ASSESSING GENDER ROLES IN DAGAA FISHERY VALUE CHAIN AMONG FISHING COMMUNITIES ON LAKE VICTORIA BEACHES IN SIAYA COUNTY, KENYA

BY

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C50/CE/28274/2013

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN GEOGRAPHY IN THE SCHOOL OF HUMANITIES AND SOCIAL SCIENCES, KENYATTA UNIVERSITY

SEPTEMBER, 2020

DECLARATION

This thesis is my original work and has not been presented for any degree or award in any university.

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This thesis has been presented with our approval as the University appointed supervisors.

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DEDICATION

This thesis is dedicated to my Lord Jesus Christ for His mercies and grace to complete this work.

ACKNOWLEDGEMENT

I extend my sincere thanks and appreciation to my supervisors: Dr. Ishmail O. Mahiri, and Dr. Francis O. Onsongo for their support, intellectual guidance, and constructive criticism throughout the period of this study. Many thanks also go to all lecturers of Geography Department of Kenyatta University.

I also acknowledge the efforts made by all the fishers, Dagaa processors and traders at Usenge, Bonge, Nyenye, Wich Lum, and Osieko beaches of Lake Victoria in Bondo sub-County. The input placed in the entire process of my study cannot go unmentioned especially for their willingness to take part in the study. Mr. John A. Nyongesa deserves gratitude for editing the final work and valuable insights offered through discussions.

To all my family members; my father Joseph Odhone, my dear wife Nancy Ogoma and my children Pheny Warren, Hilda Heri and Malia Mugenda for the great encouragement you offered and more so for according me humble time and resources during the study.

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OPERATIONAL DEFINITION OF TERMS

Access: Women gain access to resources such as labor, credit, training marketing facilities, public services, and benefits on an equal basis with men.

By-catch: Unwanted fish and other marine creatures trapped by commercial fishing nets during fishing for Dagaa.

Conscientization: Women believe that gender roles can be changed and gender equality is possible.

Control: Women and men have equal control over factors of production and distribution of benefits dominance or subordination

Dagaa: A type of small fish species scientifically known as *Rastrineobolaargantea,* commonly found in Lake Victoria fresh water, locally known as *Omena.*

Fishery: It is an economic activity aimed at exploiting the worthiness of a specified fish resource. With regards to the study, it is the Lake Victoria Dagaa resource.

Fishing communities: These are individuals inhabiting regions around natural huge water bodies such as rivers, lakes, and oceans and fishing is their sole economic activity.

Gender roles: These are the major determinants of the labor spread between men and women, and therefore reflecting on power relations between them.

Gender:	Is a conception that focuses on the responsibilities of and relationship between men and women which are influenced by factors that are dependent on the ethnicity, society, culture, religion, and politics rather than biology.
Harvesting:	It is a role of catching fish from water bodies through various methods such as boat and net.
Participation:	Women have equal participation in decision-making in all fishery progress and policies.
Processing:	It is a post-harvesting activity meant to prepare raw fish which preserves it ready for future use.
Value chain:	the process or activities by which a value is added to a product, including production, marketing, and the provision of after-sales service.
Welfare:	Women's material needs such as food.

ACRONYMS

CPR:	Common Property Resource
GAM:	Gender Analysis Matrix
GAP:	Gender action plans
SACCO:	Savings and Credit Co-Operative Society
UDHR:	Universal Declaration of Human Rights
UN:	United Nations
SPSS	Statistical Package for Social Scientists

ABSTRACT

Fisheries in the East Africa region have suffered due to less emphasis given to some fishery specifically Dagaa (*Rastrineobolaargentea*), whose quantity is the highest of all the species in the Lake Victoria. Despite the importance of this resource in Kenya, there has been a concern of gender parity and inequality in terms of roles played by both gender in harvesting, processing, trading and marketing in the Dagaa fishery. This study analyzed gender roles in Dagaa Fishery Value Chain among fishing communities around Lake Victoria in Bondo Sub County, in Siaya County, Kenya. The study addressed the following objectives: Identified the various roles of men and women in Dagaa Fishery Value Chain, discussed factors influencing gender roles in Dagaa Fishery Value Chain, analyzed the barriers to women's participation in certain Dagaa Fishery Value Chain and examined the strategies to overcome challenges in gender roles in Dagaa fishery value chain in Bondo Sub-County, Siaya County. The study adopted a cross-sectional research design. This study was guided by two models; gender analysis framework model that was developed by Sarah Longwe and supply chain model. Purposive sampling technique was used to select Bondo Sub-County and fishing community in Bondo Sub-County; random sampling technique was used to select five (5) fish landing sites/beaches where quantitative data were collected from 186 out of the targeted 188 primary respondents, from among the forty-four beaches of Lake Victoria in Bondo Sub-County. Quantitative data was analyzed using SPSS Version 25, and descriptive statistics such as frequencies and percentages were used in presenting analyzed data. The results were presented using tables and charts. The study findings revealed that majority of the boats and fishing gears were owned by men, motorized boats belonged to men while a higher percentage of females still had the paddled boats. While men dominated the fishing of Dagaa, women dominated processing and trading of Dagaa in the beaches. The study noted that men made higher returns than their female counterparts at all levels of Dagaa fishery value chain. The study concluded that there is a still wide disparity among gender roles in Dagaa fishery value chain. Most of the activities in the value chain are still dominated by men. This study recommends that women be encouraged to take part in Dagaa fishery value chains, empowerment of women to take part in transportation and distribution of Dagaa and application of various strategies such as joining SACCOs to access loans at low interest rates, formation of groups for ease of access to credit services and weakening patriarchy to mitigate factors affecting Gender roles in Dagaa fishery value chains.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Globally, fishery industry plays a significant role in the livelihoods of many people in terms of creation of employment, income generation and provision of principal protein to the diet (Funge-Smith and Bennett, 2019). In China, Hamilton-Hart and Stringer, (2016) posted that fisheries industry has ranked high among others in its contribution to the global economy. However, there is disparity in terms of gender roles in fisheries industry since this sector is mostly dominated by men.

According to Adhuri, *et al.,* (2016) gender roles is critical in value chain analysis. In Indonesia and Sri-Lanka both men and women take part in the supply value chain to help identify and understand the major opportunities for upgrading and the driving constraints to market growth of the fisheries sector (Boonstra, *et al.,* 2018). Frangoudes and Gerrard (2018) stated that globally, the segment of fisheries is viewed as the male domain. Therefore, it only appreciates the involvement of men while neglecting the endeavors of women (Stacey, *et al.,* 2019). Dosu, (2017) states that women among fishing communities around the globe are economically vulnerable and occupy fewer social positions since fishery is a tedious and risky venture thus men tend to safeguard their women from taking part in it.

However, there are global policies instituted by the UN geared towards promoting women's Economic and Social wellbeing. A typical global policy is the

Convention on the Elimination of all Forms of Discrimination against Women (CEDAW-Beijing). This is an international treaty adopted in 1979 by the United Nations General Assembly. These policies promote gender equality and advancement of women. They play a role in ensuring gender neutral language in the draft Universal Declaration of Human Rights (UDHR). Kenya shared the progress it has made in terms of policy and legal frameworks to entrench gender equality. Article 27 of the 2010 Constitution guarantees equality and freedom from discrimination stating that every person is equal before the law and has the right to equal protection and equal benefit of the law. The government has also put in place the State Department of Gender under the Ministry of public service, Youth and Gender with the mandate to: Promote the development and review of gender policies and legislations, and to oversee the implementation of socio-economic empowerment for the benefit of women. In contrary, article 27 of the 2010 Constitution is often ignored and unfairly adopted within the fishery industry hence translating to fewer women engaged in Dagaa fishery value chain.

Frangoudes and Gerrard, (2019) indicates that nations such as; Iceland, Norway, Finland, Sweden, New Zealand and Ireland, have progressed in gender equity. As a result, they have enhanced women economic and social well-being. On the other hand, Meetei, Saha, and Pal, (2016) found out that 46% of fisheries activities such as pre-harvesting and post-harvesting duties were carried out by women. Majorly, women's activities in regards to fisheries are the key contributors to household welfares. Other finding showed that women's activities received inadequate coverage and they gained reduced earnings compared to activities of men (Máñez,

and Pauwelussen, 2016). In all, full-time and part-time fisherwomen accounted for just 3.1 per cent of registered fishers in Norway in 2016 (Meetei, Saha, and Pal, 2016).

In the African countries, factors that lower the access of women to fisheries resources include: laws, uncomplimentary national regulatory constructions, and beliefs (Rekha and Minimol, 2017). These restrict women ability in the fishery value and are branded as the informal contributors in many developing countries in which Africa countries belong. Women face barriers to access and control of key fisheries assets, such as boats, capital, expertise, technologies and extension services, which are vital to ensuring stable fishing livelihoods.

Although most African governments recognize gender as a cross-cutting problem, fisheries policies rarely, if ever, include measures to improve gender equality and allow women to participate in the fisheries value chain (Torell, et al., 2019). Government-led gender integration appears to focus on supporting the post-harvest processing sector by encouraging value-chain changes and addressing social needs (Torell, et al., 2019). There is also a need for gender inclusion to collaborate with the national government to expand the scope of gender roles in fisheries policy to include decision-making (Harper, et al., 2017).

Alonso-Población and Siar (2018), state that West African women provide substantial value to the fisheries sector. Yet they seldom participate in fisheries management. Women who are dependent on fisheries for their livelihoods and

families' upkeep are directly impacted by changes in fisheries policies and rules. Hence, there is an incentive for women to be active agents of change in the fisheries sector. However, women working in fisheries face many barriers. Women's participation is often constrained by time (the result of household and reproductive responsibilities), education (literacy), access to capital, cultural rules, mobility due to household responsibilities, and discriminatory laws, among other barriers (Langworthy, 2018).

In East Africa and particularly in Lake Victoria, Dagaa fishing is still dominated by male counterparts (Mgana, et al., 2019). Men therefore, form the main owners of fishing gears such as motor boats propelled with engines (Onyango, 2017). Off-shore fishing is regarding as a sustainable practice as such as it captures mature fish. Once the fish is brought at the landing sites, mostly women transfer the catch from the fishing boats to the drying area (Jones, *et al.,* 2018).

