INFLUENCE OF MARITIME SECURITY ON EXPLOITATION OF BLUE ECONOMY RESOURCES ALONG KENYA'S COASTAL REGION

NJIRU SAMMY NJUE

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN GOVERNANCE PEACE AND SECURITY IN THE DEPARTMENT OF GOVERNANCE, PEACE AND SECURITY STUDIES, SCHOOL OF HUMANITIES AND SOCIAL SCIENCES OF AFRICA NAZARENE UNIVERSITY

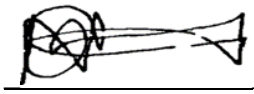
MAY 2020

DECLARATION

I declare that this thesis and the research that it describes are my original work and that they have not been presented in any other university for academic work.

Njiru Sammy Njue

16S03DMGP005



03/10/2020

Signature Date

Supervisors' Declaration

This thesis was conducted under our supervision and is submitted with our approval as the university supervisors.

Dr. Duncan Ochieng'

03/10/2020

Signature Date

Mr. Joseph Mutungi

03/10/2020

Signature Date

Africa Nazarene University

Nairobi, Kenya

DEDICATION

I dedicate this to my loving family; my spouse Eunice Wairimu, my sons Jude, Gaius and my daughter Lucy, and my dear parents for their unwavering support, motivation and understanding throughout my studies and journey of writing this research thesis.

ACKNOWLEDGEMENTS

To the Almighty God, God of providence, through whom I was able to acquire the necessary financial and material resources I needed to successfully undertake, to Him be the glory. His mercy and grace to me was vital throughout the academic journey. Appreciations also go to my supervisors Dr. Duncan Ochieng' and Mr. Joseph Mutungi for their valuable input and academic guidance from the point I began writing this thesis. It would be inappropriate if I failed to express my gratitude to staff of Africa Nazarene University's Governance, Peace Securities Studies Department led by Dr. Emily Okuto. Sincere gratitude to my lovely spouse Eunice Wairimu for being a very understanding and supportive partner who was also always there for me. I would also like to heartily thank my children Jude, Gaius and Lucy for motivating me and also being very understanding whenever I could not be there for them because of my studies. Finally, I thank all the survey participants who agreed to provide data during data collection. Without their input this research thesis would not have been a success.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Maritime security, which involves efforts related to ensuring that legal human activities taking place in marine environments are carried out without any form of illegal interference and destruction to the environment, is critical for the success of all sectors and industries of a country's economy including the blue economy. This implies that for countries turning to blue economy as an additional avenue to boost their economies, investing in the security of their marine resources is a mandatory undertaking and one in which adequate security resources must be dedicated to. Kenya being one of these countries, and a developing one for that matter, and with little studies conducted on the subject matter in this country, this research study is of necessity. The objectives of this study were; to analyze the role of maritime defence on exploitation of Kenya's blue economy resources, to assess the effects of maritime safety on exploitation of Kenya's blue economy resources and to examine the influence of maritime governance on exploitation of Kenya's blue economy resources. The findings of this study are expected to be of significance to various government ministries in Kenya that are charged with the responsibility of ensuring security of the countries territories as well as those ministries under which trade and economic performance of the country falls. Private stakeholders who activities relate to security and economic performance are also expected to find the outcomes of this study to be of use to them. The study's scope was limited to Kenya's coastal region with a specific focus on Mombasa County. Securitization Theory guided the study. Descriptive research design was employed with the survey approach being taken. The survey targeted the apposite personnel in Kenya's relevant State Departments, relevant Mombasa County government ministries and the general adult populace of Mombasa County. A mix of probability and non-probability sampling methods were used to select 384 survey participants who were engaged in this study. Questionnaires and interview schedules were used to collect data from the field. For data analysis, SPSS Version 20 was used. Frequency distribution and percentages were used to analyze the quantitative data while narrative analysis was used to analyze the qualitative data to transform the data into useful information. The findings showed that each of the three facets of maritime security covered in this study; maritime defence, maritime safety and maritime governance are quite essential in ensuring that the country's blue economy resources are harnessed in a responsible and sustainable manner in order to achieve desirable growth and performance of the blue economy and indeed the country's grander economy. However, there is still more that needs to be done to ensure that the exploitation of the blue economy is beneficial to the nation as indicated in the findings of the study which have shown that effectiveness of the measures that have so far been put in place to uphold the security of the country's territorial waters have not met the expectations of the residents of Mombasa County as well as the representatives of the national and county governments involved in this study. Fundamentally, prosperity of the country's coastal and maritime tourism, commercial fishing and marine transportation and other blue economy resources rely heavily on effective maritime security. In conclusion, each of the three facets of maritime security; maritime defence, maritime safety and maritime governance are important in exploitation of blue economy resources in Kenya.

OPERATIONALIZATION OF TERMS

Aquatic resources: These refer to the naturally occurring biological and physical possessions and attributes found in water bodies (lakes, ocean, rivers and streams) that are valuable and beneficial to human. These encompass the biological diversity, minerals and tourism potential.

Blue economy: These are sustainable economic activities that make use of marine resources for sustainable economic development.

Blue economy resources: These refer the naturally occurring resources in the marine bodies that can be harnessed for commercial purposes and include minerals, marine creatures, marine plants and geographic physical features.

Incidental catches: The untargeted fish (such as young fish and fingerlings) as well as other marine creatures captured or trapped during fishing for a different species.

Coastal and maritime tourism: Refers to commercial marine-based activities such as yachting, cruising, boating, nautical sports as and their beach-based services.

Maritime defence: State military strategies and activities aimed at effective detection, deterrence, and interdiction of aggressive acts against a state's sovereignty, assets, and infrastructure within or adjacent to its territorial waters.

Maritime This refers to integrated initiatives and conduct of

governance:	governments to develop and implement policies aimed at controlling government-sanctioned maritime activities with the aim of protecting the ocean environment by ensuring sustainable use of marine resources.
Maritime safety:	Protection of life and property through the regulation, management and technological development of all forms of waterborne transportation.
Maritime security:	This encompasses actions and measures taken by naval forces to tackle illegal marine–based activities like piracy, terrorism, illegal fishing, illegal mining and human trafficking to promote safety in the marine bodies.
Maritime terrorism:	Premeditated, politically motivated violent acts executed within the maritime environment against non-combatant targets, ships, cargo, ports and port facilities and critical maritime infrastructure by criminal agents.
Piracy:	Criminal acts such as violence and hijacking by boat or ship-borne attackers upon another ship or a coastal area with the aim or stealing or obtaining financial ransom from governments.
Terrestrial-based building blocks of economy:	These are land-based resources that are valuable and exploitable for human benefit and for economic growth.

Territorial waters: An area of water, including internal waters, over which a state has territorial jurisdiction.

ABBREVIATIONS AND ACRONYMS

AU	:	African Union
CEC	:	County Executive Committee
DSM	:	Deep Sea Mineral
EAC	:	East African Community
EEZs	:	Exclusive Economic Zones
EU	:	European Union
FAO	:	Food and Agricultural Organization
IMO	:	International Maritime Organization
IUU	:	Illegal, Unreported and Unregulated
KMA	:	Kenya Maritime Authority
KNBS	:	Kenya National Bureau of Statistics
PS	:	Principal Secretary
SALW	:	Small Arms and Light Weapons
SAR	:	Search and Rescue
SDGs	:	Sustainable Development Goals
SPC	:	Secretariat of the Pacific Community
SPSS	:	Statistical Package for the Social Sciences
UN	:	United Nations
UNDP	:	United Nations Development Programme
USAID	:	United States Agency for International Development

CHAPTER ONE
INTRODUCTION

1.1 Introduction

This chapter introduces the background to the study, and presents the statement of the problem, the purpose of the study, the research objectives, research questions and the significance of the study. The chapter further presents the scope of the study, delimitations of the study, limitations of the study, assumptions of the study, the theoretical and conceptual frameworks.

1.2 Background to the Study

Blue economy, an emerging concept, is certainly the next frontier on which nations across the world are increasingly basing the growth of their economies. In quest to bolster their already strong economies, the developed nations have delved into the ocean and other water bodies to complement other industries of their economies.

For less developed nations like Kenya on the other hand, the blue economy is yet another opportunity on which to ground their economic growth towards the first-world status. Attri (2016), remarks that development of the blue economy is based on harnessing the potential of oceans, seas, lakes and rivers through economic activities like commercial fishing and aquaculture, recreation and tourism, shipping, off-shore mining and extraction of non-renewable marine-based resources and minerals which according to Commonwealth Secretariat (2019) accounts for a worldwide ocean value of approximately $1.5 trillion per year.

To emphasize the significance and potential of the blue economy, Commonwealth Secretariat (2019) asserts that globally, 350 million jobs are linked to fisheries, and estimates crude oil production from off-shore fields at 34% by the year 2025. The International Maritime Organization (IMO) (2019) advances that by

approximately more than 90% of global trade is transported by sea which has been boosted by expansion in the level of international trade over the last few decades. These statistics simply serve to highlight the significance of the blue economy.

The potential and significance of the blue economy brings to fore the fact that maritime security of the world's water bodies cannot be overemphasized and much time cannot be wasted in putting in place the right policies, structures and systems to ensure that oceans, seas, lakes, rivers, coastlines and harbours of the world are adequately secured from any form of activity that is a threat and an impediment towards sustainable exploitation of the world's blue economy. Given that productivity and sustainability of the water resources, which is quite essential for now and the future and relies heavily on security and protection of the water resources, understanding maritime security, a dimension of international security, is therefore the first step towards ensuring that the territorial waters of any nation are adequately secured and protected.

Barros and Hespen (2013) suggest that maritime security is a term that draws the international community's attention to new challenges and rallies support for tackling these challenges. Yet, the term 'maritime security' remains a large and sometimes nebulous concept with no concrete universally accepted definition of what it means. According to Feldt, Roell and Thiele (2013), maritime security is a combination of preventive and responsive security measures with an objective of protecting the maritime domain against threats and intentional unlawful acts. The accent in this definition is on both preventive as well as responsive through deterrence as well as surveillance and interdiction aimed at law enforcement – as a civilian and military requirement – and defence operations as a military.

That said, maritime security can be structured into key six categories of activity essential for a stable, safe, and prosperous maritime sector. These categories proposed

by the United States Agency for International Development (USAID) (2010), in the form of a guide on Maritime Security Sector Reform – part of which also forms the basis of the specific objectives of this study – are maritime governance, maritime civil and criminal authority, maritime defence, maritime safety, maritime response and recovery, and maritime economy. This is an indication to the effect that an integrated approach to maritime security is crucial in order to realize the intended key objectives which, in the understanding of Feldt, et al. (2013), are to uphold safe maritime environment, promote stability and prosperity across international waters, preserve the freedom of the seas, facilitate and defend commerce and maintain good governance at sea. Facilitating and defending commerce forms the key areas of interest of this study with a focus on blue economy as an emergent economic frontier.

Historically notable security breaches and security lapses – maritime and non-maritime related give credence to the creation and adoption of numerous international treaties, conventions and policy regulations guiding maritime security. From the hijacking of the Italian cruise ship Achille Lauro in 1985 to the infamous 9/11 terrorists attacks in the US and the widespread and sporadic piracy in the high seas across the oceans and seven seas of the world, the international community has over the years made major strides in enhancing maritime security. South American countries like Venezuela, Colombia and Brazil among others all know too well the problem of maritime insecurity because of the numerous challenges their seafarers and those working in their coastlines experience regularly. In the course of their economic activities, they have to grapple with intensifying levels of high-impact off-shore kidnaps and hijacks (International Maritime Organization, 2008). Incidences such as that experienced in Guyana in 2018 where Guyanese fishermen were hijacked and attacked off the coast of Venezuela and their catch as well as vessels stolen represent

the increase in maritime insecurity incidents occurring around South America and the threat such insecurities pose the blue economy in the region. Increasing drug trafficking and piracy are also some of the security concerns that have been found to riddle the blue economy in the South America ocean waters (Clark, 2018).

Maritime security is also an area of concern among the Indo-Pacific and Asia-Pacific states. Lin and Gertner (2015), observes that tensions in the East China Sea and South China Sea among various Asian nations has led to deterioration in the continent's maritime security environment. The waning state is attributed to among other factors historical and legal claims to sovereignty over maritime territories which are intricate and cannot be solved through the Westphalian notion of statehood and land-based projection of power. Kept unchecked, such strained relationships continue to derail the economic prosperity of the blue economies of the Asian countries that rely directly on the commercial maritime activities of the region. In a research study on maritime security challenges in Southeast Asia, Amri (2016), concludes by pointing to the inadequacy of the existing international and regional legal frameworks in addressing these challenges which also include illegal, unreported and unregulated (IUU) fishing, maritime terrorism, human trafficking, piracy and marine pollution (Liss, 2013).

According to Islam and Mostaque (2019) Bangladesh, a developing nation that boasts the longest sea beach in the world, has the potential of accelerating its economic growth through sustainable exploitation of its marine resources through marine fishing and tourism. This potent is however stifled by weak institutional capacity and poor socio-cultural practices which continue to endanger the sea resources (Islam, Rahaman & Zobayer, 2018). Blue economy also provides fundamental opportunities for countries bordering the Caribbean Ocean like Colombia, Costa Rica, Guatemala, Nicaragua Honduras and Panama and the Commonwealth Caribbean island nations like Grenada,

Jamaica and Bahamas to enhance their economic growth by exploiting and harvesting the marine and littoral resources. The allusion here, according to Roberts (2015) and Rustomjee (2016), is that if these nations effectively harness and manage their blue economies, they were better placed to address problems associated with unemployment and poverty, poor growth and food insecurity among others.

The African Union (AU), Africa's intergovernmental institution has its sight on blue economy as a fundamental contributor to the realization of the continent's Vision 2063 agenda as the development blueprint for Africa. In line with this, many African countries have taken to exploration of marine resources to enhance their economic growth and boost their already frail economies. This is evidenced by the growing investments in maritime infrastructure as well as modern innovations and scientific advances in many nations across the continent. South Africa, according to Spamer (2017), leads the way in implementation of various marine projects which include marine protection services, offshore gas and oil exploration, marine transport and manufacturing, and aquaculture in the continent.

In Africa, just as is the case in other continents, the need for effective maritime security is down to the fact that exploitation of the blue economy is riddled with a lot of insecurities. Omondi (2017) points out that in East Africa some of the most dominant and notable maritime security threats are the inter-state disputes on unsettled maritime boundaries as in the case between Kenya and Somalia and Kenya and Uganda, maritime terrorism, piracy, trafficking of narcotics, people and illicit goods, arms proliferation, illegal fishing, environmental crimes such as maritime pollution by way of illegal dumping of solid and hazardous waste in water bodies that threatens aquatic life, and maritime accidents and disasters. Long'iro and Maluki (2017), found that the horn of Africa nations still grapple with a lot of maritime insecurity challenges like IUU fishing

as well as transnational crimes in the form of maritime piracy, human, drugs and small arms and light weapons (SALW) trafficking, and piracy. Hamad (2016), alleges that persistence in the insecurity issues in Africa, especially maritime domain of the East African Community (EAC) is due to lack of proper structures and mechanisms to address these challenges and reliance on ad-hoc, case-by-case manner of dealing with maritime security threats. A positive pointer by Vrey (2013), is that maritime security is increasingly occupying prominent places on the continent's security agenda.

Kenya itself is endowed with vast aquatic resources thus presenting a big opportunity for boosting its blue economy's growth while supplementing the traditional segments of the larger economy through creation of employment opportunities, alleviating poverty, enhancing food security, and supplementing other industries. Through the blue economy, the country can drive itself to stop being over reliant on the traditional terrestrial-based building blocks of its economy by diversifying in order to deliver sustainable and inclusive economic growth (UNDP, 2018). There is already growing interest in the nation's blue economy as evidenced by the clamour shown by institutions of higher learning in the country to develop curriculum on the same and also carry out research studies on various elements of the country's blue economy. Muigua (2018), however points out that the country's blue economy is greatly underexploited and that the viability of Kenya's blue economy is greatly hindered by a number of challenges such as poor policies and infrastructure as well as maritime insecurity.

Whilst most developed nations across the world have for a long time included maritime security in their security mandates, in Kenya inclusion of maritime security in the national security mandates only began gaining unprecedented salience in the recent past. This is evidenced by recent institutionalization and launch of Kenya Coast

Guard Unit at the Kenyan coast, a security unit entrusted with the responsibility of protecting territorial waters and Exclusive Economic Zones (EEZs) under Kenya jurisdiction. However, inland aqua ecosystems like Lake Victoria which equally need similar security institutions have seemingly been ignored despite the various challenges and insecurities faced in these water bodies by the surrounding residents, as observed by Smed (2016) and Smed and Wivel (2017). This study therefore assesses the influence of maritime security on exploitation of Kenya's blue economy resources with a focus on the littoral region and specifically Mombasa County.

1.3 Statement of the Problem

The blue economy is a potentially high growth area for Kenya's economy and the country is fortunately endowed with a number of water bodies which are highly rich in resources which can be exploited to enhance the economic wellbeing of the residents living where these water bodies lie as well as boosting the economy of the country as a whole. However, as has been experienced in the recent and distant past in Kenya and elsewhere across the world, failure to safeguard marine ecosystems and the marine resources can render optimal exploitation of marine resources for economic growth a mirage.

The relationship between economics and security is a critical one. The integration between these between these factors implies that the country's economic performance depends on its security stability (Retter, Frinking, Hoorens, Lynch, Nederveen & Phillips, 2020).

