ASSESSMENT OF GENDER BARRIERS TO MARINE RESOURCES ACCESS: A CASE STUDY OF INHACA ISLAND, MOZAMBIQUE

OTEKE RISPER ATIENO

PAUWES/2016MWP20

A Thesis Submitted in Partial Fulfilment for the Award of Degree in Masters of Science in Water Policy in Pan African University Institute of Water and Energy Sciences (including Climate Change).

August 2018

DECLARATION & APPROVAL

This thesis is my original work and has not been submitted by anyone else for examination in any university

28/08/2018

Date

Signature

Oteke Risper Atieno

CERTIFICATION

This Thesis has been submitted by my approval as the University Supervisor

28th August 2018

Date

Signature

Dr. Salomao Bandeira

(Pan African University Institute of Water and Energy Science Inc. Climate Change)

DEDICATION

To my beloved husband Willy, my daughters Michal & Tamekah. Am humbled by the great sacrifice and endurance you made for me.

ACKNOWLEDGEMENT

This study honours the indigenous community of Inhaca villages in Mozambique. Their hospitality, conservation of culture and wisely contributing to the information required for the objectives of the study has been appreciated. It is humbling to mention CORDIO EA, a non-governmental research institute in Mombasa Kenya for providing me with an office space to work on my write up. The study also recognizes the invaluable contribution of the supervisor in ensuring that the work was done appropriately. It is not easy to be able to piece up data and bring out a document without the guidance and technical advice from the supervisor. Finally I acknowledge the African Union and GIZ for the provision of the research grants to be able to conduct this study successfully.

ABSTRACT

The coastal and marine environment supports livelihoods to the communities adjacent and far beyond it. The ability of men and women in the access and utilization of these resources has been found to differ profoundly. These variations provides for inequalities in resources access. This research therefore aims to assess the gender barriers to marine resources access in the islands. The study was conducted in Inhaca Island off Maputo bay in the Indian Ocean. The specific objectives of the study were to characterise and map the marine resources of the Island; to examine the challenge that women and men experience in accessing the resources and finally to understand the role of management and institutional structures in promoting sustainable and fair access and management of the marine resource. Semi-structured questionnaires were designed for different sets of purposed sampled respondents. A total of 130 questionnaires were administered. Analysis of the data both qualitative and quantitative was done systematically including the use of SPSS software and MS Excel. Gender analysis was applied in this study to determine the effects on marine resources access affecting different sets of gender. Results were presented in descriptive form, in tables, graphs and charts. The study recommends an all-inclusive and shared management and sustainable utilization as a policy intervention to address gender barriers in accessing marine resources.

Key words: *Inhaca, gender barriers, resources access, policy options, Western Indian Ocean.*

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS & ABBREVIATIONS

BMU		Beach Management Unit
CCP	:	Community Fisheries Council
GMP		Gross Marine Product
GDP	:	Gross Domestic Product
FAO		UN Food and Agriculture Organisation
IKS	:	Indigenous Knowledge Systems
IOM	:	Integrated Ocean Management
LMMA	:	Locally Managed Marine Area
SPSS	:	Statistical Package for Social Scientists
MPA		Marine Protected area
WIO	:	Western Indian Ocean

DEFINITION OF OPERATIONAL TERMS

Policy refers to a course or principle of action adopted or proposed by the government

Gender refers to the socially-determined roles and responsibilities of men and women and the relationship between them in any given society.

Resources refers to an economic or productive factor required to accomplish an activity, or as means to undertake an enterprise and achieve desired outcome

Barrier refers to in this case as laws, rules policies and systems that prevent the community from the effective utilisation of the resources

Access refers to the ability, right, or permission to approach or use a resource

Governance is the legal, social, political and economic arrangements and processes through which resources are managed

Marine Protected Area refers to an area set aside for the purpose of conservation and sustainable management of the sensitive marine resources

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background

This section outlines the theoretical, conceptual and contextual background of the study. The abundance of marine resources within coastal ecosystem and their importance in supporting livelihoods cannot be ignored (M. de la Tores-Castro et al, 2017) It is currently threatened by numerous human and climate change factors. (Obura, 2017) In addition, there exist a gender imbalance in the access and utilization of marine resources in Mozambique and as the case in Fiji and other islands in Pacific Ocean. A study in Zanzibar Island depicts how gendered activities are embedded in the ecosystem throughout the seascape. The importance of gender consideration in Natural resources management with reference to coastal marine management is paramount. (UNEP-Nairobi Convention and WIOMSA, 2016) Most studies have focused on assessing the status of marine resources while ignoring the existing gender barriers and gaps that influence sustainable use of marine resources. (Barclay, Payne and Mauli 2015) The representation of women and their crucial role in decision-making process is often ignored. In community hierarchical structures, decision making has been placed as majorly the duties of the elderly males notably the village chiefs or headmen on behalf of their people with the notion that the decisions are in the best interest of the whole community. These decisions, however, may fall short of integrating factors that may affect women's access to resources or their fishing activities.

1.1.1 Theoretical background

Coastal and marine ecosystems are vital in supporting millions of people globally. Fisheries' based livelihoods in particular are important for economic growth and development and have employed over 155 million people globally (FAO, 2008). However, these ecosystems are subjected to a range of anthropogenic factor such as the rapid population increase, and overreliance on the coastal and marine resources to support the livelihoods (Obura, 2017), which have resulted in stock depletion and resources decline. Climate change driven stressors such as extreme weather conditions, droughts and floods, leading to changes in productivity and structure, and reduction in abundance and stocks of fish and other marine resources is also a key factor. This has further affected the resilience and increased vulnerability of the

coastal communities in accessing these resources to meet their daily needs (UNEP-Nairobi Convention and WIOMSA (2015).

This section provides a theoretical basis for the study of gender barriers and marine resources access. In order to appropriately address these issues, the study focuses on the theory of access (Ribot and Peluso,2003) to analyse how men and women of Inhaca Island access marine resources. Frequently, scholars have used different approaches in different pieces of research (Bryant & Bailey, 1997). Thus the approaches below are essential in understanding why there are gender barriers towards marine resource access.

In this research, the theory of access (Ribot & Bailey, 2003) is used to look at the women and men's livelihood strategies in addition to the accessibility and contestation over marine resource utilisation.

Theory of Access

Access to resources is a vital component in shaping rural livelihood strategies and outcomes (Scoones 1998). Access is a key factor that constantly reshapes people's income portfolios. In a coastal community analysis, an emphasis on access highlights the diverse mechanisms that actors use to control and retain power over particular resources or forms of capital. Therefore, I use the theory of access to unravel the power struggles among Inhaca Island marine resource users and identify the mechanisms by which octopus collectors and fishers gain and control access to marine resources.

In theorising access and how it is set up and questioned by people, I draw on Ribot and Peluso's (2003) theory of access to scrutinize "who actually benefits from things [Resources] and through what processes they can do so". In their theory, property rights point to different types of socially-acknowledged assertions to resources and form a subsection of access, approving their holder to manage, use and benefit from resources (Bromley 1991).

Thus the legal framework conditions access by defining rights. In a legal perspective customary normative and statutory systems exist side by side. On the other hand, claims based on customary law and national legislation may often conflict (Benjaminsen and Lund, 2002; Leach et al. 1999; Mearns, 1999). Moreover, they may be recognised differently by dissimilar social actors (Colchester 2008). I for one

concur with Ribot and Peluso (2003) and Bebbington and Perreault (1999), who state that access is like more to "a bundle of powers" that the people hold as a means through which they can control, gain and maintain resources.

Institutions and People are positioned differently in relation to resources at various historical moments and geographical scales. Leach et al (1999). The aspects thus shift over time, whereby changing the nature of the power and forms of access to resources.

1.1.2 Conceptual background

Enhancing the resilience of coastal communities in the access and use of marine resources, an equitable, balanced and sustainable development approach of the various sectors must be considered. Fair access and utilization of marine resources can be achieved through social and gender inclusion (Fitzpatrick and Roach Lewis, 2009). Previous studies of the WIO region have revealed that the contribution of women in development of fisheries and marine sector has not been fully recognized (Maricela de la Tores –Castro 2013). Their concerns and challenges in accessing marine resources have received less attention from legislators, managers and policy makers. The lack of full gender representation and recognition has led to an incomplete understanding of the functionality and operations of the fisheries sector (MRC, 2006).

Formulation of policies and measures in addressing gender imbalance in marine resource access requires knowledge; on the gender barriers, the role and status of women in the marine and fisheries sector development and an understanding of why gender related issues are usually neglected. Based on this background, there is a need to assess the existing gender barriers to accessing marine resource in Inhaca Island.

In the WIO region, the gender-specific roles of both men and women, the status and relationships between them are evolving and responding to the socio-ecological changes in coastal and marine ecosystems. Engagement of women and their access in exploitation of marine resources vary in the different countries depending on the supporting policy frameworks, traditions and infrastructure. The Solomon Islands government developed a gender implementation strategy in an effort to recognise and support the role of women in the fisheries sector and the economy at large (Barclay, Payne and Mauli, 2015). In the Mozambique fisheries sector, the traditional practice have seen women engaged in octopus harvesting, shell fish collection, catching of

small shrimps and gleaning in the near shores mainly necessitated by technological innovations, market expansion and increase of fisher populations. (Muacanhia, 2003). The intensification of marine resource exploitation has sometimes led to marginalization of women, thereby preventing them from pursuing viable livelihoods fisheries sector (Mwaipopo, 2008).

1.1.3 Contextual background

In Mozambique, most studies have focused on assessment of the status of the different resources and their contribution to the economy (Muacanhia, 2003 and Book, 2012). Studies on gender issues in resource development and especially the involvement of women have revealed that the participation of women is limited and needs to be considered to achieve sustainable development and management of marine resources.

Inhaca Island found in the coast of Mozambique has been known for its terrestrial and marine ecosystems, which is of biological significance. Various marine habitats are found in Inhaca Island including mud flats, mangroves, tidal channels, seagrass beds and coral reefs. In the fisheries sector, both men and women are involved. However, men go fishing while women work in "lady organization," buying fish and selling majorly in small scale in Maputo. Studies in Inhaca Island have focused on assessment of the marine resources, their status and vulnerability to human degradation and climate change impacts. However, little focus has been given to gender-specific issues and gender barriers influencing the access of marine resources. In the context of this study, understanding the role of gender in the access of marine resources is key to enhancing their sustainable use, management and improvement of community wellbeing.

1.2 Problem statement

Coastal communities depend on the marine resources such as fisheries, corals and mangroves for their daily survival. To enhance the resilience and sustainable use of these resources, there is need to establish an equitable and balanced gender involvement and participation in accessibility. Gender and social inclusion are key elements in achieving this equity. Past studies in Inhaca Island have shown that women are less involved in the currently male-dominated marine and fisheries sector. This is despite the fact that they represent almost half of the people working in small-scale fisheries' sector (WWF, 2012). In many cases, their participation is neither

socially acknowledged nor economically remunerated. These studies have focused on the resources' status (Macnae, 2001), and gender involvement status, without clearly determining the barriers to entry and the role of women in the management of these resources. This information is important if effective policies are to be formulated to address the gender inequalities in accessing marine resources. (Pryck, 2013).

This study concentrated on assessing the gender barriers in accessing marine resources in Inhaca Island to promote gender mainstreaming in marine resource development.

1.3 General objective

The general objective of the study is to assess the gender barriers and gender discrepancies in the access of marine resources in Inhaca Island of Mozambique.

1.3.1 Specific objectives

i. To identify and characterize the different types of marine resources within Inhaca Island.

ii. To examine the challenges women and men face in accessing marine resources within Inhaca Island.

iii. To assess the role of management and institutional structures in marine resources' access within Inhaca Island.

1.4 Research questions

i. What are the marine resources found within Inhaca Island?

ii. What challenges do women and men face in accessing the marine resources within Inhaca Island?

iii. What is the role of management and institutional structures in marine resources' access within Inhaca Island?

1.5 Significance of study

This study aimed to provide relevant information to various stakeholders such as government agencies, research institutions and local communities in formulating policies that integrate the gender differentiated aspects of marine resources' accessibility and management. Conceptually, the study sought to assess if integrating the gender aspect into policies can act as an effective management strategy of marine resources in Inhaca Island.

