.
Objective 2 To explore the influence of risk assessment on disaster risk management at Kenya Red Cross Society	Hypothesis 2 There is no significant relationship between risk assessment and disaster risk management at Kenya Red Cross Society.	Simple stepwise Regression analysis $Y = \alpha_2 + \beta_2 X_2 + e_2$ Pearson's product moment Correlation coefficient (r)	Coefficient of determination R^2 =0.7 or more indicates perfect fit of regression model. ANOVA. F-Test, showing a significant and valid model at p<0.05 t-value > 1.962 shows statistical significance P-vale< 0.05 shows significant correlation between variables r=0.700 or more indicates a strong positive relationship and r=0.300 or less indicates a weak relationship.
Objective 3 To investigate the influence of risk	Hypothesis 3 There is no significant relationship between risk	Simple stepwise Regression analysis	Coefficient of determination R^2 =0.7 or more indicates perfect fit of regression model.

visualization on disaster risk management at Kenya Red Cross Society	visualization and disaster risk management at Kenya Red Cross Society	$Y = \alpha_3 + \beta_3 X_3 + e_3$ Pearson's product moment Correlation coefficient (r)	ANOVA. F-Test, showing a significant and valid model at $p<0.05$ t-value > 1.962 shows statistical significance P-vale< 0.05 shows significant correlation between variables r=0.700 or more indicates a strong positive relationship and r=0.300 or less indicates a weak relationship.
Objective 4 To assess the influence of risk communication on disaster risk management at Kenya Red Cross Society	Hypothesis 4 There is no significant relationship between risk communication and disaster risk management at Kenya Red Cross Society	Simple stepwise Regression analysis $Y = \alpha_4 + \beta_4 X_4 + e_4$ Pearson's product moment Correlation coefficient (r) Pearson's product moment Correlation coefficient (r)	Coefficient of determination R^2 =0.7 or more indicates perfect fit of regression model. ANOVA. F-Test, showing a significant and valid model at $p<0.05$ t-value > 1.962 shows statistical significance P-vale< 0.05 shows significant correlation between variables r=0.700 or more indicates a strong positive relationship and r=0.300 or less indicates a weak relationship.

3.9 Operationalization of Variables

This study had five main variables. That is, four independent variables (stakeholders' involvement, risk assessment, risk visualization as well as risk communication) and one

dependent variable (disaster risk management). Table 3.1 describes the operationalization of each of these variables.

Table 3.3: Operationalization of Variables

Dependent Variable	Independent Variables	Indicators	Measurement scale	Tool of data collection
Disaster risk management		• Mitigation measures selected • Implementation of mitigation measures • Level of damage in a disaster situation	Likert type scale 1) Very great extent 5) No extent at All	Questionnaire
	Stakeholders' involvement	• General public • Local authorities	Likert type scale 1) Very great extent 5) No extent at All	Questionnaire
	Risk assessment	• Potential hazards • Vulnerable groups	Likert type scale 1) strongly agree to 5) strongly disagree	Questionnaire
	Risk visualization	• Seriousness of risk • Risk reduction options	Likert type scale 1) strongly agree to 5) strongly disagree	Questionnaire
	Risk communication	• Timeliness of disaster communication • Modes of communication used	Likert type scale 1) strongly agree to 5) strongly disagree	Questionnaire

3.10 Ethical Issues

In carrying out this research, various ethical issues were adhered to. Prior to field activities to collect primary data, the researcher obtained permission and an introductory letter from the University of Nairobi and KRCS permission to administer the questionnaires to the respondents. Further, the study was conducted after obtaining research permit from National Commission for Science Technology and Innovation (NACOSTI).

For confidentiality and privacy, the researcher ensured that any information provided by the participants about their private life was kept confidential. Moreover, the researcher assured the respondents that there would be no leaking of their private information to any third party whatsoever. They were also assured that no information that can be used to identify them would be revealed in written or any other communication form. In addition, they were assured that all the information they gave would only be used for academic purpose only.

To ensure anonymity of the participants, the researcher assured them that their individual identity would not be revealed at all. This was further enhanced by ensuring that they did not write their names anywhere in the data collection instruments or in any other material used in the exercise.

Finally, participants were not coerced to take part in the study. Instead, the researcher briefed them on the nature and the purpose of the exercise in simple and clear language that was well understood. Then, the researcher explained to them the procedure to be followed during the data collection and requested their voluntary participation. Those who declined to take part were not compelled to do so.