Kenya's territorial waters have somehow remained inadequately secured and its blue economy remains underexploited. Insecurity concerns include seaborne terrorism, piracy along the Kenyan coast, pollution of the marine environment, and inconsiderate,

careless and unsustainable harvesting of marine resources like overfishing (Randrianantenaina, Fanning, Williamson & Bailet, 2013). Despite all these issues, there are pointers and indicators that maritime security in Kenya's territorial waters and the influence it has on the country's blue economy remain largely under-researched. The existing few researches such as that carried out by Thadeus (2013), are only limited to piracy as a concern area. Busiega (2016), carried out a study to assess the role of maritime diplomacy in harnessing maritime security for resource exploitation. This research study is subsequently designed to assess Kenya's maritime security sector with an aim of identifying its capabilities and any existing gaps to enable coordination and collaboration to enhance maritime security in order to support and boost the growth and performance of the country's blue economy.

1.4 Purpose of the Study

The purpose of this study is explain how an enhanced security in Kenya's territorial waters can significantly contribute to the overall growth and development of the country blue economy and by extension the country's entire economy. Further, the study seeks to explain how the economic wellbeing of people who rely on blue economy can be improved through enhanced security at the sea hence better exploitation of the country marine resources.

1.5 Objectives of the Study

1.5.1 General Objective

The general objective of this study was to assess the influence of maritime security on the exploitation of Kenya's blue economy resources.

1.5.2 Specific Objectives

The specific objectives of the study were to:

i) Analyze the role of maritime defence on exploitation of Kenya's blue economy resources.
ii) Assess the effects of maritime safety on exploitation of Kenya's blue economy resources.
iii) Examine the influence of maritime governance on exploitation of Kenya's blue economy resources.

1.6 Research Questions

The study was guided by the following research questions;

i) What is the role of maritime defence on exploitation of Kenya's blue economy resources?
ii) How does maritime safety affect exploitation of Kenya's blue economy resources?
iii) How does maritime governance influence exploitation of Kenya's blue economy resources?

1.7 Significance of the Study

The findings of the study are expected to be of significance to various institutions and stakeholders in the area of national and international security as well in the realm of national economics. On the security front, the Ministry of Interior and Coordination of National Government, as the government organ charged with the responsibility of ensuring the country's internal security, are likely to find the outcomes of this study important because it is in a position to establish ways of enhancing the country's security through the National Security Policy in order to maximize on the exploitation of its water resources. The findings of this ministry are also of significance to the country's Ministry of Defence enabling it to enhance security at Kenya's coastal

strip and within the ocean's territorial waters that are within the country's jurisdiction. By understanding the contribution of the country's blue economy, robust policies can be developed and implemented to ensure that Kenya's territorial waters within the ocean are properly secured.

Away from the security front, another government institution likely to find the outcomes of this study useful is the Ministry of Environment and Forestry. Because the maritime safety is essential for development, maintenance and harvesting of water resources, the ministry will strive to ensure that existing policies that are meant to protect the country's water bodies and resources are effectively implemented and enhanced to secure the country's blue economy. Finally on the government side, the State Department for Trade, which lies in the Ministry of Industry, Trade and Cooperatives could use the findings of this study to augment the country's economic policy through exploitation of the country's blue economy to enhance its economic scope and growth. It is also expected that the findings of this study is of significance to researchers, experts and professionals in the fields of national security and economy, both locally and internationally. Students carrying out studies in related fields are expected find this study to be of importance as it serves as a source of empirical information.

1.8 Scope of the Study

According to Simon and Goes (2013), the parameters within which a research study is operating defines the scope of the study. These include elements such as geographical coverage, time span and the target population. A UN-Report on Oceans and International Law of the Sea (2008), explains that maritime security has many aspects core of which are maritime governance, maritime civil and criminal authority, maritime defence, maritime safety, maritime response and recovery and maritime

economy. For the purposes of this study, only three activity areas namely maritime defence, maritime safety and maritime governance were of interest.

While appreciating the significance of other water bodies like lakes and rivers as essential elements of the country's blue economy, this study focused only on the section of Indian Ocean that is within the country's territorial boundaries. Consequently, geographically the research survey was focused on the coastal county of Mombasa. The rationale behind the choice of Mombasa County is that in the recent past it experienced regular insecurity issues which significantly impact on its economy and by extension the economy of Kenya.

The study covered a five-year period, from the year 2014 to 2019 for the reason that during this period considerable disruption was experienced in the coastal region. Additionally, the security situation within the chosen period is still fresh in the mind of the respondents hence the effects were easy to assess.

1.9 Delimitation of the Study

As much as some of the aspects that were reviewed in the objectives of this study are applicable to water sources such as rivers and other small water bodies, the findings are largely be applicable to larger water bodies like rivers, lakes and oceans. Another boundary in this study is with regard to the choice of survey participants drawn from the general population. From the general population, the survey only engaged residents who have resided in the selected geographical region for a period of at least four years, in line with the time scope of the study. From the target population that was purposively chosen, the researcher only engaged high ranking officials for ease of data collection and also because of the quality of information they possess. Of the five facets that designate blue economy namely blue energy, aquaculture, coastal and maritime

tourism, blue biotechnology, mineral resources (Steven, Vanderklift & Bohler-Muller, 2019), this study considered only two of these; coastal and maritime tourism and off-shore mining because these are most applicable areas with regard to Kenya's blue economy.

1.10 Limitations of the Study

Since this study was confined to the five years period between the years 2014 to 2019, it is essential to mention that some significant maritime securities issues that may have taken place out of the selected time period and may have effect on the country's blue economy were not captured and this may influence the findings of this study. Whereas the study was limited to Kenya's territorial waters, some activities happening in other countries' territorial waters latently have direct effect on Kenya's blue economy and maritime security and such activities have the potential of affecting the outcomes of this study. For instance, the northern parts of Kenya's territorial waters in the Indian Ocean borders Somalia's, a country which has for a long time now been unstable and experiences a lot of criminal activities like piracy within its territorial waters. The insecurities in Somalia's territories are likely to affect economic activities at the Kenyan coast.

To mitigate the effects of these influences that place restrictions on the methodology and results but the researcher has no control over, the questionnaire was structured in such a way that only issues touching Kenya's territorial waters and blue economy are captured. The questions in the data collection instruments were constructed to avoid inclusion of information from the periods prior to the year 2014.

1.11 Assumptions of the Study

It is assumed in this study that the selected sample population gave views that can be replicated across the entire population hence making the findings of the study relevant and applicable to the entire population. To justify this assumption, respondents from the general public were randomly chosen while the ones from key government institutions were carefully purposely chosen. The response of the survey participants, it is assumed, were objective and not influenced by any biases. This assumption of based on the premise that the findings of the study are of significance in bettering the economic activities and security of the respondents, and they were made aware of the same in order to encourage them to be impartial in their responses. The researcher also assumes that the concept of blue economy has significantly gained roots in the targeted maritime areas and has been strongly embraced by the residents of these regions. This assumption is informed by the fact that the water resources are very significant for the economic wellbeing of the selected locations and the country at large and therefore, whether or not the residents are conscious of the concept of blue economy, they are making use of these natural resources to grow themselves economically.

1.12 Theoretical Framework

1.12.1 Securitization Theory

This theory was developed by the Copenhagen School of Barry Buzan, Ole Wœver, Jaap de Wilde and others in the mid-1990s. According to the proponents of this theory, when issues are construed as extreme security that need to be dealt with urgently, they transform from normal, everyday issues to ‘dangerous’, ‘threatening’, ‘alarming’ that need to be addressed quickly with appropriate security measures (Stritzel, 2014). The implication is that security issues are just ‘out there’ but rather

must be articulated as problems by securitizing actors. For instance, immigration of people from one country to another may be a normal everyday occurrence. However, if an individual or group of individuals considers the act a 'security threat' and start advancing their views on the same, then migration shifts from being a low priority concern to a high priority issue that requires appropriate security action like securing borders. The securitizing actors are often concerned with the security of the state and often focused on analyzing the military and political stability.

However, securitization often goes beyond these limited realms to include other types of threats that are non-military in nature such as human security. The proponents of this theory have subsequently largely focused on five sectors namely economic, societal, military, political and environmental sectors. In the context of this study, this theory relates various activities which in some instances may be taken as normal become serious security issues which, going by the main tenet of this theory, become securitized. For instance, IUU and pollution of the marine environment which for a long time remained non-concern issues have in the recent years become major security concerns due to securitization of the issues by different players like politicians, security professionals and environmentalists.

1.13 Conceptual Framework

Rocco and Plakhotnik (2009) define conceptual framework as a diagrammatic presentation that, in summary, explains the main variables, concepts and key factors to be studied and the presumed relationships among them. Figure 1.1 outlines the relationship between the independent variable maritime security comprising, which are maritime defence, maritime safety and maritime governance, and the independent variable which in this study is the exploitation of Kenya's blue economy resources. In the conceptual framework maritime defence which is delineated by antiterrorism and

antipiracy measures the government can enforce such measures to ensure that coastal and marine tourism as well as the commercial fishing sector does not suffer. Similarly, antipollution and emergency measures in the water bodies are essential to exploitation of the country's maritime resources. Equally, maritime governance as demarcated by illegal mining mitigation and incidental catches mitigation measures are fundamental maritime security measures under maritime governance essential in promoting Kenya's blue economy.

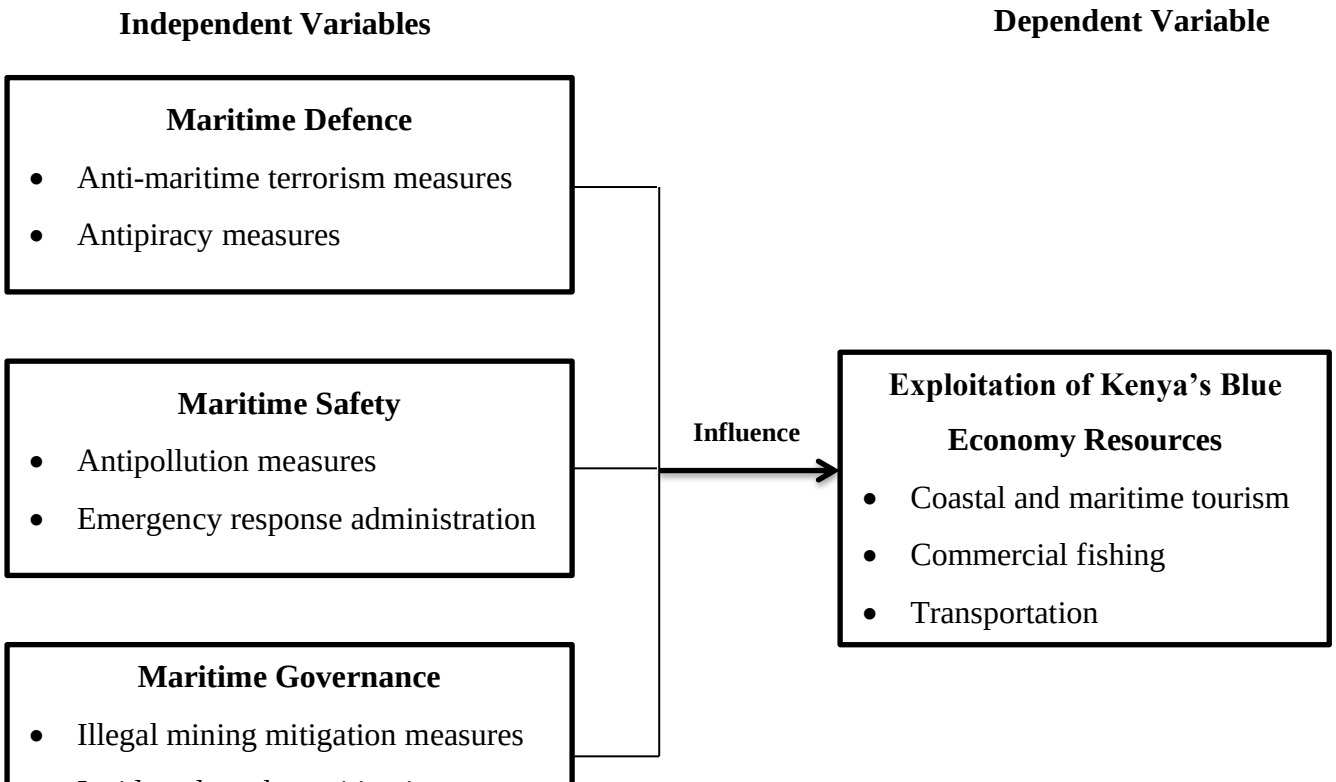


Figure 1.1: Conceptual Framework
Source: (Researcher, 2020)

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to provide an overview of previous research studies on maritime security. The literature review introduces and expounds on the framework of this study that comprises the three focus areas with regard to the specific objectives of this survey aforementioned in the previous chapter.

2.2 Empirical Review

This section of the study concentrates on previous research result findings based on the specific objectives of the study. It discusses and summarizes and previous publications on maritime defence, maritime safety and maritime governance as operationalized in the context of this thesis.

2.2.1 Maritime Defence and Exploitation of Blue Economy Resources

Maritime terrorism and piracy have had significant negative effects on blue economy activities both on shore and offshore thereby being among the major challenges facing exploitation and growth of the blue economy across the world. The Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (1988) defines maritime terrorism attempts or threats made by terrorist organizations to seize control of water transportation vessels forcefully with the intention of damaging the vessels with its cargo, stealing the, injuring or killing the occupants of the vessels, or endangering the safe navigation of the vessels. Literary work by (Greenberg, Chalk, Willis, Khilko & Ortiz, 2006), have outlined incidents of maritime terrorism in recent history that have taken a toll on the blue economies a number of countries in the Americas as well as in the Middle East. For instance, terrorist attacks against the SuperFerry 14 in the year 2004 in Manila, Philippines as well as the attack on the USS Cole in the Gulf of Aden in 2000 led to destruction of goods that were being transported while at the same time interrupting marine economic activities (Banlaoi, 2005). More recently, explosive-laden drone boats, maritime mines, and fast attack craft outfitted with rocket-propelled grenades have been employed by Houthi to terrorize US, Saudi, and Emirati warships, and international commercial oil tankers and other civilian ships passing through the Bab el-Mandeb Strait. These acts of terrorism have undoubtedly led to massive loses to marine-based business thereby affecting the blue economy negatively.

Bruno and Giacomo (2016) note that as an element of insecurity, maritime terrorism and piracy are serious obstacles to exploitation of resources for economic growth and developed. Sustained maritime piracy as has been observed along the African coastline presents threat to economic security. Maritime terrorism and piracy affect trade activities in the marine environment through increasing insecurity which for instance lead to destruction of goods transported as well as delayed delivery of the same. As a result of increased inefficiencies through the geographical re-routing of shipping networks in order to avoid crossing paths with terrorists and pirates have proved uneconomical hence costly to traders (Fu, Ng & Lau, 2010).

In addition to the direct costs incurred by economic giants and other stakeholders in a bid to shield themselves from maritime terrorists, Brück, Schneider and Karaisl (2007) accentuate that these measures taken to enhance security which include investments in emergency relief, security technologies and adaptation of consumption and investment behaviour contribute to the costs of doing business therefore impacting negatively on blue economies of the affected nations. As in the rest of the world, the maritime domain is a critical lifeblood component of Africa's blue economy to both littoral and landlocked countries. Like other components of the main economy, maritime commerce faces security challenges too. Similar to the Eastern Africa countries and the western Indian Ocean nations, Randrianantenaina et al. (2013) established that with regard to maritime piracy and armed robbery against ships, Madagascar is confronted with analogous challenges. Maritime piracy and armed robbery against marine vessels off the country's coast cost the Madagascar significant amount in terms of lost revenue due to disruption of revenue generation activities. Reform of the country's national legislation on maritime piracy to ensure an arrest, prosecution and conviction of the pirates is one measures proposed in by the researchers

to help Madagascar address the problem of piracy off its coast.

In Ghana, terrorism and piracy of the country's coast continue to present a serious challenge to the exploitation of the country's blue economy. In recent times, the import and export activities off and along the coast of Ghana are negatively impacted by the intermittent attacks on merchant, fishing, container and auxiliary ships leading to loss of cargo and in extreme instances death of crew members which subsequently dents the economy (Amarh, 2019). A study be Elisha (2019) revealed that Nigeria faces identical challenges as Ghana with regard to harnessing its blue economy resources. Piracy along the Gulf of Guinea according to Brume-Eruagbere's (2017) findings, affects Nigeria, among other West African countries, thus presenting a major maritime security impediments that present serious challenges and derails the blue economy activity in the region. Theft of oil cargo, kidnappings of seafarers and disruption of transport along the gulf are just among the piracy issues that continue to be an anguish to the governments in the region because of the effects this vice has on economic activities along the coast. The effects disruption of activities along the coats by terrorists spill over the landlocked countries as well.

Primary interactions between blue economy and maritime security interests can be viewed from two perspectives. The first perspective is in relation to maritime security being a critical enabler of the blue economy through safeguarding navigation routes, providing important oceanographic data to marine industries and protecting rights over valuable marine resources and activities within claimed zones of maritime jurisdiction. The second facet is with regard to maritime security by being itself a source of economic development and growth through creation of employment opportunities for people employed in the security agencies and the sale and manufacture of the various resources needed to secure the waters (Voyer, Schofield, Azmi, Warner,

McIlgorm & Quirk, 2018). This intersection means that deficiencies and in capabilities in maritime security has direct effect on exploitation of blue economy resources. Piracy in the Horn of Africa and in the Gulf of Aden led to significant disruption of blue economy as well as other mainstream economy activities along the Horn of Africa's Indian Ocean coastline. Since this is a major transit route for marine vessels bringing goods to the region and moving goods from the region to other parts of the world, piracy impacted international business and disrupted the global supply chain (Johnson, 2014; Sullivan, 2010). According to Sergi and Morabito (2016), intensified maritime piracy along the East African coastline from around the year 2010 represented serious and sustained threat to economic security and ocean-faring commerce of the coastal countries as well as the landlocked countries of the East Africa that relied on them for waterborne importation and exportation of goods and services.