The findings of the study will help policy makers in prompting the inclusion of suggested recommendations both into national policies of Mozambique and internationally. They may adopt the findings in order to either formulate or amend existing policies that are gender responsive in order to ensure equitable and fair access to marine resources to the communities of Inhaca Island.

Similarly, the study results might be used as the basis for budget allocation where local or national governments will be informed on the need to prioritize and effectively allocate resource. Moreover, in the spirit of the sustainable development goals to promote gender equity, the study will provide vital information local and national governments with the aim of boosting economic growth and development in poor rural areas in the country.

1.6 Scope of study

The study was conducted in Inhaca Island in coastal Mozambique. The town is located 32km East of Maputo City and is endowed with various marine resources including seagrass, mangroves, corals and fisheries resources. The island is about 42.5km^2 and extends from Ponta Mazondue to the North East to Ponta Torres to the South East. This island has a high population whose livelihoods depend on marine and fisheries resources hence the choice for the study.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter seeks to discuss in details the existing literature regarding gender barriers to accessing marine resources and their governance in Inhaca Island. A critical review of literature will be conducted according to the objectives of the study. The purpose is to find out if there is indeed gender barriers to marine resources' access and what policy recommendations can be put in place to enhance sustainable resources access in the area. Relevant information will be obtained from textbooks, article journals, internet and other technical documents from research institutions and government libraries. The chapter is structured to cover; the characterization of the different types of marine resources in Inhaca Island, the challenges men and women face in accessing marine resources and the management and institutional structures in Inhaca Island.

2.2 Theoretical Review

2.2.1 Marine Resources types, uses, distribution and threats

Marine resources are vital in supporting the economic wellbeing of the coastal communities. Globally, over 3 billion people depend on coastal and marine resources for their livelihoods. (Obura et al 2017) Similarly, about 4.3 billion people get their protein intake from fish. The marine environment also plays a significant role in tourism development, which has been shown to contribute up to 25% of the GDP of Small Island Developing States. Some of the highly studied global marine ecosystems include mangroves, seagrass and coral reefs that offer numerous benefits such as shoreline protection, act as carbon sinks, food and support other marine organisms by actively providing habitat and breeding ground for fish, crabs and other marine life. The oceans capture and store about 30% of carbon dioxide produced by human activities.

Mozambique has a coastline of 2,470km and consists of productive and diverse continental shelf area of about 104,300km^2, which is of great economic and ecological significance to the country. (UNEP- Nairobi Convention and WIOMSA 2016)The coastline is made up of diverse habitats including sand dunes, rocky beaches, seagrass beds, bays, coral reefs, mangrove forests and estuaries which support high biological diversity, pristine ecosystems and host both endangered and endemic species.

Fisheries resources are among the most important resources that are heavily exploited and used in Mozambique. This sub-sector comprises of artisanal, semi-industrial and industrial types of fisheries. Commercial fisheries (industrial and semi-industrial) exploit the most important and valuable resources such as shallow- and deep-water shrimp that occur on the Sofala Banks as well as pelagic fish species such tuna, billfishes, and sharks. On the other hand, artisanal fisheries occur along the entire coast and captures pelagic and demersal species in the shallow waters through the use of traditional gears. The fisheries sector is one of the main contributor to economic development providing food and employment to the local people (Santana Afonso, 2006).

The coastal mangroves, corals and seagrass are similarly vital blue carbon ecosystems that have been exploited to serve various purposes. These ecosystems serve as breeding grounds and habitats to juvenile fishes, protect the shoreline, stabilize sediments and offer protection from cyclones and coastal erosion. However, these ecosystems are under threats from both human and natural stressors. Deforestation, unsustainable fishing methods (use of illegal gears), overexploitation and reclamation of the coastline have negatively been linked to degrade marine resources (Samoilys, 2012). On the other hand, some of climate induced natural factors such as coral bleaching, diseases, sedimentation and coastal erosion also lead to diminishing of marine resources (Obura, 2000).

2.2.2 Gender

Gender is the socially and culturally constructed identities of men and women. It refers to the roles, duties, access and opportunities available to men and women, boys and girls, in a society. The terms “equity” and “equality” are sometimes confused in their application to gender. ‘Gender equity’ refers to the process of fair and just treatment of women and men (i.e. the set of actions, attitudes, and assumptions that provide opportunities and create expectations about individuals) to reach gender equality. Gender equality on the other hand, implies a situation where men and women are equally treated and have equal opportunities and responsibilities. From a global perspective, gender equality exists when women and men are capable of living equally fullfilling lives. Working towards gender equality involves enhancing the

capability of men and women to enjoy a status and opportunities that enable them to realize their potential to contribute to, economic, social and political development.

Introducing gender lens to marine resources' access exposes how women participate and they are impacted by the marine sector. Despite the fact that men are typically fishers, women account for 47% of the workforce in fisheries-related activities and other marine resource capture globally. They hold about 56 million jobs in the pre-harvest and post-harvest sector (World Bank 2012). Culturally, the household division of labour permeates activities where women's roles include credit, processing, marketing, and decision-making regarding family nutrition and management of household fishing receipts. The fish catches of women and their economic value is usually unreported. Similarly, their nutritional dependence on the near-shore resources have been ignored and not been properly valued in fisheries management (Harper et al., 2013).

To enhance effectiveness in the development and management of marine and fisheries resources, there is need to incorporate gender issues. Women make vital contributions to activities related to fisheries apart from the actual fishing. They participate in the processing of fish and fisheries products and also in the marketing activities. These are integral roles and therefore ignoring them means ignoring a significant portion of the sector. The under representation of women in the process of decision-making takes away a large portion of expertise from both the community and the government involvement of women which could lead to better cooperation and strengthening of the sector (Woolley et al., 2006).

2.2.3 Governance

In the marine sector, governance involves the control of use and exploitation of these resources for sustainable development. In Mozambique, there are many governance systems in the management of marine ecosystems and resources. These include:

National and Local Governments

The coastline of Mozambique has ten cities in seven provinces some of which are Maputo, Sofala, Maxixe, Pebane Nacal and Angoche among others. The main policy that governs the environmental and natural resource management is the National Environmental Policy. The Environmental Law recognizes the need to control the environmental degradation that has increased over time. It also establishes regulations for sound use and management of coastal resources thereby integrating

socioeconomic aspects with environmental issues. Other authorities tasked with the management of marine and coastal environment include the Mozambique Maritime Authority, which facilitate control and monitoring of activities within the waters so as to ensure maintenance of law and order.

International Public Bodies

Different international bodies have taken part by facilitating projects that aim at ensuring conservation of the marine resources. Bodies such as United Nations Development Program, the World Bank, Food and Agricultural Organization (FAO) are involved in the conservation and management of marine resources in Mozambique. FAO has particularly been involved in the assessment of Mozambique's marine ecosystem through EAF – Nansen Project. Other bodies such as UNESCO have contributed in the Intergovernmental Oceanographic Commission that actively participates in integrated coastal management.

National and International Organization

According to a study by Pereira (2008), about 24 NGOs operate in Mozambique that carries out different conservation activities. The study similarly revealed that despite starting many conservation initiatives, there is still need to accomplish the training, networking and communication requirements. The NGOs do capacity building for the community members. Other organizations carry out research lobbying and advocacy, training and conservation activities. Some of the organizations include; Association of Coastal Conservation of Mozambique, World Wide Fund for Nature (WWF), International Union for Conservation of Nature (IUCN), The Marine Mega fauna Foundation, Friends of Vamizi Trust, Peace Parks Foundation and All Out Africa among other organizations (Blythe et al., 2013).

Currently, some of the NGOs such as IUCN are involved in the funding for the protection of endangered species. They carry out research in the conservation of dugong in Vamizi Island. The park authority (PPF) on the other hand is involved in conservation and management of frontiers parks. They have the strength of international recognition and credibility hence have created positive impacts. The structure of these organizations varies with some of them considering gender inclusivity in the management while others being highly dominated by the male workers.

2.3 Empirical review

2.3.1 Types of Marine resources within Inhaca Island

Mozambique has rich geological features that play important role in influencing nutrient cycling, abundance of marine flora and fauna, species diversity and endemism. The architecture of Mozambique Channel and Mascarene plateau forms features and cyclic system, which is known to support nutrient concentration, flora and fauna colonization and coral formation (Obura et al., 2012; Parson and Evans, 2005; Spencer et al., 2005). This region is known to influencing the genetic variability and abundance in the WIO region. It is characterized by emergence of a rich complex of coral reefs northern of the Mozambique Channel, which is the second to the Coral Triangle region of South East Asia hotspot in aspects of tropical marine biodiversity (Obura et al., 2012). Eddies in the channel create high nutrient convergence zones in open waters leading to high abundance of marine biota (sea turtles, seabirds, sea grasses and fish) (Obura et al., 2012).

Mangroves

Mozambique is endowed with the largest mangrove area in the WIO region with eight species making up between 290,900-318, 800 ha of forest cover (Giri et al., 2011). These species occur as pure stands and mixed formations of dominant *A. marina, R. mucronata* and *C. tagal.* Due to the interplay of human and natural factors, mangrove in Mozambique are fragmented with only one continuous forest system along the Save-Zambezi River complex that overlaps between Sofala and Zambezi Provinces (Fatoyinbo et al., 2008). In Mozambique mangroves provide wood fuel, shoreline protection, habitat for marine fauna and migratory birds, and an important carbon sink. Approximately 75% of coastal fisheries depend mangrove in one way or another as nursery, spawning, feeding and sheltering grounds making them critical in fisheries supporting. While Inhaca Island, mangroves cover 12% of the Island, 500 ha, with six dominant species (Muacanhia &Albano, 2002).

Coral reefs

Coral reefs found in Inhaca Island have broad significance in shoreline protection since they act as barriers against strong waves and surf. They also serve as nursery grounds for juvenile prawns, fish and other crustacean species. Additionally, they are home to starfish, anemones, sponges, and sea urchins and other marine worms and

organisms. The corals in this Island are equally important tourist attraction due to intrinsic beauty and close proximity to Maputo city. The quality of the corals has an effect on fisheries. This means that degradation of coral reefs could potentially result in dwindled fish stocks thus affecting the access by artisanal fishers whose livelihood is heavily dependent on them (Muacanhia, 2003).

Fisheries resources

The population of Inhaca Island largely depends on fish and fishing-related activities for their livelihood. (Enebrand, 2012) The fisheries include both men and women where men usually go fishing while the women buy the fish, and sell further upon after value addition. Women and children are on the other hand engaged in the search for molluscs, small fish and crustaceans in the intertidal areas and reefs. Other fisheries' resources that are usually exploited by both men and women include crabs, lobsters and seaweed. Tourism activities in marine environment similarly earn coastal communities income.

Seagrasses

The seagrass ecosystem of Inhaca Island is home to 9 species and 7 seagrass communities namely *Thalassia hemprichii/Halodule wrightii, Zostera capensis, Thalassodendron ciliatum/Cymodocea serrulata, Thalassodendron ciliatum/*seaweeds, *Cymodocea rotundata/Halodule wrightii, Cymodocea serrulata* and *Halophila ovalis /Halodule univervis*; with *Syringodium isoetifolium* occurring growing in mixed stands (Bandeira 2002, Bandeira et al 2014). These species account for 75% seagrass species in Mozambique and 16% of the world species (Den Hartog 1970, Kuo and McComb 1989). Considering the size of the island and seagrass species abundance, the area is considered a high biodiversity hotspot. The connectivity between seagrass, mangroves and coral reefs form a rich marine fauna biodiversity complex providing nesting and grazing zones. Coastal communities exploit these fishing grounds for economic and domestic purposes. Likewise, seagrasses meadows are an important carbon sinks thus helping to regulate global climate (Gullstrom, et al 2017). Productivity of seagrasses predisposes them to an array of human induced threats, which contribute to canopy disturbance causing reduction of its cover. In Inhaca Island, tourism and near-shore artisanal fisheries coupled with trampling and increasing boat anchorage and small port development and predation from sea urchins account for majority of degradation sighted in the

meadow that caused disappearance of *Z. capensis* (ASCLME/SWIOFP, 2012a). The development of the main village Jetty prompted the disappearance of *Z. capensis* (Bandeira, 2002. Cumulatively, these activities together with extreme events of flooding and sedimentation resulted to an estimated loss of 2755 ha of seagrass in Mozambique (Bandeira and Gell, 2003).