3.11 Summary

This study used descriptive research design. The target population for this study was the Kenya Red Cross Society (KRCS) in which case, the staffs in this organization were surveyed. Purposive sampling technique was used to select the participants in the study. In this regard, the participants were the members of KRCS national council. The researcher used both primary and secondary data. Primary data was collected using a

questionnaire that was administered to the selected staffs at Kenya Red Cross Society through drop and pick method. Secondary data was gathered from published reports and other documents containing empirical studies on risk governance and disaster risk management. It was also sourced from the company's publications, journals and information obtained from the internet and other sources considered relevant to the study. Consequently, the study gathered quantitative and qualitative data. Quantitative data was analyzed through descriptive statistics of percentages, means, standard deviations and frequencies. Inferential statistics were also used. In this regard, correlation analysis, regression analysis as well as analysis of variance were computed. Qualitative data wasanalysed through content analysis whereby it was organized into themes in accordance to the study objectives. The findings were presented in tables and interpreted in line with the objectives of the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter discusses the findings from the data analysis. Data was analyzed through descriptive statistics of frequencies, percentages, mean and standard deviation. In addition, inferential statistics were used where regression analysis was done to establish the relationship between variables. Findings were presented in tables, pie charts and bar graphs. The chapter is organized basing on the research questions with a section on the general information of the participants also included.

4.2 General Information

4.2.1 Response Rate

To establish the response rate for the study, a record was kept for all the questionnaires administered and the ones that were completed and returned as well as those that were not returned or were returned unfilled.

Table 4.1: Response Rate

Questionnaire	Frequency	Percent
Response	83	81.4
No response	19	18.6
Total	102	100

The study targeted 102 members of staff in the various departments in KRCS. However, the respondents who completed and submitted their questionnaires were 83 while the rest 19 did not respond to the questionnaire. This indicates that the response rate for the study was 81.4% as illustrated in Figure 4.1. According to Edward *et al* (2002), while a response rate of between 60% and 80% is adequate for a study, it is excellent if it is above 80% and poor if it falls below 60%. This confirms that the response rate (81.4%) for this study was sufficient for data analysis.

4.2.2 Demographic Characteristics

The demographic characteristics that were analyzed included the gender, education level and the length of time worked by the staff members in KRCS.

Table 4.2: Gender

Gender	Frequency	Percent
Male	57	68.7
Female	26	31.3
Total	83	100

With regard to gender, majority of the employees were male (68.7%) while female were 31.3%. This implies that most of the staff members in KRCS are mostly men. It also indicates the low proportion of women (31.3%) in organizations. This may not be an appropriate ratio of men to women in an organization like KRCS which is humanitarian in nature. It manifests low representation of women in humanitarian leadership despite women being acknowledged as more efficient and effective in humanitarian response in disaster preparedness and building resilience (ActionAid International, 2016). It is thus important to recruit more women staffs in KRCS to improve on gender equality in their staffing and hence promote women empowerment.

Table 4.3: Education Level

Education level	Frequency	Percent
Doctorate (PhD)	5	6.0
Masters	49	59.0
Bachelor's degree	26	31.3
Diploma	3	3.6
Total	83	100

As to their education level, most of the respondents (59%) affirmed that they had a Masters' degree while 31.3% had a bachelor's degree. There were also a few with PhDs (6%) with only 3.6% having a diploma. This implies that majority of the staff members in KRCS are highly educated and this made it easy for them to understand the subject matter examined in the questionnaire hence stood a better chance to give relevant and useful information. This was echoed by Boyer-Villemaire *et al.*, (2014) who affirmed the

importance of having adequately educated staffs in a disaster risk management organizations. According to them, it facilitates better formulation and implementation of action plans.

Table 4.4: Length of Time Worked in KRCS

No. of years worked in KRCS	Frequency	Percent
Less than 1 year	9	10.8
1 - 3 years	18	21.7
4 - 5 years	31	37.3
Above 5 years	25	30.1
Total	83	100

Regarding the number of years worked at in KRCS, 37.3% of the respondents asserted that they had served in KRCS for 4-5 years; 30.1% had worked above 5 years while 21.7% had worked for 1-3 years. The rest 10.8% had worked for less than 1year. This is an indication that most of the staff members had an experience of over four years and above. Boyer-Villemaire *et al.*, (2014) also indicated that adequate experience (preferably over three years) of the personnel involved in addressing disaster management is necessary. The respondents thus can be considered as having adequate experience. This implies that they had an in-depth understanding of the issues investigated in this study thus enhancing the reliability of the information collected.