Due to the little attention Dagaa fishery gets, there are few studies done on this fishery more so on the gender roles and its significance on the Dagaa Fishery Value Chain. This study sought to identify the roles played by men and women in Dagaa fishery to make it both a reality and good to the fishing communities of the study area.

1.2 Statement of the Problem

The Dagaa fishery and value chain consists of male and female crews. However, the proportion of female engaged in fishery value chain is often low. There are

development and review of gender policies to oversee the implementation of socio-economic empowerment for the benefit of women. For instance, article 27 of the 2010 Constitution guarantees equality and freedom from discrimination stating that every person is equal before the law and has the right to equal protection and equal benefit of the law. As a result, both men and women have the right to take part in any economic activity. Nonetheless, these policies are ignored and unfairly adopted within the fishery industry hence translating to fewer women engaged in Dagaa fishery value chain.

Despite the fact that Dagaa Fishery Value Chain is both men and women affairs, there have been a lot of assumptions associated with the responsibility of women and their contribution to the Fishery Value Chain. Allocation of fishing rights to women has faced serious short fall. There have been factors lowering the access of women to fisheries resources including unfriendly cultural beliefs, nature of fishing area, patriarchal communities and lack of safety and security on the lake at night (Rekha and Minimol, 2017). These restrict women ability to take part in Dagaa fishery.

Due to the little attention Dagaa fishery gets, there are minimal studies done on fishery value chain more so on the gender roles and its significance on the Dagaa value chain. As such, there is a need to examine gender roles in Dagaa Fishery Value Chain. This study sought to assess the gender roles in Dagaa fishery value chain among the fishing communities living around Lake Victoria in Bondo Sub County, Siaya County.

1.3 Objectives of the Study

General Objective

The general objective of this study was to assess gender roles in Dagaa Fishery Value Chain among fishing communities around Lake Victoria in Bondo Sub-County, Siaya County.

Specific Objectives

The study sought to achieve the following specific objectives:

i. To identify the various roles of men and women in Dagaa fishery value chain in the fishing communities in Bondo Sub-County, Siaya County.
ii. To discuss factors influencing gender roles in Dagaa fishery value chain in Bondo Sub-County, Siaya County.
iii. To analyze the barriers to women's participation in certain Dagaa Fishery value chains in Bondo Sub-County, Siaya County.
iv. To examine the strategies to overcome challenges in gender roles in Dagaa fishery value chain in Bondo Sub-County, Siaya County.

1.4 Research Questions

This study addressed the following research questions:

i. What are the various roles of men and women in Dagaa fishery value chain in the fishing communities in Bondo Sub-County, Siaya County?
ii. What are the factors influencing gender roles in Dagaa fishery value chain in Bondo Sub-County, Siaya County?

iii. What are the barriers to women participation in certain Dagaa Fishery value chains in Bondo Sub-County, Siaya County?

iv. What are the strategies to overcome the challenges in gender roles in Dagaa value chain in Bondo Sub-County, Siaya County?

1.5 Justification and Significance of the Study

This study focused on gender roles in Dagaa Fishery Value Chain since gender is an important consideration in development. It is a way of looking at how social norms and power structures impact on the lives and opportunities available to different groups of men and women. The study plays an important role in demonstrating how women are less likely than men to take part in Dagaa Fishery Value Chain. It thus helps in understanding that men and women face different barriers in accessing economic resources, and demonstrates the right interventions that can promote equal participation of men and women in Fishery Value Chain.

The study is important both to men and women of the fishing communities since it can help them to understand gender roles in fishery value chains. The dynamics behind gender roles in Fishery Industry is demonstrated as a prerequisite for understanding individuals' access to and distribution of economic resources, the ability to make decisions and the way women and men are affected by social and economic development.

This study is equally important to fishery departments. Through this study, fishery department can acknowledge and incorporate gender role in fishery value chains inequalities. It can also help fishery department to foster sustainable economic growth since a higher level of imbalanced gender roles in fishery sector can be associated with higher risks of conflict.

Lastly, the study is important to the academia since it enhance the knowledge of gender roles, and how men and women control Fishery Value Chain. This information can be used to benchmark Kenya Fishery Value Chain against other countries in the Africa region. In addition, the knowledge generated from the Gender Role Value Chain in Dagaa Fishery study can be shared with other countries in East Africa region with almost similar fishery value chain practices.

1.6 Scope and Limitations of the Study

The study focused on the gender roles in the Dagaa fishery value chain among the fishing communities living along Lake Victoria beaches of Bondo Sub County, Siaya County. The study explicitly looked at the contribution of both gender at each stage on the value chain of Dagaa fishery in the study area.

The limitations this study faced were that some respondents were illiterate; therefore, they could not effectively read and fill the questionnaires. The researcher therefore had to read and translate all the information in local dialect which was somewhat tedious and time-consuming. Besides, most respondents in the study area were poor and therefore, asked for financial incentives for their time spent with the researcher. A good number of them were not willing to give information without the incentive. Nonetheless, the researcher had adequate respondents from which study sample were drawn to fill up the gap left by uncooperative respondents.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section presents review of relevant literature pertaining to key variables as well as themes of this study. This included literature focusing on identifying the various roles of men and women in Dagaa fishery value chain; factors influencing gender roles in Dagaa fishery value chain; the barriers to women's participation in certain value chains in Dagaa fishery value chain and the strategies to overcome challenges in gender roles in Dagaa fishery value chain. The chapter also discussed the theoretical and conceptual frameworks adopted by this study.

2.2 The Various Roles of Men and Women in Dagaa Fishery Value Chain

Harper, et al., (2017), argues that the central role of women in fisheries in maritime countries is ignored in management and policy formulation. Women make a major difference to the world's fishing economies. The role of women in fisheries is under-estimated (Rohe et al., 2018). The Dagaa fishing and supply chain consists of ownership of fishing vessels, dealers, transporters, importers, distributors and customers. The chain is a global network, covering hundreds of internal and external markets in other countries and involving thousands of people. The distribution route begins from the fisherman to small-scale traders who, in effect, either sell directly to distributors or to wholesalers and the chain continues to retailers and distributors (Mayala and Kristófersson 2018).

Bronnmann and Asche (2017), states that there is substantial experimental data indicating the serious disadvantage among women to access fisheries and its

resources. Women are not equally represented in equipment and storage ownership (Lynch *et al*., 2016). Likewise; they are disadvantaged in finding market. A study conducted by Thilsted, et al., (2016) established that women play a significant role in fishery industry. In addition, through women participation in fishery value chain, there is promotion in families' welfare in terms of reduced post-harvest losses and increased value addition.

According to Hakim (2016), gender is fundamental in ensuring that women and men undertake diverse or same activities. Both men and women have dissimilar resources, experiences, as well as diverse decision-making responsibilities in fisheries value chain. On the other hand, lack of recognition of women's responsibilities in fisheries practices limits women's role in fishery industry (Koralagama et al., 2017).

A research by Mayala and Kristófersson (2018) in Tanzania found that Dagaa processing is largely a women's reserve at several landing sites. The vendors in Tanzania are made up of both sexes, but mostly the work is dominated by women. Wet Dagaa, however, is transported by male bicycle vendors to various estates where it is easily purchased by customers who choose to handle the fish themselves (Allegretti, 2019).

Limbu et al., (2017), established that fisheries around Lake Victoria are characterized by gender imbalance. In reality, the majority of men in Dagaa fisheries are engaged in processing and trading. Many of the operators in Dagaa

business also belong to middle-aged people who probably must have accrued savings that could be invested in Dagaa trade. Odhiambo, (2019) indicated that gender distribution in Dagaa fishery is averagely 55 per cent males and 45 per cent females. Generally, women are the lowest proportion in Kenya.

2.3 Factors Influencing Gender Roles in Dagaa Fishery Value Chain

There many factors that influence gender role in fishery industry and these are well established in previous studies on fishery supply chain (Kawarazuka, et al., 2017). These factors comprise of: enhanced skills and education; market dynamics and changing cultural values spread through global media (Kleiber, et al., 2017). Ownership and access to fishing resources such as the common property resource (CPR) including water bodies and markets are also important, but only where both women and men can equally feel involved. Similarly, the present study examined factors influencing women engagement in Dagaa fishery value chain in Bond Sub-County.

Manyungwa, et al. (2019) claims that involvement in the fishery value chain to a great extent is influenced by the socio-economic growth of the key players in fishery sector. According to Jeyanthi and Chandrasekar (2017), the value chain of fisheries is the method of taking fish from harvesting through various stages of processing and distribution to the customer. While men and women engage in different fisheries value chain projects, women have been restricted to less competitive form of utility that has had an effect on their level of access and control of fisheries resources. This was influenced by social, cultural and

economic factors like gender roles, history, beliefs, attitudes and norms (Chandran and Aleidi, 2018).

Alonso-Población and Siar (2018) observed that women are always exempted when there is the introduction of certain resource as well as through community-based preparation. They are generally constrained from access to transport and other fishing resources. Women significantly work in low-status, semi-talented and less paid fishery value chains. This likewise decreases their prospect of advancement in correlation with men who win as managers and gifted specialists (Khan, et al., 2018). Division of labour among the rural communities also contributes towards depriving women an opportunity to actively participate in fishery activities.

Women in the value chain of fisheries account for a large majority but are least ranked in terms of access and control of economic resources (Gardner et al., 2017). The rationale for this is centered on structural prejudice and patriarchal policies, financial restrictions and socio-cultural factors that restrict women's access to entrepreneurial opportunities (Kleiber, et al., 2017). The consequences of this are evidence of disparities between females and males at the level of performance in the value chain of fisheries based on male control of productive resources; thus, women continue to work in a challenging economic and socio-cultural environment (Kaminski, et al., 2018).

In Kenya, MA (2016) noted that although the fisheries value chain is characterized by a high participation of women; mostly single, divorced and widowed, their participation in the value chain has lower economic potential. Culture and norms are essential factors that might have affected the lower end fisheries value chain for women and further acted as an informal regulatory mechanism that influences access and control of resources. According to Vuki and Australia, (2016) management of fishery resources in the value chain is a job for men, while women are typically more engaged in post-harvest activities such as smoking, drying and subsistence marketing. This degree of participation gives women a small profit margin relative to that gained by the men who manage the resource.