2.3.2 Challenges women and men face in accessing marine resources

In the access of marine resources, various challenges affect men and women. These challenges have primarily seen women participation unrecognized. Some of these challenges include; the belief that fisheries and fishing activities are basically men's domain, the gender stereotype that women are not technically minded and the concept of fisheries as vastly limited to activities of direct fishing. Additionally, the stereotype that women are physically weak hence not suited to the physical demands of fishing activities is still a barrier to women development.

As a result of the gender blindness of marine resource management in places like Philippines, it is undocumented whether the feminization of obligation and responsibility is linked to degraded fisheries. In South Asia, studies show that women are usually highly impacted due to degradation of marine resources (Agarwal, 1997; Chant, 2007). Lack of gender sensitive information makes difficult in the assessment of long-term degradation impacts of fisheries resources on the nutrition, employment and well being of women.

2.3.3 Management and Institutional Structures in Inhaca Island

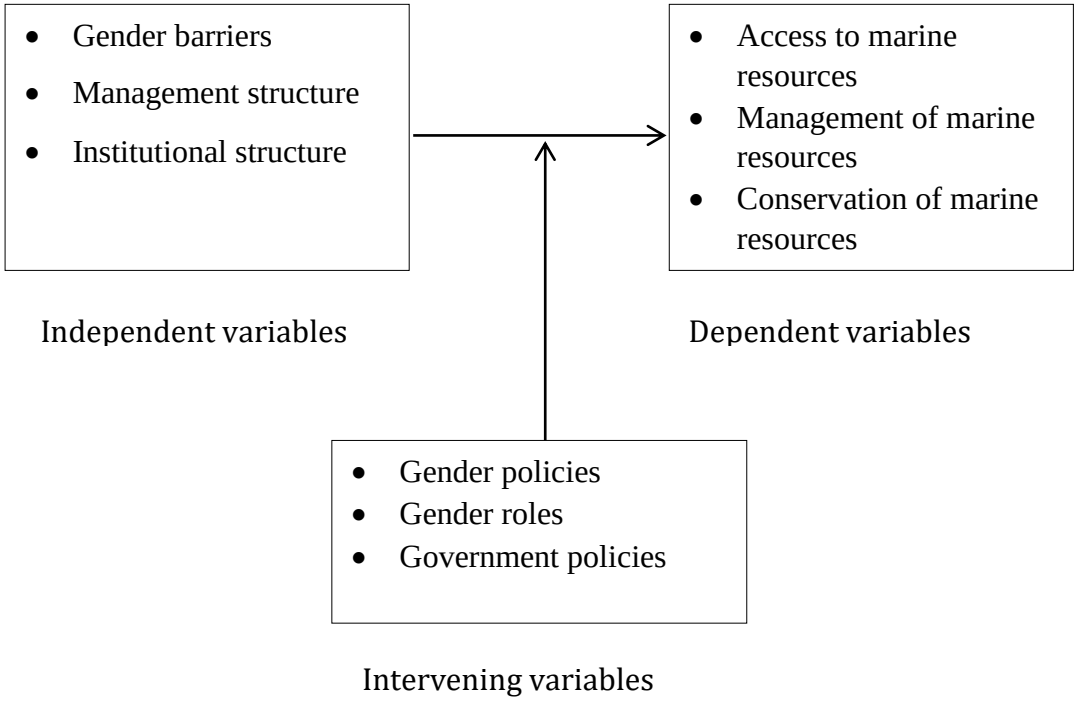
In many coastal areas of the world, gender sensitive approaches to marine resource management have not been prioritized due to gender roles that do not majorly recognize women participation. This has revealed the impacts of the degraded marine resources on women. Past studies have indicated the exclusion of women from natural resource management, research and academia attributed to high illiteracy levels among the girl child (Walker, 2009; Mai et al., 2010). Other studies have revealed that there has been little support for women in fisheries management (Williams et al., 2012). The existing management and institutional arrangement in the management of marine resources is designed to favour men over women and has seen a dominance of men in all levels of fisheries resources management; local, national and international. In Philippines for example, 2002 fisheries census indicated that about 95% of the people involved in municipal fisheries capture are men leaving out the unpaid labour

for children and women. Such gender blind statistics are sources of illustration why the employment of women in fisheries sector is usually not considered.

2.4 Conceptual framework

The current study is based on the Driving Forces, Pressures, State, Impacts and Responses (DPSIR) framework. This model describes the various interactions that exist between the society and the environment (Cutter, 1996). It describes the link that exists starting from the driving forces such as human activities to pressures like climate change to the state (status of marine resources) and finally the response, which are the access rates of the marine resources by coastal communities.

The study has the independent variables including the gender barriers, management structure and the institutional structure. These factors can be affected in one way or another by the government policies, the gender roles and gender policies. The dependent variables on the other hand include marine resource access, management and conservation of marine resources.



The conceptual framework has been adopted from DPSIR framework that has been applied in some coastal zones in the world to help conceptualise the complex sustainability challenges and facilitates organising research that increases the understanding about interacting ecological and societal processes, predicts changes and supports the management, persistence and resilience of coastal systems. However, the current DPSIR framework is limited and innovations are required (Cutter, 1996 and Lewison, et al. 2016). Within the WIO region, most countries' population growth rate is alarming. This is coupled with increased economic development on the finite marine and coastal resources. The DPSIR framework has been adopted in many of these coastal countries such as Kenya and Tanzania for the management of such resources. (UNEP –Nairobi Convention and WIOMSA, 2005).

2.5 Critique of the literature

Most of the past research regarding gender from the literature focuses on women without considering the dangers that men would similarly face if most of the issues regarding gender were addressed in support of women participation. Similarly, most of the findings indicate the gap in gender consideration without emphasizing on the barriers to the gender involvement or women participation. Limited gender research has been done in other deeper areas such as the biology of sharks, seaweeds, echinoderms, molluscs and seabirds. This therefore calls for more studies into the other areas of marine ecosystems and resource for sustainable use. The migratory routes of tuna that usually travel the Mozambican coast in a recurrent manner are not properly known (Pereira et al.2004). Similarly, shark fishing, deep-sea fisheries, reproductive aspects of lobsters, sea cucumbers, mussels, fishing effort, and catches of the artisanal sub-sector have been poorly reported. These need to be properly researched for better management. Also, challenges men face and the barriers to women accessing marine and fisheries resources need to be well understood for proper management of the resources and equal participation. The lack of gender specific sectors and policy objectives for improved participation and development is a result of limited studies on gender related concerns in marine resources management and utilization.

2.6 Summary of the literature

The coastal communities rely heavily on various marine resources such as mangroves, corals and fisheries for their daily needs. From the findings of the recent studies,

gender involvement has not been given the much-needed priority and attention in marine resource access and exploitation in Inhaca Island.

In conclusion, the discussion surrounding the access to marine resources and the influence of gender roles is not just about women but rather to emphasize on the importance of gender equity in sharing naturally resources. Human resources are needed for pushing forward the gender agenda up to, and beyond to achieve sustainable development. Solidification of the human capacity is therefore pivotal to widen both the spheres of influence of the marine resources accessibility in terms of gender awareness and equality, and the actual impacts it aims to achieve. Scientists and skilled personnel are needed to conduct gender analyses and to promote gender mainstreaming in all aspects of marine and fisheries sector. Gender training is "a range of activities which seeks to inform, raise consciousness and equip different categories of persons with the skills to enable them to address gender inequalities in their work, their lives, and in society at large" (Acquaye-Baddoo and Tsikata, 2001) which will also change the communities' perspective and thus reduce the existing gender barriers related to cultural norms and traditional practices.

3 CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter aimed to illustrate how data was collected, encoded, analysed and interpreted in order to prove the hypothesis tested-the ultimate purpose of the study. The chapter therefore describes and discusses the study area, research design and methodology employed in this study. It also justifies and explains the choice of the methodology applied in conducting the study as well as highlighting details of the research design, target population, sampling design and technique, data collection instruments, analysis and presentation.

3.2 Research design

This study employed a case study research design. The design was particularly suitable for the study because the findings were intended to reflect the assessment of the gender barriers to marine resources access in Islands with Inhaca Island in Mozambique being the chosen study area. A correlation research design was used to enable the researcher find out the relationship between the study variables. To gather qualitative and quantitative data for analysis and interpretation to answer the research questions and to obtain the present knowledge systems employed, the study used both descriptive and analytical approach as the former determines and reports the way things are and attempts to describe such things as possible behaviour, attitudes and values (Mugenda and Mugenda 2003) and the latter explains with reasons why such pattern is observed**.**

3.3 Research Site and Study Rationale

This study was conducted in Inhaca Island, Mozambique in 3 selected villages. The rationale behind this site selection was that the population in these villages have their livelihoods dependent on marine resources. Access to these resources has not been adequate, sustainable and fair limiting the potential of the people to explore their resources equally as well as conservation efforts. Inhaca Faunal reserve is one of the

oldest in the WIO region, established through a government decree or proclamation in 1965. The Nhacane municipality, the youngest administrative structure in Mozambique greatly depends on the marine resources for its livelihoods support.

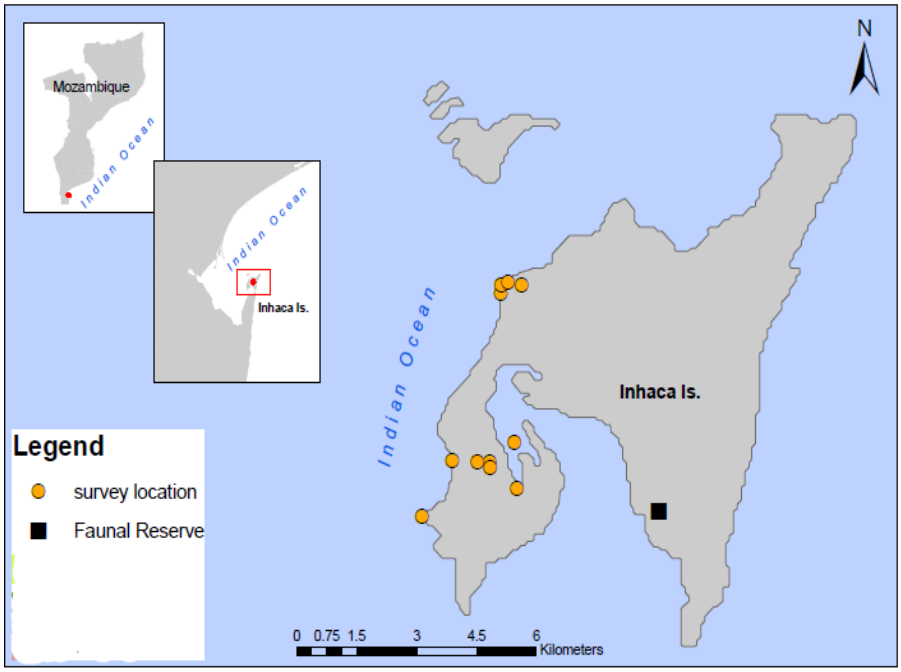


Figure 1: A study area of Inhaca in the villages of Malhangalene, Ribzene and Txromene

3.4 Population and Target Population

The population of this study engaged 130 respondents. It involved households that are affected by gender barriers to resources access. A total of 100 households were selected. It also engaged key informants, 15 in number, who have historical background of the study area as well as have deeper understanding of the subject. The study finally selected 15 organizations/institutions involved in the area as stakeholders including government agencies. The households were selected because they were impacted by access to marine resources in their daily activities. In this category, women and men were sampled separately for a gender response. The community elders and key informants were selected since they had years of historical knowledge and could recall events from the past to the present. Research organizations and government agencies were key since they had relevant information of the subject on marine resources accessibility and management that was resourceful as secondary data.

3.5 Sample size and sample determination

Though it is always maintained that the rule of thumb is to obtain as big sample as possible, the resources and time being a major constraint did not allow this to be effected. The sample size was determined as illustrated in the Table 1 below and as recommended by Morgan and Krejcei (1970). This therefore means that the sample size was 100.

3.6 Sampling frame

The sample frame constituted the population characteristic, population size, sample size and the sampling technique.