4.3 Influence of Stakeholders' Involvement on Disaster Risk Management

Table 4.5: Effect of Stakeholders' Involvement on Disaster Risk Management

Aspect	Very great extent	Great extent	Moderate extent	No extent at all	Mean	Sd v
General public	54.2	42.2	3.6	-	4.5	0.6
Local authorities	66.3	14.5	19.3	-	4.5	0.8
Community leaders	36.1	49.4	10.8	3.6	4.1	0.9
Average					**4.4**	**0.7**

The effect of stakeholders' involvement on disaster risk management was assessed through evaluation of the involvement of three main stakeholders. These include the general public, local authorities and community leaders. The overall mean for the stakeholders' involvement stood at 4.4 with a low deviation of 0.7. This implies that there is great stakeholders' involvement in disaster risk management at KRCS. The specific mean rating for the involvement of, the general public, local authorities and community leaders was 4.5, 4.5 and 4.1 respectively. This is an indication that KRCS engage these stakeholders greatly in disaster risk management. The importance of stakeholder involvement is widely recognized and considered essential to disaster governance (IPCC 2012; UNISDR 2005; UNISDR 2011). It has been asserted that it influence the availability of a social context in which people can formulate risk beliefs and actions. Discussion with other community members can increase the ability of people to collaborate to determine what consequences they could face, work out what would be an effective response, and then consider what information and resources they require to enact their mitigation strategies (Duncan et al., 2003).

4.4 Influence of Risk Assessment on Disaster Risk Management

Table 4.6: Effect of Risk Assessment on Disaster Risk Management

Aspect	Very great extent	Great extent	Moderate extent	Little extent	No extent at all	Mean	Sdv
a) Single-risk assessments determine the likelihood and consequences from a particular hazard	95.2	-	-	-	4.8	4.8	0.9
b) Risk assessments should provide for advances in risk management to improve disaster risk reduction,	43.4	34.9	8.4	-	4.8	3.9	1.5
c) At Kenya Red Cross Society, risk assessment are conducted on the consequences of a disaster event or hazard and the associated likelihood of its occurrence	65.1	25.3	4.8	4.8	-	4.5	0.8
d) At Kenya Red Cross Society, risk assessment are conducted on the vulnerability of different groups to a particular disaster event	83.1	3.6	13.3	-	-	4.7	0.7
Average						**4.5**	**1.0**

The average effect of risk assessment on disaster risk management was rated at a mean of 4.5 out of 5 with a deviation of 1.0. This indicates that risk assessment affects disaster risk management to a very great extent. Among the assessed areas, the greatest influence on disaster risk management is exerted by single-risk assessments that were strongly affirmed to determine the likelihood and consequences from a particular hazard as indicated by the highest mean of 4.8 with a standard deviation of 0.9. The second most influential is the aspect that risk assessments are conducted on the vulnerability of different groups to a particular disaster (mean= 4.7; standard deviation= 0.7). The third influential aspect is that risk assessments are conducted on the consequences of a disaster event or hazard and the associated likelihood of its occurrence which was rated at a mean

of 4.5 with a standard deviation of 0.8. The respondents strongly proposed that risk assessments should provide for advances in risk management to improve disaster risk reduction with a mean of 3.9 and a standard deviation of 1.5. The findings are in sync with the assertions by European Commission (2010) that indicated that risk assessment combines a characterization of the hazards with the level and extent of exposure with an assessment of differentials in vulnerability (and its converse – capacity) providing a calculated estimate of the risk of disaster in terms of impacts and their probability. This should therefore help KRCS to increase effectiveness in disaster management. According to UNISDR (2009), risk assessments should provide for advances in the systematic approach and practice of managing uncertainty to minimize potential harm and loss.

4.5 Influence of Risk Visualization on Disaster Risk Management

Table 4.7: Effect of Risk Visualization on Disaster Risk Management

Aspect	Very great extent	Great extent	Moderate extent	No extent at all	Mean	Sdv
a) High level of technology is used at Kenya Red Cross Society for the production and presentation of risk information	58.0	31.0	2.5	8.4	4.3	1.1
b) Statistical information per administrative unit (county) is used in exploring single-risk or multi-risk situation that can lead to significant impacts	19.3	62.7	10.8	3.6	3.8	1.1
c) Spatial and temporal distribution of potential hazards and risk are well identified at Kenya Red Cross Society	66.3	15.7	14.5	-	4.4	1.1
d) At Kenya Red Cross Society, there are set thresholds on levels of impacts that guide the exploration of single-risk or multi-risk situation	54.2	27.7	3.6	10.8	4.0	1.5
Average					**4.1**	**1.2**