2.4 The barriers to Women's Participation in Dagaa Fishery Value Chain

Policy makers in different parts of the world assume that fisheries are the domain of males (Frangoudes and Gerrard, 2018). Haimbala, (2019) found out that three-quarters of individuals involved in fisheries were women that were critical in post-harvesting processes and marketing. The current global data reflects positive initiatives in providing quantitative confirmation as well as the position of women with regards to fishery production (Béné, et al., 2016).

There are systems that tend to under value the fish resource access by women to help them participate in fishery value chains (Arthur, Leschen and Little, 2015). In addition, limited institutionalized capacity poses barriers to women ability to engage in fishery value chains among the fishing communities. Although there is

a substantial improvement in Dagaa fishery value chain, the fishery is still considered to be of low economic value despite its abundance in quantity (Kolding, et al., 2019). The shortcoming does not only demean the fishery but also reflect an inadequacy in knowledge on the fishery's wealth, source of livelihood to significant populations and importantly, the vital role of women in fishery value chain.

Kizito, et al. (2017) did a study in Kenya to assess the role of men and women in entrepreneurial fisheries in Kenya. The study focused primarily on Nairobi City County and was driven by different areas in the fisheries value chain that men and women participate in. The reviewed study also identified socio-economic factors that act as barriers to women participation in fishery value chain. Due to low income and less accessibility to fishery value chain resources, they to a low degree engage in fishery value chains. This present study aimed at determining the barriers to women participation in Dagaa fishery value chain among women in the fishing communities in Bondo Sub County.

According to Rohe, et al., (2018) women often have no control over income earned from fisheries' activities. Women lack opportunities to hold managerial and decision- making posts. The main obstacles appear to be a lack of confidence in their abilities to hold such positions, as well as finding sufficient time to do so. As a result they hold back from participating in fishery activities. The current study aimed at examining the barriers to women participation in Dagaa fishery value chain in Bondo Sub-County.

2.5 Strategies to Overcome Challenges in Gender Roles in Dagaa Fishery Value

In Asia, Bosma, et al. (2019) claims that gender action plans (GAPs) have been a political issue for human rights and welfare for many decades. Most countries have also embraced gender equality in order to facilitate fair access for both sexes to education, work and finance. Two workshops on GAPs in the fisheries sector raised the question on what is lacking in the Asian sectoral GAPs (Jaquette, 2017). All Asian countries have GAPs for fisheries, but are faced with constraints to achieve their objectives in terms of fair access for women. Gender Action Plans allow the contribution of women to aquaculture to go beyond the conventional gender divide.

According to Millar, et al. (2017) in the uplands of Vietnam, people have historically regarded fish farming as male activity. Women were not very interested and had no say about what strategies to use or what investments to make. Nonetheless, women have recently been involved in most stages of fishing value chains in the North. They own and run farms and manufacturing firms. This has been facilitated by capacity building, which allows women to improve fishery skills during their reproductive life (Sari, et al., 2017). In addition, through planning and policy making, women's voice have become strong and their role and opinions in fishery industry being heard by men (Koralagama, Gupta and Pouw, 2017).

At the other hand, Cambodia, the Philippines, Thailand and Vietnam are marked by a weak patriarchy, which means that there is no or restricted cultural ban at women's involvement in any income-generating activity (Jang and Kim 2018). The weak patriarchy enables women to be flexible and their roles negotiable (Xheneti, et al., 2019). Men and women work together to set up joint ventures that contribute to their diverse portfolio of livelihoods. The division of labor by sex is less explicit and this is shown by examples from Vietnam as well as the Philippines (Patel, 2017).

Abolishing common views at consecutive symposiums on gender in fisheries encourages women's involvement in value chain fisheries (Obwanga, et al., 2017). However, the understanding of the allocation of tasks between men and women varied from that of the actual tasks performed by women. In Vietnam, the role of women in the marketing of fish is significantly higher, although they are not involved in any action without men's help (Harper, et al., 2017). The presence of men, even if it is small, may explain the fact that given the active role of women in aquaculture. Many people still feel that aquaculture is a male operation, with women considered to be largely confined to processing and marketing activities (Choudhury, et al., 2017).

2.6 Research Gaps

Dagaa fishery value chain in the fishery industry in Kenya creates employment to numerous people more so the fishing communities living around Lake Victoria. It is not an industry that can be done away with altogether without serious socio-

economic repercussions. Under efficient management, fishery is one viable way to grow economically in comparison to other sectors.

Rohe et al., (2018) observed that gender roles in fisheries is under-estimated although women seem to own fishing vessels. Bronnmann and Asche (2017), states that there is substantial experimental data indicating the serious disadvantage among women to access fisheries and its resources. Women are not equally represented in equipment and storage ownership (Lynch *et al*., 2016). According to Hakim (2016), both men and women have dissimilar resources, experiences, as well as diverse decision-making responsibilities in fisheries value chain. Mayala and Kristófersson (2018) in Tanzania found that Dagaa processing is largely a women's reserve at several landing sites while me mainly is transported wet Dagaa by bicycles to various estates. Lastly, Limbu et al., (2017), established that fisheries around Lake Victoria are characterized by gender imbalance. The reviewed studies only examined the general gender roles in fishery sector but not specific to various roles played by women. It thus creates a gap that the present study focused on.

Secondly, reviewed studies indicated that there are many factors that influence gender role in fishery industry and these are well established in previous studies on fishery supply chain (Kawarazuka, et al., 2017). These factors comprise of: enhanced skills and education; market dynamics and changing cultural values spread through global media (Kleiber, et al., 2017). Ownership and access to fishing resources such as the common property resource (CPR) including water

bodies and markets are also important, but only where both women and men can equally feel involved. Manyungwa, et al. (2019) claims that involvement in the fishery value chain to a great extent is influenced by the socio-economic growth of the key players in fishery sector. The empirical studies reviewed focused on factors influencing gender roles but were not specific on how such factors inhibits women participation in fishery value chains. The present study will focus on how such factors deter women involvement in Dagaa fishery value chain in Bondo Sub-County.

Thirdly, there are always a number of barriers to women participation in fishery value chains. These range from policy making which tend to assume that fisheries are the domain of males (Frangoudes and Gerrard, 2018). According to Arthur, Leschen and Little, (2015) there are limited institutionalized capacity which poses barriers to women ability to engage in fishery value chains among the fishing communities. Kizito, et al. (2017) also identified socio-economic factors that act as barriers to women participation in fishery value chain. Due to low income and less accessibility to fishery value chain resources, they to a low degree engage in fishery value chains. According to Rohe, et al., (2018) women often have no control over income earned from fisheries' activities. Women lack opportunities to hold managerial and decision- making posts. This present study aimed at determining the barriers to women participation in Dagaa fishery value chain among women in the fishing communities in Bondo Sub County.

Reviewed study on the strategies to address factors affecting gender roles in Dagaa fishery value chain indicated that in Asia, adoption of gender action plans (GAP) have created platforms for women to take part in fishery (Bosma, et al. 2019). According to Millar, et al. (2017) in the uplands of Vietnam, people have historically regarded fishery as male activity. However, women have been facilitated by capacity building, which allows them to improve aquaculture skills during their reproductive life.

At the other hand, Cambodia, the Philippines, Thailand and Vietnam are marked by a weak patriarchy, which undo cultural ban and allow women's involvement in any income-generating activity (Jang and Kim 2018). Abolishing common views at consecutive symposiums on gender in aquaculture and fisheries encourages women's involvement in value chain fisheries (Obwanga, et al., 2017). Although the reviewed studies showed out specific strategies for addressing factors affecting gender roles, they were not exhaustive. The present study exhaustively examined strategies for overcoming factors affecting women participation in gender roles.

2.7 Theoretical Framework

This study was guided by two framework models; gender analysis framework developed by Sara Longwe and supply chain model. The Gender framework model focused on women's empowerment which is often seen as a process that moves through five levels of intervention namely; welfare, access, heightened consciousness, participation and control. Supply chain model focused on networks between fishing communities and fish suppliers, their distribution a specific product to the final buyer.

2.8 Gender Framework Model

Gender framework model was developed by Sarah Longwe and it demonstrates gender analysis matrix (GAM). The purpose of Longwe's Women's Empowerment Framework is to move from gender inequality to substantive gender equity (farness in treatment) and equality (equal rights, responsibilities and opportunities of women and men, and girls and boys). The framework focuses on the provision of the needs of women followed by raising awareness of women's rights. The third through fifth steps involves facilitating women access, participation and ultimately control within three frameworks: Social-Cultural, Legal and Political sectors.

Sarah Longwe's Framework is a method to rise from gender inequality to gender equity and equality. In this model, women's empowerment is seen as a process that moves through five levels of intervention. Longwe considers that interventions intended for the empowerment of women offers women not only a clearer understanding of the existing social and political oppressions but also allow them to act to initiate change.

