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Nairobi, Kenya

Maritime Disaster Risk Reduction Preparedness along Kenya's Coastline

OCCASIONAL PAPER: SERIES 9, NO. 1

Joseph Kioi Mbugua and Major Said Mwachinalo

"Enhancing Capacity for Maritime and Infrastructure Disaster Response and Management"

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Foreword

International Peace Support Training Centre (IPSTC) is a regional Centre of Excellence. It trains for the African Standby Force (ASF) in Eastern Africa among other clients. It is a Peace Support Operations (PSO) research and training institution focusing on capacity building at the strategic, operational and tactical levels within the framework of the African Peace and Security Architecture (APSA). The Centre has made considerable contributions in training and research on peace support issues in Eastern Africa through design of training curriculum, field research and publication of *Occasional Papers and Issue Briefs*.

IPSTC presents one of the occasional papers produced this year titled: *Maritime Disater Risk Reduction Preparedness along Kenya's Coastline.* The study provides the current picture of the state of maritime disaster risk reduction preparedness in the Kenya coastal maritime domain, the strategic, institutional and capacity response put in place by the national and county government, Non Governmental Organizations and development partners. The study identifies the gaps and provide recommendations to key actors for improved effectiveness of maritime disaster preparedness.

Brigadier Patrick M. Nderitu
Director
IPSTC

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Lastly, we wish to thank the Government of Japan through UNDP- Kenya who through their generous support have made the research and publication of this Occasional Paper possible.

List of Abbreviations

AU	African Union
BMC	Border Management Committees
BMU	Beach Management Units
CBO	Community Based Organization
CDMC	County Disaster Management Committee
CDOC	County Disaster Operations Centre
CFC	County Forest Committees
CSG	County Steering Group
CSO	Civil Society Organizations
DRR	Disaster Rusk Reduction
EIA	Environmental Impact Assessment
EWS	Early Warning System
G.K	Government of Kenya
FEMA	Federal Environment Management Authority
FGD	Focus Group Discussion
HFA	Hyogo Framework of Action
ICAM	Integrated Coastal Area Management
ICAO	International Civil Aviation Organization
ICMZ	Integrated Coastal Management Zones
ICPAC	IGAD Climate Prediction and Application Centre
IMO	International Maritime Organization
KAA	Kenya Airports Authority
KCAA	Kenya Civil Aviation Authority
KEWOPA	Kenya Women Parliamentary Association
KDF	Kenya Defence Forces
KFS	Kenya Forest Service
KFS	Kenya Ferry Services
KII	Key Informant Interview
KMA	Kenya Maritime Authority
KMD	Kenya Meteorological Department
KMPU	Kenya Maritime Police Unit

KPA	Kenya Ports Authority
KRCS	Kenya Red Cross Society
KWS	Kenya Wildlife Service
LMMPA	Locally Managed Marine Protected Areas
MRCC	Maritime Rescue Coordination Centre
NDCC	National Disasters Coordination Committee
NDOC	National Disasters Operations Centre
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
SFDRR	Sendai Framework for Disaster Risk Reduction
S&R	Search and Rescue
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Risk Reduction
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNOCHA	UN Office for Coordination of Humanitarian Affairs
WMO	World Meteorological Organization
WOAA	World Oceanic Atmospheric Administration (WOAA)

Operationalization of Key Terms

Maritime Disaster Risk Reduction

A strategic disaster management approach for reducing vulnerabilities and disaster risks in coastal society, to avoid or limit the adverse effects of hazards while raising community resilience capacity within the broader context of sustainable development

Maritime Disaster Preparedness

In this study preparedness refers to national and county capacity to deal effectively with natural and man-made maritime disasters. Assessment will include management system and structures, political, cultural, social, economic and environmental factors that determine preparedness capacity.

Coastal Resilience

This refers to the ability of coastal communities to respond to maritime (sea level) related hazards. Planning is essential in reducing the risk and vulnerability. Effective resilience is based on existing institutional structures at all levels, well planned response and recovery, active participation and community awareness (UNESCO, 2012).

Maritime Disaster

A serious disruption of the functioning of society within the coastal maritime domain causing widespread human, material or environmental damage and losses which exceed the ability of the affected community to cope using their own resources

Hazard

A potentially damaging physical event, human activity or phenomenon with a potential to cause loss of life or injury, property damage, social and economic disruption of life, environmental degradation among others effects.

Risk

Risk is the probability of harmful consequences or loss resulting from the interaction between natural hazards and vulnerable conditions to property or people

Vulnerability

A set of conditions resulting from physical, social and economic and environmental factors within the maritime domain. Vulnerability also refers to the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of natural hazards.

Abstract

This study is about the assessment of Disaster Risk Reduction (DRR) preparedness level in Mombasa and Kwale counties of Kenya. The main objective of the study was to examine disaster risk governance and the level of preparedness for effective response and recovery in the two counties. The study aimed at providing new insights for policy and practice as the country gears toward making the blue economy a major contributor to the national income. The study employed a descriptive cross sectional survey. A total of 31 organizations were surveyed. Primary data was collected from respondents using: a 5 scale Likert type questionnaire, Focussed Group Discussions and Key Informant Interviews. Data collected was then analysed through Statistical Package for Social Sciences (SPSS) and summative content analysis. Median and mode were used as measures of central tendency while the inter quartile range (IQR) was used as a measure of dispersion. The Mann – Whitney U Test was used to compare preparedness between Mombasa and Kwale Counties through hypothesis testing. The study found that DRR preparedness is low in both counties, however there are commendable initiatives that have been put in place by various actors to boost preparedness.

It was also established that the counties have not yet put in place an efficient and effective disaster preparedness system. Actors do not speak in one voice through efficient coordination framework, communication and early warning strategy. Neither do they have clear understanding of each other's resources and contribution against expected hazards. There was low understanding of community vulnerabilities and capacity. The study recommends that an Emergency Operation Centre be established in both counties and that efforts be made to strengthen multi-agency approach to DRR so as to enhance synergy/solidarity.

Key Words: Maritime Disaster Risk Reduction Preparedness of Coastal Communities

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CHAPTER 1:

Introduction

1.1 Background of the Study

Disasters pose significant challenges to developing countries through the losses incurred and diversion of fund from development to humanitarian relief (UNISDR, 2015). Kenya is prone to various disasters such as terrorism, pandemics, road accidents, famine, drought and floods and the latter two have been the most severe due to climate change (GK, 2015).

The frequency and magnitude of these disasters has been increasing with rise of temperatures and erratic rainfall (DI, 2017). Floods contaminate water reservoirs with sewers and waste disposal systems thereby increasing water-borne diseases such as typhoid. They also destroy infrastructure thereby disrupting supply routes. The extent of vulnerability and stress placed on humanitarian relief largely occasioned by climate change is not expected to abate in the near future (UNISDR, 2015). Coastal populations are more vulnerable due to high rate of poverty, urbanization, poor social services, weak institutional frameworks and low capacity in Disaster Risk Reduction (DRR) (Connors & Ayobi, 2016; UNESCO, 2012).

1.1.1 Disaster Risk Governance

Disaster risk governance envisages going beyond reactive top-down approaches to proactive community agency and empowerment and also recognizes the local capacities available and seek to reinforce their resilience (UNISDR, 2005). Disaster risk governance which is a corollary of DRR refers to a systematic disaster management approach aimed at minimising vulnerabilities and disaster risks throughout a society, to avoid or limit the adverse effects of hazards within the broader context of sustainable development (UNISDR, 2015; G.K, 2010).

A number of attempts have been made to improve disaster risk governance from a global, national and county level (UNISDR, 2015). In Kenya the efforts have largely been through establishment of legislations, policies, institutions and county government structures among others. However their impact on reduction of disasters remain low. Disasters have overshadowed Kenya government's efforts to increase resilience and sustainability in most areas (DI, 2017).

The achievement of disaster preparedness takes place through a process of planning, training and exercising accompanied by the acquisition of funds, human resorce, equipment and apparatus to support emergency and action (FEMA, 2013). Recovery phase includes planning for impact and needs assessment to inform rebuilding, restoring and rehabilitating community. It also includes maintaining strategic supplies reserve, enforcement of public safety and health standards, adhering to building codes, occupational safety and health act and professional ethics (UNISDR, 2015). Planning also provides roles and responsibilities of practitioners while coordination, collaboration and communication structure are regarded as vital component for enhancing efficient operations through managing different functions, skills, resources and organizational cultures (FEMA, 2013).

1.1.2 Disaster Preparedness

Disaster preparedness refers to the readiness of a political jurisdiction to react constructively to threats from the environment in a way that minimises the negative consequences for the health and safety of individuals and the integrity and functioning of physical structures and systems (Perry, 2003). The achievement of disaster preparedness takes place through a process of planning, training and exercising accompanied by the acquisition of funds, human resorce, equipment and apparatus to support emergency and action (FEMA, 2013).

Zhou et al (2011) identify organizational structure, clear division of responsibilities, government leadership in planning and coordination and continuous improvement of the operational system as critical factors for effective preparedness. Such structures can involve training and testing, professional knowledge sharing platforms and networks, internal and external evaluation. Stakeholder and community participation is a key variable noting that well planned measures that do not involve communities will most often fail (Runhaar et al, 2012).

Stakeholder and community participation is a key variable noting that well planned measures that do not involve communities will most often fail (Runhaar et al, 2012). This is also confirmed by the field research findings. It has also been noted that disaster preparedness in the country and the target counties is low (DI, 2017).

1.1.3 Integrating Maritime Disaster Risk Governance and Preparedness

A number of initiatives have been carried to link DRR with preparedness especially in coastal areas. The concept of Integrated Coastal Area Management (ICAM) provides

a comprehensive approach to sustainable management of coastal zones with effective community participation (UNESCO, 2012). The UN Sustainable Development Goals (SDG) number 14 focusses on conservation, use of oceans, seas and marine resources for sustainable development. However in developing countries little resources are channelled to preparedness and therefore suffer severe impact when disaster strike.