On risk visualization, its overall influence on disaster risk management was rated at a mean of 4.1 with a standard deviation of 1.2. This implies that disaster risk management is also greatly influenced by risk visualization. In particular, the respondents strongly asserted that spatial and temporal distribution of potential hazards and risk are well identified at Kenya Red Cross Society (mean= 4.4; standard deviation=1.1). They also concurred that the organization uses high level of technology for the production and presentation of risk information (mean= 4.3; standard deviation=1.1). They further attested that there are set thresholds on levels of impacts that guide the exploration of single-risk or multi-risk situation (mean= 4.0; standard deviation=1.5). Lastly, statistical information per administrative unit (County) is used in exploring single-risk or multi-risk situation that can lead to significant impacts (mean= 3.8; standard deviation=1.1). The findings indicate that risk visualization is a fundamental element in determining disaster risk management. The findings confirm the assertions by ICSU-ISSC (2015) that risk visualization is essential to understand the underlying causes that create risk conditions when increasing exposure of population and infrastructure in hazard prone areas.

4.6 Influence of Risk Communication on Disaster Risk Management

Table 4.8: Effect of Risk Communication on Disaster Risk Management

Aspect	Very great extent	Great extent	Moderate extent	Little extent	No extent at all	Mean	Sdv
a) Kenya Red Cross Society uses collaborative and participatory approaches in risk information communication	0.6	1.2	2.9	59.5	35.8	4.3	0.6
b) Kenya Red Cross Society often gives an early warning about the disaster risk in a particular area	19.1	22.5	12.1	35.3	11.0	3.0	1.3
c) There is proper information distribution and communication to the community during risk information communication at Kenya Red Cross Society	10.4	15.0	17.3	49.1	8.1	3.3	1.1
d) In our risk communication program, we focus on the long-term potential for such events to happen	0.6	1.7	3.5	29.5	64.7	4.6	0.7
Average						**3.8**	**1.0**

With respect to risk communication, respondents rated its overall influence on disaster risk management at a mean of 3.8 with a low standard deviation of 1.0. This indicates that the influence of risk communication at KCRS is relatively lower compared to the other aspects of risk governance. It was revealed that in their risk communication program, KRCS focus on the long-term potential for such events to happen as indicated by a high mean of 4.6 with a standard deviation of 0.7. They also use collaborative and participatory approaches in risk information communication (mean= 4.3; standard deviation=0.6). However, some doubts were noted on the ability of KRCS to give proper information distribution and communication to the community during risk information communication as reflected by the mean of 3.3 with a standard deviation of 1.1.

Respondents also rated the effectiveness of KRCS in giving an early warning about the disaster risk in a particular area as moderate with a mean of 3.0 with standard deviation of 1.3. This could undermine the effectiveness of KRCS in disaster risk management since one of the major objectives of the disaster communication is to give an early warning about the disaster risk in a particular area (Sarun, 2011). In this regard, it is meant to focus on the imminent threat of an extreme event (warning) and produce an appropriate emergency response (van Westen & Kingma, 2009). Early warning helps to reduce economic losses and mitigate the number of injuries or deaths from a disaster, by providing information that allows individuals and communities to protect their lives and property. This information empowers people to take action when disasters close to happening (Sarun, 2011) which implies that ineffective early warning by KRCS could undermine their effectiveness in disaster risk management.

4.7 Relationship between Risk Governance and Disaster Risk Management

Table 4.9: Effect of Risk Governance and Disaster Risk Management

Extent that risk governance in KRCS has improved disaster risk management in the community	Frequency	Percent
Very great extent	58	69.9
Great extent	17	20.5
Moderate extent	5	6.0
Little extent	3	3.6
No extent at all	0	-
Total	83	100

Overall, most of the staff members alleged that risk governance at the Kenya Red Cross Society has improved the disaster risk management to a very great extent (69.9%). An additional 20.5% of them rated the improvement as great while 6.0% rated it as moderate. The rest 3.6%felt that risk governance had caused a little improvement in disaster risk management at KRCS. This is an indication that at KRCS, the staff members at KRCS have confidence in the effectiveness of risk governance in improving disaster risk management in the organization.

4.7.1 Correlation between Risk Governance and Disaster Risk Management

Variable relationship was analysed using Pearson correlation coefficient (r). This helped to show the relationship between elements of risk governence (stakeholder's involvement; risk assessment; risk visualization and risk communication) and disaster risk management.