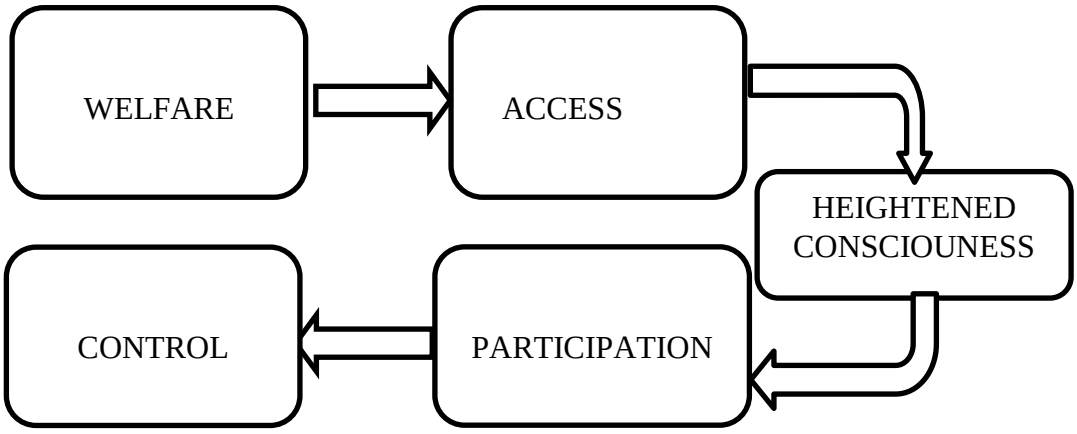

***Figure 2. 1*: Gender Framework Model developed by Sarah Longwe**

Source: Modified from Sarah Longwe Model by Researcher

2.9 Supply Chain Model

Nguyen, et al., (2018), describes supply chain model as a network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network includes different activities, people, entities, information, and resources. In this study, the supply chain model depicts fishing activities of boat owners and fishers in the supply chain value. Fresh market, artisanal processors, traders/middle men and factory agents/processors receive from the first component of the chain, and lastly either feed the domestic/regional markets or international markets. The model helped the researcher to identify gender roles in the fisheries and assisted in modifying/establishing specific supply chain of Dagaa fishery for this study. From the model, fishers and boat owners sell the Dagaa directly to factory agents, middlemen, traders or consumers (on low scale). The cohort takes to the processors and market which sell to retailers and consumers. Middlemen also sell Dagaa to the international, regional and domestic market.

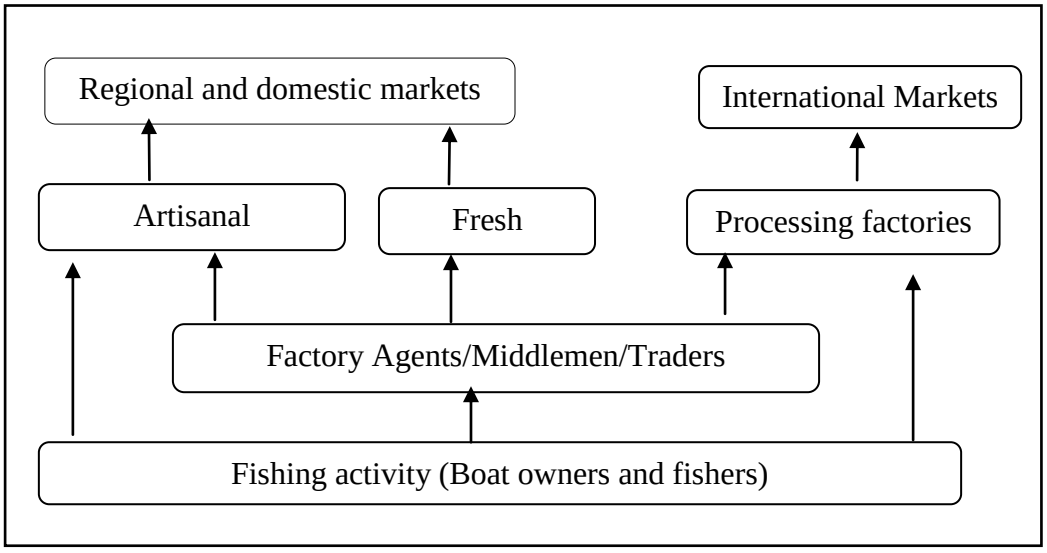

Figure 1.2: **Lake Victoria Dagaa Fishery Supply Chain Model**

Source: Adapted and modified from Pollard (2008).

2.10 Conceptual Framework

This study adapted the Global Value Chain Analysis Framework. Through the value chain analysis, each node was mapped and analyzed. The term value chain describes the full range of activities that firms, producers and workers do to bring a product from its conception to its end user (Campling and Selwyn, 2018). According to Hara, et al., (2017) fishery value chain is operationally defined as a set of interdependent economic activities and a group of vertically linked economic agents (men and women). Fishery value chain can be seen as a vehicle through which organizational relations and networks are linked and connected.

Hamilton-Hart and Stringer, (2016) argue that a Value Chain is characterized by its network structure rather than only vertical relations and linkages including governance form and the way value is added. Manyungwa-Pasani, et al., (2017) assert that properly applied value chain analysis can be a powerful tool for addressing gender inequalities in markets.

In the context of Dagaa Fishery in Bondo Sub County, a value chain consists of established production and distribution networks. Initially, Dagaa fishery value chain was dominated by men while currently it has both men and women participants. In order to establish the factors that hamper and constrain women's participation in the value chains, the study adopted both vertical analysis, to focus on inter node dynamics and specific actors, and a horizontal analysis, to take account of constraints at each node and in the specific contexts of the study sites.

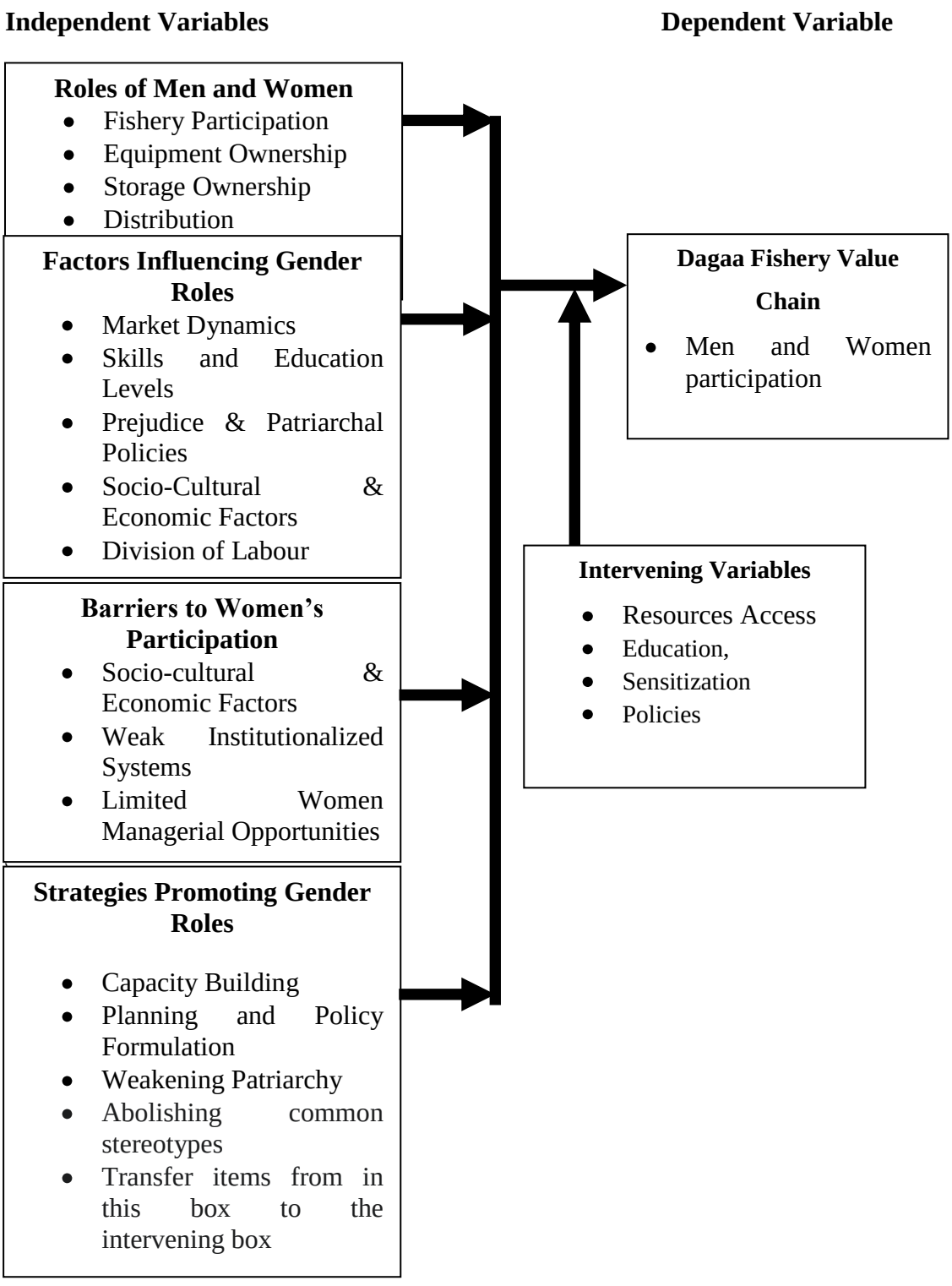

Figure 2.2: Conceptual Framework

Source: Author 2018

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines methods used to carry out the study and collect research information. It describes the study site, population, sampling strategy as well as instruments of data collection, analysis and presentation.

3.2 Cross-Sectional Research Design

This study adopted a cross-sectional research design to establish determinants of gender roles among the fishing communities in the study area. The design was relevant for this study since it helped in exploring different interests and characteristics among fishing communities in the study area. The research design is also used widely because it aids in determination of various key aspects of the community (Leavy, 2017).

3.3 Study Area

The study specifically focused on Bondo Sub-County in Siaya County. Bondo Sub-County just like Rarieda Sub County borders Lake Victoria hence a main source of fish. Its Capital town is Bondo Town located 50 kilometres west of Kisumu, the provincial capital. In entire Siaya County, fishing activities to a greater extent take place within the beaches in Bondo Sub-County which justifies the choice of this site for this study. The main economic activity that takes place in Bondo Sub-County is Lake fishing, alongside its related activities such as fish

processing, trading, and boat/net repair. Subsistence crop farming and animal rearing are the alternative minor economic activities in the area.