Kenya has equally been confronted with piracy in its territorial boundaries of the Indian Ocean which has affected the performance of the country's blue economy. Marine piracy has also largely remained a real threat to international trade taking place within Kenya's territorial waters which subsequently affects the country's blue economy. In the recent past, incidents of piracy in the high seas, according to United Nations Economic Commission for Africa (2018), resulted in sharp drop in tourism activities along the Kenyan coast and in the country's territorial ocean waters. The rise of piracy off the coast of Kenya also impacted heavily the global trade volume, which the Commonwealth Secretariat (2019) places at eighty per-cent, that passes through the country's coast. According to the findings of a study by the National Crime Research Centre (2017), piracy along the coastline borders of Kenya has convoluted the situation for Kenya thus affecting the region's industry with a grievous negative effect on the country's economy Such dangers of marine piracy along in the high seas can be seen

through the significant reductions in the amount of cargo passing through the country's port with traders opting to use the ports of other Indian Ocean bordering nations which they perceive to be safer than Kenya's. Coupled with piracy, terrorism on Kenya's coastal islands has compounded the negative effects in this sector of the economy through the ripple effect across the tourism value chain as well as other segments of the blue economy.

2.2.2 Maritime Safety and Exploitation of Blue Economy Resources

Illustrative studies reviewed in this section are fundamental in bringing to fore the dependence of the success of the blue economy on effective addressing of maritime safety factors such as antipollution and emergency response administration. Pollution activities in the marine ecosystems mainly affect the lives of plants and animals that live in these ecosystems. As has been shown in the various literatures reviewed herein, pollution of the marine ecosystem leads to subsequent death of the blue economy, which solely relies on the wellbeing of this ecosystem to thrive. A study by Wenhai et al. (2019) on China's blue economy indicates just how much pollution of the marine environment can bring the blue economy to its knees. As a result of the threats posed by heavy pollution of the marine environment on the blue economy, the government of China has put in place measures to significantly reduce, and in stances where possible to completely prevent, marine pollution. These include pollution control of river distributaries; stern control of industrial pollution by ensuring treatment of effluent and carrying out comprehensive improvement of fishing port environment among other measures.

Emission and introduction of debris, pollutants and contaminants into the water bodies also remain a major source of marine pollution (Ramirez-Llodra et al., 2011).

For instance, marine microplastics, which are major components of marine litter and a major global marine pollution, adversely affect the marine ecosystem (Raubenheimer & McIlgorm, 2018). Mainly caused by human activities, microplastics accumulate in estuaries and coasts thereby affecting the marine ecological environment (Cole et al., 2011). These in turn affect the sustainable utilization of blue economy including the tourism and fishing sectors of the economy. Further, the plastic scourge has high economic impacts which encompass clean-up costs (UN Environment, 2017).

In addition to the pollution activities taking place within the water bodies, the marine ecosystems are subject to several externalities such as habitat loss and pollution as a result of land-based activities. For instance, disposal of wastes in landfills, which may be many miles from the water bodies, can directly and indirectly affect the marine ecosystems when chemicals in these wastes get washed up into the lakes, rivers, seas and oceans. The effect of this on blue economies is that the blue economies are probably under-achieving their true potential in terms of supporting livelihoods with regard to food security and human health, and broad economic growth for many of the coastal and landlocked countries (Andrew, Mathew & Narnia, 2019).

Based on analysis on marine industrial activities, the health of marine eco-system and the significance of the blue economy, it is paramount to maintain a healthy marine ecosystem by solving pollution such as marine transport waste and plastic litter and microplastic. However, Klinger et al. (2018) argues that implementation of pollution control mechanisms largely remain inadequate due to poor understanding of the integrated management of multiple economic sectors which is a central tenet of blue growth and socially optimal use of ocean-based natural resources. In order to overcome such challenges, Voyer et al. (2018) advocates for free access to environmental data. Sharing such data is crucial in realization of industry transparency and sound

environmental management because different stakeholders become aware of how much environmental destruction is happening under their watch the various steps they can put in place in order to effectively address the challenges. Further, parties with the greatest responsibilities with regard to the pollution of the marine ecosystems can be put to task in order to account for their misdeeds and take corrective actions.

Besides pollution, safety concerns in the water bodies are also core to maritime safety. Threats of natural and human disasters negatively impact on the blue economy. Consequently, the need to develop and put in place effective systems to address any disasters that may strike in the water bodies cannot be overemphasized. This implies the need to have adequate capacity to respond to disasters whenever and wherever they occur in the water bodies. Generally, emergency response to marine disasters tend to be poor in the less developed countries as compared to the developed countries that have better facilities hence enhanced capacity to address any challenges that may arise within their territorial waters. Ishak and Johari (2019) put emphasis on preparedness program and emergency plan as essential management elements critical to preparedness and response to disasters in the marine environment.

Oil spills, which in addition to being environmental pollutants are also disasters that occur in the marine environment, need to be prevented and properly and addressed whenever they occur in order to mitigate on minimize the effects on marine ecological environment. Given the frequency of oil spill disasters that occurred in China between the years 1973 to 2010 and the resultant effects on the marine ecological system, the government of China put in place mechanisms to the enhance the country's efforts to advance oil spill emergency response and prevention in recent years (Weiwei, Wei, Yupeng, Zhaoyu, Jianwei & Shasha, 2015). The effort put in by the Chinese government has gone a long way in enhancing the country's blue economy activities

and performance.

The study carried out in Southern Africa also illustrated that poor operational arrangement in countries' like Kenya, Tanzania, Seychelles, Mozambique and Madagascar the security apparatus to ensure secured waters has been a major problem as demonstrated by poor coordination among stakeholders' thus leading to deficiencies in terms of operational capabilities in the areas of information sharing arrangement, equipment, infrastructure, manpower and budget. Additionally, there were also serious operational deficiencies identified in terms of operational procedural issues of the stakeholders (Coelho, 2013). Off Africa's west coast the Gulf of Guinea, the coastal zone that stretches from Senegal to Angola, provides an economic lifeline (energy production and the fishing industry) to both the littoral and landlocked countries in the region. However, insecurity of the coast waters in the form of piracy threaten the region's blue economy. Additionally, trafficking of narcotics, people and weapons into Europe using the coast as the transport corridor causes destabilization (Anyimadu, 2013). This explains the need for such countries to upgrade their operational response capacity.

Kenya is endowed with rich and diverse marine and coastal ecosystems on which it leverages its overall economy by harnessing the blue economy resources. According to a UNDP (2018) policy brief, the country's blue economy has the potential to contribute to higher and faster GDP growth by providing recreational and tourism facilities, food, minerals, energy and transport. A number of studies have however shown that these marine ecosystems are under threat of pollution from land based sources and marine environment activities which when not addressed effectively and in time could derail the country's blue economy. Odada (2010) established that as a result of pollution, people residing in the marine areas are losing sources of livelihoods as a

result of pollution which affect the quality of fish catch and even cause death of fish. Mucugia (2019), notes that Kenya is currently doing well in harnessing its blue economy resources (food harvesting, tourism and transport) but observes that pollution threats this economy. The researcher therefore proposes adoption and implementation of eco-friendly mechanisms, environmental friendly technology innovations and conducive legal framework to address the problem of pollution and promote sustainability of the blue economy resources.

The fact that emergencies in the high seas remains a reality in nations' efforts in pursuing economic development through blue economies necessitates the need to invest in large-scale Search and Rescue (SAR) operations. This involves educating and training of seafarers and rescue staff in addition to the heavy investment in machinery needed to successfully find and rescue people in distress (Schmied, Borch, Roud, Berg, Fjørtoft, Selvik & Parsons, 2017).

2.2.3 Maritime Governance and Exploitation of Blue Economy Resources

Globally, coastal ecosystems and the communities that rely on them continue to face extreme challenges which include intensifying ocean pollution, loss of habitat and decline in ocean productivity (Taylor, Roberts, Milligan & Ncwadi, 2019). Additionally, across the world, in countries where mining of marine resources is carried out, a range of environmental, economic and social impacts continue to affect exploitation of blue economy. Environmental impacts as a result of marine mining encompass habitat destruction, removal of materials, dust plumes, noise and vibrations. With regard to the blue economy, unregulated and destructive deep-sea mining activities lead to displacement of bottom-trawling fishing and interference with deep-sea commercial fisheries. Near-shore mining has negatively impacted fishing thereby affecting the quality and quantity if fish caught (Ertör & Hadjimichael, 2020).

In other instances, marine mining leads to pollution of the environment in in turn negatively affect activities that drive the blue economy. Notably oil spills such as the ones that in the recent years occurred off the coast of the US and the Gulf War oil spill showed that if mining activities are not well handled can lead to destruction of the marine environment which consequently affects marine life. The BP oils spill in the Gulf of Mexico in 2010 led to massive deaths of ocean birds and fish in the Atlantic Ocean. This event, lead to negative effects on tourism activities, fishing and marine transportation among other economic activities that are key to the growth of the blue economy.

In Bangladesh, salt mining is a key contributor to the country's blue economy and the and by extension then entire nation's economy. This mining activity, which contributes to approximately over 90% of the salt sold in the country, and been a practiced for centuries, is creating and supporting an estimated 5 million employment opportunities directly and indirectly (Al Mamun, Raquib, Tania & Rahman, 2014). The case of Bangladesh shows just how essential responsible mining of blue economy resources is in sustaining the economy and the marine resources in general. If the mining of salt from the shores of the nation were not done responsibly with a focus on environmental conservation, then probably it wouldn't have supported the country's economy for years.

In Africa, Kenya included, marine mining, both deep-sea and near-shore mining, is a relatively novel area because the industry is only new and emerging in this part of the world. Subsequently, geological and technology knowledge and skills as well policy gaps are still a reality. The limitations and gaps in knowledge skills and policies imply that challenges are abound with regard to marine-based mining. Tanielu (2013) advances that addressing these insecurity-related challenges posed by deep-sea

and near-shore mining of minerals requires effective implementation of a raft of well-developed policies, legislation and regulations to manage deep-sea mining operations. A good example is the West Indian Ocean from the Deep Sea Mineral (DSM) Project, an initiative between the Secretariat of the Pacific Community (SPC) and the European Commission aimed at 'supporting informed and careful governance of off shore mining activities in accordance with international law, with particular attention to the protection of the marine environment and securing equitable financial arrangements for Pacific Island countries and their people'.

United Nations Economic Commission for Africa (2018) African Progress report describes Africa's coastal fisheries as a resource under threat. This is attributable to illegal, unreported and unregulated fishing activities in Africa's water bodies which is essentially a major problem impacting the continent's blue economy. In Kenya, and by extension Africa, sustainable exploitation of fisheries is under threat due to overexploitation of ocean resources made possible by conditions of open access to marine sources. Intensive fishing by small-scale fleets and foreign industrial vessels, IUU fishing and ineffective maritime governance continue to render the fishing sector of the nation's blue economy vulnerable. For instance, it is approximated that Kenya loses USD 118 million annually due to IUU fishing in its waters (Mwakio & Kabubu, 2014). Similar figures can be mapped on other nations of the continent. These problems are further compounded by institutional weaknesses, inadequate capacity for effective policy implementation and increasing demand for fish products which enhance the fragility of fish stocks in Kenyan waters. IUU also lead to lead to destruction of habitats and dwindling biodiversity in the marine ecosystem. Gordon, Dugan and Egerton (2006) suggest that these challenges are not unique to Africa's seas and oceans but are also experienced in the inland water bodies which also experience similar resource-

exploitation pressures, lack of effective management, and are unlikely able to deliver significant and sustained increases to the continent's blue economy (Welcomme & Lymer, 2012).

These problems can effectively be addressed by international agreements and international commissions relevant to Africa as accentuated by Brück, Schneider and Karaisl (2007) who give examples of three major international agreements namely the United Nations Convention on Law of the Sea (UNCLOS), the FAO Code of Conduct of Responsible Fisheries, and the Agreement on Port State Measures to prevent, deter and eliminate IUU fishing. Effective implementation of these measures by member states, it is expected, would lead to major achievements in conservation of marine living resources. Alongside formulation of effective policies and regulations and effective implementation of the same, modern technological monitoring, control and surveillance are essential in monitoring fishing activities in order to tackle the challenges faces and mitigate or significantly reduce the country's vulnerability to large-scale IUU fishing (Adi, 2009; Chircop, 2009).

2.3 Summary and Research Gap(s)

Arguably, from the literature material reviewed, not many studies have been conducted to address the subject of maritime security and the effects it has on blue economy. Most of the studies reviewed have focused on economies in general without going into details of blue economy. Further, despite maritime insecurity being a reality in territorial waters and EEZs under the Kenya's jurisdiction, much research have not been conducted in this area by experts and even scholars. In consideration of the missing research knowledge in the literature reviewed herein, the main thrust of this survey was to critically analyze and present valuable knowledge on influence of

maritime security on exploitation of the country's blue economy resources.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter details the description of the research process. It outlines research methods that were followed during the study. At the onset, the chapter explains and justifies the research design that was chosen for this study. Information provided here also includes the target population, how a sample was drawn from this target to participate in the study and the criteria for inclusion of the sample. The instruments that were used for data collection are also described as well as the procedures that were followed to carry out this study. The latter sections of the chapter discuss the methods that were employed to analyze the data. Finally, ethical and legal issues that were observed in the process are discussed.

3.2 Research Design

Research design is defined as the systematic approach that researchers use to carry out scientific studies. It is the framework of methods and techniques that explains how the various components of the study such as data collection tools and target population was synchronized in the process of carrying out the research in order to arrive at plausible research outcomes (Abutabenjeh & Jaradat, 2018). In this study descriptive research design was employed with the survey approach being taken to answer the questions what, when, where, when and how maritime security influences exploitation of blue economy resources within Kenya's territorial waters. To answer these questions both quantitative and qualitative techniques were used to investigate the relationship between the variables of the study.

3.3 Research Site

Kenya is richly endowed with numerous water bodies, from small streams and water pans to big lakes and long winding rivers. The country also borders the Indian Ocean to its south east. Cognisant of this fact, this research did not encompass on all the water bodies in Kenya but focused on specific marine environments and their immediate surroundings. This survey was therefore be restricted to the Kenyan coastal county of Mombasa (Appendix VI). The rationale behind the choice of this county is that it largely relies on the marine environment – the ocean – for economic activities. Further, given its location and size, its faces a number of issues which are of interest to this study namely human-induced pollution and insecurity from both internal and external aggressors. These factors consequently affect the maritime economic activities in these region and by extension Kenya's blue economy.

3.4 Target Population

A number of stakeholders are essential with regard to the quality of information that was collected in this survey, which subsequently determined the credibility of the findings of this study. As such the target population for this study was carefully chosen. To begin with the survey targeted the adult residents of Mombasa County (Table 3.1). This segment of the target population relies directly and heavily on these water bodies for their sources of livelihoods hence any insecurity activities in these marine ecosystems directly affects the economic status. Also to targeted in this study for face-to-face interviews were the Director General of Kenya Coast Guard Service, the Commander of Kenya Navy, Principal Secretary (PS) of State Department for Fisheries, Aquaculture and the Blue Economy, PS of State Department for Maritime and Shipping Affairs, PS of State Department for Tourism, and PS of State Department for Environment and Forestry. The top leadership of the Kenya Maritime Authority (KMA), the institution whose mandate and principal objectives are to regulate, coordinate and oversee maritime affairs including maritime safety and security in the Kenya (KMA, 2006) also formed part of the target population. The County Executive Committee (CEC) members in charge of trade in Mombasa County was equally be engaged in this survey. Table 3.1 presents the breakdown of the various segments of the target population that were targeted in this study.

Table 3.1: Target Population

Respondent Segment	Frequency
Director General, Kenya Coast Guard Service	1
Commander, Kenya Navy	1
PS, State Department for Fisheries, Aquaculture and the Blue Economy	1

PS, State Department for Maritime and Shipping Affairs	1
PS, State Department for Tourism	1
PS, State Department for Environment and Forestry	1
Kenya Maritime Authority top leadership	7
Mombasa County Executive Committee members in charge of trade and tourism	2
Members of the public (Adult population)	724,928
Total	**724,243**

Source: KMA, (2020); Council of County Governors, (2019); KNBS, (2019)

3.5 Study Sample

3.5.1 Study Sample Size

Sample size refers to the quantity of individuals selected from the general target population who are engaged in a survey (Singh & Masuku, 2014). From the target population, 384 individuals were involved during data collection and the itemization of the sample size was as presented in Table 3.2. In each of the State Departments and the two county government ministries, the heads of the institutions were engaged in the study through interviews. The remaining proportion of the sample size, 374, was allocated to the general public. The Krejcie and Morgan (1970) Table for sample size (Appendix V) has been used to arrive at the sample size.

Table 3.2: Sample Size

Respondent Segment	Frequency	Sample Size

Director General, Kenya Coast Guard Service	1	1
Commander, Kenya Navy	1	1
PS, State Department for Fisheries, Aquaculture and the Blue Economy	1	1
PS, State Department for Maritime and Shipping Affairs	1	1
PS, State Department for Tourism	1	1
PS, State Department for Environment and Forestry	1	1
Kenya Maritime Authority top leadership	7	2
Mombasa County Executive Committee members in charge of trade and tourism	2	2
Members of the public (Adult population)	724,928	374
Total	**724,243**	**384**

Source: Researcher, (2020)

3.5.2 Sampling Procedure

According to Ogula (2005), sampling procedure refers to the process or techniques that a researcher uses to arrive at a specific number of individuals to participate in a research study. The procedure outlines the process of selecting a number of individuals in such a way that the individuals chosen were a reliable representation of the larger target population from which they were drawn. A mix of probability and non-probability sampling was used in selecting survey participants. Specifically, simple random sampling, a type of probability sampling, was used to select participants from the general population segment of the target population. Purposive sampling procedure, which is a type of non-probability sampling, was used to choose CEC members from Mombasa County as well as the top leadership of KMA, Kenya Coast Guard Service and the Kenya Navy. Purposive sampling was used since from the two segments of the

target population, the research sought to engage appropriate individuals who adequately responded to the research questions.