Coastal hazards preparedness entails awareness of the hazards and innovative approaches, elements and tools for making coastal areas safe zones. Coastal risk management is now approached systematically in the ICAM global framework and DRR, (UNESCO, 2012; UNISDR, 2015). This strategy supports coastal member states to develop cost-effective disaster risk strategies for enhancing capabilities and community preparedness.

Oceans and coastal areas face a number of hazards such as; pollution, population growth and man-made vulnerabilities, overexploitation, limate change impact, tsunamis, storm surges, coral bleaching, warming of coastal waters leading to mortality of sea grass and shoreline erosion (Wong et al., 2016). It has been shown that coastal communities are usually less prepared and not resilient to such risks (UNESCO, 2012).

1.1.4 Mombasa County Disaster Risk Profile

Mombasa County is one of the counties located in the coastal region of Kenya along the shore line of the Indian Ocean. It is the largest seaport in East Africa and Kenya's second largest city after Nairobi. The Mombasa County Integrated Development Plan (CIDP) (2013) avers that the county has had a long history of frequent natural disasters that have a severe impact on socio-economic welfare and infrastructure. The CIDP (2013) names floods as a frequent phenomenon due to poor infrastructure and semi-permanent settlements. It also list others as; high temperature and humidity which can destroy marine organisms, storms, tidal gauge, waves and landslides. It also names traffic accidents, ferry and boats, fire, diseases/epidemics, pollution/oil spill/chemicals, sea-shore erosion and coastal storm surges. Terrorism, diseases, capsizing of boats, tsunami, Ship accidents, oil and chemical spills, pollution, hazardous waste on land and sea are yet other disaster risks (CIDP, 2013).

1.1.5 Kwale County Disaster Risk Profile

Kwale County is located at South Eastern tip of Kenya where it borders Tanzania and counties of Taita Taveta, Mombasa, Kilifi and the Indian Ocean. The Kwale County Integrated Development Plan (KCIDP) (2013) avers that it experiences a number of natural and man-made disasters such as Tsunami, storm water, epidemic, floods and

drought, Al Shabaab related violent extremism terrorism/ especially among returnees, drugs and substance abuse. These disasters cause loss of lives, destruction of property, infrastructure and collapse of buildings, destruction of marine life, coral reefs, mangrove, fish, beaches and ecosystem and prevents regeneration of sea vegetation.

1.2 Statement of the Problem

Kenya spends 2.8% of its GDP on disasters especially drought and floods where this cost is seven times higher than cost of prevention (East African, 2018). DRR preparedness has not been very effective as noted by previous studies (DI, 2017; Kertich, 2017). Given the high level of exposure and community vulnerability in the coastal areas, disaster can have severe impact on the vulnerable population (Wong, et al, 2016; UNESCO, 2012).

Kenya coastal flooding from sea level rise is projected to affect 10 000 to 86 000 people per year that may lead to erosion and wetland loss at an annual cost of US$ 7-58 million by 2030, rising to US$ 31-313 million by 2050 (SEI, 2009). Coastal erosion and salt water intrusion are already disaster threats (Comte et al., 2016; Mwakumanya et al., 2009). The two counties are susceptible to Tsunami and other disasters expected to increase in frequency and magnitude with increasing effects of climate change. Unlike previous studies reviewed, this study will be more focused in terms of research site and will cover both man-made and natural disasters.

1.3 Research Questions

I. What is the capacity of disaster risk reduction governance framework for effective response and recovery in Mombasa and Kwale Counties?

II. What is the disaster risk reduction preparedness capacity for effective response and recovery in both counties?

III. What are the similarities and differences between Mombasa and Kwale County's disaster risk reduction governance and preparedness capacity

IV. How best can the two counties enhance disaster risk reduction governance and preparedness capacity?

1.4 Study Objectives

The study aimed at achieving the following objectives; to:

I). Analyze disaster risk reduction governance framework for effective response and recovery in Mombasa and Kwale Counties

II). Evaluate disaster risk reduction preparedness capacity in Mombasa and Kwale Counties

III). Compare and contrast Mombasa and Kwale County's disaster risk reduction governance and preparedness capacity

IV). Appraise options for enhancing disaster risk reduction governance and preparedness capacity in both counties

1.5 Justification of the Study

This research will provide knowledge that can be used by policy makers to raise disaster risk governance and preparedness at the County level. It will also provide insights and gaps to inform practitioners. The study will inform evidence DRR preparedness based curriculum and course development at IPSTC and other institutions.

1.6 Focus and Scope

This study investigated the state of maritime disasters preparedness along the Kenya coastline mainly in Mombasa and Kwale Counties from 2000 to 2018. The study did not cover all aspects of DRR but was limited to preparedness in the two target counties.

CHAPTER 2:

Literature Review and Theoretical Framework

2.1 Introduction

This section reviews literature on DRR and preparedness in a bid to establish theoretical foundations, best practices, strengths and gaps. It further gives the conceptual framework of the study.

2.2 Global Disaster Risk Governance and Disaster Preparedness Framework

The global approach of disaster risk governance and disaster preparedness is informed by the UN International Strategy for Disaster Risk Reduction (UNISDR) (Sendai) Framework (2015-2030). It has three strategic goals: '*to integrate DRR into sustainable development policies and planning, develop and strengthen institutions, mechanisms and capacities to build resilience to hazards and integrate DRR approaches into the implementation of emergency preparedness, response and recovery programmes',* (UNISDR, 2015).

The Sendai Framework makes an improvement from Hyogo Framework of Action (HFA, 2005-2015) through fostering resilience at all levels, addressing underlying disaster risk factors and ensuring adequate means of implementation. It calls for empowering women and people with disabilities in response, recovery, rehabilitation and reconstruction approaches and improved preparedness through multisectoral inclusion in policy making and contingency plans (UNISDR, 2015, p.17). The framework also proposes a number of measures such as evaluation of multihazard and multisectoral Early Warning Systems (EWS).

Effective disaster risk governance includes strategy and implementation structures, monitoring, assessment and analysis, vulnerability and hazard mapping, sectoral contingency plans, resource mobilization, climate change adaptation and mitigation mechanisms, education, training and capacity building, knowledge management and research (FEMA, 2013). It involves addressing institutional frameworks and developing policies to support technical personnel and institutions to actively carry out activities while ensuring effective community participation (UNISDR, 2015).

However Zia & Warner (as cited in Marchezini et al, 2017) hold that Sendai Framework for Disaster Risk Reduction (SFDRR) lack specific means of implementation that combines both top-down and bottom-up approaches. It has also been criticised for

focussing on climate induced hazards than multihazard approach (Kelman, 2015; Marcheziniet et al, 2017). Further the SFDRR does not provide guidance on youth participation, a significant limitation given that they account for 50-60% of those affected by disasters (Marchezini et al, 2017). This study will make use of subsequent revisions that have been captured in the National Platform for DRR.

2.3 Africa's Disaster Risk Governance and Disaster Preparedness Framework

Africa Union (AU) closely follows the Sendai Framework through the strategy of Extended Programme of Action (2015-2030) (AU, 2016). The African Union Commission (AUC) coordinates DRR activities of the AU. AU has African Regional Strategy for Disaster Risk Reduction (ARSDRR, 2004) that acts as a guideline for regional organizations and member countries including non-state actors. The strategy together with revised Action Plan calls for political commitment, assessment of disaster risks, knowledge management, awareness, improved governance and integration of DRR in emergency response plans (AU, 2016). However AU assistance in individual countries during emergejncies is hardly visible given its lack of resources.

2.4 Kenya's Disaster Risk Governance and Disaster Preparedness

Kenya has developed standards for DRR response i.e. the Kenya Initial Rapid Assessment Tool (KIRA) to support evidence based decision making however there is no common framework for risk assessment (G.K, 2015). Kenya also has Draft National Disaster Policy (2009) that recognizes responses to marine life and resource, environmental protection and hazardous materials containment. Vision 2030 and CIDP provide strategic direction for DRR especially focusing on the most vulnerable communities (G.K, 2015).

Disaster management within the County is a function of the County government, (GK, 2010; GK, 2014). However in practice it is a shared responsibility. The County Government Disaster Management Act (2014) empowers counties to prevent any disaster, reduce risks and mitigate consequences, engage in vulnerability assessment, capacity building, preparedness, prompt and effective response and recovery. All counties are expected to develop disaster plans. However legal instruments from the national to the county have not been harmonized into one DRR Legal and policy framework (Kabubi, 2017). This gap affects operations at county level.

Disaster risk governance in Kenya is under a number of administrative structures that include; National Disasters Operations Center (NDOC), Kenya National Platform for DRR, Kenya Food Security Steering Group, Community based Disaster Management Committees and County Disaster Management Committees (CDMC) (Kertich, 2017). There is also climate change secretariat and National Climate Change Adaptation Strategy and National Drought Management Policy and National Drought Management Authority (NDMA) among others, (Kertich, 2017).

The NDOC is a monitoring, coordinating and mobilization of resources and response mechanism for disasters management. It implements governments' decisions and liases with other key partners and UN Office for Coordination of Humanitarian Affairs (UNOCHA). NDOC also reviews, evaluate and validate preparedness in the country on an annual basis (Kertich, 2017).

2.5 Empirical Studies

In a 2016 desk top study of early warning systems in Africa, Carribean and South Asia; Lumbroso found that the main reason for their ineffectiveness was lack of high quality data, technical and technological capacity to generate forecasts (Lumbroso, 2016 as cited in Marchezini et al, (2017). Other draw backs are deterioration of monitoring networks, inadequate communication to communities and inaccessibility of the warning systems. This study was however a macro global focus study limited to EWS and therefore lacks details of a micro-DRR preparedness study.