Study Area Map

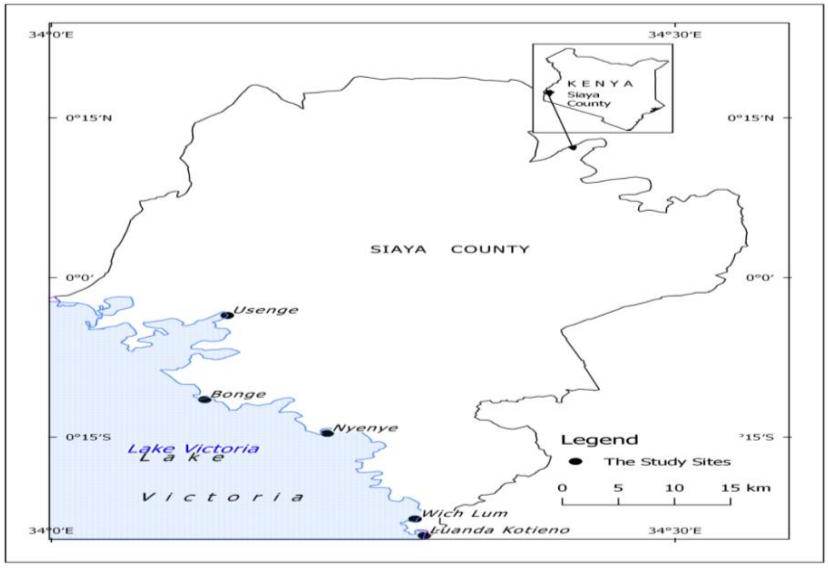

Figure 3.3: Fisheries in Siaya County

Figure 3.4: Fisheries Areas in Bondo Sub-County

Source: **Republic of Kenya (2015).**

Bondo Sub-County in Siaya County enjoys warm equatorial climate with an annual temperature of between 18^0C and 28^0C and an average annual rainfall of above 1500mm (Ochieng, 2018). Such conditions are conducive for the availability of freshwater fish species such as Nile Perch, Tilapia, and Dagaa (*Rostrineobolaagrentea*). According to the 2009 population and housing census, Bondo sub-County had a total population of 157,522, with a density of 266 persons per square kilometer, within a total area of 593 square kilometers (Republic of Kenya, 2009).

3.4 Target Population

The target population was the communities in Bondo Sub-County in Siaya County whose sole economic activity was related to fishing. This comprised fish dealers (boat and net owners, fishers, processing personnel, wholesalers and retailers) along Lake Victoria, drawn from selected fish landing sites/beaches. There were 40,852 registered fishers from the 44 beaches; (The Republic of Kenya, 2015). However, the total number of BMU officials and fishers in Usenge, Bonge, Nyenye, Wich Lum and Osieko beaches were 69 and 4373 respectively. Key informants, officials from Fisheries Departments and Beach Management Units were also involved in the study to provide details of relevant information.

Table 3.1: Targeted Population

Landing Beaches	BMU and Fishery Officials	Fishers
Usenge	15	1359
Bonge	13	748
Nyenye	15	740
Wich Lum	11	473
Osieko	14	1058
Total Population	**69**	4,447

Source: Field Data, (2018)

3.5 Sampling Techniques and Sample Size

This study used simple random sampling technique to select study participants in Bondo sub-County within Siaya County. This was so because simple random sampling helped focus on diverse category of the fishing communities in Bondo Sub-County hence it assisted in gathering credible data for this study. Boudah (2019), postulates that a sample of 10% to 30% of the population is adequate for educational research. Secondly, the researcher used random sampling technique to sample five landing beaches/sites (which was 11% of a total of 44 beaches along Lake Victoria in Bondo sub-County) to ensure that generalizations made from the study findings were reliable.

The five beaches sampled were Usenge, Bonge, Nyenye, Wich Lum, and Osieko Fishing Beach, all with a total of 4,447 registered fishers. A sample frame covering all the locations was preferred and relied on the existing beach management structures to select the respondents so that the samples were representative of the full range of location variability.

The sample size was calculated using the formula by Nassiuma (2000), from the 4,447 registered fishers of the five selected beaches:

$$n = \frac{NC^2}{C^2 + (N-1)\,e^2}$$

Where;

n = sample size

N = the population

C= coefficient variation (assumed to be 70%)

e =the standard error (assumed to be 0.05)

$$n = \frac{4447 \times 0.7^2}{0.7^2 + (4447-1)0.05^2}$$

$$= \frac{2179.03}{11.605}$$

$$= 187.76$$

Fishers = 188

Therefore, the sample size for quantitative data was 188 respondents consisting of fishers, boat operators, crews, repairers, traders and agents. Since all these people are part and parcel of the overall fishing activities, they were all considered under fishers for the purposes of this investigation. Table 3.1 shows the proportional distribution of the total sample size.

This distribution was based on the proportional size of the sampled beaches. Therefore, proportionate sampling was applied to distribute questionnaires to

respondents across all the five beaches. The number of current working and registered fishers/boats within the beaches were used as a basis for determining the relative number of respondents from each beach. Furthermore, the registered fishers from each beach were categorized as showed in table 3.1 from which the study participants were given the distribution using proportionate sampling as shown in Table 3.2. A list of registered fish dealers was obtained from the Fisheries Department and/or Beach Management Unit.

Sampling involved taking any name on the list from each location site where the starting point was selected randomly until the proportionate sample was attained. Random sampling removed biases on the research and thus provided a good representation of the target population.

Table 3.2: Sample Size Distribution for Fishers

Landing Beaches	**Fishers (Men)**	**Fishers (Women)**
Usenge	51	6
Bonge	33	1
Nyenye	30	2
Wich Lum	13	7
Osieko	41	4
Total Population	**168**	**20**
	188	

Source: Field Data, (2018)

3.6 Research Instruments

3.6.1 Research Questionnaires

This study used the questionnaire to collect data from the targeted sample size of 188 fishers (168 men and 20 women) from the selected 5 beaches of Lake Victoria (Usenge, Bonge, Nyenye, Wich Lum and Osieko beaches) in Bondo Sub-County. The questionnaires comprised both closed-ended and open-ended questions.

3.6.2 Interview Schedules

Interview guide was used to collect data from BMU officials and officials from fisheries departments. Interview schedule was conducted to obtain in-depth information on gender roles and how they influence women participation in Dagaa fishery and value chains.

Landing Beaches	**BMU and Fishery Department Officials**	
	Men	**Women**
Usenge	2	1
Bonge	2	1
Nyenye	3	1
Wich Lum	1	2
Osieko	2	1
Total Population	**9**	**6**

3.7 Pilot Survey and Pre-Testing

A pilot survey was conducted for this study using 19 respondents from other beaches in the study area that were not sampled for actual study in order to test the research instruments. The questionnaire and the interview schedule were pre-tested. Pre-testing was also used for training the three research assistants used in the study. According to Sorzano, et al., (2017) pilot sample should constitute 10% of the study sample. Therefore, 19 fishers were used in the pilot study. Piloting helped to pre-test the research instruments in order to validate and ascertain their reliability. Where necessary, questions in the instruments were adjusted or discarded in cases where the items were unable to meet the objectives of the study.

3.8 Validity and Reliability of the Research Instruments

3.8.1 Validity

The researcher used content validity to test the validity of the questionnaire and interview schedule. This was achieved by going through the items one at a time and comparing the contents of each of the instrument to ensure that it contained all the information required in line with the study objectives and variables of the study. The researcher also sought expert opinion on the instruments from his study supervisors. Items found to be unsuitable were removed while those with inadequacies were modified to improve the validity of the instruments.

3.8.2 Reliability

To improve the reliability of the instrument, the researcher critically assessed the consistency of the responses on the piloted instruments to make a judgment on their reliability. Brandmaier et al., (2018) defines reliability as a measure of the degree to which a research instrument yields consistent results on data after repeated trials. Therefore, in this study test-retest method was used to establish the reliability of the instruments. To achieve this, the researcher administered the questionnaire to 19 fishers from the study area. The interview schedule was also administered to one key informant.

After a period of one week, the researcher visited the same respondents and administered the questionnaire and the interview schedule to the same group for the test-retest. The collected data was then analyzed by comparing the responses of the two tests to ascertain the internal consistency of the questionnaire and interview schedule items from the two sets of data obtained. The correlation was calculated using Cronbach Alpha (α). This study will be interested on a reliability value of 0.75 since Taber, (2018) supports that acceptable values of alpha, range from 0.70 to 0.90. The Cronbach's Alpha formula is given as:

The correlation was computed using Cronbach's alpha method given by;

$$\alpha = \frac{p}{p-1}\left|1 - \frac{\sum_{i=1}^{p}\sigma_t^2}{\sigma_T^2}\right|$$

Where

p is the number of items in the scale

σ_i^2 is the variance of the ith item, i = 2

σ_r^2 is the variance of the entire test.

The responses from the test-retest yielded 0.89 for the questionnaire and 0.94 for the interview schedule. Therefore, the two research tools were considered reliable.

3.9 Data Collection

This study collected both quantitative and qualitative data, from primary and secondary sources. The primary data were collected by use of questionnaires, in-depth interviews. The researcher visited every sampled beach to seek for permission and booked appointments with the respondents. The visit also helped the researcher to familiarize himself with the participants before the actual study. Data was collected in three stages and done per beach. First, the questionnaires were administered to the fishers and were given 30 minutes to fill and return (Appendix I). The researcher then conducted the interviews with the Beach Management Unit officials and officials of Fisheries Departments (Appendix II).

Quantitative data was used in establishing gender roles in the Dagaa fish value chain. Qualitative data was meant to supplement quantitative data by answering the Why and How questions that ordinary quantitative data could not answer. According to Smith and Smith (2018) qualitative data is aimed at filling the explanation gaps resulting from the use of quantitative method in order to give a more complete picture of gender roles in fish value chain for possible

intervention. Information like fish harvesting, processing, socio-economic characteristics, and marketing depended on closed-ended questions.

On the other hand, open-ended questions captured detailed opinions like causes of difference among women and men in the Dagaa fishery sector. In-depth interviews using interview guides were used to collect qualitative data from Beach Management Unit officials and Fisheries Department officials on various issues related to the study (Appendices II). In-depth interviews were also used to collect information from officials of the Ministry of Devolution and Planning. Direct observation was used to establish the real-life situation on various gender roles and fishery value contributions and the information recorded in a field notebook.

Lastly, secondary data were obtained from resource centers such as the Fisheries Department. Secondary data included topographical maps, library documentaries, and journals.

3.10 Data Analysis

Data obtained from various sources was processed before being analyzed. Quantitative data was edited and coded before being entered in the Statistical Package for Social Sciences (SPSS) for analysis. The independent variables were; fish harvesting, fish processing, fish trading and fish marketing in Dagaa fisheries while the dependent variable was fishery value chain comprising of Employment, Turn over, Food security and Value addition.