3.6 Data Collection

3.6.1 Data Collection Instruments

Questionnaires and interview schedules were used to collect data from the field. The questionnaire was mainly used to gather data from the general public. To do this effectively, the researcher developed a structured questionnaire with specific questions which the participants responded to.

The interview schedule on the other hand comprised both structured and semi-structured questions. This implies that in addition questions whose sequence are determined in advance, there were questions that evolved as the interview proceeded in order to enrich the quality of the information collected.

3.6.2 Pilot Testing of Research Instruments

One week prior to the actual, full-scale data collection field activity, pilot test was conducted to evaluate the feasibility, suitability and adequacy of the data collection instruments with an aim of improving the instruments appropriately and amending potential flaws in their research design and approach. For practical reasons, the pilot study was carried out in Kongowea Ward in Nyali Constitutency, Mombasa County. The pilot test was conducted in a laboratory context with 50 test participants whose profiles suitably matched those of the targeted participants being invited. The researcher began by explaining the rationale and the objectives of the study to the test participants. After the briefing session, questionnaires were handed to 40 participants to complete. They were left alone to complete the instruments without any assistance and interruption from the researcher and the research assistants. The remaining 10 test

participants were taken through and interview session in order to assess instrument.

Immediately after the test, the researcher and the assistants evaluated the pilot process and activities. To gain a deeper understanding of the feasibility aspects of the questionnaire and interview schedule, times taken to complete the instruments and respond fully to the questions were analyzed. All participants found the length of the questionnaire and interview schedule convenient. As such, they were all able to complete the questionnaires within the time provided. The interview sessions were also completed within reasonable time.

In relation to the easy of understanding the questions and the terms used in the research instruments, the researcher noted test participants' impressions and concerns with the phrasing of the questions in both research instruments and comments, focusing especially on the terminologies used. The participants found that some of the terms used, such as bycatch, were not easily understandable to a layman. Additionally, the some questions were not very clear thus uneasy to interpret and understand. All in all, participants emphasized the need to make the questionnaire more user friendly to participants. The researcher therefore considered revising the wording of the questions. The recommended adjustments were taken into consideration and appropriate changes integrated into the research instruments making them more user-friendly. This activity was essential in improving the quality of data collection instruments and improve the research experience.

3.6.3 Instrument Reliability

Mohajan (2017) explains instrument reliability as the consistency with which the instruments a data collection instrument measures the factors that it is intended to measure. That is, the ability to yield similar or almost similar results whenever the same

test is carried out using the instrument. During pilot testing, test-retest and internal-consistency measures were used to assess the consistency of the instruments. Test-retest was used to measure the consistency from one time to the next while internal-consistency was used to measure consistency of the questions within the instrument. Reliability analysis was done using Cronbach's Alpha, which measures the internal consistency by establishing if certain items within a scale measure the same construct. The Cronbach's Alpha coefficients for all the variables was 0.79 which is greater than 0.7 and ergo, according to Ursachi, Horodnic, and Zait (2015), the alpha value 0.79 was sufficient for research instruments to be considered reliable.

3.6.4 Instrument Validity

Instrument validity according to Taherdoost (2016) refers to how well a data collection instrument measures what it is intended to measure thus the accuracy of the survey questionnaire. Construct, content and criterion validity was used to measure the validity of the data collection instruments. Construct validity was used to assess the whether the instruments measure the concepts they are intended to measure. To ensure construct validity, the indicators and measurements of maritime security and the three independent variables were carefully developed based on the constructs of maritime defence, maritime safety and maritime governance and tested during the pilot study. The interview schedule and the questionnaire therefore included only relevant questions that measured the indicators of maritime security and the indicators of the respective independent variables. The outcomes of the pilot study established that the constructs of the instruments were valid.

Content validity focused on assessing the representativeness of the instrument in measuring the research objectives. To produce valid results through content validity,

the data collection instruments were designed in such a way that the instruments covered all relevant parts of the survey's subject. From the pilot study, questions that were deemed irrelevant to the subject were expunged from the instruments and the further relevant questions added. Finally, criterion validity tested the correspondence of different tests of the instruments during the pilot testing phase. The degree of correlation between the outcomes of the different instruments administered to the 50 test participants was high hence upholding the validity of the instrument. Additionally, the instrument was submitted to the supervisor for further scrutiny to identify any possible gaps. Ambiguities and difficulties pointed out by the supervisor in the construction were addressed accordingly.

3.6.5 Data Collection Procedure

After successfully testing the instruments and adjusting them appropriately, the researcher embarked on full-scale data collection. Questionnaires were administered in-person. With the help of research assistants, questionnaires were issued to members of the public. To ensure that the respondents from the country were represented in the study, all the smallest administrative units, the 30 wards were visited, with the exception of Kongowea ward where the pilot study was conducted. From each of the remaining 29 wards, approximately 13 individuals from the general public were approached and requested to take part in the survey (to achieve the figure of 374 the researcher engaged 12 people in some wards). Individuals who agree to participate in the survey were brought together in a common meeting place and after which they were briefed about the study and the objectives of the study explained to them. They those who consented to take part in the study were issued with questionnaires and given

ample time to complete them. There researcher and the assistant readily assisted participants who had challenges understanding some questions to ensure that questionnaires were completely filled in. All the questionnaires were then collected back and checked for completeness. On average, two wards were covered each day for a period of 15 days including the weekends.

After the questionnaire administration exercise, the researcher embarked on interview sessions. The key informant interviews were exclusively conducted by the researcher. This involved booking appointments with the respective officers of KMA, the Kenya Coast Guard Service, the Kenya Navy and the Mombasa County CEC members in charge of trade and tourism. It took ten days to meet the interviewees and conduct interviews since only one interviewee was engaged in a day. For each interview session, the researcher brought a long an audio recording device and sought the consent of the interviewees to allow for recoding of the interviews. The interviews were conducted successfully with very minimal challenges. At the end of each day, the audio data from the interviews was indexed and transcribed to ready the device for the next interview exercise.

The entire data collection process was conducted in a systematic manner to enhance the quality of response obtained from the survey participants and also to ensure that all the data collection instruments were fully answered and received back from the survey participants.

3.7 Data Analysis

The process of data analysis began with inspecting and cleansing the data. This was followed by coding of the questions and keying them into the Statistical Package for Social Sciences (SPSS) software (version 20) for analysis purposes. Frequency

distribution and percentages were used to transform the quantitative data into useful information. Narrative analysis was used to analyze the qualitative data and this involved reformulation of accounts presented by the interviewees taking into perspective the context, position and experiences of each respondent. The outcomes of the analysis was presented in tables and charts for interpretation through analytical and logical reasoning to determine relationships between the different variable of this study.

3.8 Legal and Ethical Considerations

Yip, Han and Sng (2016) emphasize the significance of legal and ethical issues as components of modern research related to the research subject and the researcher. At all times, the researcher ensured that honesty is observed even by the research assistants while dealing with different individuals and institutions. This meant exhibiting high levels of professional competence. Academic integrity was also observed by acknowledging all sources of borrowed information by way of appropriate and adequate citation and referencing. The researcher also took full responsibility, where reasonable, of all the outcomes of their activities during the research process. Further, the researcher and assistants showed respect for people's rights, dignity, and diversity while carrying out the study. Permission was sought from relevant authorities and institutions namely the National Commission for Science, Technology and Innovation, County Directors of Education and Africa Nazarene University and the respective government agencies.

CHAPTER FOUR
DATA ANALYSIS AND FINDINGS

4.1 Introduction

The study aimed at assessing the influence of Kenya's maritime security on exploitation of the country's marine resources for the economic benefit of people living in the concerned areas as well as the economy of Kenya as a whole. This chapter presents the analysis of the qualitative and quantitative data based on the questionnaires completed by the general public and the interviews conducted. A total of 384 questionnaires were administered to the members of the public who were potential participants in the study and all responded. Analyses was done using SPSS version 20. The analysis relates to the research objectives that guided the study. Data were analyzed to identify, describe and explore the relationship between maritime security and exploitation of Kenya's blue economy resources. The findings are presented in tables and figures and discussed. The implications of the findings are interpreted and discussed including other important details such as response rate and the various

characteristics of the participants.

4.2 Response Rate and Respondents' Demographic Profile

Important personal information of respondents was necessary to understand the kind of respondents from which primary data was collected and the basis under which the interpretations are made. The background information is important to the study because it helps the researcher to understand some issues that are important in the analysis. Among the demographic characteristics regarding the respondents include gender, age category, duration lived in Mombasa County, employment status and sector of employment.

4.2.1 Response Rate

The researcher distributed various research instruments to diverse study participants. They comprised of questionnaire to 384 participants. Face to face interviews were conducted with the Director General of Kenya Coast Guard Service, the Commander of Kenya Navy, PS of State Department for Fisheries, Aquaculture and the Blue Economy, PS of State Department for Maritime and Shipping Affairs, PS of State Department for Tourism, and PS of State Department for Environment and Forestry. The top leadership of the KMA, The CEC members in charge of trade in Mombasa County. Researcher distributed the questionnaires to participants to determine the influence of maritime security on exploitation of Kenya's blue economy resources along its coastal region. The inclusion of participants from all areas in the coastal region ensured that the information obtained reflect the views of all stakeholders in the coastal region, thus minimizing biasness.

After executing the survey, it was highly essential to review the answers of the

respondents provided in the questionnaire from the angle of legibility, completeness, consistency and homogeneity. The return rate was very high (100%) because the researcher ensured the respondents were sensitized prior to the administration of the questionnaire and collected on the spot due to the busy schedule of the respondents. The instruments return rate presented in Table 4.1, shows a response rate of 95% which is statistically significant for analysis. As depicted in Table 4.1, the response rate for this study was adequately high, thus indicating low non-response bias. Further, the sample of the respondents involved in the study were highly representative of the target population.

According to Lavrakas (2008), a response rate of at least 60% is adequate and an indicator of success in data collection. Besides response rate, low non-response bias as well high representativeness of the survey respondents reflecting elements of the population with breadth and depth are very essential in yielding statistically relevant research outcomes (Harrison, Henderson, Alderdice & Quigley, 2019; Fincham, 2008). This response rate was acceptable for analysis since, the whole point of conducting a survey is to obtain useful, reliable, and valid data in a format that makes it possible to analyze and draw significant conclusions about the target population.

Table 4.1 Response Rate

Responses	**Frequency**	**Percentage**
Valid responses	365	95%
Invalid responses	19	5
Total	**384**	**100**

Source: Field Data (2020)

4.2.2 Gender of Respondents

The respondents were asked to indicate their gender. Since gender is an important indicator in the blue economy resource utilization the views of both the males and females are significant to the study and the findings presented in Table 4.2 indicate that 72% of the respondents are male while 28% are of the female. The findings imply majority of the respondent adult population in the coast region are males and are actively involved in the blue economy activities.

4.2.3 Age Category

The study sought to assess the age category of respondents because age is a determinant factor in the involvement of livelihood blue economy activities and the study findings presented in Table 4.2 shows that 27% of the respondents are aged between 28 years and 32 years, 19% are aged between 33 years and 37 years, 13% are aged between 43 years and 47 years, 12% are aged between 18 years and 22 years, 12% are aged between 23 years and 27 years, 10% are aged between 38 years and 42 years and 7% are aged 48 years and above. The study findings imply majority (80%) of the respondents are below 42 years of age, and are economically and physically active in the blue economy livelihood.

4.2.4 Duration Lived in Coast Region

The respondents were further asked to indicate how long they have lived in the coast region and the study findings presented in Table 4.2, shows that 33% have lived in the coast region for between 16 years and 20 years, 20% have lived for between 21 years and 25 years, 20% have lived for between 11 years and 15 years, 11% have lived for between 5 years and 10 years, 6% have lived for 31 years and above and 5% have lived for between 26 years and 30 years. The study findings imply majority (100%) of

the respondents have lived for more than 5 years in the region and are established in terms of the blue economy activities.

4.2.5 Employment Status

The study further sought to determine the employment status of the respondents to ascertain whether they are involved in the exploitation of the blue economy and the findings presented in Table 4.2, shows that 56% are employed for wages, 27% are self-employed, 13% are not employed and 4% are retired from active employment. The findings imply majority (83%) of the respondents are either employed for wages or are self-employed.

Table 4.2 Demographic Characteristics (*n=365*)

Demographic Factor		**Frequency**	**Percentage**
Gender	Male	263	72%
	Female	102	28%
Age bracket	18 – 22	44	12%
	23 – 27	44	12%
	28 – 32	99	27%
	33 – 37	69	19%
	38 – 42	37	10%
	43 – 47	47	13%
	48 and above	25	7%
Duration lived in	Less than 5 years	18	5%
Mombasa County	5 – 10 years	40	11%
	11 – 15 years	73	20%

	16 – 20 years	121	33%
	21 – 25 years	73	20%
	26 – 30 years	18	5%
	31 years and above	22	6%
Current Employment	Not employed	47	13%
Status	Self-employed	99	27%
	Employed for wages	204	56%
	Retired	15	4%

Source: Field Data (2020)

4.2.6 Occupation Sector

The respondents who indicated they are employed are further asked to indicate their sector of employment and as indicated in Figure 4.1, 32% of the respondents are employed in the tourism sector, 27% are employment in the transport sector, 22 % are employed in the fishing sector, 9% are employed in the agriculture sector, 7% are employed in the environmental care sector and 3% indicated other. The study findings imply majority (81%) of the respondents are employed in the tourism, transport and fishing sectors, which are the backbone of the blue economy.

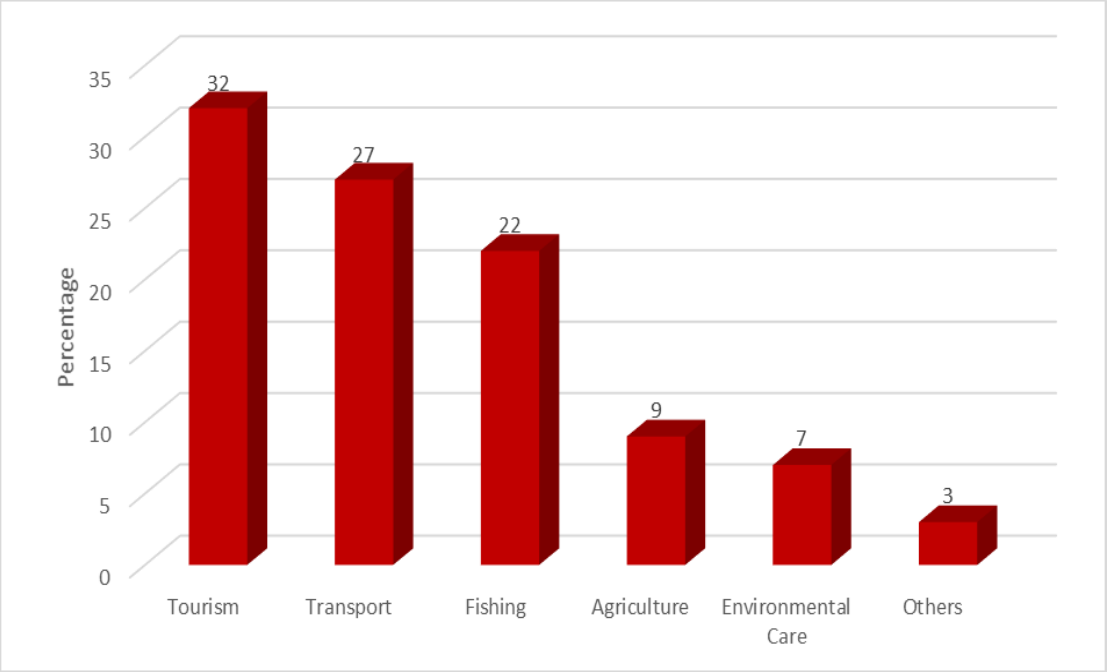


Figure 4.1: Occupation Sector, *n = 303*
Source: Field Data (2020)

4.3 Presentation of Research Analysis and Findings

4.3.1 Maritime Defence and Exploitation of Blue Economy Resources

Respondents were asked if, in their view, the current anti-maritime terrorism measures that have been put in place was adequate in promoting coastal tourism in this county. The research findings indicate that 22% of the survey participants are positive that the current anti-maritime terrorism measures that the government of Kenya has put in place are adequate in promoting coastal tourism in Mombasa while the rest (78%) respondents are of a contrary view, as depicted in Figure 4.2. This probably implies that as in as much as the government has made some effort, the measures put in place do not meet the expectations of majority of the residents in promoting tourism in the county hence the popular view.