Table 1: Sample frame showing the sample size and techniques used

Category of population	**Population size**	**Sample size**	**Sampling technique**
Households	100	70	Simple random
Research Organisations	15	15	Purposive sampling
Government agencies	15	15	Purposive sampling
Total	**130**	**100**	

Source: Researcher's Output (2018)

3.7 Sample & sampling technique

Simple random and purposive sampling techniques were employed in this study. The purposive study targeted the government and research organizations as well as key informants in the community. This was to ensure a specific targeted data that can be obtained from the sample. The households were selected randomly in regard to the researcher's preference as according to Kothari (2004). Sampling refers to the systematic selection of a limited number of elements out of a theoretically specified population of elements. The rationale was to draw conclusions about the entire population

3.8 Data collection procedure

First and foremost, the researcher acquired the introductory letter from the host University. The researcher then sought authorization from the Community/village leaders in order to conduct the resource mapping, household surveys and focused group discussions in order to collect data. To enhance the response rate, the researcher considered the research ethical issues. The respondents were instructed to

indicate each answer with any mark in the appropriate box representing their answer or fill a blank space in case of open-ended questions. The questionnaires were administered with the help of the translator and collected as soon as the respondent attended to it. This procedure is standard in social science research as used in Marshall and Rossman (2011).

3.9 Data Collection Methods and Instruments

3.9.1 Survey

According to Kothari (2008) information obtained by means of questionnaires is free from bias as the person conducting the research cannot influence the respondents hence accurate and valid data can be obtained. They are also cheaper, easier to administer and convenient as the respondents are given time to fill in the questionnaires. This study used questionnaires to collect data that identified and characterized marine resources as well as identified barriers that men and women encounter in accessing these resources. The questionnaires were randomly distributed depending on the willingness of a household to participate in the study. The questionnaires administered to the government and research organizations were in regard to the policies that can be but in place for sustainable management of marine resources and the ease of accessing them. The questionnaires were semi-structured to enable respondents provide their answers from the available choices as well as express their free thought and opinion.

3.9.2 Key informants

The information reliability and accuracy is achieved through measures such as use of the key informants (KI). In this study area, there was careful selection of individuals who had a deeper understanding of the subject emanating from village locals to the government agencies and research institutions were used as key informants giving direction and guidance on data collection.

3.9.3 Interviews and guide

The purpose of interviewing a respondent is to engage into a deeper understanding of the study topic. This is especially done to selected respondents and for this case it was conducted to key government agencies and research organizations as well as key informants. The interviews sought to establish the marine resources available in the area, barriers faced by women and men in accessing the resources and policy options available or to be enhanced to alleviate the barriers to resource access and encourage

sustainable utilization and management of marine resources. According to Mugenda (2003), interviews are advantageous in that they provide in-depth data, which is not possible to get using questionnaires.

3.9.4 Literature Review

As recommended by Ngau et al. (2004), majorly the secondary data was collected through a critical review of literature. Documented works from previous studies conducted in the area by Bandeira and Paula (2014), journals and technical reports from the research institutions in Inhaca were visited and reviewed. All these focused on the objectives of the study and were analysed as secondary sources of data to supplement primary data.

3.9.5 Focus Group Discussion

This consisted of a group of 8 members of homogenous characters. The main aim of conducting a Focused Group Discussion (FGD) was to obtain detailed information about the study. In this case, the community members were divided into 2 FGD each of separate genders. There were groups of women shellfish collectors and the fishermen. This was to get a deep insight of what barriers affected them separately.

3.9.6 Community Resource Mapping

Resource Mapping refers to collating and plotting information on the occurrence, distribution access and use of resources within the economic and cultural domain of a specific community. (Rambaldi et al. 1998). In this case, variations such as gender, were introduced for a purposed output. This involved the use of a systematic walk along a defined path (transect) across the study area together with the local informed people to explore the marine resources conditions by observing, asking, listening and recording. This tool was specifically applied in the objective (i) of this study.

3.10 Data processing and analysis

Based on the questionnaires both qualitative and quantitative data was generated. Descriptive and analytical statistics was then applied to analyse the data through the use of Statistical Package for Social Science (SPSS) and Microsoft Excel. This was appropriate as it was possible to calculate percentages, averages and frequencies presenting them in form of charts and graphs and to analyse the relationship of each variable to the adaptation strategies to climate change. Another tool for resources related data was the use of ArcGIS.

3.10.1 Quantitative analysis

Quantitative data analysis involved the use of both descriptive and inferential statistics in the SPSS and the GIS Software. Descriptive statistics entailed determination of measures of central tendency such as mean, mode, median; measures of dispersion such as range, variance, standard deviation; frequency distributions; and percentages. Data was processed through editing, coding, entering, and then presented in comprehensive tables and graphical presentation showing the responses of each category of variables. Inferential statistics included correlation analysis using a correlation coefficient in order to answer the research questions. Maps overlays and tables were the outputs of GIS mapping.

3.10.2 Qualitative data analysis

Qualitative data analysis involved both thematic and content analysis, and, was based on how the findings related to the research questions. Content analysis was used to edit qualitative data and reorganize it into meaningful shorter sentences. Thematic analysis was used to organize data into themes and codes were identified. After data collection, information of same category was assembled together and their similarity with the quantitative data created, and results discussed. Qualitative data was interpreted by composing explanations or descriptions from the information. The qualitative data was illustrated and substantiated by quotation or descriptions.

3.11 Ethical considerations

Issues regarding ethics were considered and did not affect the respondents. Most importantly, the respondents' privacy and confidentiality was maintained. The researcher obtained an informal consent from every respondent and authorization from the University and all relevant authorities involved. The informal consent was through asking the respondents of their willingness to participate in the filling of the questionnaire. To ensure privacy, the respondents were informed upfront that indeed their names were not required, that they had the right to leave questions unanswered for which they did not wish to offer the required information, and that the researcher did not put the respondent under pressure to give information (Mugenda & Mugenda, 2003). To ensure confidentiality, as suggested by Amin (2005) the subjects were informed in advance that the information they gave was solely used for research purposes and data obtained on private matters would be treated in confidence.

3.12 Limitations of the study

First the study area was a representation and did not cover the whole Island. The use of a small sample size was a limitation of getting data from a wider audience through selected respondents. Secondly, confidentiality by respondents limited the amount of information to be captured. The fear of victimization by the community due to providing confidential information limited the data collection process. The researcher assured the respondents that the study was for academic purposes and was not to be used for any other reason except for the reasons provided by the researcher.

Finally, the language barrier in the study area amongst the respondents especially the household respondents slowed down the data collection process. However, this was overcome through the use of a translator who had a comprehension of the local language and had previously conducted her study in the study area.

4 CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides information on the findings of the study form the data. After cleaning, coding and analyses, results from the data were presented in tables and figures. The data was interpreted to show detailed perceptions and explanations from respondents regarding their knowledge on the issue relating to gender barriers in accessing of marine resources in Inhaca Island, southern Mozambique.

4.2 Results

4.2.1 Study sample

As recommended by Morgan and Krejcei (1970), the study targeted to have a large sample size so that the results obtained from the data can represent views of the whole population. A total of 70 respondents were interviewed in the household survey, 41 in key informants' interviews and two groups of 8 respondents each with uniform characteristics in the focus group discussion (**see Table 2**). From the household survey, 45.7% of the respondents were from Ribzene village, 34.3% from Malhangalene village and 20% form Txromene village. The Key informant interviews consisted of 38 interviews from opinion leaders in the community across the 3 villages and 3 interviews from government institutions including an administrator at DPMAIP (Provincial Directorate for the Seas, Interior Waters and Fisheries), a head teacher at a local primary school and a manager at Maritime Authority. The two groups targeted in the focus groups were fishermen and women group.

Table 2: Sample distribution across the three villages in Inhaca Island

Data Collection Technique	**Sample**	**Distribution**	**Count**
Household Survey	70	*Malhangalene*	24
		Ribzene	32
		Txromene	14
Key informant interview	41	*Malhangalene*	23
		Ribzene	6
		Txromene	8
		Primary school	1

		DPMAIP	1
		Maritime Authority	1
Focus Group Discussion	2	*Fishermen*	1
		Women group	1

4.2.2 Social demographic characteristics

The socio-economic characteristics of the respondents (which included gender, number of household in the family, head of the family, occupation and level of education) were assessed in order to understand the composition of the population and its implications on the marine resource management. The following sub-topic give a view of the results obtained.

4.2.2.1 Gender and household composition

Across the three villages, more respondents were recorded in Ribzene village (45.7%), followed by Malhangalene village (34.3%), then Txromene village (20%). In terms of gender, the survey data depicted a skew in favor of women, depicting 70% against 30%, men. Correspondingly, more women and men were recorded in Ribzene village more than any other village, 28.6% and 17.1% respectively (**see table 3**). The high number of respondents from Ribzene village is because it is the main village in Inhaca Island with a high population, while others are smaller or less populated villages.

Table 3 : Gender distribution across the three villages in Inhaca Island

Village	**Gender**	**Percentage**
Malhangalene	*Female*	*25.7%*
	Male	*8.6%*
	Total	***34.3%***
Ribzene	*Female*	*28.6%*
	Male	*17.1%*

	Total	***45.7%***
Txromene	*Female*	*15.7%*
	Male	*4.3%*
	Total	***20.0%***

Three group rages, 0 – 3, 3 – 6 and above 6 were used to assess the number of people in a given household. Results illustrated that; more households had 3 – 6 people (58%), then above 6 people (27.5%). Very few households had 0 – 3 number of people (15.5%). These results give an indication that most of the respondents regard the importance of family hence the high number of people per household.

Major Activities

The Ka-Nhaca people, as traditonally known majorly depend on the marine resources. Fishing is a major activity done by both men and women followed by farming. Men and women however vary in the method of fishing and farming, the species collected and the purpose of resource use. 28.6 % of men and women in the study area practice farming while 34.9% are fishers.

Table 4: Major Activities Carried Out in Inhaca Island

Activities	**Gender**		**Tools**	**Observation**
	Male	***Female***		
Fishing	Deep sea	Near shore, mangroves and seagrasses	Basket traps and hand picking for women while men use nets, hook, harpoons and line	The fishing vessels are local, small with simple fishing gear including mosquito nets. Women majorly use basket traps. Children wait for the fishermen to be given the Juvenile catch to take home.
Farming	Bush Clearing Selling produce	Ploughing Planting Weeding	Simple farming tools	Most of the farming activities done by women. Same crops types are planted year round (maize, cowpeas, potatoes

Activities	Gender		Tools	Observation
	Male	***Female***		
		harvesting		and cassava) Majorly sandy soils

Plate 1 a) A fisherwoman drying sea cucumber b) a field of *ipomea batata* c)a Fisherwoman with her fish trap d) a fisherman mending his net.