Table 4.10: Correlation Matrix

		Disaster risk management	Risk assessment	Stakeholder's involvement	Risk communication	Risk visualization
Risk assessment	Pearson correlation	0.805(*)	1.00			
	Sig. (2-tailed)	0.01	0.00			
	N	103	103			
Stakeholder's involvement	Pearson correlation	0.755(*)	0.489(*)	1.00		
	Sig. (2-tailed)	0.01	0.03	0.00		
	N	103	103	103		
Risk communication	Pearson correlation	0.769(*)	0.658(*)	0.507(*)	1.00	
	Sig. (2-tailed)	0.00	0.02	0.01	0.00	
	N	103	103	103	103	
Risk visualization	Pearson correlation	0.780(*)	0.602(*)	0.740(*)	0.626(*)	1.00
	Sig. (2-tailed)	0.01	0.03	0.02	0.01	0.00
	N	103	103	103	103	103

Correlation analysis indicated that there is a positive correlation between risk governance and disaster risk management. This was reflected by strong positive correlation of above 0.7 in the relationship between disaster risk management and each of the elements of risk governance investigated including stakeholder's involvement; risk assessment; risk visualization and risk communication. In particular, findings indicate a strong positive correlation of r value 0.805 between Risk assessment and Disaster risk management. There is a also strong positive correlation of r value 0.755 between Stakeholder's involvement and Disaster risk management while a correlation of r value 0.769 exists between Risk communication and Disaster risk management. A correlation of r value 0.780 was found between Risk visualization and Disaster risk management. The findings indicate that for disaster risk management to be high, risk governance must be high to in terms of stakeholder's involvement; risk assessment; risk visualization and risk communication.

4.7.2 Coefficient of Determination on Disaster risk management

Through regression analysis, the Coefficient of determination (R square) was used to show the extent to which any change in Disaster risk management was explained by the independent variables (stakeholder's involvement; risk assessment; risk visualization and risk communication) collectively.

Table 4.11: Coefficient of Determination on Disaster risk management

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
0.891	0.793	0.719	0.175

Predictors: (Constant), Stakeholder's involvement, Risk assessment, Risk visualization and Risk communication

From the findings, R square was 0.793 which indicates that Risk assessment, Stakeholder's involvement, Risk communication and Risk visualization collectively influence 79.3% of the change in Disaster risk management in KRCS. The rest of the changes; that is 20.7% in Disaster risk management, is caused by other factors except the ones covered by the independent variables. The multiple correlation co-efficiency

(r=0.891) indicates a strong correlation between dependent and independent variables. The results also indicate that the standard error of the estimate was significantly low at 0.175.

4.7.3 Regression Coefficients

To determine the relationship between the dependent variable (Disaster risk management) and the independent variables (Stakeholder's involvement, Risk assessment, Risk visualization and Risk communication) the standardized Beta coefficients generated from regression analysis were used to develop the regression model for the relationship. The regression analysis was conducted at 5% level of significance (95% confidence level).

Table 4.12: Coefficients of Risk governance on Disaster risk management

	Coefficients(a)				
	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	0.493	0.177		5.120	.000
Risk assessment	0.621	0.064	0.697	9.201	.000
Stakeholder's involvement	0.447	0.380	0.511	3.775	.053
Risk communication	0.322	0.050	0.373	2.816	.017
Risk visualization	0.385	0.047	0.425	3.559	.000

Dependent Variable: Disaster risk management

From the findings, the model was therefore estimated as:

Disaster risk management = 0.493 + 0.697 Risk assessment + 0.511 Stakeholder's involvement + 0.425 Risk visualization + 0.373 Risk communication + ε

Disaster risk management in KRCS was expressed as a function of Stakeholder's involvement, Risk assessment, Risk visualization and Risk communication. To achieve standardized coefficients, all the variables were analyzed using regression tools. From the regression coefficients, the study found that an increase of a unit of Risk assessment leads

to an increase in Disaster risk management in KRCS by 0.697 while an increase of a unit of Stakeholder's involvement increases the Disaster risk management by 0.511.

Similarly, an increase by one unit of Risk visualization results to an increase in Disaster risk management by 0.425 while an increase in Risk communication by one unit was found to increase Disaster risk management by 0.373. The regression constant was 0.493 which means that if Risk assessment, Stakeholder's involvement, Risk communication and Risk visualization are held constant (at zero); in other words, if they are absent, Disaster risk management in KRCS would be 0.493 out of 5.