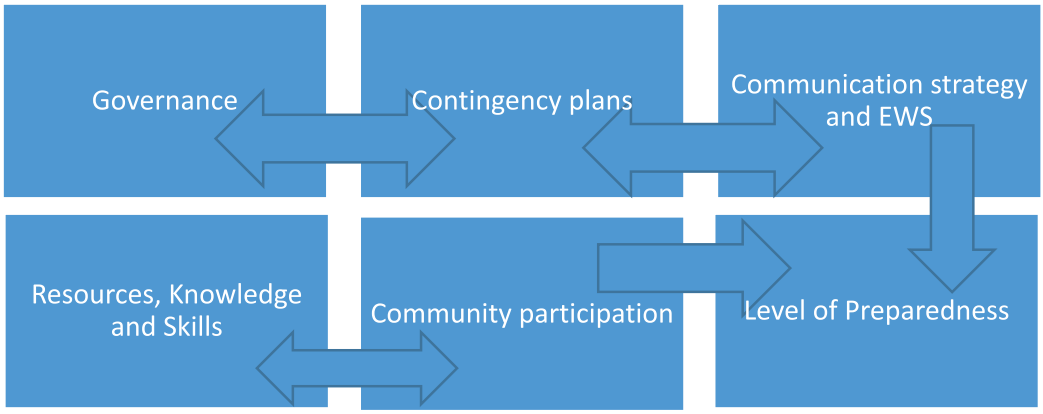
Development Initiatives (DI), (2017) did a qualitative review of Kenya's preparedness against natural disasters. It found that there is reliable early warning data, information and systems but there is lack of fund allocation and a culture of preparedness. The study focused on Mandera and Migori County, two counties that offer comparative outcomes, however the study misses the man-made disasters that also informs vulnerability especially in the coastal areas.

2.6 Theoretical Framework: HFA and UNISDR

There are some indicators of DRR preparedness according to UNISDR that sets global standards for best practices (UNISDR, 2015). The study utilised these indicators as study variables. The illustrative diagram below provide a snap shot of the variables relationship with level of preparedness.

2.7 Conceptual Framework

Table 2. 1. Relations among variables



Source: Authors' Adaptation of HFA and UNISDR Disaster preparedness variables

Therefore the outcome in the level of preparedness at the coastal region will depend on; capacity of agencies, contingency planning at county level, communication and early warning systems, community participation and national DRR governance framework implementation.

CHAPTER 3:
Research Methodology

3.1 Introduction

This chapter explains the research design chosen to answer the research questions. It highlights the data collection methods employed and justification thereof. It also gives a rationalization on the sample size used to collect data.

3.2 Research Design

This study utilized a descriptive cross sectional research design. Cross sectional study refers to a method that compares independent and dependent variables over a specific period of time. It generates rather than test hypothesis. It seek to answer questions such as what, where, how and when and helps to report on the independent variables at a certain point in time (Mugenda & Mugenda, 2003). The nature of the study design was suitable in responding to the 'what is' query the researchers wanted to establish (Bickman & Rog, 1998).

3.3 Population of the Study

The study population consisted of all agencies in Mombasa and Kwale Counties responsible for maritime disaster risk governance and preparedness. The study identified 41 organizations/agencies as part of the study population. The organizations were mainly: national and county government apparatus, Non-Governmental Organizations (NGOs) and the local community. The list of the study population is as provided in Appendix 1.

3.4 Study Site

The study covered all the sub counties of Mombasa except Changamwe and two sub counties of Kwale namely Msambweni and Matuga. Mombasa County was chosen since it is Kenya's second biggest city and the largest sea port (CIDP, 2013). As a gateway to East Africa, disasters can have far reaching effects to Kenya's and the regional economy. Kwale was chosen due to its strategic importance to the Kenyan economy. It is a prime tourists' destination with a rich marine ecosystem that require conservation (KCIDP, 2013).

3.5 Sample Size and Sampling Procedure

The study utilized stratified random sampling. Stratified random sampling is a technique which involves categorizing a study population into groups that are homogenous from which samples are drawn at random (Mugenda & Mugenda, 2003). The study population was thus categorized into the following stratus from which the sample size was drawn: national government apparatus, county government authorities, private enterprises, NGOs and local community.

The study targeted 41 organizations/agencies. A total of 31 organizations were sampled. This represented 75.61% of the study population. Mugenda & Mugenda (2003) hold the view that a response rate of 70% and above is excellent. The sample size drawn is as shown in Table 3.1 below.

Table 3. 1: Respondents by Type of organization worked for

		County		Total
		Mombasa	Kwale	
Type of organization worked for	National Government Actor	65	38	103
	County Government Actor	11	7	18
	Private Enterprise	4	1	5
	NGO/CSO/CBO	13	8	21
	Local Community	1	0	1
Total		**94**	**54**	**148**

In total the study sampled 148 respondents. 94 respondents were from Mombasa County while Kwale County accounted for 54 respondents. The national government actors had the largest number of respondents followed by county government authorities and then NGOs. A further analysis of the respondents indicate that the sample size was made up of 22.3% (33 respondents of 148) female respondents with the males making up 77.7% (115 respondents of 148) of the rest of sample.

The sample size was drawn from the three levels of management namely; strategic, operation and tactical level.14.86% (22 out of 148 respondents) were drawn from the stategic level, 57.43 % (85 out of 148 respondents) from operational level while the low level management accounted for 27.71% (41 out of 148 respondents).

3.6 Data Collection Method and Tools

The study's data was collected through both quantitative and qualitative methods. Using both approaches enabled a comprehensive understanding of the subject under inquiry.

For quantitative data, a 5 scale Likert type questionnaire was used. The quantitative questionnaire was based on the indicator as adapted from the Hyogo and Sendai Frameworks. To analyze disaster risk governance the questionnaire solicited data on county strategy, institutional and legislative framework. To evaluate disaster preparedness the questionnaire sought data on contingency plans, capacity building and analysis, hazard monitoring, EWS, knowledge management, emergency services and standby arrangements, planning for early recovery and resources.

The questionnaire sought responses ranging from totally disagree, Disagree, I don't Know, Agree to totally agree (scale 1 to 5 respectively). The response I don't know was utilized as the neutral middle point in the range of responses. A drop and pick later method of administering the quantitative questionnaire was used. Before dropping the questionnaire, the respondents were reached on phone and requested to participate in answering the quantitative questionnaire. Emphasis was placed on anonymity to increase response rate.

The qualitative questionnaire was made up of open ended questions that sought further information on the data adduced by quantitative data collection tool. Respondents were given latitude to speak freely on the various indicators of preparedness with follow up questions used to probe further for clarity. Key Informants Interviews (KIIs) and Focused Group Discussions (FGDs) were used to collect qualitative data. A total 10 KIIs were conducted in Mombasa County while 6 were done at Kwale County. 4 FGDs were held in Mombasa while Kwale accounted for 3 FGDs. A smart phone voice recorder was used to record the qualitative interviews after obtaining consent of the respondents.

3.7 Data Analysis

The quantitative questionnaire yielded ordinal data whose measures of central tendency are median and mode (Jamieson, 2004). Summative content analysis was used to draw findings for qualitative data. For quantitative data the median was used as a measure of central tendency showing the general perception and level of disaster risk governance and preparedness for the indicator(s) under examination. The Inter Quartile Range (IQR) was used as a measure of dispersion since it is not affected by extreme values unlike the range in the analysis of ordinal data (Jamieson, 2004). The study considered

an IQR of greater than or equal to 2.00 as an indicator of very strong divergent views. For indicators that yielded an IQR of less than 2.00, the study concluded that there was a general concurrence on the level of preparedness for the indicator under scrutiny.

The Statistical Package for Social Science (SPSS) software was used to automatically generate hypotheses which were tested using the U Test. The Mann – Whitney U Test automatically generated the significance values and decision(s) to reject or accept the null hypotheses.

3.8 Validity and Reliability

As advanced by Patton (as cited in Golafshani, 2003) methodological triangulation was used to assure validity of the study. Quantitative data findings were cross checked with qualitative data findings for verification. To test for reliability, reliability analysis using SPSS was done. The Cronbach's alpha statistic was used to measure reliability by examining the internal consistency of the ten categories of multiple response set indicator categories. Table 3.2 gives the Cronbach's alpha score for the various categories of indicators.

Table 3. 2: Reliability Analysis

Item	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
County Strategy and institutional framework	.768	.854	10
Legislative framework	.468	.718	5
Coordination at the County level	.870	.870	7
Contingency plans	.874	.905	18
Capacity analysis and capacity building	.899	.899	11
Hazard monitoring, forecasting and early warning	.753	.879	15
Information management and communication	.773	.844	10
Emergency service and standby arrangements	.762	.861	12
Incorporating early recovery into preparedness planning	.837	.837	6
Resource allocation and funding	.837	.840	7
Overall	.784	.851	101

Thai (2013) holds the view that a Cronbach's alpha score of 0.600 and above is an indicator of reliability which the study shared. Nine of the ten categories had a Cronbach's alpha score of above 0.600 with only one category (legislative framework) scoring below at 0.468. Overall the Cronbach's alpha score stood at 0.784 which indicates that the quantitative questionnaire was quite reliable.

CHAPTER 4:

Data Analysis and Interpretation

4.1 Introduction

This chapter presents findings obtained from the cross sectional survey of disaster preparedness in both Mombasa and Kwale Counties. The findings are outlined both quantitatively and qualitatively. The statements were presented to the respondents to rate on a scale of 1 to 5 whether they totally disagree (scale 1) or totally agree (scale 5). All the tables are derived from field research data.

4.2 Strategy and Institutional Framework

This category containing 10 statements aimed to elucidate responses meant to measure the degree to which disaster preparedness is factored in disaster planning and to measure community and other actors' participation.

Table 4. 1: Strategy and Institutional Framework

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Participatory assessment of risks, hazards and capacities.	3.00	4.00	2.00	4.00	4.00	2.00
Structure in place to promote information sharing	4.00	4.00	2.00	4.00	4.00	2.00
Resources allocated at all levels	2.00	2.00	2.00	3.00	2.00[a]	2.00
County plans indicate harnessing community capacities	3.00	2.00	1.25	3.00	4.00	2.00
Plans to support vulnerable populations	3.00	4.00	2.00	3.00	4.00	2.00
Age and sex-disaggregated data to support men and women	3.00	3.00	2.00	3.00	4.00	2.00
CSO and community participation	3.00	4.00	2.00	4.00	4.00	2.00
Participation of old people with disabilities and youth	2.00	2.00	2.00	2.00	2.00	2.00
Equitable gender representation	2.00	2.00	2.00	3.00	4.00	2.00
National structures disseminate good practices and support counties	3.00	4.00	2.00	4.00	4.00	2.00

Multiple mode exist. The smallest value is shown

4.2.1 Strategy and Institutional Framework – Mombasa County

The quantitative findings pointed to general lack of awareness in this category. For 6 out of the 10 statements, on average the respondents indicated they didn't know (median = 3.00). This position was not unanimous however since 5 of those items rated I don't know had an IQR of 2.00 except for one with IQR of 1.25.