4.2.2.2 Occupation

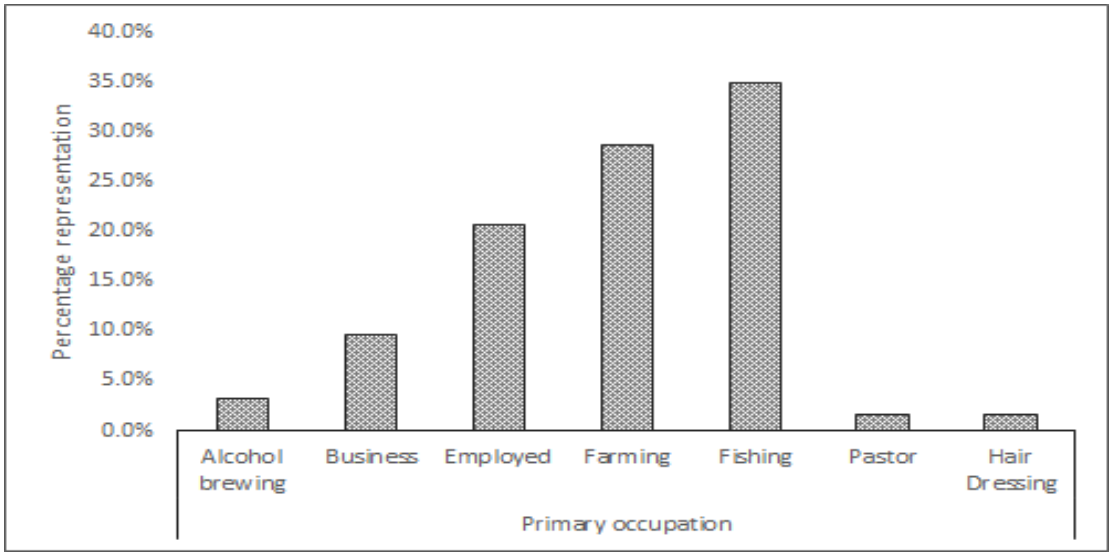


Figure 2: Occupation of the head of household

Ninety-one-point 3 percent (91.3%) of household head reported that they work. The most common form of employment was fishing (34.9%) then followed by farming (28.6%) (**See Figure 2**). The least preferred form of employment was hair dressing or being a pastor, which both had 1.6% respectively. Those engaged in a formal

employment were 20% since most of these were working in the reserve at the Marine Biological Station

4.2.2.3 Level of education

The respondents were characterized by low levels of education (about 82.3%) having attained primary education, or no education at all (**see Figure 3**). 27.4% attained no education (both men and women i. e 19 out of 68 respondents) as compared to 72.6% who attained either primary/secondary or both. On the other hand, 16% of the male respondents had no education compared to 33% of female respondents

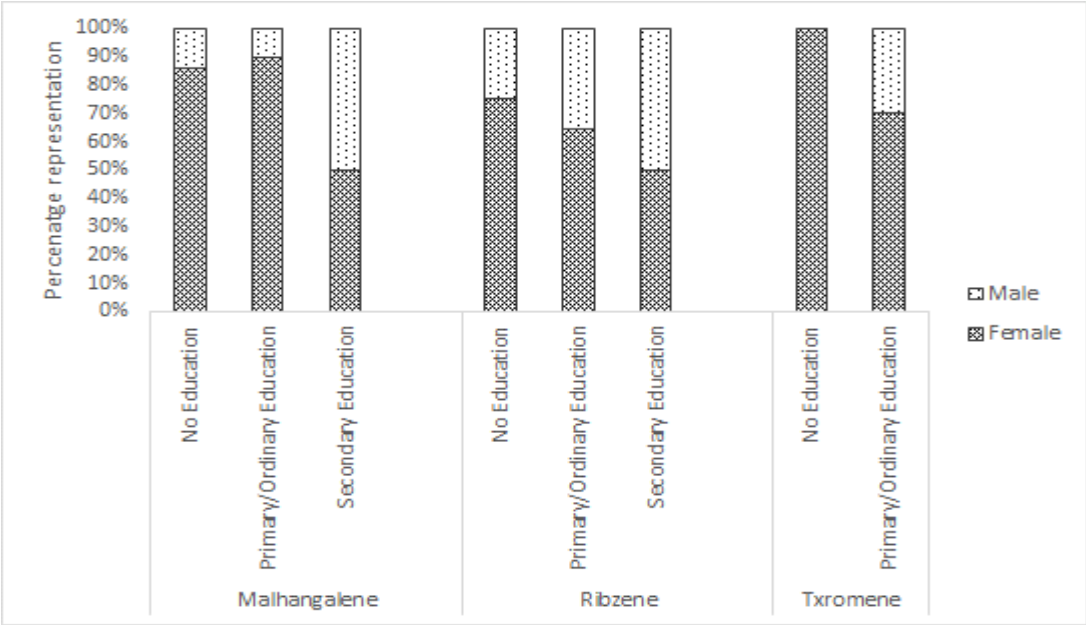


Figure 3: Respondents' level of education

4.2.3 Local perceptions on marine resources

Across the three villages, 97.1% of the respondents were aware of the marine resources in their locality. Among them, 68.7% of the respondents were women indicating that women were more aware of marine resources present locally than men (**see Figure 4**). In order of popularity, mangrove was the most common resource, followed by seagrass, open sea, coral reef, marine animals, coastal forest and lastly intertidal area.

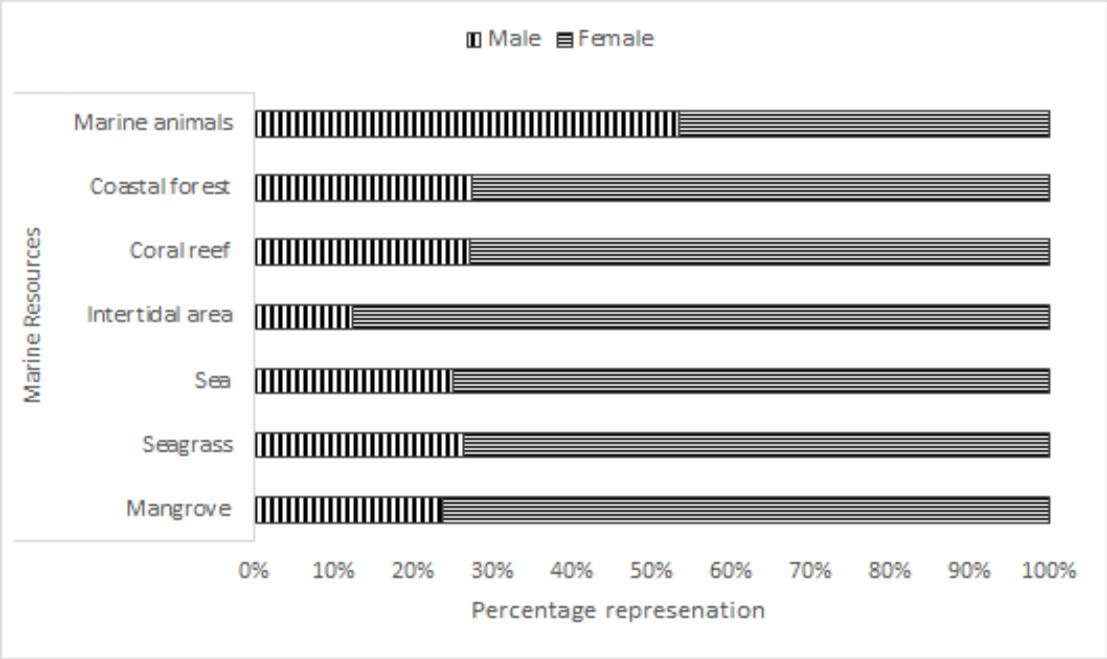


Figure 4: Marine resources as identified by respondents

Mangroves (31.7%) and seagrass (31.7%) were the most commonly accessed resources in Inhaca Island, followed by the open-sea (15.4%), marine animals (9.8%), coastal forest (4.9%), intertidal area (4.9%) and lastly reeds (1.6%). Across gender, results indicated that, female (70%) accessed more of the identified resources than male (30%) (See Figure 5). Men had higher levels of accessibility to the open-sea.

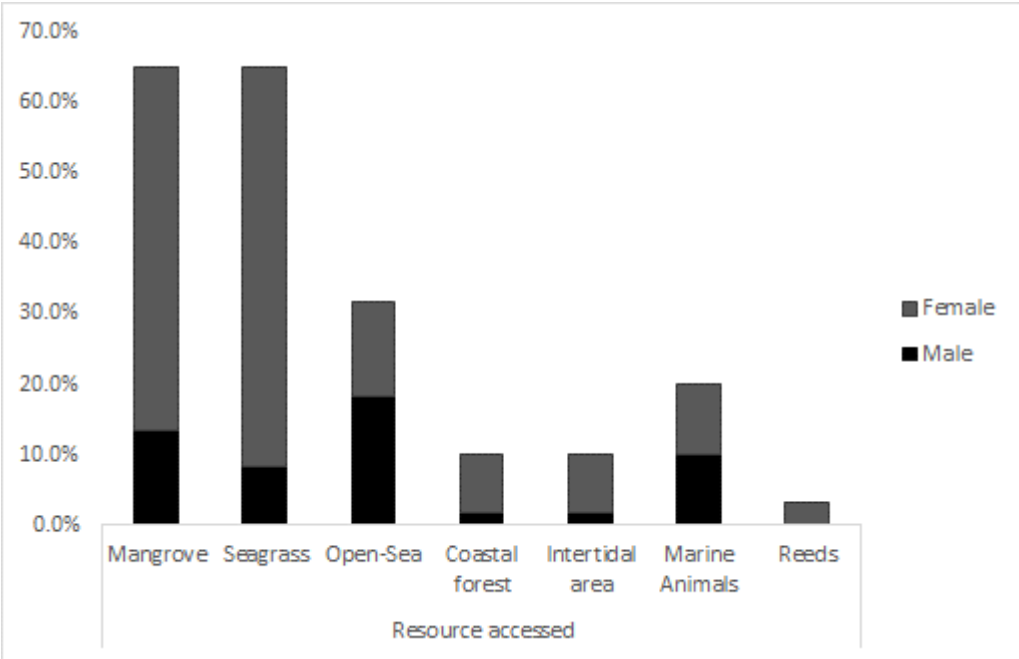


Figure 5: Gender accessibility to marine resources

Level of education had no direct impact on how marine resources were accessed in Inhaca Island. Results show that, the more the number of people in a given level of education, the more the frequency in accessing marine resources, therefore, Primary/Ordinary education which had many respondents recorded the highest (55.2%) number of people who access marine resources, followed by those people who had No Education (20.3%), then those with Secondary level of education (15.5%) (See figure 6).

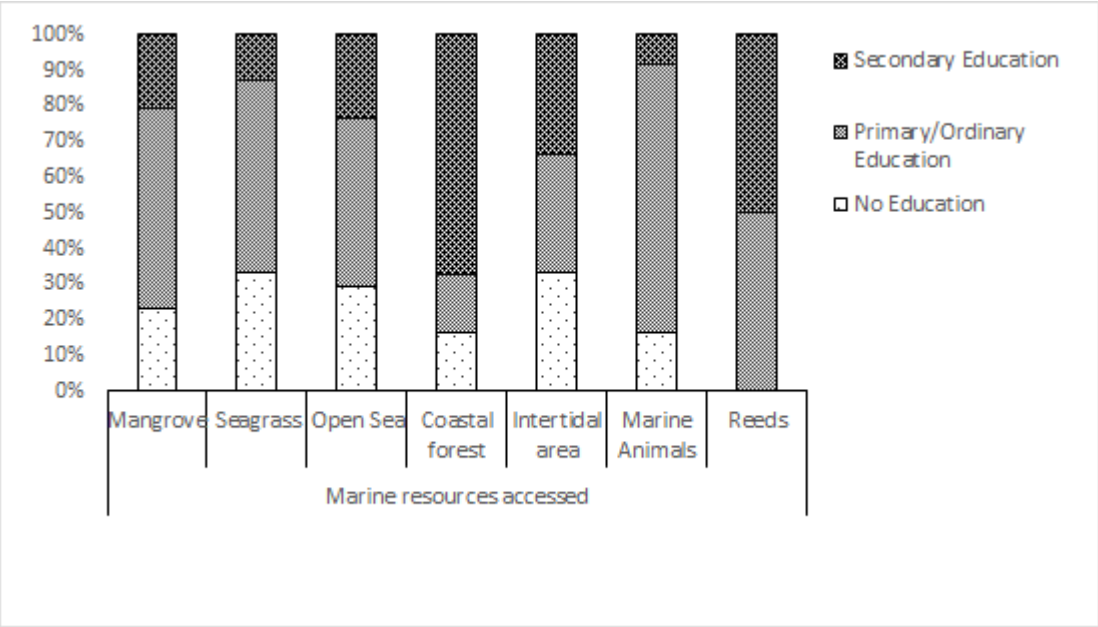


Figure 6: Influence of level of education to marine resources

The respondents noted, the following benefits to be derived from different marine ecosystems: fishery i.e. crabs such as *Scylla serata (mud crabs)*, lobsters, cuttlefish, prawns; sea shells; firewood; building poles and fruits (**see Figure 7**).