Qualitative data was analyzed using Computer Assisted Qualitative Data Analysis Software (CAQDAS) where responses from the interviewees were examined and consistent themes were generated. This also involved quotations from the respondents. These were finally used to identify causes of gender differences in fisheries among the fishing communities of the study area.

3.11 Data Management and Ethical Considerations

Approval to carry out the research was obtained from the Kenyatta University Ethics Review Committee (KUERC). A permit was also obtained from the National Commission for Science, Technology and Innovation (NACOSTI). In addition, permission was obtained from the local administrations and also from the respondents before embarking on the research. This was alongside explanations on how the research would contribute towards enhancing the welfare of the local community in the study area as well as eliminating gender stereotyping. Privacy, dignity, and confidentiality of the respondents were considered during the research. Names of the respondents were not written anywhere in the research tools nor used in the reporting of the study findings.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study and their discussion. The findings from these results are arranged according to the study objectives. These results also include information on the questionnaire return rate and demographic characteristics of the respondents because these are pertinent in the interpretation of the results. The study focused on the following objectives: to identify the various roles of men and women in Dagaa fishery value chain, to discuss factors influencing gender roles in Dagaa fishery value chain, to analyze the barriers to women's participation in certain Dagaa Fishery value chains and to examine the strategies to overcome challenges in gender roles in Dagaa fishery value chain among fishing communities in Bondo Sub-County, Siaya County.

4.2 Questionnaire Response Rate

In this study, 188 questionnaires were issued out but 186 were successfully administered to the fishers giving a response rate of 98.94%. High response rate was achieved because the questionnaires were filled and returned while the researcher waiting. The other respondents who were illiterate were assisted by the researcher to fill the questionnaires. The researcher also conducted interviews with 15 key informants that were sampled from County Fishery Department offices and Beach Management Unit officials. This resulted in 100% response rate. Taherdoost, (2016) asserts that a response rate of 75.0% and above is adequate and therefore suitable for generalization of the outcomes to the target population.

Hendra and Hill, (2018) cautions that low response rates provide biased results. Therefore, this response rate allowed for reliable generalization of the data obtained from this study.

4.3 Demographic Characteristics

Information on demographic characteristics of the respondents that was considered in this study included gender, age, marital status, and level of education attained by the respondents.

4.3.1 Gender of the Respondents

The results according to the gender of the respondents were as presented in Figure 4.6.

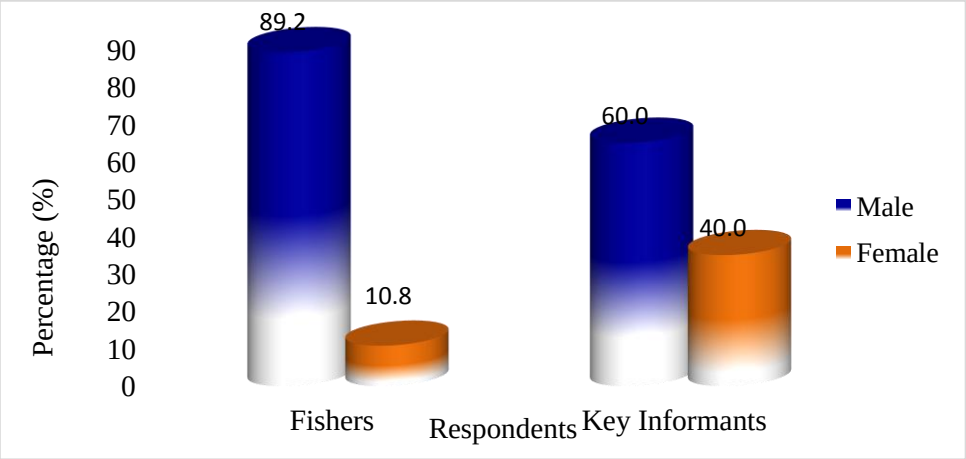

Figure 4.5: Gender of the respondents

Source: Field Data, (2018)

The results given in Figure 4.6 show that 89.20%of the fishers were male while 10.80% were female. The study also showed that among 15 key informants from

Beach Management Unit, Fishery Department and the Ministry of Devolution and Planning, 60.00% were male while only 40.00% were female. This reveals that Dagaa fishing is dominated by people of the male gender while females form a small proportion. This finding contradicts the common belief that fishing in the study area is 100% men's undertaking. The finding disagrees with that by Secretariat (2016) that an average of 55% males and 45% females are among Dagaa fishers.

4.3.2 Age of the Respondents

The study sought to determine the age of the respondents and the findings results were as presented in Table 4.3.

Table 4.3: Age of the respondents

Age of the Respondents	Frequency (n = 186)	Percentage (%)
Below 21 years	17	9.14
21 - 30 years	26	13.98
31 - 40 years	69	37.10
41 - 50 years	54	29.03
Above 50 years	20	10.75
Total	**186**	**100.00**

Source: Field Data, (2018)

The study revealed that 37.10% of the respondents were between (31-40) years of age, while 29.03% were between 41 and 50 years. The respondents below 21 years of age formed only 9.14% while those above 50 years were 10.75%. The average age of the respondents falls within (31-40) years. This finding agrees with that by Lake Victoria Fisheries Organization Secretariat (2016), which found out

that the average age of the fishers was 35.5 years. In this study, the majority of the respondents were 40 years and below. Lake Victoria Fisheries Organization Secretariat (2016) noted that the advantage of having youths in the Dagaa activities was that they were energetic to go fishing and move between landing sites and markets to sell Dagaa. They were also likely to be better educated and able to acquire knowledge and skills for quality control and business management. Mature people in the sub-sector, on the other hand, would have the advantage of having capital, either having saved it over the years or having collateral against which to obtain loans from financial institutions.

4.3.3 Marital Status of the Respondents

The study sought to establish the marital status of the respondents in the study area. It compared the marital status by gender to establish the variability among male and female gender. The results were as presented in Table 4.4.

Table 4.4: Marital Status of the Respondents

Marital Status	Gender					
	Male		Female		Total	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Single	7	3.8	1	0.5	8	4.3
Married	119	64.0	3	1.6	122	65.6
Divorced	8	4.3	2	1.1	10	5.4
Widowed	10	5.4	9	4.8	19	10.2
Separated	22	11.8	5	2.7	27	14.5
Total	166	89.25	20	10.75	186	100.0

Source: Field Data, (2018)

The study showed that the majority (64%) of the male respondents were married while only 1.6% of their female counterparts were married indicating that married women were likely restricted to work as fishers either from their husbands or due to house chores they are exposed to. While 4.3% of the male were divorced, the studies showed that 1.1% of the females were divorced. Similarly, while 11.8% of the males were separated, while that of females was 2.7%. The study also showed that while 3.8% of the male respondents were single, only 0.5% of the females were single. The study implied that fishing activity is an affair of married men in Bondo Sub County.

4.3.4 Level of Education of the Respondents

This study sought to establish the level of education attained by the respondents; and this was determined in relation to gender. The presentation gives the outlook of gender disparities in the fishery value chain. Results are shown in Figures 4.7 and Figure 4.8 respectively.

To begin with the male respondents, the study revealed that among 166 respondents, a half 83 (50.00%) of male respondents had primary level of education followed by 48 (28.92%) that had secondary education. In addition, 13 (7.83%) men had college education while 6 (3.61%) had attained university education. However, 16 (9.64%) male respondents had no formal education. This finding gave an implication that male fishers basically primary education.

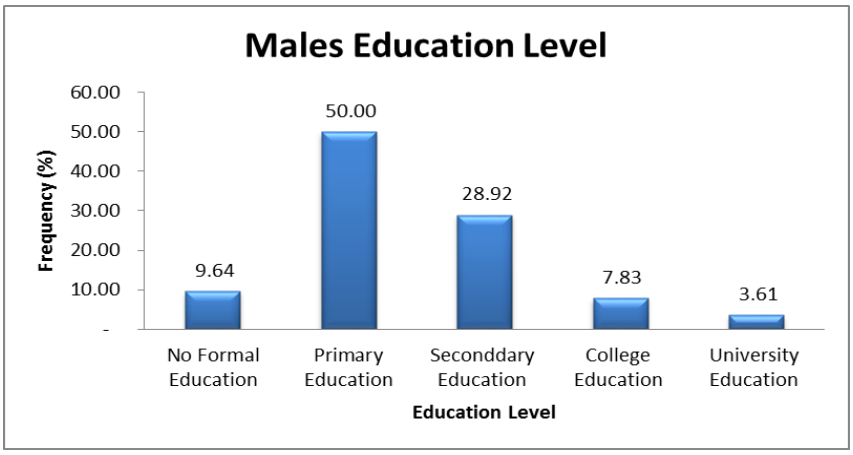

Figure 4. 6: Level of Education of the Male Respondents

Source: Field Data, (2018)

With regards to a total of 20 female respondents, results indicate that 10 (50.00%) respondents had primary education, 5 (25.00%) female respondents had secondary level of education and 2 (10.00%) female respondents had attained college level of education. A smaller proportion 1 (5.00%) female respondents had attained university education. However, 2 (10%) of the females had no formal education. Similarly, study finding gave an implication that female fishers basically primary education.

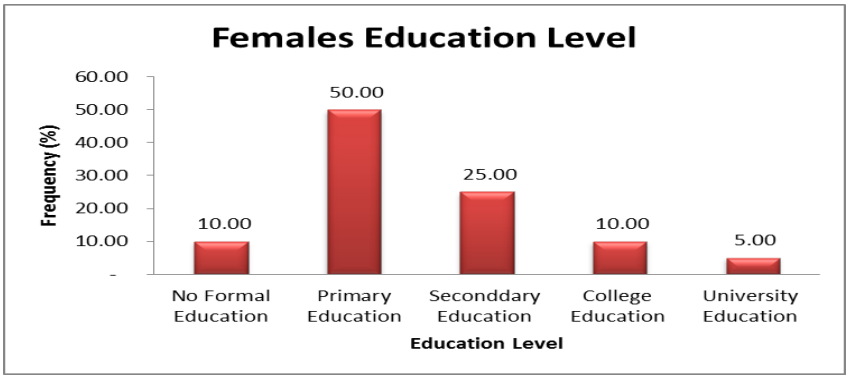

Figure 4. 7: Level of Education of the Female Respondents

Source: Field Data, (2018)

The study generally shows in figure 4. 9 that majority of respondents 50.00% had primary education followed by 28.49% who had secondary education. In addition, 8.06% and 3.76% respondents had Middle College and University education respectively. However, 9.68% respondents had no formal education. The findings were somehow reflecting Lake Victoria Fisheries Organization Secretariat (2016) study which showed that 44.5% of the respondents had finished their primary education, 30.1% had completed primary school education, 3.0% had tertiary while 2.0% had university education. The results provide an implication that majority of fishers only have primary level of education.