The 6 issues that respondents were not aware of was whether the strategy and institutional framework: *'clearly encompassed participatory preparedness based on assessment of risks, hazards and capacities; had plans for utilization of community capacities include vulnerable groups, was age and sex-disaggregated and reflected gender equity, inclusion of civil society and community members, and that national structures disseminated good practices and support counties'.*

Qualitative data findings indicated that the strategy at the County prioritized human and animal lives, Ship, Environment, Cargo and Property. Many organizations in the county engaged communities in their operations and some had affirmative policy for vulnerable groups.

4.2.2 Strategy and Institutional Framework – Kwale County

The case was not any different in Kwale. For 5 out of the 10 statements, on average the respondents indicated that they didn't know (median = 3.00). The statements that were rated as I don't know include whether: *'resources were allocated at all levels, county plans and strategies reflected utilization of community capacities, plans supported vulnerable populations, and whether data was age and sex-disaggregated and reflected gender equity'.*

The findings pointed to less involvement of all stakeholders in Mombasa and Kwale. The general apathy does not augur well for DRR in the two counties. Gender considerations in strategy formulation was missing in the two counties. This will likely exacerbate poverty levels especially amongst the women.

4.3 Legislative Framework

This section bearing 5 statements aimed at assesment of the extent to which disaster preparedness activities was anchored in law.

Table 4. 2: Legislation Framework

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Accurately reflects institutional arrangements, and funding mechanisms is in place	3.00	3.00	1.00	3.00	3.00	2.000
Has mechanisms for compliance and enforcement of laws, regulations and codes.	3.00	3.00	1.00	3.00	4.00	2.000
Are widely disseminated and the County staff are well trained	3.00	3.00	2.00	3.00	4.00	2.000
CSO and communities participate in the process	3.00	3.00	2.00	3.00	4.00	2.000
National government support counties	3.00	3.00	1.00	3.00	4.00	2.000

While both Mombasa and Kwale counties had disaster management bills on paper, on average respondents were unaware of the existence of such legislations. Respondents in both counties rated the statements on legislative framework as I don't know (median =3.00). Follow up qualitative questions revealed that no policy had been formulated for effective implementation of disaster management bills.

These findings solidified the respondents' assertions of lack of knowledge of the institutional framework. Legislations provide the structural design for institutions. In its absence the institutional framework becomes void or completely absent. Generally the strategic national and county DRR legislations have gaps (Kertich, 2017).

4.4 Coordination at the County Level

This section contained 7 statements aimed at assessing the counties achievement of economy of efforts in their disaster preparedness activities. The section examined where redundancies exist in coordination structures.

Table 4. 3: Coordination at the County Level

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Coordination mechanisms are in place for all national and county structures	4.00	4.00	1.25	4.00	4.00	2.00
County coordination mechanism for linking CSOs, specialists and communities is in place	3.00	4.00	2.00	4.00	4.00	2.00
CSOs participate and support institutional development activities	4.00	4.00	1.00	4.00	4.00	2.00
CSOs participate in multi-stakeholder forums for sharing of knowledge and experiences	3.00	3.00	1.00	4.00	4.00	1.00
CSOs are aware of their roles in County policies	3.00	3.00	1.00	4.00	4.00	2.00
Coordination mechanisms are established in advance	3.00	4.00	2.00	3.00	4.00	2.00
Support is provided for development of County and Inter County coordination mechanisms	3.00	3.00	2.00	3.00	4.00	2.00

4.4.1 Coordination – Mombasa County

There was a general lack of knowledge amongst the respondents on coordination in Mombasa County. Of the 7 statements, in 5 of them had a response of I don't know (median = 3.00). Further probing revealed that Mombasa County Disaster Management Committee (CDMC) meetings were ad hoc and that the relationship between county and national government had been marked with suspicion in the past.

Coordination in Mombasa was at best fragmented with individual institutions taking own initiatives at times. A respondent remarked thus:

> *'There is an inter-agency collaboration among some organizations such as: Kenya Defence Forces (KDF – Navy), Kenya Maritime Authority (KMA) amongst others under the auspices of Oil Spill Management Group (OSMAG). The county has two disaster management committees one for the national government and the other for the county government existing parallel to each other' (KII, 19 June, 2018).*

Two issues on coordination were however on average rated agree (median = 4.00) in Mombasa County even though there was a lack of consensus (IQR = 2.00). These two issues were; *'coordination mechanisms are in place within the County for linkages with other national mechanism; and that CSO participates and supports the development of activities at all levels'.*

4.4.2 Coordination – Kwale County

A stark contrast of findings were recorded in Kwale. 5 of the 7 statements were on average rated agree (median = 4.00). The statements that most respondents rated agree were: '*coordination mechanisms are in place for linkages with national mechanism, there is a county coordination mechanism for linkage with CSOs, specialists and communities, CSOs support activities at all levels and participate in forums for sharing information and are aware of their role in County policies'.*

The two levels of government in Kwale enjoyed a positive working relationship. The county had a coordination mechanism namely County Steering Group (CSG) which brought together the two levels of government. Inter-agency cooperation in Kwale amongst government and non-government actors was satisfactory as alluded to by the respondent below:

> *'There is active participation of all partners including the local community such as Ukunda Residents Association. We intend to put up a County Disaster Operations Centre (CDOC) composed of national and county government, private sector and CSOs' (KII, 25 June, 2018).*

Coordination can be critical in saving lives and property. The existence of coordination arrangements saves efforts and resources by reducing reduncies and increasing the timeliness of response. Multi-agency collaboration with national and county government agencies can be enhanced through joint strategy, effective communication and training. Frequent meetings amongst stakeholders can enhance rapport, improve interoperability, information flow and enable assignment of responsibility. This can however come to naught if politics come into play. The general political atmosphere affects coordination activities at county levels.

4.5 Contingency Plans

This section comprised of 18 statements aimed at assessing existing arrangements for responding to disasters in a judicious and apt manner. It also aimed at indicating whether such plans were reflective of the needs of their target population.

Table 4. 4: Contingency Plans

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Plan is multi-sectoral and based on solid multi-hazard assessment and risk analysis.	3.00	4.00	1.00	3.00	4.00	2.00
Inclusive annual training and simulation exercises to inform review of contingency plan	3.00	3.00	2.00	2.00	2.00	2.00
CSO participates in development of the plans	3.00	3.00	2.00	3.00	4.00	2.00
County's plans incorporate local level resources and capacity needs	3.00	4.00	2.00	3.00	4.00	2.00
National government support Counties' plans	3.00	3.00	1.00	4.00	4.00	1.00
County plans actively include other actors	3.00	4.00	1.00	3.00	4.00	2.00
National government support County and organizations' plans	4.00	4.00	1.00	4.00	4.00	1.00
Plan allow adjustments in line with incident magnitude	4.00	4.00	1.00	4.00	4.00	1.00
Include cost-sharing and training with others	3.00	3.00	1.00	4.00	4.00	1.00
Gives a list of major actions and actors	4.00	4.00	1.00	4.00	4.00	1.25
All actors links their activities to the contingency plans	4.00	4.00	2.00	3.00	4.00	2.00
There is consensual sharing of responsibilities	3.00	4.00	2.00	4.00	4.00	2.00
Ensure actions are closely monitored and coordinated	3.00	4.00	2.00	4.00	4.00	1.25
Applies procedures in routine emergencies	3.00	4.00	2.00	4.00	4.00	1.00
Actors use and perceive plan as legitimate and appropriate	3.00	3.00	1.00	4.00	4.00	2.00
Plan sought the input of its users	3.00	3.00	2.00	4.00	4.00	1.00
Is based on realistic incidents assumptions	4.00	4.00	1.00	4.00	4.00	1.00
Assigns responsibilities for the various aspects of warning	4.00	4.00	1.00	4.00	4.00	1.25

4.5.1 Contingency – Mombasa County

12 out of 18 items were rated I don't know (median = 3.00). This reflected the fragmented nature in which organizations and the general community operate in Mombasa. The CDMC coordinates DRR activities but some key organizations are not aware of its activities.

Individually, different organizations have well thought out contingency plans. A respondent averred:

> *'For Kenya Airports Authority (KAA) response systems are in place depending on level and nature of accidents. Moi International Airport Mombasa is categorized at class 9 for Aircraft landing. This means a certain level of DRR preparedness must be in place at all times'. (KII, 20 June, 2018)*

> *'Kenya Red Cross Society (KRCS) has done its own vulnerability analysis and has mapped resources but it does not include all the capacities of other actors. However it is a member of CDMC secretariat'. (KII, 22 June, 2018)*

Some organizations like Kenya Ports Authority (KPA) and KMA, KAA and Kenya Civil Aviation Authority (KCAA) had contingency plans for: maritime safety, oil spill contingency and search and rescue plans. The county however had been receiving technical advise on development of contingency plans from the national government. Thus majority responded by rating the statement agree (median =4.00) which was a consensus view (IQR = 1.00).