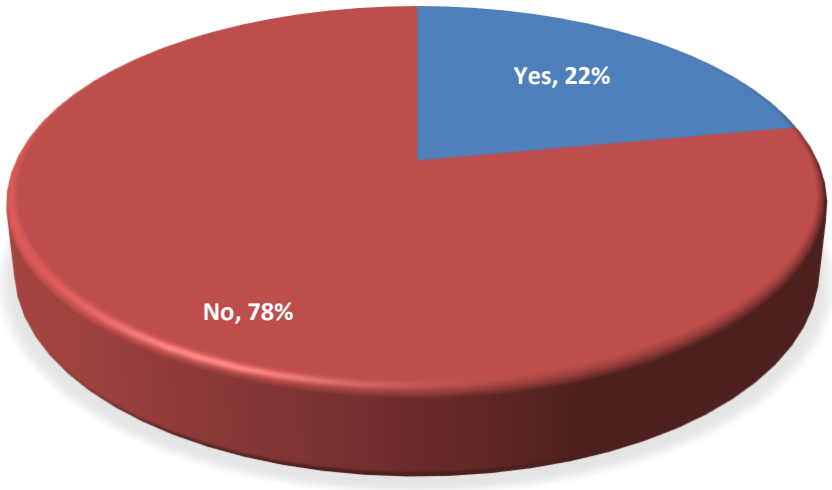


Figure 4.2 Adequacy of Anti-maritime Terrorism Measures in Promoting Coastal Tourism
Source: Field Data (2020)

From the study findings presented in Figure 4.3, more than one half of the respondents responded negatively to the question on adequacy of antipiracy measures that have so far been instituted to enhance marine transportation in Mombasa County. The results show that 56% of the respondents found the measures that are so far in place inadequate in promoting safe marine transportation in the county, while 9% found the measures to be very inadequate. Out of those who responded positively to the question, 13% found the antipiracy measures to be adequate in ensuring safe transportation in the country's territorial waters while 7% are of the view that the measures are very adequate. The remaining 15% of the survey participants felt that the adequacy of the measures are moderately adequate. The implication here is that the residents of the county felt unsafe from piracy activities while travelling from one point to another despite the presence of various measures. Probably there were traces of piracy activities that went unreported.

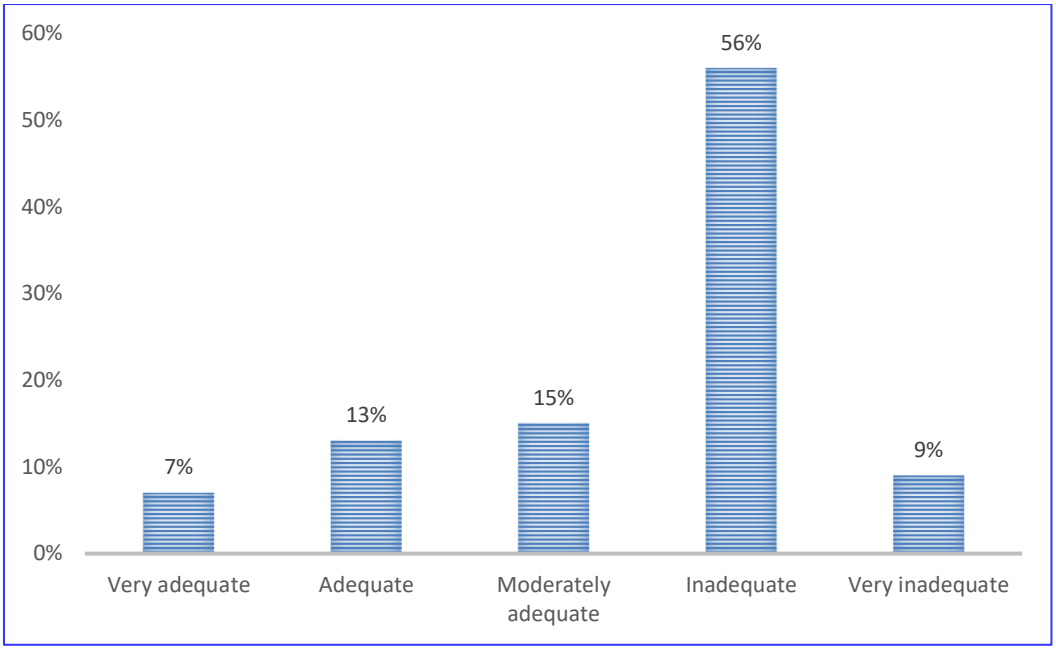


Figure 4.3 Adequacy of Antipiracy Measures in Enhancing Marine Transportation
Source: Field Data (2020)

Table 4.3 present outcomes of various questions on maritime defence in relation to the measures of performance of the county's blue economy. From the study findings, 8% of the respondents strongly agree that the anti-maritime terrorism that the government has put in place to enhance maritime tourism in Mombasa County have been effective. About 22% of the respondents agree that these measures have been in effective while 17% of the respondents are not sure whether these measures have been effective or not. Cumulatively, majority of the respondents are not convinced that these measures have been effective with 43% of the negative responders disagree that the anti-maritime terrorism measures that have been put in place have been effective in enhancing maritime tourism in this county while the rest 10% strongly disagree on the effectiveness of these measures in enhancing maritime tourism.

Table 4.3 Elements of Maritime Defence on Exploitation of Blue Economy Resources

	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree
The anti-maritime terrorism measures that have been put in place have been effective in enhancing maritime tourism in this county.	8%	22%	17%	43%	10%
Commercial fishing in this county has experienced positive growth because of good antipiracy measures that the government and its stakeholders have put in place.	11%	17%	11%	45%	16%
Maritime transportation activities in Mombasa County have been made easy due to enhanced maritime security by the different security agencies in this area.	13%	20%	7%	39%	21%

Source: Field Data (2020)

With regard to the question on performance of commercial fishing, the outcomes were almost similar as presented in Table 4.3. Approximately 11% of the respondents strongly agree that the antipiracy measures put in place are good thus enhancing commercial fishing in the county. Those who simply agree that commercial fishing in this county has experienced positive growth because of good antipiracy measures were 17% of the survey participants. Another 11% of the respondents expressed indifference. Those who disagree that the measures were good thus resulting in positive growth of the fishing industry were 45% of the respondents and the rest 16% of the survey participants strongly disagree that commercial fishing in this county has experienced positive growth because of good antipiracy measures that the government.

With regard to ease of transportation within Kenya's territorial waters in Mombasa County, Table 4.3 shows that 13% of the respondents strongly agree that

maritime transportation activities in the county have been made easy due to enhanced maritime security by the different security agencies in this area, 20% agree with the question statement and 7% of the respondents were indifferent. On the other hand, 39% of the respondents disagree that transportation activities within Kenya's territory of the Indian Ocean in Mombasa County have been made easy due to enhanced maritime security while the 21% of the respondents strongly disagree with the questions statement.

A few suggestions were made by the questionnaire respondents with regard to maritime defence to enhance the performance of the blue economy in Mombasa County. One of these suggestions was installation of radar systems at that coast, similar to those used in airports, to help in identifying water vessels from a far in order to identify unfriendly vessels and tackle in a timely manner. Respondents also suggested development and installation of regular day and night aerial survey of the Kenyan territorial waters using drones. Strong partnership with neighbouring countries in identifying and neutralizing local criminal elements that engage in piracy and terrorism agents was also a popular suggestion among the respondents.

The interview sessions yielded outcomes that were in most instances largely similar to the views expressed in the questionnaires. It came out from the interviews that largely, the existing current anti-maritime terrorism are not adequate to guarantee safety of the seafarers and traders in the coastal region of Mombasa County of their safety in such a way that they are able to go about with their activities without much worry. Some of the interviewees offered that from time to time, the fishermen have expressed concerns and fear about their security while they are out in the sea. They felt that while they were working hard to ensure that the much needed food was available to support the tourism industry at the coast and by further providing sea food to the

coastal region and the country at large, the government was doing less to ensure that they were safe. On aggregate, such inadequacies and inefficiencies significantly affect the ability of the traders at the coast to perform optimally thereby negative affecting the full potential of the region's blue economy. One of the interviewees commented as follows:

> What I can say is that the government is trying so hard to ensure that our territory of the Indian Ocean is well guarded and defended. But I must be honest with you that these measures have, in the bigger picture, been inadequate. We have challenges of inadequate equipment necessary to provide effective defence. Without the assistance we have been getting from the international actors, probably we would have been overrun by terrorists and pirates in the high seas. [Interviewee 6]

The sentiments were upheld by another interviewee who remarked that:

> As a country we are doing well in tackling terrorism on dry land. However, Kenya's competency in tackling seaborne terrorism and piracy is not satisfactory. This is because majority of the personnel are not adequately trained for marine counterterrorism. Similarly, the equipment we have are not adequate. As a long-time resident of the coast who has served in the national security for a considerably long time, I can tell you that investor confidence is not so high because some of them fear losing their investment to the intermittent attacks the country experiences from time to time. [Interviewee 1]

Interviewees' comments on the country's antipiracy measures also revealed that as compared to maritime terrorism, the country has done relatively well in addressing piracy issues. Caution was nonetheless expressed that more still need to be done because of the country attempts to let its guard down, the pirates, who in most instances work hand-in-hand with the terrorists, are likely to resurface and this will have further negative effects on the coastal regions' blue economy activities.

4.3.2 Maritime Safety and Exploitation of Blue Economy Resources

Numerous causes of marine pollution in the Mombasa County were identified

by the respondents. Disposal of plastic wastes was found to be the most mentioned cause of pollution. Discharge of effluents by local industries into the ocean was identified as another major cause of pollution that significantly affected the viability of the coastal region's blue economy. Other causes of marine pollution that came up during the study included oil spillage from water vessels, agricultural effluents from nearby and far away farms, and abandoned fishing gear.

The identified causes of marine pollutions were found to increase the chances of disease and negatively affect reproduction and productivity. The findings show that oil spillage from the marine vessels could get on to the gills and feathers of marine animals thus making it difficult for them to move properly or feed their children thereby affecting their reproduction and in extreme cases resulting into deaths, sometimes in large scale, of the affected animals. Oil spills were also found to cycle of coral reefs thus affecting both marine life and tourism. The health of both human and the ocean animals were also found to be affected by pollution of the water body. For instance, it was established that when some of the animals ingest the chemicals disposed in the ocean, it causes diseases to them, these animals are then eaten by human and the toxins from these contaminated animals get deposited in the tissues of human and lead to ailments such as cancer, birth defects and other health problems. Cumulatively, the blue economy is gradually but steadily gets adversely affected by pollution.

Research results presented in Table 4.4 touch on views on maritime safety and exploitation of blue economy resources. The question on creation of environment for tourism to thrive through good pollution-free marine environment show that majority of the respondents replied positively to this question with 24% strongly agree that such as environment was critical for tourism to thrive in Mombasa County while 64% strongly agree with the question statement. About 5% of the respondents are indifferent

while and equal proportion disagree that pollution-free marine environment creates a good environment for tourism to thrive. The rest (2%) strongly disagree with the question statement.

Table 4.4 Elements of Maritime Safety on Exploitation of Blue Economy Resources

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
Pollution-free marine environment creates a good environment for tourism to thrive.	24%	64%	5%	5%	2%
Anti-marine pollution measures have put in place to ensure that the ocean is attractive to tourists.	14%	31%	6%	41%	8%
To enhance the quality and quantity of marine food fished in the ocean the government needs to ensure that pollution of the ocean is very minimal.	47%	27%	3%	12%	11%
In my view the government of Kenya has put in place good emergency response administration facilities and personnel to secure the marine environment at the coast.	4%	16%	21%	40%	19%
Government response have been effective in addressing accidents and disasters that have in the past occurred in the country's territory of the Indian Ocean.	4%	10%	12%	61%	13%
Effective emergency response administration services by the government have been very important in promoting transportation services in and along the ocean.	7%	13%	19%	49%	12%
If the emergency response administration services are good, more people will be encouraged to engage in fishing	23%	66%	3%	4%	4%

activities since they will be assured should they face any challenges in the ocean.

Source: Field Data (2020)

The results in Table 4.4 also show that almost one third of the respondents, (31%), agree that anti-marine pollution measures have put in place to ensure that the ocean is attractive to tourists, 10% of the study participants strongly agree with the question statement while 6% of them are not sure whether or not such pollution measures have put in place to ensure that the ocean is attractive to tourists. On the contrary, 41% of the study participants disagree that the government has put in place measures to ensure that the marine environment is not being polluted so as to enhance tourism in the county while the rest 8% strongly disagree that such as measures have been put in place.

Concerning mitigation of marine pollution to improve quality and quality of marine food fished, Table 4.4 shows that majority of the respondents replied positively to this question with 47% of the respondents strongly agree that the government of Kenya needs to that pollution is kept to a bare minimum and 27% agree with the question statement. Approximately 12% of the respondents disagree that enhancing the quality and quantity of marine food fished in the ocean required the government to ensure that pollution of the ocean is very minimal and 11% strongly disagree that to enhance the quality and quantity of marine food fished in the ocean the government needed to ensure that pollution of the ocean is very minimal. The rest 3% of the respondents were indifferent in their views.

The results in Table 4.4 also show that 4% of the study participants strongly agree that good emergency response administration has been put in place by the

government to secure the marine environment at the coast, 16% of the respondents agree with this question statement while 21% are indifferent. More than one half of the respondents were of contrary views with 40% disagree that the government of Kenya has put in place good emergency response administration facilities and personnel to secure the marine environment at the coast and the rest 19% strongly disagree at the question statement.

As presented in Table 4.4, only 4% of the survey respondents strongly agree that the government's response have been effective in addressing accidents and disasters that have in the country's territory of the Indian Ocean, 10% of the respondents agree with the question statement while 12% expressed indifference. About 62% of the respondents disagree on the effectiveness of the government in addressing past accidents and disasters that have occurred in Kenya's territorial waters of the Indian Ocean while 13% strongly disagree with the question statement.

Survey participants were also asked the effectiveness of the emergency response administration services by the government and its significance in promoting transportation services in and along the ocean. In relation to this question, the findings presented in Table 4.4 show that 7% of the respondents strongly agree with the question statement, 13% of them simply agree while 19% were not certain whether effective emergency response administration services by the government have been very important in promoting transportation services in and along the ocean. On the other end, 49% of the respondents disagree with this question statement while the rest 12% strongly disagree that past government responses have been effective in addressing accidents and disasters that have occurred in the country's territory of the Indian Ocean.

According the results in Table 4.4, almost two thirds of the respondents, 66%, agree that good emergency response administration would encourage more people to

engage in fishing in Kenya's Indian Ocean thereby enhancing he performance of the region's blue economy. About 23% of the respondents strongly agree with the question statement while only 3% were not sure whether good emergency response administration services would motivate more people will be encouraged to engage in fishing activities since they will be assured should they face any challenges in Kenya's territory of the ocean. On the contrary, 4% of the respondents disagree with the question statement while an equal proportion strongly disagree that more people would be encouraged to engage in fishing activities at the coast if good emergency response administration services are put in place by the government.

The overarching suggestion by respondents was free trainings on swimming and other survival skills in the ocean to be offered by the government of Kenya to fishermen. Further, to enhance fishing activities and to ensure good fishing practices, respondents urged the government not only develop but also ensure effective implementation of policies touching on marine anti-pollution. This way, the respondents felt, the marine environment would be kept healthy and the blue economy would boom. Further, formation of strong functional partnership between the two tiers of governments – national and county- and the fishermen, it was suggested, would be very essential in working together to promote better and timely emergency response administration. To this end, the respondents suggested that the government should provide them with some of the relevant equipment required by first responders such as life jackets and rubber dinghies to be in their possession.

Reasonably so, interviewees from the State Department for Fisheries, Aquaculture and the Blue Economy State Department for Tourism and the State Department for Environment and Forestry were the most vocal and most passionate about pollution related matters. Nonetheless, similar sentiments were shared by interviewees

from the other government agencies. With regard to maritime safety, pollution came out as a major concern that significantly impacted negatively the regions blue economy. Despite measures being put in place, the respondents expressed concern that adherence and compliance to these measures by the general public remained a big challenge. This subsequently affected the productivity of the blue economy resources that were continuously getting chocked by the pollutants. The following information regarding pollution in the Kenya's Indian Ocean was offered by an interviewee:

> For the blue economy in this region to thrive, both the government and the general public must play their roles in ensuring that the policies and measures put in place are successful. So far this has not been successful. The government has tried to formulate some measures but the implementation has not yielded the expected results. Pollution of the ocean still remains rife. The impact of this has been decline in the number of sea catch. The plastics are also an eye sore thus directly affecting tourism and the as well. [Interviewee 3]

Besides affecting the marine life, pollution was also found to negatively affect tourism activities at the Kenyan coast. As a result of dying marine animal and plants, the attractiveness of the attractiveness of the coastal scenery diminishes. Tourists are thus compelled to go to national parks. This leaves the costal tourism with little basis on which tourists are attracted. The net effect is that the income of the coastal economy generated directly from tourism activities significantly reduces.

As experienced during the recent accident that accord at the Likoni ferry when a woman and her daughter lost their lives, the inability of the government to carry out the rescue operation and the inability of the of KMA and the relevant security agencies to retrieve the sunken vehicle and the victims of the accidents laid bare the government's poor emergency response administration. Additionally, the fact that assistance from outside to retrieve the vehicle and the accident victims showed brought to fore the inadequacies of the government with regard maritime safety. These failures and inadequacies have the potential to negatively affect the region's blue economy beyond what is being currently experienced.

The following is an observation by one of the interviewees:

> The effects might not be pronounced and very obvious for everyone to see, but from where I sit and from the effects of poor emergency response based on passed accidents and emergencies, most of which are never covered in mainstream have been immense. [Interviewee 8]

Respondents from the interviewees indicated that marine safety significantly affected the blue economy in the coastal region of the country.

4.3.3 Maritime Governance and Exploitation of Blue Economy Resources

Asked how they would rate government's performance regarding maritime governance, the findings presented in Figure 4.4, shows that 5% of the respondents rated it as very good and 15% found the performance to be good. Majority of the respondents, 33%, rated government's performance as average. On the other hand of the continuum, 32% were of the view that the government's performance was poor and the rest 15% rated the government's performance with regard to maritime governance as very poor.