4.7.3 Analysis of Variance (ANOVA)

At this level F-test was used with Analysis of variance (ANOVA) to generate the F value. The ANOVA showed relationship in the variables between and within the measure of the dependent variable. It reflects the magnitude the model has on the data compared to those that are not considered in the model (residual).

Table 4.13: Analysis of Variance (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	21.720	4	5.430	74.844	0.001
Residual	5.659	78	0.073		
Total	27.379	82			

Predictors: (Constant), Change in Stakeholder's involvement, Risk assessment, Risk visualization and Risk communication

Dependent Variable: Disaster risk management

According to the ANOVA results, the probability value for the regression model was 74.844. The decision criteria is, if $F_{Critical} > F_{Calculated}$ then accept the **H0** and conclude that the independent variables jointly, have no significant relationship with the dependent variable. Given that $F_{Critical}$ (3.719) is less than $F_{Calculated}$ (74.844), the **H0** is rejected. The conclusion therefore from the ANOVA results is that the four independent variables (Change in Stakeholder's involvement, Risk assessment, Risk visualization and Risk communication) are critical in determining the dependent variable (Disaster risk management).

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusion and recommendations. The chapter also gives suggestions for further studies.

5.2 Summary of Findings

This study sought to investigate the influence of risk governance on disaster risk management at Kenya Red Cross Society. In particular, it sought to investigate the influence of stakeholders' involvement; risk assessment; risk visualization and risk communication on disaster risk management at Kenya Red Cross Society.

5.2.1 Influence of Stakeholders' Involvement on Disaster Risk Management

Stakeholders' involvement was rated at an overall mean of 4.4 with a low deviation of 0.7. The specific mean rating for the involvement of the general public, local authorities and community leaders was 4.5, 4.5 and 4.1 respectively.

5.2.2 Influence of Risk Assessment on Disaster Risk Management

The average effect of risk assessment on disaster risk management was rated at a mean of 4.5 out of 5 with a deviation of 1.0.Among the assessed areas of risk assessment, the greatest influence on disaster risk management is exerted by single-risk assessments that were strongly affirmed to determine the likelihood and consequences from a particular hazard (mean= 4.8; standard deviation= of 0.9). The second most influential is the aspect that risk assessments are conducted on the vulnerability of different groups to a particular disaster (mean= 4.7; standard deviation= 0.7).

5.2.3 Influence of Risk Visualization on Disaster Risk Management

The overall influence of risk visualization on disaster risk management was rated at a mean of 4.1 with a standard deviation of 1.2. Specifically, respondents asserted that spatial and temporal distribution of potential hazards and risk are well identified at Kenya Red Cross Society (mean= 4.4; standard deviation= 1.1). They also concurred that the organization uses high level of technology for the production and presentation of risk information (mean= 4.3; standard deviation= 1.1).

5.2.4 Influence of Risk Communication on Disaster Risk Management

Findings indicated that its overall influence on disaster risk management rated at a mean of 3.8 with a low standard deviation of 1.0.It was revealed that in their risk communication program, KRCS focus on the long-term potential for such events to happen (mean= 4.6; standard deviation= 0.7). They also use collaborative and participatory approaches in risk information communication (mean= 4.3; standard deviation= 0.6). There were however doubts on the effectiveness of KRCS in giving an early warning about the disaster risk in a particular area (mean= 3.0; standard deviation= 1.3).Generally, most of the staff members alleged that risk governance at the Kenya Red Cross Society has improved the disaster risk management to a very great extent (69.9%) with an additional 20.5% of them rating the improvement as great.

5.3 Conclusion

From the findings, the study concludes that there is quite a high level of stakeholders' involvement in disaster risk management at KRCS. In particular, it is inferred that KRCS largely engage the general public, local authorities and community leaders in disaster risk management. It is also deduced that risk assessment affects disaster risk management to a great extent in the organization. This is mostly attributed to: single-risk assessments in KRCS that determine the likelihood and consequences from a particular hazard; conducting risk assessments on the vulnerability of different groups to a particular disaster as well as risk assessments on the consequences of a disaster event or hazard and the associated likelihood of its occurrence.

Moreover, this study concludes that disaster risk management at KRCS is also largely influenced by risk visualization. In line with this, the study deduces that spatial and temporal distribution of potential hazards and risk are well identified in the organization. Additionally, the study deduces that there is use of high level of technology in the organization, in the production and presentation of risk information. KRCS also have set thresholds on levels of impacts that guide the exploration of single-risk or multi-risk situation.