4.5.2 Contingency – Kwale County

12 items were rated agree (median = 4.00). This reflected a relatively inclusive working relationship amongst actors in Kwale as stated by the respondent below:

> *'County legislation on DRR is in place. The County Secretary and County Commissioner co- chair the CDMC whose members include: the national and county goverrnment, state corporations, CSO, private companies amongst others. The county is in the process of developing and implementing a DRR policy'(KII, 25 June, 2018).*

To facilitate the formulation of the various contingecny plans, Kwale had a well developed hazard atlas. The atlas was one of the reference used in the development of the county's contingency plans. Climate change adaptation had been mainstreamed in

KCIDP where ending drought emergencies had been prioritized. Generally drought and maritime security preparedness could be rated high but multi-hazard preparedness was low. A respondent averred thus;

> *'In case of droughts, we provide livestock farmers with; feeds, vaccination, destocking - off take of affected cattle. Compensate farmers while providing meat as humanitarian relief, Commercial destocking through selling to Kenya Meat Commission. Conduct water treatment - chemicals provision and water tracking, integrated health and nutrition, mass screening of children – referrals. Relief food – Rapid assessment of needs. All these are in the County DRR preparedness framework'. (KII, 26 June, 2018).*

Kwale however had no contingency plan for cross border aggression by fishermen from Tanzania using dynamite fishing and unplanned urban development – Ukunda – Diani drainage. Kwale had not yet put in place a viable contingency plan for some radicalised elements who perpetrate violent extremism. A respondent rued:

> *'Many people have been killed and there is poor relations between security sector and youth. The prevalence of youth grievances, forced disappearances, use of violence against members of the community and attack on police has left the county insecure and has caused suspicion and mistrust'. (KII, 26 June, 2018).*

Contingency plans help take stock of existing capabilities and enable synchronizing lines of action in a coherent manner. Both counties lacked implementation policy or action plan and had limited resources. This had a negative impact on existing plans in both county and institutional level. Further more, the existing plans were not readily available to every stakeholders in both counties hence reducing their utility to wider society.

4.6 Capacity Building and Analysis

This section bearing 11 statements sought to establish: how resources and systems have been built over time to strengthen disaster preparedness, whether there is inclusive empowerment process, whether an asset ledger exists and the extent to which the resources in the ledger have been used in a timely and effective manner.

Table 4. 5: Capacity Building and Analysis

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Inter-agency, multi-sectoral capacity assessment with measurable actions completed	3.00	3.00	1.00	3.00	2.00	2.00
Appropriate training, simulation exercises developed and implemented at the County	3.00	3.00	2.00	3.00	4.00	2.00
Budgets for institutional capacity building and training available in a consistent and timely manner	3.00	3.00	2.00	3.00	3.00	1.00
CSOs participate in the capacity assessment process	3.00	3.00	2.00	3.00	4.00	2.00
CSOs and communities receive adequate training	3.00	3.00	1.00	3.00	2.00	2.00
Universities, specialized technical agencies, other actors involved in capacity building initiatives	3.00	2.00[a]	2.00	3.00	4.00	2.00
Training materials and courses provided to County Government and other actors	3.00	3.00	2.00	3.00	4.00	2.00
County specific self-assessment is conducted to prioritize actions	3.00	3.00	2.00	3.00	4.00	2.00
County training and capacity standards are disseminated throughout the County	3.00	3.00	1.00	3.00	2.00[a]	1.00
Lessons learned are collected and shared with other counties	3.00	3.00	1.00	3.00	2.00	2.00
Technical support provided to National and County actors to implement capacity building plans	3.00	4.00	1.25	4.00	4.00	2.00

Multiple mode exist. The smallest value is shown

Respondents in both counties were not aware of the existing capacity in disaster preparedness. Mombasa respondents rated all the 11 statements as I don't know (median =3.00). Kwale respondents on the other hand returned the same verdict for 10 statements except for one. The only statement that receiceived a different rating of agree (median = 4.00) was on: *'technical support provided to National and County actors to implement capacity building plans as appropriate'*. Even then this statement attracted divergent views amongst respondents (IQR = 2.00).

Further probing in Mombasa painted a picture of lacking prior planning and limited budget for disaster management. Respondents remarked thus:

> *'We have poor access routes and lack alternative routes when roads are blocked. The CDMC does not hold regular meetings. We are faced by turf wars/silo mentality and low information flow. There is inadequate technical capacity and appropriate equipment such as rescue machinery'. (KII 20 June, 2018).*

> *'Kenya Ferry Service (KFS) does not have adequate capacity to respond to disasters and relies on Navy, KPA, KMA, KAA, County government fire engines and Kenya Police Service. Crowd control is still difficult given that about 350 000 people cross the ferry daily while we have only about 300 staff. We are yet to conduct enough drills and exercises. We are in the process of installing CCTV inside ferries. We also try to separate vehicles from pedestrians. The intent is to improve security and safety of people however it is challenging to be compliant to international safety standards due to inadequate resources'. (KII, 22 June, 2018).*

The KRCS is crucial actor in raisng capacity of Mombasa county. To illustrate this point, a respondent remarked:

> *'KRCS has a warehouse and inventory of supplies (non-food items) to serve 2000 families for at least a month. It has trained DRR officers in each of the 30 wards in Mombasa. It has also endevoured to provide ambulances, trauma counsellors, paramedics, camp managers and first aid providers. (KII, 22 June, 2018).*

In Kwale, the local government has sought to build the resilience of the community through a number of initiatives. Respondents reamarked thus:

> *'The county government has been supporting youth entrepreneurship in partnership with CSO and UNDP. We have set up Biashara/Business Incubation Centers and trade revolving fund to support family businesses. The County has an established scholarship fund to support needy students up to University level. In 2014, 250 students were supported in National schools and 3450 in other secondary schools, in 2015, 150 university students and 1500 secondary school students were supported. We have a Drugs Rehabilitation Centre at Kombani which was built with the help of United Nations Office for Drugs and Crime (UNODC), that has admitted 250 youth'. (KII, 25 June, 2018).*

'NDMA is improving access to water through construction of dams, boreholes, water pans, pipes. Providing drought resistant crops/seeds and livestock (Galla breed) and encouraging goat keeping in dry areas such as Lunga Lunga and Kinango'. (KII, 26 June, 2018).

Kwale county has also endevoured to capacitate its people through training. A respondent remarked:

'We have trained life savers through the Kenya Navy some of whom saved lives when river River Ramisi broke its banks recently. We have also deployed 10 rescue boats along the beaches. There are also 10 fire engines which have been crucial in responding to school fires and plans are underway to have a fire station and acquire more engines. Our Chiefs, sub chiefs, county executives and members of county assembly have been trained on some aspects of DRR. Care Kenya partnered with us in providing training on participatory scenario planning . (KII, 25 June, 2018).

Capacity building and analysis is an important aspect of preparedness. Both counties did not have resource registers of the capacity they possess. This impacts negatively on robustness, timeliness of responses and further increases vulnerability. A respondent in Kwale remarked:

'There is no effective joint CDMC inventory of standby supplies, non-food items, camp management and knowledge and skills. We have inadequate personnel generally. (KII, 26 June 2018).

4.7 Hazard Monitoring, Forecasting and Early Warning

This section sought to establish how events that can precipitate humanitarian crises are anticipated and response prepared amongst the various actors and if such information reaches out to wide sections of the society. 15 statements were tested.

Table 4. 6: Hazard Monitoring, Forecasting and Early Warning

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
The County Disaster Management Bill indicates responsibility for generating and disseminating hazard warnings	3.00	3.00	1.00	3.00	4.00	1.00
The County Early Warning System (EWS) dissemination provide for reaching entire population in a clear and easily understood manner.	3.00	3.00	1.00	3.00	4.00	2.00
EWS are based on community knowledge of relevant hazards and risks	3.00	4.00	2.00	4.00	4.00	2.00
EWS are regularly tested and modified based on lessons learned	3.00	3.00	1.00	3.00	4.00	2.00
Institutional arrangements facilitate effective and timely EWS	3.00	3.00	1.00	3.00	4.00	2.00
CSOs regularly provide training on the county system for issuing EW	3.00	2.00	1.00	3.00	4.00	2.00
Communities and CSO are active in all aspect of EWS	3.00	2.00	1.00	3.00	4.00	2.00
EWS are aligned to community capacity for ensuring communication systems work and warning messages are recognized and understood	3.00	3.00	2.00	3.00	2.00	2.00
Information and advisory services are provided to Counties by the National Government to support the establishment of EWS	3.00	4.00	2.00	4.00	4.00	1.00
County risk and multi-hazard maps are developed for high-risk areas.	3.00	3.00	2.00	4.00	4.00	1.25
County EWS' dissemination provide for potential widespread cross-border disasters.	3.00	3.00	1.00	3.00	3.00[a]	2.00
County best practices shared between Counties	3.00	3.00	1.00	3.00	4.00	2.00
Early warning standards and guides developed and disseminated.	3.00	3.00	2.00	3.00	4.00	2.00
Counties are supported to develop policies for incorporation of multi-stakeholder assistance.	3.00	3.00	1.00	4.00	4.00	1.00

Multiple mode exist. The smallest value is shown

All the statements were responded to on average by a rating of I don't know (median = 3.00) in Mombasa. This may indicte general apathy amongst the respondents on this issue. However, further probing revealed that there existed some early warning systems in Mombasa as alluded to by the following respondents' statements:

> *'Floods alerts are provided by Kenya Meteorological Department (KMD) and disseminated to community. Fishermen get alerts through Ministry of Fisheries and Fishermen Association. Alerts to hotels are distributed by Kenya Association of Hotel Keepers and Caterers. Radio alerts on impending disasters are disseminated through KPA's VHF channels 12, 16 and 73. Mobile phones are also used to disseminate alerts'(KII, 20 June, 2018)*
>
> *'KMA operates monitoring gears on weekly basis and receives floods data from KMD. (FGD, 21 June, 2018).*
>
> '*Kenya Wildlife Service (KWS) has an operational command that provide briefs, press release and print outs through; phones and VHF radio call. We Maintain local contacts for needs identification with Beach Management Units (BMUs), Community Forest Associations (CFA), water management committees, chiefs and sub chiefs' (KII, 21 June, 2018)*
>
> *'KRCS is developing joint Satellite based DRR assessment application for early warning on incidents' (KII, 22 June, 2018).*
>
> *'County Forest Committees (CFC) have been registered, protecting forests. They provide information on fires and have mobile teams (gangs) for fire-fighting and report on intrusion. Kenya Forest Service (KFS) issue early warning on fires in dry season, send letters to national and county government officers to sensitize the community in Barazas. We also monitor temperature levels, vegetation and train community on making fire breaks'. (KII, 21 June, 2018).*

Respondents in Kwale rated 10 of the statements as I don't know (median = 3.00). This was almost comparable to the findings in Mombasa albeit with a little difference. Respondents in Kwale rated agree (median = 4.00) to the following items: EWS are based on community knowledge of relevant hazards and risks; information and advisory services provided to Counties by the National Government to support the establishment of EWS; county risk and multi-hazard maps are developed for high-risk areas; advisory, technical, organizational and policy development support is provided to Counties in the development, implementation and testing of EWS and Counties are supported to develop policies for incorporation of multi-stakeholder assistance.