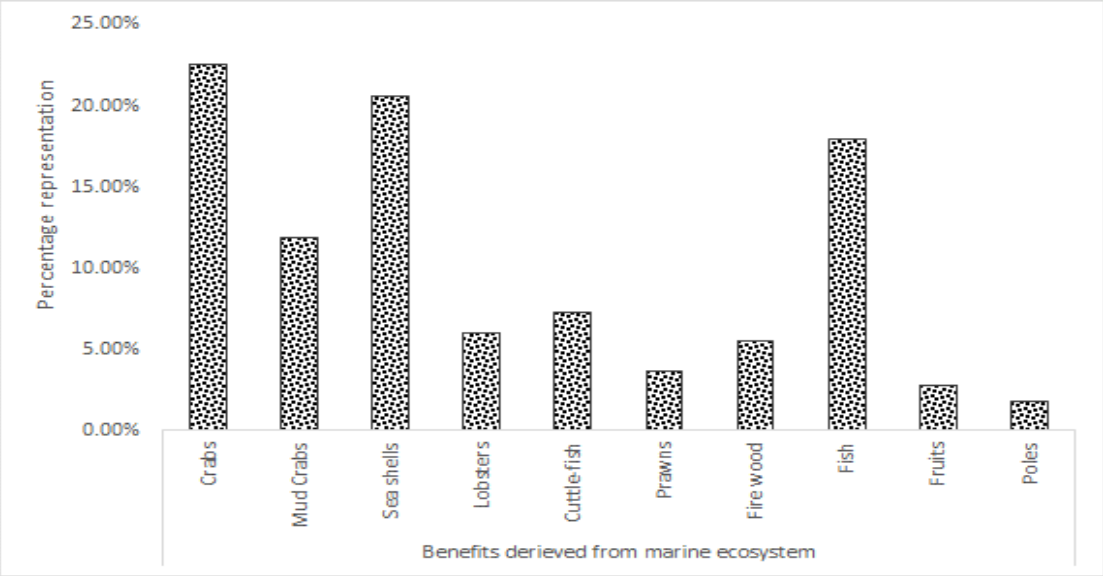


Figure 7: Benefits derived from marine ecosystem

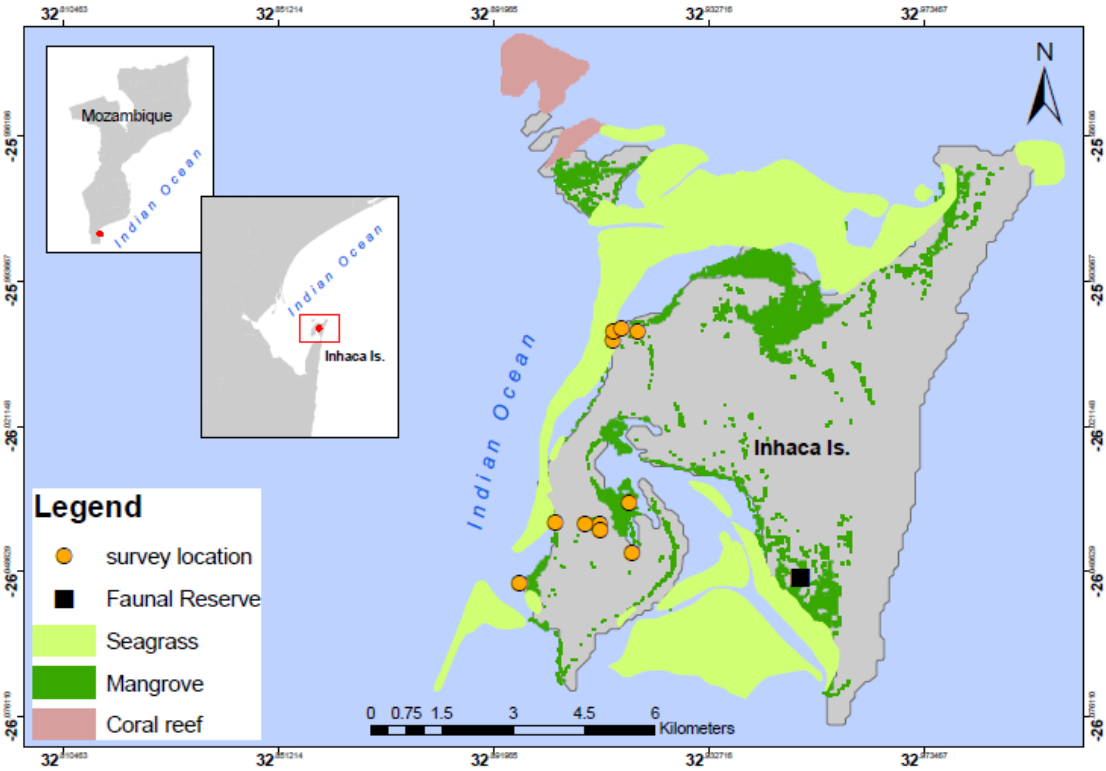


Figure 8: Marine Resources of Inhaca Island

The mapping of the marine resources indicates that there is a large seagrass meadow in the region with a high mangrove concentration in the northern shores of the island. Coral reef stands out at the furthest extent of the Portuguese Island and a faunal reserve having its management at the Marine Biological Research Station under Eduardo Mondlane University (**see Figure 8**).

Table 4: SWOT Analysis of Inhaca Community

	Strength	**Weaknesses**
Opportunities	-High level of awareness of the marine resources majorly by women -Availability of management plans and research recommendations that have not been implemented	Level of education amongst women is low Few formal fisher and women groups with no proper management structures.
Threats	-Considered a biological hotspot with immense species richness.	Weak management and regulatory structures with limited community involvement - Poor fishing techniques, vessels and gears with low income levels.

Policies and practices in Inhaca

There are no specific policies for Inhaca Island, the national laws are applied countrywide including Inhaca Island. Findings below highlight some of the most important policies and laws.

(i)Constitution of the Republic of Mozambique

-Approved by the parliament in 2004 states that all citizens have the right of living in a balanced environment and the obligation of protecting it from degradation. It also states that natural resources located in the soil, underground, sea and freshwater

belong to the state. It calls for the need of establishing areas for the protection of nature.

(ii) Environmental law and Regulations

-It followed the launching of the Environmental Policy in 1995, which is the umbrella legal framework for the sustainable development of the country. This law calls for the wise-use and protection of the environment. It provides a legal framework for the establishment of protected areas, and does not allow activities that threaten maintenance of biodiversity. In addition, it opens a room for community participation in activities contributing to environmental protection.

(iii) Regulation for the control of invasive Exotic Species

-This regulation was approved in the context if complying with obligation of parties to the Convention on Biological Diversity. It supports measures to prevent the introduction of invasive exotic species that threaten ecosystems, habitats and native species and to control eliminate species that have already been introduced.

(iv)Forests and Wildlife Strategy and Development Policy of 1997

-Provides general guidelines for the sustainable use of forests and wildlife resources for the social, economic and environmental benefits of current and future generations of Mozambicans. The government later made Forestry and Wildlife Law in 1999.

(v) Land Policy and Land Law-1997

-In line with the constitution, this policy and law states that land and natural resources belong to the state. It also calls for the establishing of areas of total protection where extractive use of natural resources should not be allowed.

(vi) Conservation policy and implementation strategy-2009

-Provides further guidance for biodiversity conservation in Mozambique. It defines the vision, mission, and principles of conservation, defines the roles of the main stakeholders and establishes the institutional framework for conservation and the mechanism of inter-institutional coordination.

(vii) General regulation for maritime fishing-2003

-Establishes protected areas for the preservation of fisheries resources. These protected areas include marine parks, marine reserves and protected marine areas.

(viii)Regulation for the prevention of pollution and protection of the marine and coastal environment-2006

-It presents restrictions applicable to coastal zones.

4.3 Discussion

4.3.1 Sample size

There are five villages on the island but the study focused on three villages because of limited resource available during the survey. Challenges experienced by the socio-economics research team during the survey included: limited capacity for extensive socio-economic data collection, as few people were deployed to collect data; limited time frame for data collection. The study was done in ten (10) days with each village having 3 day allocation – the study area is large with scattered household and no means of transport, this limited the socio-economics research team to collect substantive data; Logistical inefficiencies in acquiring transportation means to the field and language barrier. Language barrier was a major hindrance during the data collection exercise in that, though the questionnaire was designed in English, the interviewer was forced to administer it in Portuguese often with the help of a translator. This situation led to the dragging of the data collection exercise.

4.3.2 Household

In this study, a household was defined as a social and economic unit where people live, cook and eat from a common pot and share resources and tasks. Like many Africa families, fathers (55.4%), were mostly the household head followed by mothers (35.4%), grandmothers (7.7%), then brothers (1.5%). In cases where a woman was the household head, the woman was either a widow or a single parent, and in a scenario where the grandmother was the head of the family, it was when the grandchildren were living with their grandmother in absence of their parents. In one case, a brother was the household head, and he was living with his sister. Results show that most families in the three villages are controlled by the male gender; men mostly carry out meaning decisions. Consequently, an interactive discussion with the respondents indicate that most decisions regarding use of marine resources in Inhaca

area are mostly done by men and women have little or no say at all when it comes to making decision on use of marine resources. This implies that any interventions in marine resource management must target women in the society for a significant positive impact to be achieved. Perhaps, key decisions that apply considerable influence on marine resource use by women will also impact the larger community significantly. It is upon this premise that caution and consideration is highly recommended among policy makers, managers and researchers while dealing with the issues that relate to use of marine resources by women so as to sustain the welfare of the broader community and conserve the marine environment.

4.3.3 Occupation

Fishing was reported to be practiced by both men and women where men used boats and gears to do their fishing in deep sea whereas women who were mostly foot fishers, walked in the mangrove and shallow shores during low tide to collecting shells, crabs, octopus and other marine invertebrates products. The mention of low and juvenile fish catch during a discussion with the women needs redress for the sustainability of the fisheries economy in the Island. Since women are also actively involved in use of marine resource, they should be involved in decision-making regarding use of the marine resource. Farming was the second most dominant occupation with locals mostly farming for subsistence. Despite the soils being largely sandy in the whole island, farmlands have yielded subsistence crops that support livelihoods. Women are engaged in farming activities than men. Business was mostly done by women who reported to sell mostly sea shells collected along the shores and processed fish to tourist and local customers respectively. Occupational multiplicity was evident in the three villages where families were engaged in more than one economic activity. The diversity in economic activities is good as it brings stability on income generation within family (Crawford, 2002). In Inhaca Island, spouses and children in the family undertook the alternative sources of livelihoods across the three villages and they included fishing, subsistence farming and business.

4.3.4 Level of education

From the results, a significant disparity in literacy levels is seen between men and women. Even though in some communities living in the coastal area lack of education is not widely noted as cause of poverty, in other communities, educating children is perceived as a route out of poverty. However, the extent to which it is recognized that education provides an important long-term option for improving household livelihoods is wanting in most coastal communities. More often than not households regard taking their children out of school in order to start working, especially during favorable fishing and tourism seasons. Since education level is usually found to be positively correlated to income earnings from employment and other livelihood activities, this aspect stands out as a key factor that ought to gain due consideration in the management of the marine resources. If anything, to be able to address challenges both men and women face while accessing marine resources in Inhaca island, clear objective of this study, depend heavily on some level of literacy to ensure successful implementation.

4.1.5 Local perceptions on marine resources and management

Among the identified marine resources, marine animal was the only resource mostly identified by men. From the results, level of marine resource identification is significantly related to the type of fishery practiced. Men are mostly involved in deep sea fishing, meaning they interact more with various marine animals as compared to women who are foot fishers. Being foot fishers, women mostly do their fishing in intertidal areas and get to interact more with the mangrove, sea grass, and corals-and these are the most mismanaged, encroached and affected by sea temperature rise and other anthropogenic elements yet they are most crucial for ocean health.

Women also source firewood from coastal forest for domestic purposes. The respondents were able to identify and characterize marine resources within Inhaca Island as they normally interact with the resources when carrying out their daily activities.

When asked about the marine resources they were able to access, mangrove and sea grass were the mostly assessed resources and it was frequently by women who collecting crabs from seagrass and mud crabs and firewood from mangroves. Other resources also identified to be accessed by women were intertidal zone when foot fishing, coastal forest for firewood and reeds for making hand crafts. Men admitted that they regularly accessed the sea and the marine animals. The high number of women interacting with the marine resource than men from this survey can be because; the study had many women respondents than men. Even so, this does not eliminate the fact that, women interact with the marine resources when doing their day to day activity and involving them in marine resource management will contribute significantly to sustainable utilization of the resource (Muacanhia, 2003).