This study further infers that risk communication at KCRS also influence disaster risk management at KRCS but at a relatively lower extent compared with the other aspects of risk governance. From the findings, the study concludes that KRCS usually focus on the long-term potential for disasters to happen in their risk communication program. Collaborative and participatory approaches are often used in risk information communication. Nonetheless, the study concludes that KRCS do not effectively give proper information distribution and communication to the community during risk information communication. They are also not effective in giving an early warning about the disaster risk in a particular area. Nonetheless, risk governance in KRCS has improved disaster risk management in the organization.

5.4 Recommendations

Drawing from the study findings, the following recommendations are proposed:

KRCS should ensure that they conduct balanced assessment of epidemiological, environmental and socio-economic drivers of risk. This will greatly help in ensuring a complex and more informative risk assessment for improved disaster risk management.

KRCS Should facilitate the link between relief, rehabilitation and development, and use opportunities during the recovery phase to develop capacities that reduce disaster risk in the short, medium and long term.

KRCS should improve on its risk communication too. In this regard, they should put in place a two-directional risk communication strategy through the development of a Web-based platform, which allows reporting of events, querying information and the generation of hazard, exposure and risk profiles for all administrative levels. Such a tool should be aimed at the public, at local authorities of different administrative levels, at NGO's, the media, and expert organizations that can use the tool to exchange risk related data. The web-based platform should be continuously updated and maintained for effectiveness.

KRCS should enhance their early warning systems to ensure that these systems are effective in disaster risks reduction. In this regard, they need to give a careful

consideration of incorporating the role of (local) elites, central government (taking into account the distribution of power), and the County governments in expanding their early warning systems networks. This will help to make these systems more effective in disaster risk management.

5.5 Suggestions for Future Research

This study recommends that more studies should be conducted focusing on the following:

(i) Management challenges facing risk governance in Kenya Red Cross Society

(ii) The effect of community socio-economic status on vulnerability to disaster risk

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL

DATE _____

To whom it may concern

Dear Respondent,

REF: INTRODUCTION LETTER ON MBA RESEARCH PROJECT

My name is Clement Paul Ochwada, currently a student at the University of Nairobi, undertaking Masters of Arts Degree in Project Planning and Management. In line with the course requirements, I am undertaking a research project entitled "**INFLUENCE OF RISK GOVERNANCE ON DISASTER RISK MANAGEMENT IN COMMUNITY.**" In this regard, I kindly request you to be part of this project by providing information that will assist in carrying out the research. To provide the information, please fill the questionnaire provided by honestly answering all the questions. Kindly answer the following questions as accurately as possible. Any information that you provide response will be strictly held confidential and shall be used for academic purposes only.

Thank you in advance.

Yours faithfully,

Clement Paul Ochwada

APPENDIX II: QUESTIONNAIRE FOR KENYA REDCROSS SOCIETY STAFF

This questionnaire should be completed by employees who are members of the **Kenya Red Cross Society National Council** only. It seeks to collect information to aid in conducting an academic research on the influence of risk governance on disaster risk management at Kenya Red Cross Society.

Instructions:

i) **Do Not Write Your Name Anywhere** on this questionnaire.

ii) Tick where appropriate using a tick **(√)** for your choice of answer.

Part A: Demographic profile (Please tick in the space provided)

1. Please indicate your gender
   Male ( ) Female ( )
2. Please indicate your age bracket in Years
   18-30 years ( )
   30-40 years ( )
   41-50 years ( )
   Above 51 years. ( )
3. Please indicate your highest level of education attained (please tick one)
   Diploma ( ) Bachelor's degree ()
   Masters Level ( ) Doctorate (PhD) ( )
4. How many years have you served in the Kenya Red Cross Society?
   Less than 1 year ( )
   1 - 3 years ( )
   4 - 5 years ( )
   5 years - above ( )

SECTION B: Stakeholders' Involvement

5 i) In your opinion, to what extent does the Kenya Red Cross Society engage the following stakeholders in disaster risk management? NB: 5**=Very great extent, 4=Great extent, 3=Moderate extent, 2=Little extent, 1=No extent at All**

Stakeholders	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**
General public					
Local authorities					
Community leaders					

ii) In what ways does engagement of different stakeholders influence disaster risk management at Kenya Red Cross Society?

……

……

……....