Generally in Kwale the KMD and NDMA provided useful early warning tools and information that is passed over to BMUs amongst other stakeholders. Respondents averred:

> *KMD provides daily reports on early warning. Meanwhile NDMA facilitate disaster response in the County . NDMA also holds joint scenario planning with traditional forecasters – monitoring changes associated with time, seasons, effects on crops and diseases' (KII, 26 June, 2018).*
>
> *'NDMA receives meteorology reports on weekly basis and issues daily, weekly and monthly situation reports to CDMC. It has trained; chiefs, sub chiefs, wards administrators on data collection indicators. It files reports to Ministry of Interior and Ministry of devolution and NDOC'(KII, 26 June, 2018).*
>
> *'KFS protect and restore forest through patrols, standby personnel, monitor and receive information, establish fire breaks gangs and replanting. It provides fire declarations, long term forecasting, drought scenario planning, capacity assessment and drought risk categorization'(KII, 26 June, 2018).*
>
> *'There is a toll free number to report on indicators for emergence of Rift Valley Fever. We carry out syndromic/disease surveillance and mapping of hot spots while relaying information to farmers on weekly basis. The Ministry of Agriculture is improving water infrastructure, has acquired rescue boats, trained crews and is cascading preparedness to wards' (FGD, 26, June, 2018).*

Early warning was done through the County Steering Committee, Community, Airport security/safety committee, Border Management Committees (BMCs), WhatsApp groups, social media platforms and telephone calls.

While both counties exhibited some linkages with KMD, there was absolutely no linkage to seismic monitoring department. This exposed the two counties to poor information on phenomena such as tsunamis. Even then, there was little evidence that early warning recieved by both counties was utilized for meaningful activities. The linkages of monitoring of disaster trends to institutions of higher learning was non existent. This gap limited participation of such institutions in development of early warning indicators and personnel.

4.8 Information Management and Communication

This section consisting of 10 statements aimed at establishing the existence of lesson learnt system drawn from previous disaster experiences and how lessons are shared to enhance resilience of the affected community.

Table 4. 7: Information Management and Communication

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Modalities for media relations and information dissemination are planned	3.00	3.00	2.00	4.00	4.00	2.00
Information system is in place on a full range of hazards, vulnerabilities and capacity	3.00	3.00	2.00	4.00	4.00	2.00
Coordination structures enables information sharing between all levels	3.00	3.00	2.00	3.00	4.00	2.00
County has trained media liaison staff and outlined responsibility and procedures for media briefing	3.00	3.00	1.00	4.00	4.00	2.00
CSOs contribute to and receive information from information systems	3.00	3.00	1.00	4.00	4.00	1.25
Mass media campaigns are undertaken, their impact assessed and monitored	3.00	4.00	2.00	3.00	4.00	2.00
General public is well informed about disaster risk	3.00	4.00	2.00	3.00	4.00	2.00
Private sector is actively involved in supporting training and dissemination of knowledge	3.00	4.00	2.00	4.00	4.00	2.00
Mechanisms for sharing information between county, national and CSOs are in place	3.00	3.00	1.25	4.00	4.00	2.00
Support for development of information and communication strategies is provided by the national government	3.00	3.00	1.00	4.00	4.00	2.00

4.8.1 Knowledge Management – Mombasa County

Respondents on average rated all statements as I don't know (median = 3.00). This pointed to lack of inclusiveness in preparedness planning and thus the apathy. Further probing revealed that the main strategy of communication employed is structured relay of information through County government, County Commissioner, County Police Commander, Ministry of Health (MoH), (in case of disease outbreak alerts), KRCS and the media.

Individual institutions also had their own knowledge management guidelines. A respondent averred:

> *'KMD has standard information gathering, storage and dissemination system. We provide forecast information for Agriculture, Air and Maritime navigation, marine health, general public, military, health and construction sector. We continuously provide observed data after every 30 minutes. Information is recorded and disseminated through electronic, mobile phones, online soft wares and emails. (KII, 20 June, 2018).*

4.8.2 Knowledge Management – Kwale County

Respondents rated I don't know (median = 3.00) to only 3 statements in Kwale. These statements were: coordination structures share information between all levels, mass media campaigns are undertaken to increase awareness and the impact is assessed and monitored and that the general public is informed about disaster risks.

Of the remaining 7 statements the respondents on average indicated that they agree (median = 4.00). This is in stark contrast with the findings in Mombasa where respondents were generally unaware. Further probing revealed:

> *'Public Barazas, social media platforms such as WhatsApp group and Facebook, vernacular radio stations like Radio Ranet, KAYA FM amongst others are used to broadcast information on disaster hazards and preparedness plans. (KII, 26 June, 20).*

> *'KRCS produce reports after incidents. These reports are prepared by our Action Teams which are later on shared. (KII, 26 June, 20).*

To draw lessons from experience a knowledge management strategy must be in place. Mombasa and Kwale seemed not to have such strategy. The strategy in place appeared more reactive than a deliberate strategy meant to cater for information needs of its users over the whole disaster cycle.

4.9 Emergency Service and Standby Arrangements

This section sought to establish the bureaucratic, human, physical and logistic mechanisms in stand by disaster response arrangements. Twelve (12) statements were tested.

Table 4. 8: Emergency Service and Standby Arrangements

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Response utilize county's capabilities, and adhere to or exceed SPHERE Minimum Standards	3.00	3.00	1.00	3.00	3.00[a]	2.00
An Emergency Operations Centre (EOC) has been established and tested	3.00	3.00	2.00	3.00	2.00	2.00
Hazard damage assessment mechanisms have been defined, tested and teams trained	3.00	3.00	2.00	3.00	2.00a	2.00
Response include specific support for gender equity and vulnerable populations	3.00	3.00	2.00	3.00	4.00	2.00
Simulations exercises have been held, staff and communities have received response training	3.00	4.00	2.00	3.00	2.00[a]	2.00
Mechanisms to fund emergency response activities are in place	3.00	3.00	2.00	3.00	4.00	2.00
There are agreements with national, international other actors to provide assistance	3.00	3.00	1.00	3.00	4.00	2.00
Procedures are in place to document experiences	3.00	3.00	2.00	3.00	4.00	2.00
Personnel/ volunteers have been trained	3.00	2.00[a]	2.00	3.00	4.00	2.00
National Government support seamless Inter County legislation and response mechanisms	3.00	4.00	1.00	3.00	4.00	2.00
National Government support Inter County agreements	3.00	4.00	1.00	3.00	4.00	2.00
Mechanism for harnessing external and internal funding appeals are in place	3.00	4.00	1.00	3.00	4.00	2.00

Multiple mode exist. The smallest value is shown

Respondents in both counties of Mombasa and Kwale had a general unawareness of emergency arrangements. A verdict of I don't know (median = 3.00) was enterd by all respondents in Mombasa and Kwale while reacting to the 12 statements.

Through qualitative data, the study found that the County government of Mombasa fire department has an emergency management plan that describe role of actors and Standing Operations Procedures (SOP). It also found that the County Secretary and County Police Commander coordinate operations and assume Incident Command and are a point of reference when drawing rescue plans. Other agencies such as the County Inspectorate Department, KRCS, St. Johns Ambulance, MoH and Police were expected to lead evacuation to the identified rescue centres. A respondent further remarked as follows:

> *'As KRCS we have action centres on standby at the Kenya Ferry Likoni on a 24/7 basis. We have mapped probable risks and developed emergency plan. Emergency plans were developed in 2014 with different clusters of risk (KII*, 22 June, 2018)

Kwale County government indicated its plans to establish an EOC. The study gathered that benchmarking with Kilifi County was done and report was being assessed for best practices. The creation of such arrangements may help to save lives and properties thus fundamentally reducing the impact of a hazardous event. A central organ helps in streamlining information flow to incident command team, coordination of various actors and streamlines action plans.

4.10 Incorporating Early Recovery into Preparedness Planning

This section containing 6 statements sought to establish the inclusiveness of early recovery efforts and determine whether such efforts were sustainable. Six (6) statements were examined.

Table 4. 9: Recovery and Preparedness Planning

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Key early recovery stakeholders are consulted in building preparedness capability	3.00	3.00	2.00	4.00	4.00	2.00
Early recovery needs are considered in disaster assessments and processes	3.00	4.00	2.00	4.00	4.00	2.00
Funds for early recovery are allocated in advance	3.00	3.00	2.00	3.00	4.00	2.00
CSOs and community participate in developing recovery plans and are active in implementation strategy	3.00	3.00	2.00	3.00	4.00	2.00
Support is provided by the National Government to Counties	3.00	3.00	1.25	4.00	4.00	2.00
Technical advice is provided to County's and other organizations	3.00	3.00	1.25	4.00	4.00	1.00

Most of the respondents were not aware of any efforts geared towards early recovery in planning in Mombasa. On average respondents indicated that they didn't know (median = 3.00) to all 6 statements tested. In Kwale only two statements returned the 'I don't know' verdict. For the remaining 4 statements, the respondents indicated agree (median = 4.00).

The respondents indicated agree to the following statements: *'key early recovery stakeholders are consulted, recovery needs are considered, support is provided by the National Government to Counties and other stakeholders, and that technical advice is provided to County's and other organizations'.*

The inclusion of early recovery experts in preparedness planning helps to alleviate sufferings and prevent loss of life. Such plans can build resilience of communities to cope with future incidents.