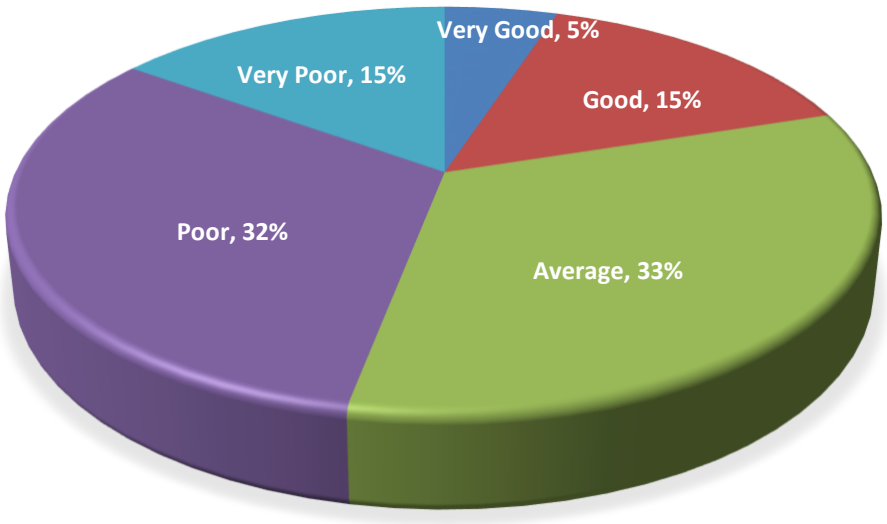


Figure 4.4 Rate Government's Performance Regarding Maritime Governance
Source: Field Data (2020)

In assessing maritime governance and its effect on blue economy respondents were asked questions touching on the indicators of maritime governance. From Table 4.5 23% of the respondents strongly agree that illegal mining activities in the ocean have for a long time gone on without proper control, almost one third of the respondents 33%, agree with the question statement while 19% were indifferent. Of the negative responders, 15% disagree that in for a long time illegal mining activities in Kenya's Indian Ocean have gone on for a long time without proper regulation and the remaining 10% strongly disagree with the question statement.

Table 4.5 Elements of Maritime Governance on Exploitation of Blue Economy Resources

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
Illegal mining activities in the ocean have for a long time gone on without proper control.	23%	33%	19%	15%	10%
Uncontrolled mining activities in the ocean negatively impacts on the sustainability of the marine resources.	25%	50%	11%	10%	4%
Steps taken so far by the government of Kenya to curtail illegal mining activities have been fruitful and this has gone a long way in enhance marine tourism in this region.	13%	17%	12%	43%	15%

Illegal mining mitigation measures put in place by the government have so far been effective in enhancing commercial fishing in this region.	19%	20%	7%	35%	21%
The incidental catches mitigation measures put in place by the government of Kenya have been effective in controlling and sustaining the fishing sector in this region.	14%	23%	8%	34%	21%
The incidental catches mitigation measures have been helpful in ensuring that the fishing sector in this region thrives.	12%	19%	7%	40%	12%

Source: Field Data (2020)

On the effect of unregulated mining activities and the resultant effects on sustainability of marine resources, 25% of the respondents strongly agree that unchecked mining activities at coastal region have negatively impacted on the sustainability of the of the marine resources. Exactly one half of the proportion of respondents, 50% agree with the question statement while 11% are indifferent. About 10% of them disagree with the question statement while the rest 4% strongly disagree that uncontrolled mining activities in the ocean negatively impacts on the sustainability of the marine resources as shown in Table 4.5.

Effectiveness of the steps taken so far by the government of Kenya to curtail illegal mining activities was also assessed. The findings in Table 4.5 indicate that 13% of the respondents strongly agree that such steps have been effective enhancing marine tourism in this region and 17% agree with the question statement. About 12% of the respondents are indifferent hence are not certain whether steps taken so far by the government of Kenya to curtail illegal mining activities have been fruitful and this has

gone a long way in enhance marine tourism in this region or not. Cumulatively, a significant majority of the respondents responded negatively to this question with 43% of the respondents disagree that maritime tourism at the coastal region has been enhance by the steps taken thus far by the government of Kenya to curtail illegal mining activities and the rest 15% strongly disagree with the question statement.

The outcomes in Table 4.5 also show that majority of the respondents responded negatively to the question on effectiveness of measures put in place by the government to mitigate illegal mining activities and enhance commercial fishing in the coastal region. Slightly more than one third of the respondents, 35% disagree that illegal mining mitigation measures put in place by the government have so far been effective in enhancing commercial fishing in the coastal region while 21% strongly disagree that such measures have been effective in enhancing commercial fishing in Kenya's territory of the Indian Ocean. Of the positive responders, 19% strongly agree that the illegal mining mitigation measures have been effective in enhancing commercial fishing in Mombasa County and 20% of the study participants agree with the question statement. The rest (7%) of the respondents were indifferent.

Regarding incidental catches mitigation measures instituted and implemented by the government of Kenya to control and sustain the fishing sector in Mombasa County, 14% of the respondents strongly agree that these measures have been effective in achieving the intended objectives, 23% agree on the effectiveness of the measures and 8% of them expressed indifference. Of the negative responders, 34% disagree that the incidental catches mitigation measures put in place by the government of Kenya have been effective in controlling and sustaining the fishing sector in this region while the rest 21% strongly disagree with the question statement as depicted in Table 4.5.

The results of the helpfulness of the incidental catches mitigation measures in

ensuring that the fishing sector in the coastal region thrives, 12% of the study participants strongly agree that measures have been helpful in ensuring bloom of the fishing sector in the region, 19% agree with the question statement while 7% are uncertain in their views in response to this question. On the other hand, 40% of the respondents disagree and the question statement while the rest 12% strongly disagree that the incidental catches mitigation measures have been helpful in ensuring that the fishing sector in this region flourishes.

Among the maritime governance was also found to significantly affect the blue economy of Kenya's coast. Similar sentiments were shared by the interviewees regarding maritime governance. Although the mining activities in Kenya's territory of the Indian Ocean is not on a huge scale, the little that go on there is being done in insensible ways that do not preserve the environment.

Highly conspicuous aspect of maritime governance was identified by the interviewees was a lot of unregulated fishing activities that were ongoing especially during the law fishing seasons. Interviewees expressed concerns that fishermen were not keen to observe the measures that the government have put in place to ensure that the fishing sustainable activities. On its parts, the government was blamed for not implementing stringent penalties to deter fishing from engaging in undesirable fishing expeditions. A combination of these factors increasingly put pressure on the fishing sector at the coast. An interviewee commented as follows:

> Very poor and unsustainable fishing activities are being carried by the fishermen in this part of the country. To meet the economic needs, the fishermen go on an overdrive and catch even young fish. [Interviewee 9]

Besides the juvenile and small fish, other sea animals caught for food were young and not fit for consumption were captured. Additionally, fish or other marine species that

caught unintentionally while catching certain target species and target sizes of fish are also not released back into the ocean. The catch of non-target juvenile fish, non-target fish and ocean wildlife, were found by the interviewees as one of the largest threats to the region's blue economy and also threats to maintaining healthy fish populations and marine ecosystems were found by the interviewees to negatively affect as a result of declining population impediment of population recovery, removal of prey and habitat damage. There are measure that have been put in place by the government as one of the interviewees noted:

> To address the problem of overfishing and incidental catches, the government of Kenya as instituted and put in place fishery observer programs overseen by the State Department for Fisheries, Aquaculture and the Blue Economy. The state department documents IUU and incidental catches (including protected species). Based on the observations made, policies and regulations are developed and implement to reduce. Although the measures are fairly good, they have not been as effective as desired in achieving the intended objectives. [Interviewee 5]

To improve its maritime governance policies and measures, respondents, both the interviewees and those who responded to the questionnaires, suggested that the government needs to invest in electronic technologies that record and transmit data, regarding fishing activities in order to implement further improve sustainable harnessing of the blue economy resources and the performance of the blue economy.

CHAPTER FIVE
DISCUSSIONS, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the discussion of the findings of the study based on the three objectives of the study are presented. The summary of findings, conclusions and recommendations are also comprise the main sections of this chapter. The chapter rounds-off with suggestions for further research areas.

5.2 Discussions

The survey participants involved in this study exhibited high levels of knowledge of the study subject. Majority were longtime residents of Mombasa County and therefore adequately and informedly commented on the significance of the blue economy to the coastal region from the point of experience. They were able to reliably comment on the efforts that the national and county governments have put in place so far and the

adequacy of these strategies. Employees of the relevant government agencies had also interacted with the blue economy activities at the coast and the factors that affected the performance of the economy in the region. Being employed either formally or informally in the coastal region's blue economy was also an essential demographic factor in giving reliable firsthand information. The respondents were therefore able to give reliable information on how the different employment industries and sectors at the coast such as tourism, fishing and agriculture were being impacted by the level of maritime security measures put in place.

5.2.1 Maritime Defence and Exploitation of Blue Economy Resources

The effects of surge in terrorism activities that Kenya has experience in the recent past have been felt in among other areas in productivity and economic growth of the country. Exposure to piracy and terrorism leads to breakdown of economic activities carried out within Kenya's territorial waters. This is in line with the outcomes of the study carried out by Bruno and Giacomo (2016) show that terrorism and piracy significantly affect the country's blue economy. At the Kenyan coast, just like in other parts of the country, piracy and terrorist attacks have led to below par performance of the blue economy compounded by reallocation of resources from growth-enhancing investment to spending designed to increase national security and increased uncertainty in the investment climate. Moreover, the surge in terrorism activities at the coast led to increase in the cost of doing business appertaining to massive investments in expensive security devices installations, metal detectors and other advanced security systems, findings consistent with those of Johnson (2014) and Sullivan (2010). Terrorism and piracy at the Kenyan coast also affected the supply chain which means that good arriving in the country got to their destination late and also at an increased cost. Terrorism and piracy also affect individual at the coast and those residing far away from

the actual place of the attacks. At the individual level, terrorism and piracy have led to disruption of household spending and livelihood. Repeated exposure to terrorist acts and allowing terrorist and pirates to flourish activates fear in residents and traders in Mombasa County thus exacerbating negative emotions and subsequently affecting economic behaviour.

The economic consequences of terrorism and piracy at the Kenyan coasts validates the need for a meticulous and effective maritime defence measures that guarantee a secure working environment for all stakeholders. Moreover, safeguarding Kenya's maritime resources is essential in ensuring that the blue economy resources are not exposed to destruction and unfair exploitation by criminal elements like terrorist and pirates. Successful exploitation of maritime resources, as shown by the findings of the study, requires well-planned and effective means of defending the territorial waters under Kenya's jurisdiction. While the findings of the study found that the measures so far put in place like institutionalization of Kenya Coast Guard Unit have largely been effective in addressing the enhancing maritime security, most of respondents more so the general public felt that more can still be done to defend the country's maritime space to enhance performance the county's blue economy as advanced by Randrianantenaina et al. (2013). For instance, weakening the local support for piracy and terrorism activities and discouraging terrorist recruits can be effective addressing the terrorism problem.

Since modern piracy has become a severe the coastal economy especially on the trade routes between the Kenyan coast and other parts of the world, effective defence which include anti-piracy and counterterrorism measures are essential in ensuring that commercial fishing and tourism activities at the coast are not threatened. Proper warning notices, defence-related training of crew members fitting marine vessels with

appropriate defence technology are significant defence steps towards enhancing maritime security. For instance, the outcomes of the study by Fu, Ng and Lau (2010) showed that defending the shipping routes against attackers reduces the vulnerability of traders and eventually the economy to piracy and terrorism.

5.2.2 Maritime Safety and Exploitation of Blue Economy Resources

The wellbeing and the performance of the blue economy of the coast and indeed the country as a whole is also dependent on the safety of the country's territorial waters, which in regard to this study is unpolluted environment as well as good administration of response in times of distress. The many factors that were identified as causes of marine pollution at the Kenyan coast which include inflow of chemicals as a result of industrial and agricultural effluents, solid waste such as plastics, man-made sedimentation, and oil spills all affect the quality of marine resources. This in effect negatively affects the blue economy in a number of ways. Accumulation of plastic waste at the shores and even on-shore renders these places unattractive for tourism activities. Additionally, such plastic wastes lead to death of sea life such as fish which traders rely on very much for these resources for livelihoods. Pollution in the water bodies also damaging food supply, a critical pillar of not just the blue economy but also human life. In summary, the key areas negatively affected by marine pollution are public health, tourism, fisheries and real estate among others. These in turn negatively affect the blue economy. These findings are in line with that of Wenhai et al. (2019) who determined that marine pollution, when not controlled, have the potential of bringing the blue economy to its knees. Raubenheimer and McIlgorm, (2018) and Cole et al. (2011) in their different studies also established that pollution of the marine ecosystem diminishes the sustainability of the blue economy. That majority of the respondents in this study were of the opinion that enough efforts and resources have

not been dedicated by the government and other stakeholders in addressing pollution implies that if the situation continues getting worse, the entire blue economy could be brought down and this is highly likely to have immense negative impact on the country's economy as a whole.

The preparedness of the KMA in addressing emergency issues that might occur in the country's territorial waters was also put to question as the majority of the respondents, going by recent event s and even events in the distant past were of the view that the government through KMA, is currently not in a position to effectively hand emergencies that might occur at the coast. This finding is supported by the experience of Ishak and Johari (2019) who averred that emergency response to marine disasters tend to be poor in the less developed countries, and Kenya is categorised as a less developed nations. Strengthening the engagement of the private players such as the businesses organizations and even individual traders in enhancing emergency response is a highly desirable undertaking as expressed in the findings of the study. Such engagements would be critical in developing and sharing technologies, practices and information that would enhance joint actions for prevention and recovery operations during emergencies such as marine accidents. Such efforts would go a long way in cushioning and boosting Kenya's coastal blue economy.

5.2.3 Maritime Governance and Exploitation of Blue Economy Resources

The general poor rating that KMA received from the survey participants with regard to maritime governance may not be a surprise. This is because, apart from the coastal region, other parts of the country have continues to experience unabated and runaway cases of illegal and unsustainable IUU and mining of the country's marine resources. The mitigation measures that the national and county governments have put in place have been deemed to be ineffective and in adequate in addressing the problem.

The effects of these have been poor performance of the blue economy of Kenya's coastal county of Mombasa. Continued IUU is attributable to weak fisheries laws and regulations and poor implementation of the same. Consequently, a lot goes on at the Kenyan coast with regard to fishermen fishing without the proper licenses, fishing in closed areas, fishing over a quota, and fishing of prohibited species. IUU implies that the illegal fishers avoid overhead costs which subsequently affects the revenue of the county government of Mombasa and the national government thus affecting the economy. These findings are congruent to that of Gordon, Dugan and Egerton (2006). In a separate study, Welcomme and Lymer (2012) determined that lack of effective management, and are unlikely able to deliver significant and sustained increases to the continent's blue economy, findings which are consistent with those of this study. Addressing the problem of IUU and therefore improving the country's blue economy requires strong partnerships and effective collaboration between the national and county government and other essential stakeholders, policy coordination within the national boundaries, and financial resource commitments. Further solid political will from the national and county governments and other arms of government like the legislation and the judiciary is essential in shielding the blue economy from unsustainable exploitation and enhancing its potential in augmenting the country's overall economy.

A finding akin to those of the studies carried out by Tanielu (2013), illegal mining of marine resource still remains a challenge at the Kenyan coast and this affects negatively the performance and the potential of Mombasa County's blue economy. Illegal harvesting, degradation and depletion of blue economy resources continue to derail the efforts put in place to shore up the blue economy in the country. Improved ocean governance, as expressed by the various survey participants, is quite essential in

ensuring that exploitation of the blue economy is done in a responsible and sustainable manner. Marine ecotourism, commercial fishing and marine transport rely largely on effective maritime governance at the coast thus the need for the government of Kenya and other players to ensure that the country's maritime environment is well-governed.

5.3 Summary of Main Findings

In summary, maritime defence was found to be a very essential component of maritime security at the coast. However, the general finding of the study was that maritime defence systems that the government of Kenya have so far put in place have been relatively effective in promoting sustainable harnessing of the country's blue economy resources which in the context of this study were delineated by coastal and maritime tourism, commercial fishing and maritime transportation. Nonetheless, the respondents noted with appreciation the assistance accorded to the government of Kenya by international partners in the fight against terrorism and piracy along ad off the Kenyan coast.

Maritime safety as defined by antipollution measures and emergency response administration in this study, were also largely found to have been ineffective in addressing promoting responsible exploitation of Kenya's blue economy resources. Poor and ineffective implementation of antipollution policies as well as poor emergency response systems were found leave the traders and investors in the blue economy chain unprotected from the adverse effects that arise from pollution and accidents that occur in the territorial waters. Not just are the people in the economic cycle affected by pollution and the accidents that take place from time to time in the water bodies but also consumers of the different resources such as fish that at extracted from the marine resources.

Finally, illegal mining mitigation measures as well as incidental catches mitigation measures that are so far in place were found not to be very supportive of the exploitation of blue economy resources in Mombasa County. Majority of the respondents were of the view that if the government and other players can put in more effort and dedicate more resources to ensure proper governance of the country's territorial waters, then the blue economy would perform as expected. Further, there were concerns that the judiciary was not very supportive of the efforts being put in place since most convicted criminals were slapped with very lenient fines while others did not get any punishments at all. This in turn encouraged further IUU and illegal mining activities which at the end of the day impacted negatively on the country's blue economy.