SECTION C: Risk Assessment

6i) Indicate the extent to which you agree with the following statements on a scale of 1 – 5 (**1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree**)

Statement	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**
Single-risk assessments determine the likelihood and consequences from a particular hazard					
Risk assessments should provide for advances in risk management to improve disaster risk reduction,					
At Kenya Red Cross Society, risk assessment are conducted on the consequences of a disaster event or hazard and the associated likelihood of its occurrence					
At Kenya Red Cross Society, risk assessment					

are conducted on the vulnerability of different groups to a particular disaster event					

SECTION D: Risk Visualization

7i) Indicate the extent to which you agree with the following statements on a scale of 1 – 5 (**1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree**)

Statement	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**
High level of technology is used at Kenya Red Cross Society for the production and presentation of risk information					
Statistical information per administrative unit (county) is used in exploring single-risk or multi-risk situation that can lead to significant impacts					
Spatial and temporal distribution of potential hazards and risk are well identified at Kenya Red Cross Society					
At Kenya Red Cross Society, there are set threshold son levels of impacts that guide the exploration of single-risk or multi-risk situation					

ii) How does exploration of a single-risk or multi-risk situation influence disaster risk management at Kenya Red Cross Society?

……

……

……....

SECTION E: Risk Communication

8 i) Indicate the extent to which you agree with the following statements on a scale of 1 – 5 (**1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree**)

Statement	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**
Kenya Red Cross Society uses collaborative and participatory approaches in risk information communication					
Kenya Red Cross Society often gives an early warning about the disaster risk in a particular area					
There is proper information distribution and communication to the community during risk information communication at Kenya Red Cross Society					
In our risk communication program, we focus on the long-term potential for such events to happen					

ii) How does Risk Communication influence disaster risk management at Kenya Red Cross Society?

……

……

……....

SECTION F: Disaster Risk Management

9. In your opinion, to what extent has risk governance at the Kenya Red Cross Society improved the disaster risk management in the community?

Very great extent ( ) Great extent ( )

Moderate extent ( ) Little extent ( ) No extent at All ( )

12. Please give suggestions on how risk governance at the Kenya Red Cross Society can be enhanced to improve disaster risk management in the community.

……
……
……..

APPENDIX III: INDEPTH INTERVIEW GUIDE

Date_____Respondent's Position _____

1) How are the following stakeholders engaged in disaster risk management atthe Kenya Red Cross Society?

i) General public

ii) Local authorities

ii) Community leaders

2) How is engagement of these stakeholders important in disaster risk management?

3) In your risk assessments, do you focus on single-risk or multiple – risk assessments? Please explain.

4) What types of technology are used at Kenya Red Cross Society for production and presentation of risk information? Please explain

5) Do you use statistical information per administrative unit (e.g. county) when exploring risk situations? If yes, please elaborate. If no, kindly explain why.

6) Do you have thresholds on levels of impacts to guide exploration of risk situations? Explain

7) Which approaches are used at Kenya Red Cross Society in risk information communication?

8) What is the central focus while using the risk information communication approaches as far as disaster risk management is concerned?

9) From your experience, how do you think risk governance at the Kenya Red Cross Society can be enhanced for improved disaster risk management?

APPENDIX IV: FOCUS GROUP DISCUSSION GUIDE

1) In what levels has Kenya Red Cross Society been effectively engaging different stakeholders important in disaster risk management? How has this affected disaster risk management?

2) How effective are risk assessments at Kenya Red Cross Society in minimizing likelihood and consequences from different hazard? Please explain.

3) How adequate is the technology used at Kenya Red Cross Society for generating and presenting risk information? Please explain

4) How can you describe the appropriateness of using statistical information from administrative units (e.g. counties) to explore risk situations?

5) How effective are the risk information communication approaches used at Kenya Red Cross Society in disaster risk management?

6) How can risk governance at the Kenya Red Cross Society be improved to enhance disaster risk management?

APPENDIX V: TIMEFRAME

Activity	Feb-Mar 2017	April-May 2017	June-July 2017	Aug 2017	Sep-October 2017
Developing Proposal Document	■	■	■		
Introduction	■				
Literature Review and Methodology		■			
Draft Proposal Submission			■		
Corrections			■		
Final Draft Proposal Submission			■		
Data Collection			■		
Data Analysis				■	
Chapter four and five				■	■
Draft Project Submission					■
Corrections					■
Final Draft Project Submission					■

APPENDIX VI: BUDGET

Item/Activity	**Amount (Kshs.)**
Travelling	11,000
Internet/research costs	5,000
Data analysis	10,000
Printing and photocopying of proposal	4,000
Research Assistant	9,000
Typing services	3,500
Printing and photocopying of project	5,500
Hard binding	1500
Miscellaneous	5,000
Total	**54,500**