4.11 Resource Allocation and Funding

In this section, the study sought to establish the status of institutionalized funding mechanism. It also sought to find out the accessibility of funds for prevention, response and recovery in disaster management. Seven (7) statements were tested.

Table 4. 10: Resources

	Mombasa County			Kwale County		
	Median	Mode	IQR	Median	Mode	IQR
Budgets allocated for preparedness are institutionalized at all levels	3.00	3.00	2.00	3.00	4.00	2.00
County Government's funding mechanism are developed, institutionalized and assessed	3.00	3.00	1.25	3.00	2.00	2.00
System for accountability in public resources use is institutionalized	3.00	3.00	2.00	3.00	4.00	2.00
Bilateral agreements signed with donor agencies for funding and technical assistance	3.00	3.00	1.00	3.00	3.00	1.00
Fund to strengthen the capacity of CSOs allocated	3.00	3.00	2.00	3.00	4.00	2.00
Joint funding mechanisms for cross-border events in place	3.00	3.00	0.00	3.00	3.00	1.00
Funding support is provided to County Government, regional organizations and CSOs	3.00	3.00	1.00	3.00	4.00	2.00

Respondents in both Mombasa and Kwale returned same verdict in this section. On average they rated the statements as I don't know (median = 3.00). Further probing revealed that funds and resources from the national government to meet preparedness activities are limited at best in both counties. Kwale alluded to setting aside 2% of their budgetary allocation for disaster response. This is very little pointing to reactive stances and lack of adequate budgeting for probable disasters from national to county level. Accurate mapping of needs and corresponding resources to enhance collective preparedness has not been done.

4.12 Hypothesis Testing

Hypothesis testing was utilized by the study to examine the veracity of various null hypotheses generated by SPSS software. The aim of this exercise was to facilitate comparison of the responses from Mombasa and Kwale Counties and establish if there were significant differences from the data collected. Mann-Whitney U Test and significance levels of 0.05 corresponding to 95% confidence level were applied in the hypothesis testing. Testing was based on each statement's distribution of responses in Kwale and Mombasa. Decision to 'Retain' indicated that the hypothesis in the category of variables tested is confirmed. This means that based on collected data the likelihood of getting similar responses for the various statements in that particular section was high. Decision to 'Reject' meant the statement is negated and that respondents held different views in Kwale and Mombasa Counties on the statement under examination.

4.12.1 Strategy and Institutional Framework

The null hypothesis for above category was retained. The most statistically significant statement was: *'plans include specific activities to enable vulnerable populations to access essential support,'* (α = 0.692) for both categories of county.

Table 4. 11: Strategy and Institutions

Null Hypothesis	Sig.	Decision
County strategy clearly encompasses response based on a sound assessment of risks, hazards, capacities and with participation of all key stakeholders	.409	Retain
Strategy has a system in place to promote experience sharing and to harmonize capacities	.558	Retain
Resources are allocated at all levels to maintain and enhance disaster risk reduction systems	.540	Retain
Plans and strategies reflect clearly how community capacities will be used and supported	.078	Retain
Include specific activities to enable potentially vulnerable populations to access essential support	.692	Retain
Population data is age and sex-disaggregated and actions are taken to ensure gender equity in access to services	.689	Retain
CSO and community members actively participate in developing, monitoring and evaluating county activities	.574	Retain
Vulnerable groups actively participate in the development and implementation of activities	.562	Retain
Women and men are equitably represented in planning activities	.564	Retain
Disaster management structures disseminate good practices and lessons learned and provide technical support to Counties	.177	Retain

4.12.2 Legislative Framework

The null hypothesis for the legislative framework was retained. The most significant statement was: *'local organizations and communities participate in the development of the legislative framework, by laws and policies'* (α = 0.841).

Table 4. 12: Legislations

	Sig.	Decision
Approved legislative framework that accurately reflects institutional arrangements and funding mechanisms	.358	Retain
Has mechanisms for compliance and enforcement of laws, regulations, codes and penalties for non-compliance	.522	Retain
Plan is widely disseminated and the County trains stakeholders on its application	.537	Retain
Local organizations and communities participate in the development of legislative framework	.841	Retain
Technical support is provided to Counties in developing legislative frameworks	.643	Retain

4.12.3 Coordination at the County Level

The null hypothesis for coordination was retained. The most statistically significant statement was: '*CSOs participate and support the development of disaster preparedness coordination efforts*' ($\alpha = 0.976$). This could be attributed to the heavy presence of KRCS in both counties in disaster preparedness activities.

Table 4. 13: Coordination

	Sig.	Decision
Coordination mechanisms link all National and county government structures	.355	Retain
Linked to CSO, technical and academic specialists, international and local CSO and communities	.973	Retain
CSO participates and supports preparedness coordination efforts at all levels	.976	Retain
CSO participates in information sharing forums with multi-stakeholders that facilitate learning lessons	.294	Retain
CSO are aware of their role, County policies and protocols	.889	Retain
Coordination mechanisms are established in advance	.441	Retain
Support is provided for the development of County and Inter County coordination mechanism	.557	Retain

4.12.4 Contingency Plans

The null hypothesis for contingency plans recorded varying results. Of the 18 statements making up the contingency plan hypothesis testing framework, 2 statements were rejected. For the 16 statements whose null hypothesis was retained, the most significant one was: '*local level preparedness planning processes are part of county's planning and reflect likely resources and capacity*' ($\alpha = 0.995$). For the rejected statements the significant one was: *Disaster Management Plan gives a list of major actions (actors) involved in responding to disasters for preparedness, response and relief'* ($\alpha = 0.029$). This implies that on the rejected statement, respondents in the two counties had different views on the matter.

Table 4. 14: Contingency Plans

	Sig	Decision
Plans are multi-sectoral and based on solid multi-hazard assessment and risk analysis	.066	Retain
Inclusive training and simulation exercises are carried out annually and plan includes lessons learnt	.362	Retain
CSO participates in the development, testing and implementation of contingency plans	.512	Retain
Local level preparedness planning processes are part of county's planning	.995	Retain
Support is provided to Counties in developing contingency plan	.215	Retain
Plans are developed and approved by participating actors in the county	.787	Retain
National government provide technical and other support to County and organizations	.489	Retain
Disaster plan can be expanded as the incident magnitude increases	.401	Retain
Plan include provisions for cost-sharing of resources and training	.653	Retain
Plan gives a list of major actions (actors) involved in responding to disasters	.029	Reject
All actors and agencies know the precise action required of them and links them to the plans	.992	Retain
Responsibility for common disaster tasks is predetermined on a mutually agreeable basis	.827	Retain
Mechanism ensures all actions are closely monitored and coordinated	.148	Retain
Adapted disaster procedures for application in routine emergencies	.022	Reject
Plan perceived as legitimate, appropriate and familiar to users	.297	Retain
Plan sought the input of its users	.100	Retain
Is based on valid assumptions about what happens in disasters and how people behave	.225	Retain
Addresses which organizations and persons are responsible for the various aspects of warning	.328	Retain

4.12.5 Capacity Building and Analysis

The hypothesis for capacity building was the same in both counties was retained. The most significant statement was: *'inter-agency, multi-sectoral capacity assessment has been completed resulting in clear measurable actions to strengthen and maintain preparedness capacity'* (α = 0.857).

Table 4. 15: Capacity Building

	Sig.	Decision
Inter-agency, multi-sectoral capacity assessment has been completed providing clear measurable actions	.857	Retain
Appropriate ongoing training and simulation exercises are implemented at the County	.572	Retain
Funding for institutional capacity building and technical training is included in budgets	.198	Retain
CSO participate in the capacity assessment process	.548	Retain
CSO and communities receive adequate training and other support	.117	Retain
Universities, specialized technical agencies are involved in capacity building initiatives	.287	Retain
Training and courses are provided to County staff and other stakeholders to increase capacity and response	.649	Retain
County specific self-assessment is conducted to identify and prioritize action to address possible gaps	.679	Retain
County training and capacity standards are disseminated throughout the County	.199	Retain
Lessons learned are collected and shared with other counties	.475	Retain
Technical support is provided to National and County actors for capacity building	.720	Retain

4.12.6 Hazard Monitoring, Forecasting and Early Warning

The hypothesis for above category received mixed results but by and large was retained. Of the 15 statements only two were rejected. The statistically significant statement whose null hypothesis was retained was: *'EWS are aligned to community capacity to ensure communication systems work and warning messages are recognized and understood'* (α = 0.962). For the rejected one, the significant statement was: *'the distribution of county risk and multi-hazard maps are developed for high-risk areas'* (α = 0.026).

Table 4. 16: Early Warning System

	Sig.	Decision
County Government Disaster Management Bill clearly indicates roles and responsibilities of all stakeholders including disseminating hazard warnings to the public	.841	Retain
EWS has multiple means of reaching the entire population in a clear and easily understood manner	.436	Retain
Based on community knowledge of relevant hazards and risks	.099	Retain
Regularly tested and modified based on lessons learned	.310	Retain
Institutional arrangements facilitate effective, inclusive and timely EWS	.081	Retain
CSO networks regularly provide training on the county system for issuing early warnings	.576	Retain
Communities and CSO are active participants in all aspects of the development, operation, training and testing of EWS	.009	Reject
EWS aligned to community capacity to ensure communication systems work and warning messages are recognized and understood	.962	Retain
Information and advisory services are provided to Counties by the National Government to support the establishment of EWS	.398	Retain
County risk and multi-hazard maps are developed for high-risk areas	.026	Reject
County EWS and dissemination for widespread cross-border disasters developed	.235	Retain
County best practice is shared between Counties	.063	Retain
Early warning standards and guides developed and disseminated	.494	Retain
Advisory, technical, organizational and policy development support provided to Counties in development, implementation and testing of EWS	.107	Retain
Counties supported to facilitate incorporation of national and international assistance	.332	Retain

4.12.7 Information Management and Communication

Of the 10 statements proffered to test the null hypothesis for above category only one was rejected. The most significant statement was: *'technical and other support in the development of information and communication strategies is provided by the national government'.* ($\alpha = 0.623$). The rejected null hypothesis was: *'mechanisms are developed for the exchange of ideas and technical information at the County level between national and non-governmental agencies'.* ($\alpha = 0.038$).