5.4 Conclusions

To conclude, each of the three aspects of maritime security covered in this study, that is, maritime governance, maritime defence and maritime safety are essential in ensuring that the country's blue economy resources are harnessed in a responsible and sustainable manner in order to achieve desirable growth and performance the blue economy. Maritime defence, in this study denoted by anti-maritime terrorism measures and antipiracy measures were found to be significant influencers of performance of tourism, commercial fishing and marine transport in Mombasa County. Equally, maritime safety, designated by antipollution measures and emergency response administration in this study, were found to fundamentally influence the exploitation of the country's blue economy resources at the coast. This implied that effective maritime security measures would likely translate to successful exploitation of the resources while poorly crafted and poorly implemented maritime safety would contribute to poor an unsustainable exploitation of the resources which would in tune affect the region's

blue economy negatively. Denoted by illegal mining mitigation measures and incidental catches mitigation measures in this study, maritime governance was also established to be an important influencer of tourism, commercial fishing and transport activities in the coastal county of Mombasa. However, in Kenya, despite efforts having been made to ensure that the country's maritime resources and environment is secure, there is still more that needs to be done to ensure that the exploitation of the blue economy is beneficial to the nation. Fundamentally, prosperity of the country's coastal and maritime tourism, commercial fishing and marine transportation and other blue economy resource rely heavily on effective maritime security.

5.5 Recommendations

Based on the study findings presented in chapter four, the discussion and conclusion made, the study makes the following recommendations. With regard to maritime defence, it is recommended here that the government of Kenya should dedicate more resources in ensuring that anti-maritime terrorism measures and antipiracy measures are effectively implemented. Further, there is need to improve the existing legislation and policies with regard to anti-maritime terrorism and antipiracy measures to ensure they are more stringent in order to deter potential crime perpetrators. The outcomes of this study also bring to fore economic costs of pollution and maritime accidents such as oil spills at the national, regional and individual level. This points to the need to for better policies to combat marine pollution. Subsequently, the government should continuously update the appropriate Acts and policies aimed at tackling marine and environmental pollution to reflect current conditions, impose stringent penalties on offenders and increase funding for research into water pollution solutions, such as bioremediation. There is also need for the government to better equip

and prepare adequately for of possible marine accidents in future. The same recommendation go for maritime governance. This include intensifying implementation of the illegal mining and incidental catches mitigation policies and adequately and properly penalizing the offenders. In addition, there is need to further enhance the 'architecture' of maritime security in the Eastern Africa region. Instead of acting alone to address the security challenges, the government of Kenya should prioritize cooperation and integration with its regional neighbours like the governments of Tanzania and Somalia to effectively fight the threats to the country's and the regions maritime security. Working together as partners, the national government in the region should strengthen coordination and regulation on a transnational scale in order to wade off the criminal activities taking place of their coats and interrupting the blue economy activities. This calls for strengthening the mechanisms and approaches of surveillance across the regions territorial waters.

5.6 Areas of Further Research

Given the geographic scope of this study which was limited to Mombasa County, other studies can be carried out to focus on other regions of the country which have the large water bodies which include the three Lake Victoria counties of Kisumu, Siaya and Homa Bay, as well as Turkana County which also has a large water body, Lake Turkana. Studies can also be carried out in other four Indian Ocean bordering counties of Kwale, Kilifi, Lamu and Tana River. Besides further studies can be carried on the other facets of maritime security namely maritime civil and criminal authority and maritime response and recovery. Finally, a similar study can be carried out on other East Africa and horn of Africa countries bordering the Indian Ocean or the Red Sea – namely Sudan, Eritrea, Djibouti, Somalia and Tanzania – and also experiencing similar

maritime insecurity challenges that Kenya faces.

REFERENCES

Abutabenjeh, S., & Jaradat, R. (2018). Clarification of Research Design, Research Methods, and Research Methodology: A Guide for Public Administration Researchers and Practitioners. *Teaching Public Administration, 36*(3), 237–258.

Adi, M. (2009). The Application of the Law of the Sea and the Convention on the Mediterranean Sea.

African Union, (2013). *The AU 2050 Africa's Integrated Maritime Strategy Making Strides on the International Stage*. Retrieved on 21st October 2019 from https://au.int/en/newsevents/20131205

Al Mamun, M. A., Raquib, M., Tania, T. C. & Rahman, S. M. K. (2014). Salt Industry of Bangladesh: A Study in the Cox's Bazar. *Banglavision 14*, pp. 7–17.

Amarh, B. A. (2019). The Challenges of the Blue Economy in Ghana and the Way Forward. *Texila International Journal of Management, 5*(1), pp. 1-8.

Amri, A. A. (2016). Maritime Security Challenges in Southeast Asia: Analysis of International and Regional Legal Frameworks. Doctor of Philosophy thesis, School of Law, University of Wollongong. Retrieved on 23rd October 2019 from https://ro.uow.edu.au/theses/4863

Andrew D. L. S., Mathew A. V., & Narnia, B. (2019). A New Narrative for the Blue Economy and Blue Carbon. *Journal of the Indian Ocean Region, 15*(2), pp.123-128.

Anyimadu, A. (2013). Maritime Security in the Gulf of Guinea: Lessons Learned from

the Indian Ocean.

Attri, V. N. (2016). An Emerging New Development Paradigm of the Blue Economy in Indian Ocean Rim Association (IORA): A Policy Framework for the Future, retrieved on 22nd October 2019 from http://www.iora.net/media/23839/the-blueeconomy-and-iora-2016.pdf

Banlaoi, R. C. (2005). Maritime Terrorism in Southeast Asia – The Abu Sayyaf Threat. Naval War College Review, 58(4; 7).

Barros, A. S. & Hespen, I. V. (2013). Maritime Security: Current Challenges. *Leuven Centre for Global Governance Policy Briefs*. Leuven, Belgium: KU Leuven - Leuven Centre for Global Governance Studies. Policy Brief No. 20 – June 2013.

Brück, T., M. Karaisl & F. Schneider (2008). A Survey of the Economics of Security. *Politikberatung Kompakt, 41*.

Brume-Eruagbere, O. C. (2017).Maritime law enforcement in Nigeria: the challenges of combatting piracy and armed robbery at sea. *World Maritime University MSc. Dissertations*. 555.

Bruno S. S. & Giacomo, M. (2016). The Pirates' Curse: Economic Impacts of the Maritime Piracy. *Studies in Conflict & Terrorism, 39*(10), pp.935-952.

Busiega, J. N. (2016). Harnessing Maritime Security and Resource Exploitation: Role of Maritime Diplomacy in Kenya. Unpublished Master's Thesis, University of Nairobi, Kenya.

Che Ishak, I. & Johari, A. (2019). The Significance of Preparedness Programme and Emergency Response Towards Oil Spill Preparedness and Response: A Case Study of Lumut, Malaysia.

Chircop, A. (2009). Issues Associated with the Implementation of Article 82 of the United Nations Convention on the Law of the Sea. ISA.

Clark, X. (2018). South America: Rising Concerns Over Maritime Security. Retrieved on 23rd October 2019 from https://www.controlrisks.com/our-thinking/insights/newsletters/maritime-newsletter-may-2018/south-america-rising-concerns-over-maritime-security

Cole, M., Lindeque, P., Halsband, C., & Galloway, T. S. (2011). Microplastics as Contaminants in the Marine Environment: A Review. *Marine Pollution Bulletin,* 62, pp. 2588–2597.

Coelho, J. P. B. (2013). African Approaches to Maritime Security: Southern Africa.

Elisha, (2019). The Nigeria Blue Economy: Prospects for Economic Growth and Challenges. *International Journal of Scientific Research in Education, December 2019, 12*(5), pp. 680-699.

Ertör, I., Hadjimichael, M. (2020). Blue Degrowth and the Politics of the Sea: Rethinking the Blue Economy. *Sustain Science, 15*, pp. 1–10.

European Commission (2019). *The EU Blue Economy Report. 2019*. Publications Office of the European Union. Luxembourg.

Feldt, L., Roell, P. and Thiele, R. D. (2013). Maritime Security – Perspectives for a Comprehensive Approach. *ISPSW Strategy Series: Focus on Defence and International Security, 222*, pp. 1 – 25.

Fincham J. E. (2008). Response Rates and Responsiveness for Surveys, Standards, and the Journal. *American journal of pharmaceutical education, 72*(2-43), pp. 1-3.

Fu, X. & Ng, A. & Lau, Y. (2010). The Impacts of Maritime Piracy on Global Economic Development: The Case of Somalia. Maritime Policy & Management. 37. 677-697. 10.1080/03088839.2010.524736.

Gordon, A., P. Dugan, and C. Egerton, 2006, Fisheries Opportunities Assessment. Africa's Freshwater Fisheries: An Assessment of Potential Investment Opportunities for USAID. Narragansett, RI: Coastal Resources Center, University of Rhode Island and Florida International University.

Greenberg, M., Chalk, P., Willis, H., Khilko, I., & Ortiz, D. (2006). Consequences of Maritime Terrorism. In *Maritime Terrorism: Risk and Liability* (pp. 29-38). Santa Monica, CA; Arlington, VA; Pittsburgh, PA: RAND Corporation. Retrieved on 18th December 2019, from www.jstor.org/stable/10.7249/mg520ctrmp.13

Hamad, H. B. (2016). Maritime Security Concerns of the East African Community (EAC). *Western Indian Ocean Journal of Marine Science, 15*(2), pp. 75-92.

Harrison, S., Henderson, J., Alderdice, F. & Quigley, M. A. (2019). Methods to Increase Response Rates to a Population-Based Maternity Survey: A Comparison of Two Pilot Studies. *BMC Medical Research Methodology 19*(65).

International Maritime Organization (2019). Overview. Retrieved on 28th October 2019 from https://business.un.org/en/entities/13

International Maritime Organization (2008). IMO Maritime Security Policy Background Paper. Sixteenth OSCE Economic and Environmental Forum - Part 1.

Islam, M. & Mostaque, L. (2019). Blue Economy and Bangladesh: Lessons and Policy Implications. 39. 135-162. *Bangladesh Institute of International and Strategic Studies Journal, 39*(2), pp. 135-162.

Islam, M. K., Rahaman, M. & Zobayer, A. (2018). Blue Economy of Bangladesh: Opportunities and Challenges for Sustainable Development. *Advances in Social Sciences Research Journal. 5*(8), pp. 168-178.

Johnson, L. M. (2014). The Consequences of Somali Piracy on International Trade. *Global Tides, 8*(5), pp. 1-16.

Kenya Maritime Authority, (2006). Legal Framework. Retrieved on 18th December 2019, from https://kma.go.ke/index.php/about-us/legal-framework

Klinger, D., Eikeset, B., Davíðsdóttir, A., Winter, M., and Watson, J. (2018). The Mechanics of Blue Growth: Management of Oceanic Natural Resource Use with Multiple, Interacting Sectors. *Marine Policy*, *87*, pp.356–362.

Krejcie, R. V., & Morgan, D. W., (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement.*

Lavrakas, P. J. (2008). *Encyclopaedia of survey research methods* (Vols. 1-0). Thousand Oaks, CA: Sage Publications.

Lin, K. & Gertner, A. V. (2015). Maritime Security in the Asia-Pacific: China and the Emerging Order in the East and South China Seas.

Liss, C. (2013). New Actors and the State: Addressing Maritime Security Threats in Southeast Asia. *Contemporary Southeast Asia, 35*(2), pp. 141-162.

Long'iro, M. J. & Maluki, P. (2017). Maritime Security in East Africa: The Role of International and Regional Instruments. Unpublished Master's Thesis, University of Nairobi, Kenya.

Mohajan, H. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. *Munich Personal RePEc Archive*, 83458

Morrissey, K. (2017). It's not just a Blue Economy moment…. *Dialogues in Human Geography*, *7*(1), 42–44.

Mucugia, M. W. (2019). Impact of Pollution Control on Blue Economy. Retrieved April 2, 2020 from https://www.kenyaengineer.co.ke/impact-of-pollution-control-on-blue-economy/

Muigua, K. (2018). Harnessing the Blue Economy: Challenges and Opportunities for Kenya.

Mwakio, P. & Kabubu, J. (2014). Kenya Losing Billions to Illegal Fishing By Foreign Vessels. Retrieved on 18th December 2019, from https://wwf.panda.org/?214630/Kenya-losing-billions-

National Crime Research Centre (2017). Emerging Crimes: The Case of Kidnappings in Kenya.

Odada, E. O. (2010). Integration of Coastal and Marine Areas into Sustainable Development Strategies: A Case Study of Africa. *Journal of Oceanography and Marine Science, 1*(3), pp. 40-52.

Ogula, P. A. (2005). *Research Methods.* Nairobi: CUEA Publications.

Omondi, J. C. (2017). Improving Maritime Surviving Maritime Surveillance In K. Eillance In Kenya's Remote Coastal Emote Coastal Islands: Application of Renewable Energy Solutions. World Maritime University Dissertations. 569.

Ramirez-Llodra, E., Tyler, P. A., Baker, M. C., Bergstad, O. A., Clark, M. R., Escobar, E., et al. (2011). Man and the Last Great Wilderness: Human Impact on the Deep Sea.

Raubenheimer, K., and McIlgorm, A. (2018). Can the Basel and Stockholm Conventions Provide a Global Framework to Reduce the Impact of Marine Plastic Litter? *Marine Policy*, 96, pp.285–290.

Retter, L., Frinking, E. J., Hoorens, S., Lynch, A., Nederveen, F. & Phillips, D. W. (2020). Relationships Between the Economy and National Security: Analysis and Considerations for Economic Security Policy in the Netherlands.

Roberts, J. (2015). The Blue Economy: From Concept to Reality in the Caribbean Region. Discussion paper for the Caribbean Regional Dialogue with the G20 Development Working Group.

Rocco, T. S. & Plakhotnik, M. S. (2009). Literature Reviews, Conceptual Frameworks, and Theoretical Frameworks: Terms, Functions, and Distinctions. *Human Resource Development Review. 8*(1), pp. 120-130.

Randrianantenaina, J. E., Fanning, L., Williamson, H. G. & Bailet, F. (2013). Maritime Piracy and Armed Robbery Against Ships: Exploring the Legal and the Operational Solutions. The Case of Madagascar.

Rustomjee, C (2016), 'Developing the Blue Economy in Caribbean and Other Small States', CIGI Policy Brief No. 75, Centre for International Governance Innovation, Ontario.

Schmied, J., Borch, O. J., Kheiri Pileh Roud, E., Berg, T. E., Fjørtoft, K. E., Selvik, Ø. & Parsons, J. R. (2017). Maritime Operations and Emergency Preparedness in the Arctic-Competence Standards for Search and Rescue Operations Contingencies in Polar Waters. In K. Latola & H. Savela (Eds.), The Interconnected Arctic – UArctic Congress 2016, pp. 245-255.

Sergi, B. S. & Morabito, G. (2016). The Pirates' Curse: Economic Impacts of the Maritime Piracy, Studies in Conflict & Terrorism, 39:10, 935-952.

Simon, M. K. & Goes, J. (2013). *Dissertation and Scholarly Research: Recipes for Success.* Seattle, WA: Dissertation Success LLC.

Singh, A. S. & Masuku, M. (2014). Sampling Techniques & Determination of Sample Size in Applied Statistics Research: An Overview. International Journal of

Economics, Commerce and Management, 2(11), pp. 1-22.

Siringi, E. M, Ikutwa C, & Chepkemboi, O. (2019). Targeting Youth Empowerment and Education Modelling to Strengthen and Harness Blue Economy Potentials in Kenya. *Journal of Marine Science: Research and Development, 9* (1), pp. 1-6.

Smed, U. T. & Wivel, A. (2017) Vulnerability Without Capabilities? Small State Strategy and the International Counter-Piracy Agenda. *European Security*, *26*(1), pp. 79-98.

Smed, U. T. (2016). Maritime Security and Development in Africa: Three narratives for a strategy for Denmark.

Steven, A. D. L., Vanderklift, M. A. & Bohler-Muller, N. (2019). A New Narrative for the Blue Economy and Blue Carbon. *Journal of the Indian Ocean Region, 15*(2), pp. 123-128.

Stritzel, H. (2014). Securitization Theory and the Copenhagen School. In: Security in Translation. New Security Challenges Series. Palgrave Macmillan, London.

Sullivan, A. K. (2010). Piracy in the Horn of Africa and its Effects on the Global Supply Chain. *Journal of Transportation Security, 3*(4), pp. 231-243.

Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. Retrieved on 18th December 2019 https://ssrn.com/abstract=3205040

Tanielu, T. (2013). Establishment of a National Regulatory Framework for the Exploration and Exploitation of Deep Sea Minerals: A Case Study for Kiribati.

Taylor, S. F. W., Roberts, M. J., Milligan, B. & Ncwadi, R. (2019). Measurement and Implications of Marine Food Security in the Western Indian Ocean: An Impending Crisis?

Thadeus, W. J. (2013). The Effect of Somali Piracy on Kenya's Maritime Sector. Unpublished Master's Thesis, University of Nairobi, Kenya.

UN Environment (2017). Marine Litter Socio Economic Study, United Nations Environment Programme, Nairobi. Kenya.

UNDP (2018): A Vehicle to Articulate Development Issues and Foster Dialogue. United Nations, Report of the Secretary-General, Oceans and the Law of the Sea, (A/63/63, 10 March 2008).

UNDP (2018). Leveraging the Blue Economy for Inclusive and Sustainable Growth.

United Nations Economic Commission for Africa, (2018). Africa's Blue Economy: Opportunities and Challenges to Bolster Sustainable Development and

Socioeconomic Transformation.

Ursachi, G., Horodnic, I. A. & Zait, A. (2015). How Reliable are Measurement Scales? External Factors with Indirect Influence on Reliability Estimators. *Procedia Economics and Finance, 20*, pp. 679-686.

Voyer, M., Quirk, G., McIlgorm, A., and Azmi, K. (2018). Shades of Blue: What Do Competing Interpretations of the Blue Economy Mean for Oceans Governance? *Journal of Environmental Policy and Planning.* 20, pp. 595–616.