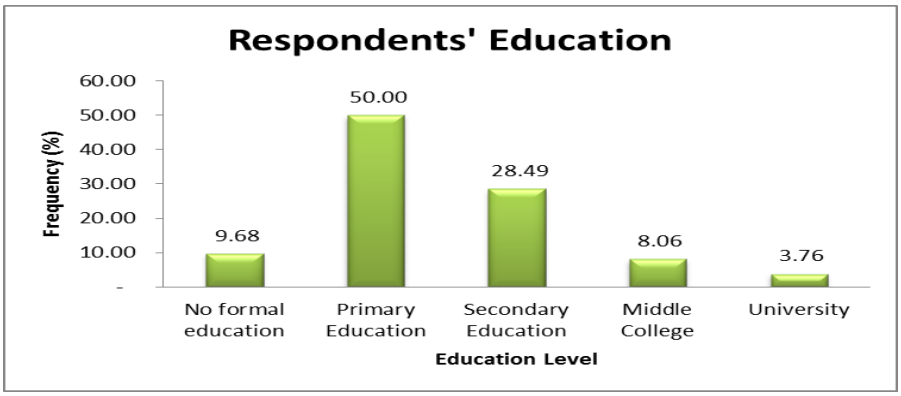

Figure 4.8: Respondents' Education Level.

Source: Field Data, (2018)

4.4 Analysis of Findings from Fishers

4.4.1 Various Gender Roles in Dagaa Fishery Value Chain

The first objective identified gender roles in Dagaa Fishery Value Chain among fishing communities on Lake Victoria in Bondo Sub-County, Siaya County. The response below indicated that both men and women had various roles in Dagaa

Fishery Value Chain. The participants' responses are presented in Table 4.5 below.

Table 4.5: Gender Roles in Dagaa Fishery Value Chain

Gender roles in Dagaa Fishery Value chain		Strongly Agree	Agree	Disagree	Strongly Disagree	Total
Both men and women take part in Dagaa fishing and supply	**F**	91	34	31	30	**186**
	%	48.92	18.28	16.67	16.13	**100.00**
Both men and women are owners of fishing vessels such as boats and nets	**F**	89	41	36	20	**186**
	%	47.85	22.04	19.35	10.75	**100.00**
Both men and women are dealers, transporters, distributors and customers of Dagaa fishery	**F**	52	32	72	30	**186**
	%	27.96	17.20	38.71	16.13	**100.00**
Both men and women take part in finding market for Dagaa fishery.	**F**	79	50	35	42	**186**
	%	42.47	26.88	18.82	22.58	**100.00**
Both men and women play a significant role in fishery industry	**F**	58	53	49	26	**186**
	%	31.18	28.49	26.34	13.98	**100.00**
Men and women's role in Dagaa fishery value chain promotes families' welfare in terms of enhanced household food security and nutrition.	**F**	102	43	21	20	**186**
	%	54.84	23.12	11.29	10.75	**100.00**
Dagaa processing is largely a women's reserve at several landing sites.	**F**	132	41	7	6	**186**
	%	70.97	22.04	3.76	3.23	**100.00**

Source: Field Data, (2018)

Findings in table 4.4 indicated that 91 (48.92%) strongly agreed and 34 (18.28) just agreed that both men and women take part in Dagaa fishing and supply. Similarly, 89 (47.85%) participants strongly agreed and 42 (22.04%) agreed that men and women are owners of fishing vessels such as boats and nets. Findings of this study concurred with Harper, et al., (2017) study which showed that fishery value chains is a global network, covering hundreds of internal and external

markets in other countries and involving thousands of both men and women. In contrary, 72 (38.71%) participants disagreed and 30 (16.13%) strongly disagreed that both men and women are dealers, transporters, distributors and customers of Dagaa fishery.

Moreover, 79 (42.47%) participants strongly agreed and 50 (26.88%) participants agreed that men and women take part in finding market for Dagaa fishery. Likewise, 58 (31.18%) participants strongly agreed and 53 (28.49%) disagreed that both men and women play a significant role in fishery industry. This finding also concurred with (Lynch *et al*., 2016; Thilsted, et al., 2016) which established that even though women may be disadvantaged in finding market, they still play a significant role in fishery value chain additions.

Furthermore, 102 (54.84%) respondents strongly agreed and 43 (23.12%) just agreed that Men and women's role in Dagaa fishery value chain promotes families' welfare in terms of enhanced household food security and nutrition. Majority of the participants 132 (70.97%) strongly agreed and 41 (22.04%) agreed with the statement Dagaa processing is largely a women's reserve at several landing sites. Study findings were in support to Hakim (2016), research which established that gender role is fundamental in ensuring that women and men undertake diverse or same activities. For instance, through women participation in fishery value chain, there is promotion in families' welfare in terms of increased productivity, reduced post-harvest losses and value addition, and enhanced household food security and nutrition.

Findings of this study gave an implication that fishing roles are shared across the gender. This is in support of Sara Longwe gender theory which asserts that gender equality is enhanced when women are facilitated to access, participate and ultimately exercise control on three frameworks: Social-Cultural, Legal and Political.

4.4.2 Factors Influencing Gender Roles in Dagaa Fishery Value Chain

The second objective determined factors that influence the gender roles in Dagaa value chain among fishing communities on Lake Victoria in Bondo Sub-County, Siaya County. The response below indicated that there were several factors that influenced the variability in participation in Dagaa fishery value chain among women. Their responses are presented in Table 4.6 below.

Table 4.6: Economic and Natural Factors Affecting Gender Roles in Dagaa Fishery Value Chain

Factors influencing gender roles		SA	A	D	SD	Total
Minimum access to market and production resources among women	F	104	61	12	9	186
	%	55.9	32.8	6.5	4.8	100.00
Subordinate position of women at household and community level	F	149	24	9	4	186
	%	80.1	12.9	4.8	2.2	100.00
Nature of fishing areas (Off-shore and on-shore)	F	100	61	11	14	186
	%	53.8	32.8	5.9	7.5	100.00
Routine and hours of fishing	F	95	52	30	9	186
	%	51.1	28.0	16.1	4.8	100.00
Loss of fishing gears	F	64	58	49	15	186
	%	34.4	31.2	26.3	8.1	100.00

Informal regulation/mechanism	F	44	36	82	24	186
	%	23.7	19.4	44.1	12.9	100.00
Cheating on production by the crew members	F	22	40	66	58	186
	%	11.8	21.5	35.5	31.2	100.00

Source: Field Data, (2018)

Results in Table 4.6 show that 104 (55.9%) of the respondents strongly agreed while 61 (32.8%) agreed that minimum access of production resources among women was a major factor influencing gender roles in Dagaa fishery value chain. In addition, 149 (80.1%) of the respondents strongly agreed and 24 (12.9%) agreed that subordinate position of women at household and community level had the highest influence on gender roles. Study findings give an implication that woman less involvement in fishing activities affect their welfare level due to lack of access to the key production resources.

The study further showed that the nature of the fishing area; on-shore and off-shore fishing affected female participation in fishing with 95 (53.8%) strongly agreeing while only 30 (5.9%) of the respondents disagreeing. Moreover, findings of the study indicated that 64 (51.1%) respondents strongly agreed and 58 (28.0%) just agreed that routine and hours of fishing influenced gender roles in Dagaa fishery. Furthermore, 64 (34.4%) respondents strongly agreed and 58 (31.2%) respondents just agreed that loss of fishing gears influenced gender roles in Dagaa fishery.

The results show that 82 (44.1%) respondents disagreed and 24 (12.9%) respondents strongly disagreed that informal regulation affected gender roles in Dagaa fishery value chain among communities living near Lake Victoria. Similarly, 66 (35.5%) respondents disagreed and 58 (31.2%) strongly disagreed that cheating on production by the crew members affected gender roles in Dagaa fishery value chain among the communities living near Lake Victoria in Siaya County. These were therefore factors that least affected gender roles in Dagaa fishery value chain in the study area.

These findings conferred with the outcome of a study carried out by Kizito *et al*. (2017) who established that gender, age, access to resources, formal education, culture and norms, and income per month were the factors that affected the participation of men and women in the fisheries value chain. Gender theory developed by Sarah Longwe considers that there is need for the interventions intended for the welfare of women. These can offer to women not only a clearer understanding of the existing social and political oppressions but also allow them to act to initiate change.

4.4.2.1 Socio-Cultural Factors Affecting Women Roles in Dagaa Fishery Value Chain

Table 4.7 shows the multiple responses from the respondents regarding problems impeding women roles in Dagaa fishery value chain.

Table 4.7: Factors Impeding Women Roles in Dagaa Fishery Value Chain.

Factors impeding women participation in Dagaa fishery value chain.	Responses	Frequency (n = 186)	Percentage (%)
Minimum access of credit facilities	Yes	145	78.00
	No	41	22.00
	Total	**186**	**100.00**
High interest rates from banks	Yes	97	52.20
	No	89	47.80
	Total	**186**	**100.00**
Poverty among female headed households	Yes	104	55.90
	No	82	44.10
	Total	**186**	**100.00**
Minimum benefits and remuneration	Yes	88	47.30
	No	98	52.70
	Total	**186**	**100.00**
Patriarchal communities and division of labour	Yes	177	95.20
	No	9	4.80
	Total	**186**	**100.00**
Delays by brokers in selling produce	Yes	119	64.0
	No	67	36.0
	Total	**186**	**100.00**
Unfriendly customary beliefs that discriminate against the women.	Yes	81	43.5
	No	105	56.5
	Total	**186**	**100.00**
Lack of safety and security on the lake at night	Yes	184	98.9
	No	2	1.1
	Total	**186**	**100.00**

Source: Field Data, (2018)

Findings in Table 4.7 show that 145 (78.0%) participants admitted that minimum access to credit facilities was a problem that Impeded Women Roles in Dagaa Fishery Value Chain. Similarly, 97 (52.20%) and 104 (55.90%) participants indicated that high interest rates from banks and high poverty level among female headed household contributed towards limiting women from getting involved in Dagaa fishery value chain. This finding was in support of a study conducted by Lwenya, et al., (2019) who revealed that poverty was a constraint to both men and

women but affecting the women much more due to lack of economic and status empowerment. This finding implied that women need to be employed by establishing key levels of interventions such as access and control to key fishery resources.