Table 4. 17: Knowledge Management

	Sig	Decision
Modalities and resources for media relations and information dissemination are planned	.538	Retain
Information system is in place for collection, compilation, and dissemination of relevant knowledge and information on a full range of hazards, vulnerabilities, and capacities	.387	Retain
Structures regularly schedule exchanges of disaster management information between all levels	.102	Retain
County procedures clearly outline which bodies are responsible for media briefing and trained staff are in place	.623	Retain
CSO contribute to and receive information from systems developed	.093	Retain
Mass media campaigns are undertaken to increase awareness of hazards and preparedness and impact is regularly assessed and monitored	.362	Retain
General public is aware of and informed about disaster risks and how to manage them	.451	Retain
Private sector is actively involved in supporting training and dissemination of knowledge with all sectors of the County government and the general public	.331	Retain
Mechanisms for exchange of ideas and technical information between national and non-governmental agencies developed	.038	Reject
Technical and other support in the development of information and communication strategies is provided by the national government	.612	Retain

4.12.8 Emergency Service and Standby Arrangements

The null hypothesis for above category in both counties was retained. The statement that was significant was: *'response simulations exercises have been held to test and improve response capacities, staff and communities have received training'* ($\alpha = 0.881$).

Table 4. 18: Emergency Service and Standby Arrangements

	Sig.	Decision
Response activities utilize county's preparedness capabilities, and adhere to or exceed SPHERE Minimum Standards	.510	Retain
Emergency Operations Centre has been established and tested	.149	Retain
Hazard damage assessment mechanisms have been defined and tested and assessment teams have been trained	.607	Retain
Response projects include specific provisions to promote gender equity and to enable vulnerable populations to receive additional support	.853	Retain
Simulation exercises have been held to test and improve response capacities, staff and communities have received training	.881	Retain
Mechanisms to fund emergency response activities are in place	.138	Retain
Agreements for assistance have been signed with national, international or other actors in advance	.792	Retain
Procedures are in place to document experiences and to assist post-disaster reviews	.279	Retain
Personnel/volunteers have been trained in their areas of responsibility and are equipped to respond at the local level	.146	Retain
National Government support Counties to ensure that legislation and response mechanisms support inter county responses	.408	Retain
National Government support Counties in developing inter county's preparedness cooperation agreement	.764	Retain
Mechanisms are in place to coordinate external and internal appeals for funding	.148	Retain

4.12.9 Incorporating Early Recovery into Preparedness Planning

The null hypothesis for above category was tested vide 6 statements all of which 5 were retained except for one. Of the null hypotheses retained the most statistically significant statement was: '*technical advice and other support provided by the National Government to Counties and other stakeholders on early recovery and disasters is the same across categories of County*' ($\alpha = 0.661$). The rejected null hypothesis was, *'technical advice and other support is provided to County's and other organizations in the development of recovery strategies is the same across categories of County*' ($\alpha = 0.042$).

Table 4. 19: Early Recovery (ER) and Preparedness Planning

	Sig	Decision
Key ER stakeholders are consulted in building a preparedness capability	.055	Retain
ER needs are considered in disaster assessments and processes	.115	Retain
Funds for ER are anticipated in allocation of disaster preparedness and response	.438	Retain
CSO and community groups participate in developing ER planning and implementation	.661	Retain
Technical advice and other support provided by the National Government to Counties and other stakeholders on ER	.636	Retain
Technical advice and other support provided to County's and other organizations in development of ER strategies	.042	Reject

4.12.10 Resource Allocation and Funding

All null hypotheses statements relating to resource allocation and funding were retained. The most statistically significant statement was: *'funds are made available to strengthen the capacity and activities of CSO'* ($\alpha = 0.900$).

Table 4. 20: Resources

	Sig	Decision
Budgets allocated for preparedness activities are institutionalized at all levels	.301	Retain
County Government's funding mechanisms are developed, institutionalized and regularly assessed	.816	Retain
System for public resources accountability is developed and institutionalized	.369	Retain
Bilateral agreements for funding and technical assistance are signed with development partners	.530	Retain
Funds are made available to strengthen capacity and activities of CSO	.900	Retain
Joint funding mechanisms are activated in case of cross-border events	.074	Retain
Support is provided to County Government, regional organizations and CSO in securing funds to implement preparedness, emergency, and recovery plans	.733	Retain

CHAPTER 5:

Summary, Conclusion And Recommendations

5.1 Introduction

This chapter presents a summary of the research findings and thereafter draws a conclusion based on the study objectives. It provides recommendations to enhance disaster risk governance and preparedness in both Mombasa and Kwale Counties. It further highlights on the study's limitations.

5.2 Summary of the Findings

The findings pointed to a number of recurrent variables that determine effectiveness of disaster risk governance and preparedness level. Both Counties had a weak legislation and action plan. The findings further pointed to low political will in the prioritization of preparedness in both counties. Capacity was clearly limited with resources in both counties' not documented. Knowledge management was generally poor while early warning systems were not adequately utilised to enhance preparedness.

5.3 Conclusion

The disaster risk governance in both countries was rated as low. There was a manifestation of low political will in disaster related activities. Legislations operated in absence of applicable polices. There was no clear strategy nor institutional framework guiding coordination of disaster risk governance. In some instances, existence of parallel operations were reported in Mombasa County.

Generally, the level of disaster preparedness was low and not well planned in both counties. The culture of preparedness had not been established and most responses were reactive. Both counties were still formalizing preparedness plans. Mombasa had a larger potential preparedness capacity but had more disaster risks. Preparedness for fire disasters was strong in Mombasa but there were no alternative traffic exit routes. Kwale had a better coordination mechanism due to goodwill between both tiers of government and pro-active financing in Kwale. Further there was better preparedness capacity for drought in Kwale due to more prevalence of the hazard and a long experience of handling the hazard in collaboration with NDMA.

Mombasa and Kwale were generally comparable in disaster risk governance and preparedness. Both counties need to create more awareness on governance structures, jurisdiction and responsibilities. They both need to enhance capacities of DRR actors. Community sensitization on DRR and awareness on value of conservation, afforestation and monitoring sea based destruction of mangrove needs to be conducted in both counties.

5.4 Implications on Theory, Policy and Practice

The study seemed to validate UNISDR framework on the core normative ingredients of an effective DRR preparedness system. Using this framework enabled the study to identify gaps. Policy and proper institutional framework is lacking in both Counties. County based disaster operation centres are lacking and working policy was lacking to facilitate: sustainable political will, technical development, participation of all actors and effective resource mobilization and deployment.

The general apathy exhibited by respondents' means there was inadequate meaningful community participation. It has been established that well prepared communities are less prone to disaster, recover faster and endure less economic hardship than those who are not (UNISDR, 2015). If relevant authorities, individuals and communities are well prepared with knowledge and capacities, the impact of disasters can be substantially reduced.

5.5 Limitations of the Study

The quantitative questionnaire used to collect data was very long. This generated a lot of fatigue amongst the respondents. The study sought to counter the fatigue by explaining the value of the study to the respondents and generally giving adequate time from the time of dropping and picking up the questionnaire.

5.6 Suggestion for Further Research

The following areas are recommended for further research:

I. Maritime DRR preparedness in Marine Protected Areas

II. Coastal climate change and DRR Adaptation for Community Resilience

5.7 Recommendations

Table 5.1 Recommendations

No.	ACTION	RESPONSIBILITY
1.	Develop Integrated DRR Strategic Governance Architecture	Ministries of: Interior, Devolution, Transport, Defence, Tourism, Agriculture, Livestock & Fisheries and Environment & Natural Resources
2.	Enact Disaster Management Act and Develop Action Plans for Implementation	National government and Parliament
3.	Establish National and County Recovery Fund where the Kitty is easily Accessible.	Treasury, CRA, County governments
4.	Establish fully-fledged Emergency Operations Center (EOC) to enhance coordination at the County Level	National and County government
4.	Develop strategic Communication and Community Participation Strategy	National and County government
5.	Strengthen multi-agency approach to enhance synergy/solidarity	National and County government
6.	Conduct Training Needs Assessment on DRR for Mombasa and Kwale Counties	IPSTC and Government of Japan through UNDP

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Appendix

Population of the Study

1. Association of Seafarers
2. Base Titanium Limited
3. Beach Management Units (Mombasa and Kwale)
4. Coast Development Authority
5. County Government Authorities (Mombasa and Kwale)
6. Fire Brigades (Mombasa, Kwale)
7. Inter-Agency Working Group on Disaster Preparedness for East and Central Africa
8. Kenya Airports Authority
9. Kenya Civil Aviation Authority
10. Kenya Defence Forces (Kenya Navy, Nyali Barracks and Mariakani Garrison)
11. Kenya Ferry Service
12. Kenya Fisheries Service
13. Kenya Forest Service
14. Kenya Maritime Authority
15. Kenya Meteorological Department
16. Kenya Ports Authority
17. Kenya Red Cross Society
18. Kenya Revenue Authority
19. Kenya Wildlife Service
20. Local community in Mombasa and Kwale
21. Media
22. Ministry of Devolution and ASAL
23. Ministry of Environment and Forestry

24. Ministry of Health
25. Ministry of Interior
26. Ministry of Transport and Infrastructure
27. Ministry of Water and Sanitation
28. National Disaster Management Unit (NDMU)
29. National Disaster Operations Centre (NDOC)
30. National Drought Management Authority (NDMA)
31. National Youth Service
32. National Police Service (Regular Police, Directorate of Criminal Intelligence, Maritime Police, Tourist Police and Administration Police)
33. NEMA
34. Plan International
35. PMAESA
36. Public Utilities Companies (Kenya Power and Lighting, Mobile Telephony Services)
37. Kwale Coast General Hospital and Msambweni Hospital)
38. St Johns Ambulance
39. Training Institutions (Colleges and High Schools)
40. Tourist Hotels in Mombasa and Kwale
41. Water Resources Management Authority (WRMA)

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