Vrey, F. (2013). Turning the Tide: Revisiting African Maritime Security. *Scientia Militaria - South African Journal of Military Studies. 41*(2), pp.1-23.

Welcomme, R. and D. Lymer, (2012), "An Audit of Inland Capture Fishery Statistics: Africa". FAO Fisheries and Aquaculture Circular 1051. Rome: FAO.

Wenhai, L., Cusack, C., Baker, M., Tao, W., Mingbao, C., Paige, K., et al. (2019). Successful Blue Economy Examples with an Emphasis on International Perspectives. *Frontiers in Marine Science*, 6(261).

Weiwei, J., Wei, A., Yupeng, Z., Zhaoyu, Q., Jianwei, L., & Shasha, S. (2015). Research on Scheduling Optimization of Marine Oil Spill Emergency Vessels. *Aquatic Procedia, 3*, 35-40.

Winder, G. M., & Le Heron, R. (2017). Assembling a Blue Economy Moment? Geographic Engagement with Globalizing Biological-Economic Relations in Multi-use Marine Environments. *Dialogues in Human Geography*, *7*(1), 3–26.

Yip, C., Han, N. R, & Sng, B. L. (2016). Legal and Ethical Issues in Research. *Indian Journal of Anaesthesia*, 60(9), pp. 684–688.

APPENDICES

Appendix I: Research Questionnaire for the General Public

Dear Respondent,

I am a candidate at Africa Nazarene University pursuing Master of Science in Governance, Peace and Security. As part of my academic programme, I am carrying out a research survey to establish the **Influence of Maritime Security on Exploitation of Kenya's Blue Economy Resources Along its Coastal Region**. You are welcome to participate in this survey by responding honestly and objectively to this questionnaire. The information collected will be treated with confidentiality and will only be used for the purpose of this research. Your contribution in facilitating the success of this study will be highly appreciated.

Thank you.

Section A: Background Data

1. Gender

   Male [ ] Female [ ]

2. Age bracket

   18 – 22 [ ] 23 – 27 [ ] 28 – 32 [ ] 33 – 37 [ ]

   38 – 42 [ ] 43 – 47 [ ] 48 and above [ ]

3. How long have you lived in this county?

   Less than 5 years [ ] 5– 10 years [ ] 11– 15 years [ ]

   16 – 20 years [ ] 21 – 25 years [ ] 26 – 30 years [ ]

   31 years and above [ ]

4. What is your current employment status?

   Not employed [ ]

   Self-employed [ ]

   Employed for wages [ ]

   Retired [ ]

5. Which of the following industries/sectors do you work in?

   Tourism [ ]

   Transport [ ]

   Fishing [ ]

   Agriculture [ ]

   Environmental care [ ]

   Other [ ] Please identify: _____

Section B: Maritime Defence and Exploitation of Blue Economy Resources

6. In your view are the current anti-maritime terrorism measures that have been put in place adequate in promoting coastal tourism in this county?

   Yes [ ]

   No [ ]

7. How would you rate the adequacy of antipiracy measures that have been put in place

to enhance marine transportation in this county?

Very adequate [ ]

Adequate [ ]

Moderately adequate [ ]

Inadequate [ ]

Very inadequate

Rate the following sentences in the way that comes closest to your own views. Please tick (✓) the option that best describes your opinion of the statement.

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
8. The anti-maritime terrorism measures that have been put in place have been effective in enhancing maritime tourism in this county.					
9. Commercial fishing in this county has experienced positive growth because of good antipiracy measures that the government and its stakeholders have put in place.					
10. Maritime transportation activities in Mombasa County have been made easy due to enhanced maritime security by the different security agencies in this area.					

11. What suggestions would you make to the government of Kenya with regard to maritime defence in order to enhance the performance of the blue economy in this region?

_____

_____

_____

Section C: Maritime Safety and Exploitation of Blue Economy Resources

12. What are some of the main causes of marine pollution in the region?

_____

_____

_____

13. Explain how pollution affects economic activities that rely on the ocean.

_____

_____

_____

14. In your view, do you think the government of Kenya and other stakeholders have put in adequate effort to address the problem of marine pollution in this region?

_____

_____

_____

Rate the following sentences in the way that comes closest to your own views. Please tick (✓) the option that best describes your opinion of the statement.

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
15. Pollution-free marine environment creates a good environment for tourism to thrive.					

16. Anti-marine pollution measures have put in place to ensure that the ocean is attractive to tourists.					
17. To enhance the quality and quantity of marine food fished in the ocean the government needs to ensure that pollution of the ocean is very minimal.					
18. In my view the government of Kenya has put in place good emergency response administration facilities and personnel to secure the marine environment at the coast.					
19. Government response have been effective in addressing accidents and disasters that have in the past occurred in the country's territory of the Indian Ocean.					
20. Effective emergency response administration services by the government have been very important in promoting transportation services in and along the ocean.					
21. If the emergency response administration services are good, more people will be encouraged to engage in fishing activities since they will be assured should they face any challenges in the ocean.					

22. What would you advise the government to improve on with regard to marine safety in Kenya's territorial waters?

_____

_____

_____

Section D: Maritime Governance and Exploitation of Blue Economy Resources

23. How would you rate the performance of Kenyan government with regard to maritime governance?

    Very good [ ]

    Good [ ]

    Average [ ]

    Poor [ ]

    Very poor [ ]

Rate the following sentences in the way that comes closest to your own views. Please tick (✓) the option that best describes your opinion of the statement.

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
24. Illegal mining activities in the ocean have for a long time gone on without proper control.					
25. Uncontrolled mining activities in the ocean negatively impacts on the sustainability of the marine resources.					
26. Steps taken so far by the government of Kenya to curtail illegal mining activities have been fruitful and this has gone a long way in enhance marine tourism in this region.					
27. Illegal mining mitigation measures put in place by the government have so far been effective in enhancing commercial fishing in this region.					

28. The incidental catches mitigation measures put in place by the government of Kenya have been effective in controlling and sustaining the fishing sector in this region.					
29. The incidental catches mitigation measures have been helpful in ensuring that the fishing sector in this region thrives.					

30. Are there areas for improvements you would like the government of Kenya to address with regard to maritime governance of the country's territorial waters? Explain.

_____

_____

Appendix II: Interview Schedule for the Key Informants

General Information. Please fill out	
Stakeholder type:	
Date:	
Location Interview Conducted:	
Organization:	

1. In your view, are the current anti-maritime terrorism measures adequate in enhancing coastal and maritime tourism, commercial fishing and marine transportation in the Kenya's territorial jurisdiction of the Indian Ocean?
2. Comment on the country's antipiracy measures with regard to its blue economy in the identified regions.
3. Pollution in the identified water bodies is definitely one of the key challenges facing the country's blue economy. What anti-maritime pollution measures have been put

in place and how effective are they?

4. What is the government doing to enhance emergency response administration services in the marine environment in order to enhance the confidence of people when they are going about their economic activities?
5. Comment on the illegal mining mitigation measures that the government has put in place and how these measures are enhancing the country's blue economy.
6. Incidental catches mitigation measures are essential in addressing issues to do with illegal, unreported and unregulated. Explain how the government's efforts have been essential in addressing such challenges and the resultant effect on the country's blue economy.

Appendix III: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 103521

Date of Issue: 15/May/2020

RESEARCH LICENSE

This is to Certify that Mr.. Sammy Njue Njiru of Africa Nazarene University, has been licensed to conduct research in Mombasa on the topic: INFLUENCE OF MARITIME SECURITY ON EXPLOITATION OF KENYA'S BLUE ECONOMY RESOURCES ALONG ITS COASTAL REGION for the period ending : 15/May/2021.

License No: NACOSTI/P/20/4915

103521

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

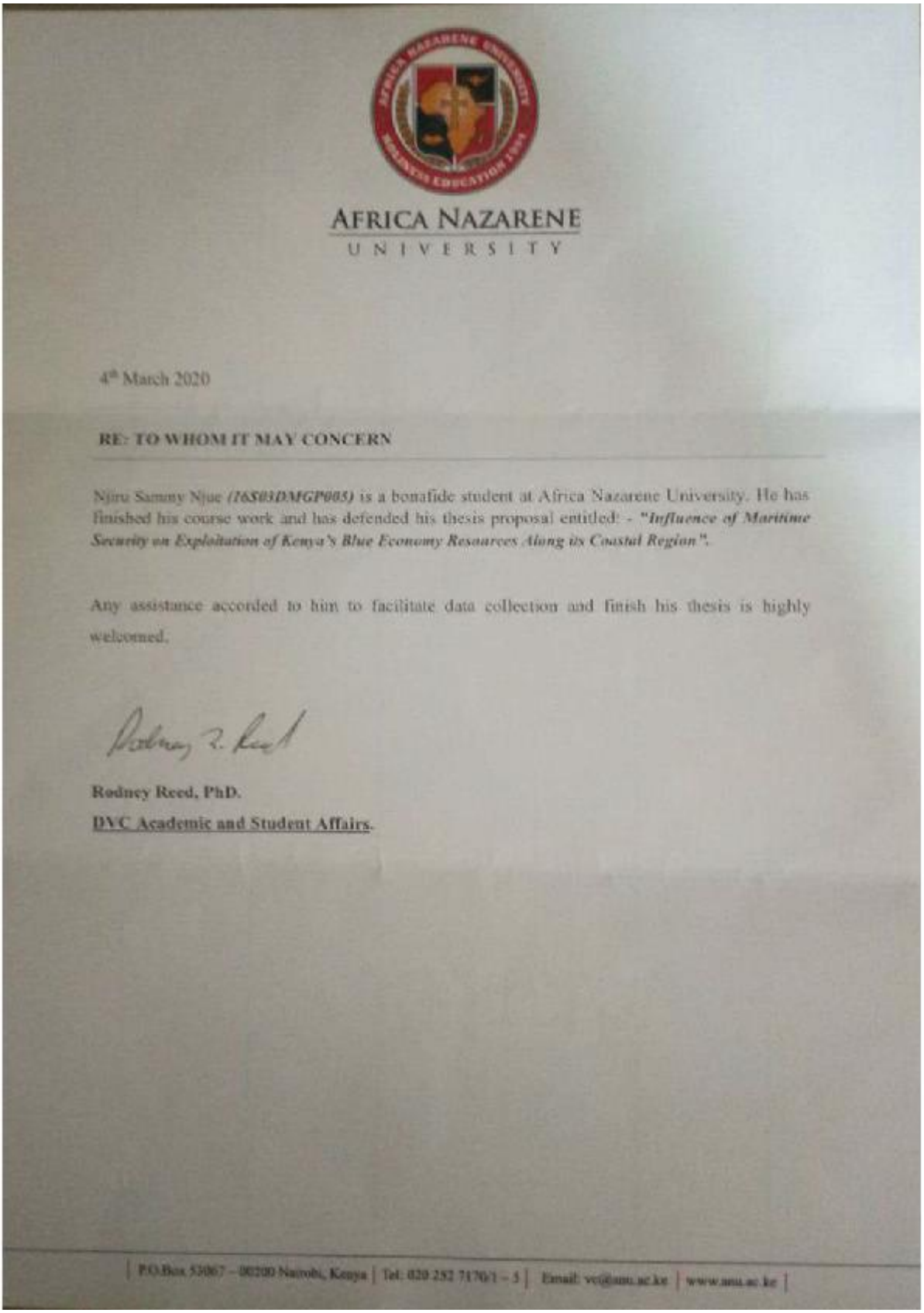
The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearence from relevant Government Agencies
5. The License does not give authority to tranfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

National Commission for Science, Technology and Innovation
off Waiyaki Way, Upper Kabete,
P. O. Box 30623, 00100 Nairobi, KENYA
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077
Mobile: 0713 788 787 / 0735 404 245
E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix IV: ANU Research Data Collection Approval Letter



AFRICA NAZARENE
UNIVERSITY

4th March 2020

RE: TO WHOM IT MAY CONCERN

Njiru Sammy Njue ***(16S03DMGP005)*** is a bonafide student at Africa Nazarene University. He has finished his course work and has defended his thesis proposal entitled: - ***"Influence of Maritime Security on Exploitation of Kenya's Blue Economy Resources Along its Coastal Region".***

Any assistance accorded to him to facilitate data collection and finish his thesis is highly welcomed.

Rodney Reed, PhD.
DVC Academic and Student Affairs.

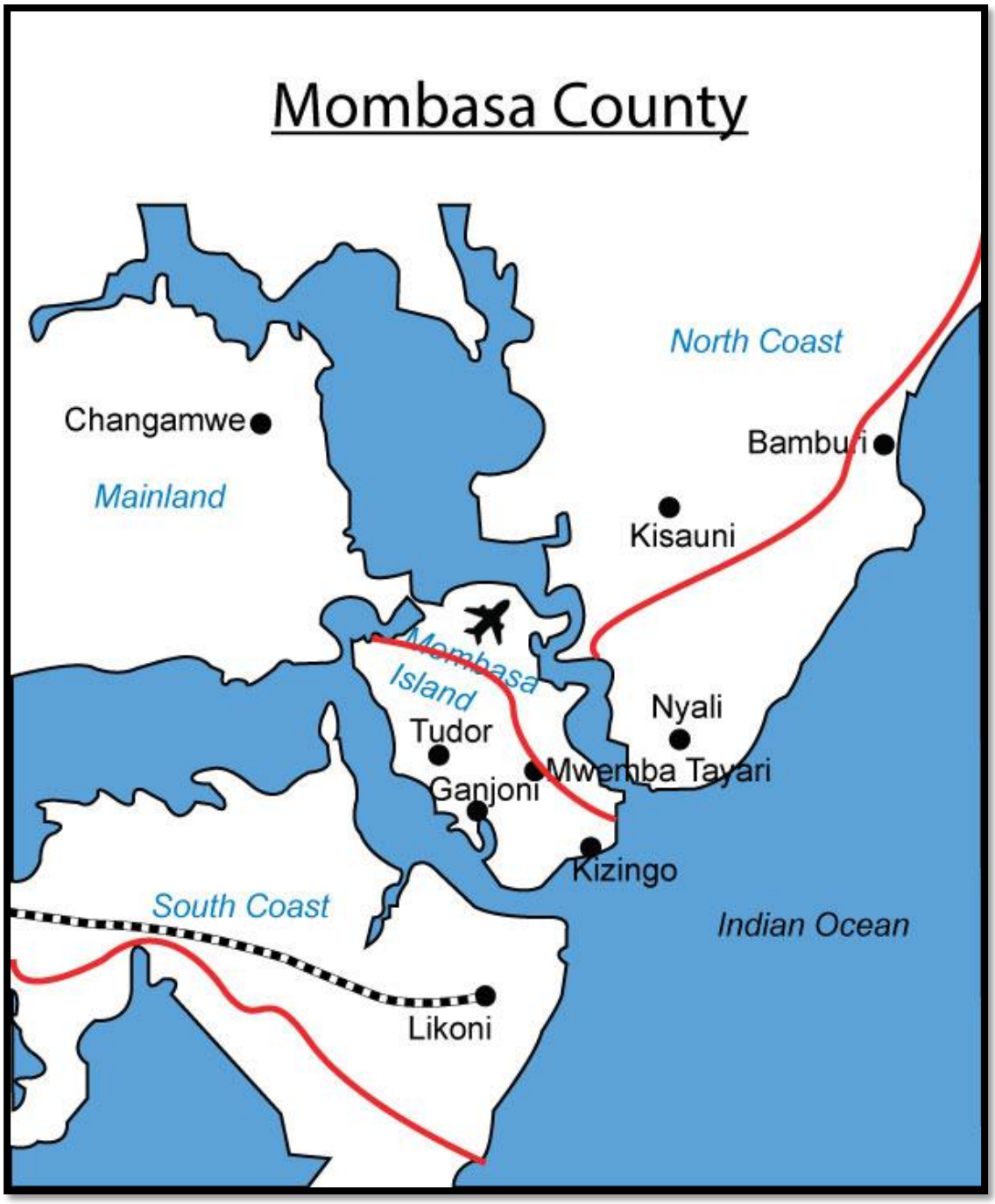
P.O.Box 53067 – 00200 Nairobi, Kenya | Tel: 020 252 7170/1 – 5 | Email: vc@anu.ac.ke | www.anu.ac.ke

Appendix V: Krejcie and Morgan Sample Size Table

Population	Confidence = 95%	Confidence = 99%

Size	Margin of Error				Margin of Error			
	5.0%	**3.5%**	**2.5%**	**1.0%**	**5.0%**	**3.5%**	**2.5%**	**1.0%**
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1000	278	440	606	906	399	575	727	943
1200	291	474	674	1067	427	636	827	1119
1500	306	515	759	1297	460	712	959	1376
2000	322	563	869	1655	498	808	1141	1785
2500	333	597	952	1984	524	879	1288	2173
3500	346	641	1068	2565	558	977	1510	2890
5000	357	678	1176	3288	586	1066	1734	3842
7500	365	710	1275	4211	610	1147	1960	5165
10000	370	727	1332	4899	622	1193	2098	6239
25000	378	760	1448	6939	646	1285	2399	9972
50000	381	772	1491	8056	655	1318	2520	12455
75000	382	776	1506	8514	658	1330	2563	13583
100000	383	778	1513	8762	659	1336	2585	14227
250000	384	782	1527	9248	662	1347	2626	15555
500000	384	783	1532	9423	663	1350	2640	16055
1000000	384	783	1534	9512	663	1352	2647	16317
2500000	384	784	1536	9567	663	1353	2651	16478
10000000	384	784	1536	9594	663	1354	2653	16560
100000000	384	784	1537	9603	663	1354	2654	16584
300000000	384	784	1537	9603	663	1354	2654	16586

Appendix VI: Map of Study Area



Source: Google Maps, (2020)