Though there is free access to marine resources in Inhaca Island, there are other resources the locals have limited access to. The identified marine resources with limited access are: coral reef; mangrove; juvenile marine animals; endangered animals like turtles; dolphins and wales and the deep sea. Reasons given by respondents as to why they were prohibited to access some of the marine resources are as given. First, some of the marine resources are in a conserved reserve especially the coral reefs and they are highly protected. Corals are a home to unique marine fisheries (Spotted Rubberlips, Jewel Damsels, Zanzibar Butterflyfish, Purple Butterflyfish, surgeons, Trigger Fish and File Fish) in Inhaca Island and a source of tourist attraction, many people actually tour the Island because of snorkeling activities in Coral gardens and Santa Maria, the two unique coral sites. Through the mangroves are highly protected in Inhaca Island, the use of mangrove products has continued to be essential for purposes of subsistence i.e. firewood as the sole source of energy utilized daily by many homesteads. The locals are allowed to collect dead and dry mangroves along the shores, but not allowed to go and do logging in the forest. The island is also endowed by some of unique marine animals i.e. turtles, dolphins and wales which are protected, they area also a source of tourist attraction in Inhaca Island. Fishing in Inhaca Island is artisanal, and fishers use traditional fishing methods which limit them into fishing in the shallow inshore area. The vessels used are not powered by engine and cannot go into the deep sea, this has made it difficult

for local fishers in the area to exploit pelagic stocks depending mostly on demersal reef stocks.

From the survey, 92.9% of respondents claimed that they benefit from marine resources and the most common benefit derived from the marine ecosystems was Crabs (34.4%). This is because both men and women harvested crabs and they were easily found in seagrass and mangrove environment. The second most common benefit derived from the marine environment was shellfish, which was identified as the most common type of fishery done by women in Inhaca Island; the shells were collected from seagrass environment (Picaulima, 2017 and Muacanhia, 2003). Fish (17.9%) was another common benefit identified to come from marine environment. Other benefits identified from marine water were lobsters, cuttlefish, prawns, and from coastal forest firewood, building poles and fruits ((Muacanhia, 2003 and Kalk, 1995).

Apart from benefits derived from marine environment, 83.3% of respondents also claimed to derive benefits from terrestrial environment especially through agricultural activities. Farming was done at subsistence level and crops commonly farmed were cassava, maize, sweet potatoes and vegetables. However, rapid population rise, high levels of poverty, reduced land for farming and unplanned development have led to increased demand for marine resources (Muacanhia, 2003).

4.3.5 Suggestion by respondents to improve marine conservation and accessibility

Most (97.1%) number of respondents claimed to be aware of marine resources and also 92.9% said to benefit directly from the resources. To ensure sustainability in consumption of the marine resources, the respondents highlighted some of the reasons that will aid in the process. The reasons are:

1. There should be increase in knowledge on how to access marine resources and both men and women should be given equal opportunities.
2. The locals should be allowed to access mangrove forest and fetch firewood for domestic consumption.

3. Most people in Inhaca Island are dependent on marine environment, this should not be the case, locals should also farm as an alternative source of livelihood
4. The authorities should not collect levies from locals, especially those who consume resources at subsistence level.
5. The locals should be sensitized on dangers of logging both terrestrial and marine forests.
6. Locals use poor fishing gears i.e. use of mosquito net to catch prawns, which also catch juvenile species and they wish they could get better fishing gears that will enable them fish large marine fishery.
7. The fish stocks near shore are declining and local fishers would wish to be given large fishing boats that will enable them go deep sea to fish large demersal species.

Women should be involved in decision-making process on matters relating to conservation of marine resources (Muacanhia, 2003).

5 CHAPTER FIVE: SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter draws summary of conclusions and provides possible recommendations for adoption into policy formulation and management. The study clearly indicates that both men and women have a local understanding of the marine resources found in Inhaca Island. Also, government through the marine protected area is shown to be a key challenge limiting access to marine resources for both men and women with existing management structure favoring men over women due to high illiteracy levels in the later gender group.

5.2 Summary of objectives

The study main focus was to assess the gender barriers in access of marine resources in Inhaca Island of Mozambique. To achieve the main objective, the results from the study tried to answer the three identified specific objectives which include: to identify and characterize the marine resources within Inhaca Island; to examine the challenges

women and men face in accessing the marine resources in Inhaca Island; and to assess management and institutional structures in Inhaca Island.

5.2.1 To identify and characterize the marine resources within Inhaca Island

Results indicate that across the three villages, 97.1% of the respondents were aware of the marine resources in their locality. Among them, 68.7% of the respondents were women. The most common marine resource identified were mangroves, this is basically because both men and women fished in the mangrove areas, and in addition men accessed mangroves to obtained building materials while women accessed mangroves to fetch firewood for domestic purposes. Other marine resources identified by locals in Inhaca Island are: seagrass, sea, coral reef, marine animals, coastal forest and intertidal area. From the study, the locals are well aware of the marine resources around them as they interact with them when carrying out their day-to-day activities.

In addition to identifying the marine resources, 92.9% of the respondents also admitted to benefit from the resources and identified crab catches, sea shell collection, fishing, lobster collection, firewood and harvesting of building poles as some of the benefits they obtain from marine environment. The results show that, the locals have an understanding of what marine resources are and they also use them in their day-to-day activities.

5.2.2 To examine the challenges women and men face in accessing the marine resources in Inhaca Island

Though both men and women have the right to access resources in Inhaca Island, there are other resources in the area that they both have limited access to and they are, coral reef; mangrove; juvenile marine animals; endangered animals like turtles; dolphins and wales and the deep sea. The coral reefs are in gazetted as protected area around the Island and tourists who visit the Island for snorkeling activities mostly access them. The mangroves are also protected, and logging is prohibited though the locals are allowed to access them and carry out minimal activities like fishing (mud crab collection) and harvesting firewood from dead mangroves. It is illegal to fish juvenile marine mammals and hunt endangered species of turtles and dolphins in Mozambique. Though the locals have not been prohibited to access the deep sea, there is limited access to the sea as the locals mostly use traditional fishing vessels that cannot go beyond the reef. These traditional crafts are used to fish within the reef

areas near shore and this has also greatly contributed to the decreasing fishing stocks near shore.

5.2.3 To assess management and institutional structures in Inhaca Island

High illiteracy levels characterize people in Inhaca Island with 54.4% of the respondents having attained only the primary levels of education and about 30% of them having no form of education at all. Across gender, more women, 23.5% reported to have attained no education at all as compared to men, 4.4%. In addition, there is no collage on the Island to offer tertiary trainings. The high illiteracy levels especially for women who mostly drop out of school due to early marriages, has resulted to less involvement of women in management activities. Women in Inhaca Island are less empowered and they are rarely involved in management processes hence they are less consulted in decision-making regarding marine resource management. There is need for knowledge empowerment of people living in Inhaca Island and such an initiative must be give priority to women so as to enable them hold managerial positions and consequently be involved in decision making processes.

5.3 Conclusions and Recommendations

Based on this study, we can conclude that, there is free access to marine resources for both men and women in Inhaca Island. The perceived limitations to marine resources by people in Inhaca Island are actually measure put in palace to assist in conservation of marine resources. To achieve sustainability in marine resource use, there is need to empower both men and women living in Inhaca Island through training programs and for posterity the Mozambique government need to invest in educational processes for younger people living in Inhaca Island. The use of unsustainable fish gears coupled by fishing in shallow areas near Inhaca Island and influx of fishermen in the area has resulted in decrease in fish stock around the Island often forcing fishermen to intrude marine conserved areas. This is a major concern as it has always resulted in conflict between locals and the authority. This aspect however was beyond the scope of this study.

In view of these and other aspects of the study, it is viable to recommend that:

1. The diminishing marine resources in Inhaca require a collaborative action. The established CCP has to play a major role with the line ministries. Capacity building on fish stock assessment, reduction in by-catch and seasonal ban of

fishing grounds to allow growth and maturity of fish stock. Mangroves are breeding grounds of fish and largely accessed by women hence they should be trained on their management.

2. Educational programs, which target women, need in regard to marine resources to be increased in the area to empower the girl child so that in future she can also be consulted in decision-making processes.

3. More investment need to be put in fisheries; fishers need to be empowered to be able to access demersal species like tuna in deep water instead of competing for already diminished near shore fisheries resources. This includes use of modern fishing gears. A thorough fisheries needs assessment is essential and varied training programmes initiated including efficient fishing gear, sustainable fishing methods

4. Alternative sources of livelihood need to be promoted by local and national government through incentives and farmer education in the area to help reduce pressure on fisheries and other marine resources. The potential of farming should be enhanced to give alternative proteins and improve income.

5. Tourism is a great investment that can support both the community and the nation at large. Inhaca Island has been considered a great holiday destination for tourists. An improvement of the facilities should be promoted to offer employment to the locals with an ecotourism approach to the investment.

REFERENCES

Acquaye-Baddoo, N.A., Tsikata, D., 2001. Gender training and trainers in Ghana. In: Tsikata, D. (Ed.), Gender Training in Ghana. Politics, Issues and Tools. Woeli Publishing Services, Accra.

Amin E. M. (2005). Social Science Research, Conception, Methodology and Analysis, Makerere University Press. Kampala.

Andréfouët, S., Chagnaud, N. and Kranenburg, C.J. 2009. Atlas of Western Indian Ocean Coral Reefs. New-Caledonia: Centre IRD de Nouméa

Asogwa I.S., Okoye J.I, Oni K. Promotion of Indigenous Food Preservation and Processing Knowledge and the Challenge of Food Security in Africa. Journal of Food Security. 2017; 5(3):75-87. doi: 10.12691/jfs-5-3-3

Bandeira, S. and Gell, F. 2003. The Seagrasses of Mozambique and South Eastern Africa. World Atlas of Seagrasses. UNEO/WCMC. University of California Press, Berkeley, USA.

Barclay, Payne and Mauli (2015). Gender, Fisher, Trader, Processor: Towards Gender Equitable Fisheries Management and Development in Solomon Island.

Best, P. B., Rademeyer, R. A., Burton, C., Ljungblad, D., Sekiguchi, K., Shimada, H., Thiele, D., Reeb, D. and Butterworth, D. S. 2003. The abundance of blue whales on the Madagascar Plateau, December 1996. Journal of Cetacean Research and Management, Vol. 5(3).

Bourjea J. Nel. R, Jiddawi NS, Koonjul MS, Bianchi G (2008) Sea Turtle Bycatch in the Western Indian Ocean: Review, Recommendations and Research priorities. Western Indian Ocean Journal of Marine Marine Science 7: 137-150

Crawford B, (1999) Seaweed farming: an alternative livelihood for small-scale fishers? Coastal Resources Centre, Working Paper, University of Rhode Island, Rhode Island, USA, pp. 1-22

IDPPE, 2009a, Atlas da pesca artisanal em Mocambique. IDPPE, Maputo.

IDPPE, 2009. Census of Artisanal Fisheries, Institute for Development of Small Scale Fishing, Maputo

Kalk, M. (1995). Natural History of Inhaca Island: Mozambique. Third Edition. Witwatersrand. University Press, Cape Town. Pp 395

Kothari, C.R. (2008). Research Methodology: Methods and Techniques, Wishwa Prakashan, India.

Lima, A.P., 1971. History of the railways of Mozambique 4 Vols., Lourenco Marques

Loveson A. and R. Sivalingam. 2013. Phytotoxicological assessment of two backwater wetlands in Kannamaly, Ernakulam using aquatic macrophyte-Spirodela polyrhiza. Journal of Environmental & Analytical Toxicology 3 (4):180. doi:10.4172/2161-0525.1000180, 5 pp

March, C., Smyth, I., Mukhopadhyay, M., 1999. A Guide to Gender Analysis Frameworks. Oxfam Publications, Oxford.

Morgan Krejcie (1970), as cited in Amin, (2005).

Muancanhia, T (2003). Environmental Changes on Inhaca Island, Mozambique : Development Versus Degradation ? (http://www.oceandocs.org/handle/1834/410)

Mugenda and Mugenda (2003). Research Methods. Quantitative and Qualitative Approaches, ACTS, Nairobi.

Ngau P and Kumssa A (2004) (eds). Research Design, Data Collection and Analysis: A Training Manual, UNCRD, Nairobi.

Obura, D.O., Church, J.E. and Gabrié, C. (2012). Assessing Marine World Heritage from an Ecosystem Perspective: The Western Indian Ocean. World Heritage Centre, United Nations Education, Science and Cultural Organization (UNESCO).

Olande M. et al (2016). Current Status of Sea Turtle Protection in Lamu Seascape, Kenya: Trends in Nesting, nest predation and stranding levels.WIO Journal of Marine Science 15 (1) 2016-13

Pereira, MAM., Litulo, C., Santos, R., Leal. M., Fernandes, RS.,Tibirica, Y., Williams, J., Atanassou, B., Carreira, F., Massingue, A., Marques da Silva, L. (2014). Mozambique Marine Ecosystems review. Maputo /CTV

Picaulima (2007). Women and MPAs : How Gender affects Roles in Planning and Management. Vol. 4, No. 5. November, 2002

Rajagopalan, R. 2012. Pulicat's Padu System. Yemaya 39 (March). http://community.icsf.net/en/yemaya/detail/EN/ 1825-Asia-/-India.html? detpag=mapart. Accessed 18 March 2013.

Ribot, J. C. and N. L. Peluso (2003) A theory of access. Rural Sociology 68(2):153-181

Seager, J., Hartmann, B., 2005. Mainstreaming Gender in Environmental Assessment and Early Warning. United Nations Environment Programme, Nairobi.

Thomson, K. 2009. Development policies, state interventions and struggles for livelihood rights in coastal communities in Kerala, India: A case study of the Cochin clam fishery. Ocean and Coastal Management 52 (11):586-592

UNEP-Nairobi Convention and WIOMSA (2015). The Regional State of the Coast Report: Western Indian Ocean. UNEP and WIOMSA, Nairobi, Kenya, 546 pp. ISBN.

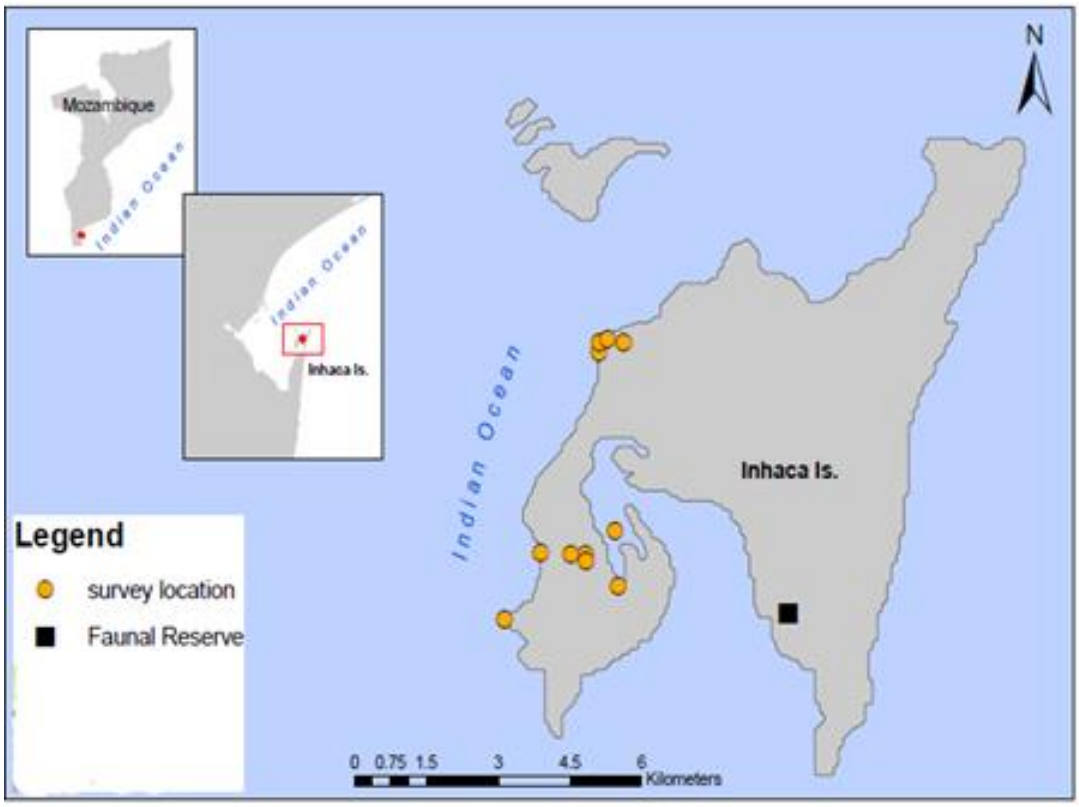
Williams, M., Williams S. and P. Choo. 2001. From women in fisheries to gender and fisheries. Paper submitted to Global Symposium on Women in Fisheries. November, Taiwan.

World Bank, 2012. World Development Report 2012: Gender Equality and Development. World Bank, Washington.

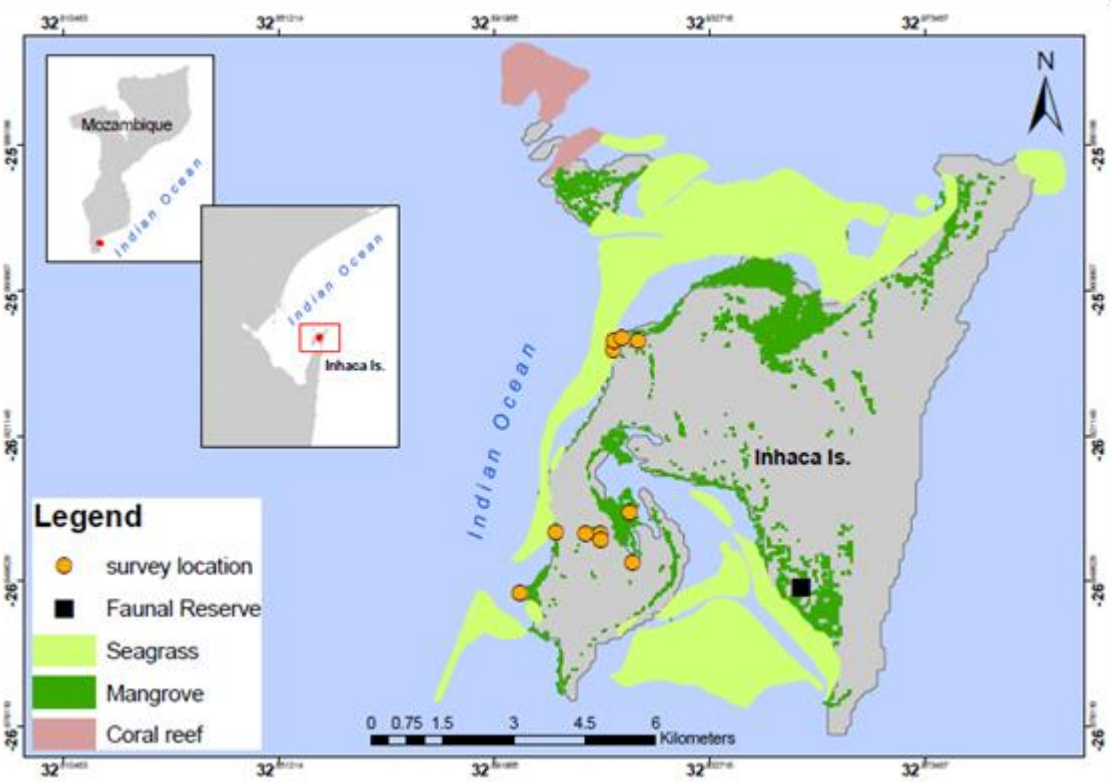
APPENDICES

MAPS

1. A Map of the study area



2. Map of Marine Resources in Inhaca Island



LETTER OF INTRODUCTION/AUTHORISATION.

UNIVERSIDADE
EDUARDO
MONDLANE

Faculdade de Ciências
Departamento de Ciências Biológicas

Dear Ms Risper Atieno Oteke
(Address: Pan African University, Institute of Water and Energy Sciences, Argelia)

INVITATION LETTER

This is kindly to invite Ms Risper Atieno Oteke (Passport number C042015, Expiry date: 01 September 2026) a Masters student from Pan Africa University (Argelia) to take part in the field work survey at Inhaca Marine Research Station, to be carried out together with a team from the Universidade Eduardo Mondlane, Dept of Biological Sciences.

Ms. Oteke is to conduct an assessment of gender barriers to marine resources access with a case of Inhaca Island in Maputo Bay.

Risper Oteke will be staying at Inhaca Marine Biological Research Station during the period April to June 2018.

Yours sincerely,

Maputo, 21 March 2018

Salomão Bandeira, Assoc.Prof. marine botany
Departamento de Ciências Biologicas
Universidade Eduardo Mondlane
PO Box 257, Maputo, Mozambique
Phone: +258 21 410100 Ext 1745; Mobile: +258 843983290
Email: salomao.bandeira4@gmail.com

QUESTIONNAIRES

Questionaire A

HHS

Nr:

Date:

Village name:

I. Personal data

1. Sex:
a) ()Male b) ()Female
2. Number of household members
a) ()1-3 b) ()3-6 c) ()Above 6
3. Who is the head of the family?
a) () Father b) ( ) Mother c) Other:
4. Does he/she work?
a) ( ) yes b) ( ) No
5. Which kind of activity he/she does?
6. Which is your Education level?
a) ( )No education b) ( )Primary / ordinary level c) ()Secondary level d) ( )University level

II. Resource access and control

7. Are you aware of the marine resources around your area?
a) ( ) yes b) ( ) No
8. Name them.
9. Which are the resources that you access? (and the facilities)
10. Which are the resources you don't access?

Questionaire B

Focused Group Discussion

Group gender: Women

Date:

Village name:

Dear Respondent,this questionnaire is for study purposes to assess the gender barriers to resource access in Inhaca Island. The purpose is to propose and recommend sustainable policies that enhance marine resource access and management. Through this brief survey, your responses shall be treated as confidential as possible. Your free will to answer the questions shall be greatly appreciated.

I. Personal data

1. Which is your Education level?
a) ( )No education b) ( )Primary / ordinary level c) ( )Secondary level d) ( )University level

II. Resource accessing control

2. What marine activities are you mainly engaged in?
3. What challenges do you encounter in your daily marine activities? What you think are the causes?
-
4. What other alternative activity apart from main activity are you engaged in? What do you think about fishing as a livelihood?
5. How is the management structure over the marine resources you access?
6. What best ways do you think we can engage to get the best out of the marine resources you access?

Questionaire C

Focused Group Discussion

Group gender: Fishermen

Date:

Village name:

I. Personal data

1. Which is your Education level?
a) ( )No education b) (x)Primary / ordinary level c) ( )Secondary level d) ( )University level

II. Resource accessing control

2. What marine activities are you mainly engaged in?
3. What challenges do you encounter in your daily marine activities? What you think are the causes/ barriers?
4. What other alternative activity apart from main activity are you engaged in?
5. How is the management structure over the marine resources you access? 6. Do you have a formal or an organization amongst fishers to lobby for your needs and concerns?
7. What best ways do you think we can engage to get the best out of the marine resources you access?
8. What previous activities did men engaged in? What were the barriers?
9. What is your opinion in engaging woman in fishing activity as a livelihood?
.

INTERVIEW GUIDE
Verbal Consent
You have been selected to voluntarily take part in this interview for purposes of research. The primary goal is to assess the gender barriers to marine resources access in the Island of Inhaca. Your response shall be treated with great confidentiality and you are free to respond and not to where you are not comfortable. The exercise shall last approximately 30 minutes. Your cooperation shall be greatly appreciated. Would you like to proceed with this interview?
M F
Community status
Question
1. How long have you stayed in Inhaca Island

2. What are the changes in terms of the environmental conditions in the area

3. What major economic activities are carried out in Inhaca?

4. What are the constraints to undertaking these activities? Kindly explain

5. Are there laws and policies that hinder the access to marine resources use in this island. Which are they? Are there those that promote them

6. What are the marine resources that are exploited or used widely in the Island and what have you observed in their availability over time

7. What opportunities and threats exist in this community in therms of resources management

8. What is the status of women in resource access and management in this Island. What is your view of women involvement in decision making and management of marine resources in Inhaca?

9. Kindly explain any management efforts that can be used in the area

10. How is the involvement of government, community and other stakeholders in the resources within the reserve

11. Are there any conflicts of interest within the reserve. What benefits do the reserve or resources around the marine area provide?

12. Where are the major resources valued by the community located?

13. What is your opinion on the education level and resources use in the Island

14. Dou you support the empowerment of women in Inhaca? Why?

15. What structures are there for the fisheries and farmers in this area

Thank you for your participation in this exercise.