Moreover, study findings showed that 88 (47.30%) participants agreed that minimum benefits and remuneration; 177 (95.2%) participants indicated that patriarchal beliefs among the communities around Lake Victoria and 119 (64.00%) participants showed that delays by brokers in selling produce were among the factors that impeded women roles in Dagaa fishery value chain among fishery communities living around Lake Victoria. Study finding supported results of Kleiber, et al., (2017) which indicated that structural prejudice and patriarchal policies, financial restrictions and socio-cultural factors restrict women's access to entrepreneurial opportunities.

Results showed that 81 (43.5%) participants indicated other factors that impeded women roles in Dagaa fishery value chain were unfriendly customary beliefs that discriminated against women. In addition, lack of safety and security on the lake at night was a major factor 184 (98.9%) that impeded women participation in Dagaa fishery value chain. Similarly, Kleiber, et al., (2017) research showed that customary beliefs have made women to receive little attention hence their involvement in economic activities is limited to small-scale, lower remuneration tasks of processing Dagaa such as smoking, drying, and marketing, which earns a narrower profit margin than that earned by the fishers. Similarly, gender theory

supports that without women empowerment, socio-economic and political factors to a great extent impede women involvement in various development sectors such as fishery department. This therefore implies that women are vulnerable to a number of factors hence the need for their empowerment.

4.4.3 Barriers to Women's Participation in Certain Dagaa Fishery Value Chains

The third objective of this study sought to establish the barriers to women participation in certain Dagaa Fishery Value Chains among the fishing communities in Bondo Sub-County, Siaya County. The barriers to women participation in Fishery Value Chains was determined at different levels of Dagaa fishery value chain namely; harvesting, processing, trading and marketing.

4.4.3.1 Dagaa Harvesting

The study considered Dagaa harvesting in relation to the cultural perception on ownership of fishing equipment such as the fishing nets and boats, as well as the fishing personnel involved in Dagaa fishing. Results are presented in Table 4.7 below.

Table 4.8: Dagaa Harvesting

Questions	Responses	Frequency (n = 186)	Percentage (%)
Does your culture allow fish harvesting to be done freely by both men and women in your community?	Yes	114	61.29
	No	72	38.71
	Total	**186**	**100.00**
If the answer is No, then who does the law of your community favor to harvest the fish from the lake	Both Men and Women	114	61.29
	Men	72	38.71
	Women	0	0.00
	Total	**186**	**100.00**
Which is the convenient harvesting time for Dagaa fishery?	At Night	184	98.90
	During Day Time	2	1.10
	Total	**186**	**100.00**
Which instrument/method is mostly used in fish harvesting?	Boats and Nets	186	100.00
	Strings and Hooks	0	0.00
	Others		
	Total	**186**	**100.00**

Source: Field Data, (2018)

Study findings showed that Dagaa harvesting was not preserved as men's affair only. A total of 114 (61.29%) indicated that their culture allows fish harvesting to be done freely by both men and women in your community whereas 72 (38.71%) indicated that the culture does not allow fish harvesting to be done freely by both men and women in your community. Findings of the study also showed that majority of the respondents 184 (98.90%) indicated that the convenient harvesting time for Dagaa fishery is at night. Similarly, study results showed that all the respondents 186 (100.00%) indicated that boats and nets were the instruments/methods mostly used in Dagaa harvesting.

Ownership of Fishing Equipment

In the ownership of fishing equipment, the study randomly sampled 200 boats and 200 nets from five sampled beaches. It was established that a majority of the boats (90.4%) and nets (89.7%) were owned by men, while the women owned only 9.6% of the boats and 10.3% of the nets. Youths had no ownership of either boats or nets. This is shown in (Table 4.8).

Table 4. 9: Ownership of Dagaa Fishing Equipment

		Fishing Equipment			
		Boats		Nets	
Who are the majority in the ownership of the instruments used in harvesting?		Freq	P (%)	Freq	(%)
	Male	181	90.4	179	89.7
	Female	19	9.6	21	10.3
Total		**200**	**100**	**200**	**100.0**

Source: Field Data (2018)

This showed that fishing equipment ownership was still male dominated. These results indicate an increase from the findings by Okello, (2017) who found out that less than 2% of fishing crafts and gears in Kenya were owned by women. The boats were categorized as motor boats (engine) and manual boats (paddle). Table 4.9 presents the results of the category of the boats by gender.

Table 4.10: Category of Boats Ownership by Gender

		Category of Boats					
		Motor boats		Manual boats		Total	
Gender		Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
	Male	61	92.4	120	89.6	181	90.4
	Female	5	7.6	14	10.4	19	9.6
Total		**66**	**100.0**	**134**	**100.0**	**200**	**100.0**

Source: Researcher, 2019

The study found out that 67% of the 200 boats sampled were manual (paddled) while 33% of them were motorboats. Findings in Table 4.9 shows that out of 66 motorboats sampled, 92.4% belonged to the men while only 7.6% belonged to the women. Likewise, the majority of manual boats were also owned by men (89.6%), while only 10.4% belonged to the women. It can also be noted that 14 of the 19 boats owned by women were manual, suggesting that most of the boats owned by women were manual. These results indicate that women have not been empowered in the study area and are still economically behind their male counterparts.

Medard, et al., (2019) found only 3% out of 200 fishers to be women. They owned boats, nets or both and hired crewmembers. In some instances, women bought fishing gear and hired them out to men for cash or in return for a share of the catch. However, this study established that although there very few women engage in fishery value chains, the number has significantly increased currently compared to how it was some decades back. This is owing to the fact that the gender framework plays a big role in promoting provision of the needs of women followed by raising awareness of women's rights to take part in various sectors.

4.4.3.2 Dagaa Fishery Processing

This study also examined barriers to women participation in Dagaa fishery value chain in terms of fishery processing. This section covered Dagaa drying, freezing, trading as well marketing.

i. Dagaa Drying

Concerning Dagaa drying, the study established that after landing, women had limited barriers to take part in Dagaa drying process. Women could therefore, spread Dagaa on drying surfaces such as rocks, sand, grass, nets, and in rare cases, raised racks in order to dry. There was also some other handling/processing methods whereby processors/traders would take wet Dagaa and salt it before either smoking or frying, but this was insignificant. Three main methods of Dagaa drying were identified as sand (bare ground); on net; and use of raised racks. These activities were done differently by different gender, as shown in Table 4.11.

Table 4.11: Dagaa Drying by Gender

		Gender Distribution							
		Sand drying		On net drying		Raised racks		Total	
According to you, who does the role of Dagaa Drying after the harvest in your community?		Freq	%	Freq	%	Freq	%	Freq	%
	Male	35	18.8	53	28.5	78	41.9	166	89.2
	Female	9	4.8	7	3.8	4	2.2	20	10.8
Total		**44**	**23.7**	**60**	**32.3**	**82**	**44.1**	**186**	**100**

Source: Field Data, (2018)

The study findings in Table 4.10 show that 23.7% (out of 186) of the respondents dried Dagaa on bare ground (sand), 32.3% dried on the net while 44.1% of the respondents dried on raised racks. The study further shows that of the 44 respondents who dried their Dagaa on the sand, 18.8% were male while 4.8% were female, 28.5% of those who dried on net were male while 3.8% were

women. Lastly, 41.9% of the respondents who had raised racks were male while 2.2% were female.

The study reveals that there were more men than women using better methods of drying Dagaa in the study area. There were more women using more traditional methods of drying while more men than women used more recent methods suggesting that men were more empowered than women since current drying methods require more financial input than traditional methods.

ii. **Dagaa Freezing**

On Dagaa freezing, the study established that each beach had one mobile freezer that would collect the Dagaa from the fishers and other traders. Out of a total of five freezers, 80% were owned by men, while 20% were owned by women. This gives implication that women in the study area were still economically inferior to their male counterparts in the Dagaa fishery value chain. Gender theory developed by Sarah Longwe is thus significant in addressing the gender imbalance witnessed in among fishing communities in Bondo Sub County. The theory helps in advocating for access to key resources by female counterparts.

Table 4.12: Ownership of Dagaa Freezing

	Gender	**Frequency**	**%**
Who owns Dagaa freezers in the 5 beaches?	Men	4	80.00
	Women	1	20.00
	Total	**5**	**100.00**

Source: Field Data, (2018)

iii. Dagaa Trading and Marketing

This section focused on the Dagaa trading and Marketing. However, the Dagaa distribution chain consists of crew, fishing vessel owners, traders, processors, transporters, importers, retailers and consumers, all in a three-tier marketing system-local and national markets, international markets, and animal feed industries. This study considered women limitations to Dagaa fishery value chain participation at the three levels of trading and marketing system, and the results were as shown in Table 4.13.

Table 4.13: Dagaa Trading and Marketing by Gender

	Market	**Male**		**Female**		**Total**	
		Freq	**(%)**	**Freq**	**(%)**	**Freq**	**(%)**
Who does the role of Dagaa Trading and Marketing after the harvest in your community?	Local	74	39.8	16	8.6	90	48.4
	National	91	48.9	4	2.2	95	51.1
	International	1	0.5	0	0.0	1	0.5
	Total	**166**	**89.2**	**20**	**63.1**	**186**	**100.0**

Source: Field Data, (2018)

The study results showed that 90 (48.4%) of the 186 respondents sold Dagaa to the local market constituting consumers and local traders while 95 (51.1%) of them sold to traders who distributed to other parts of the country. 1 (0.5%) of the traders sold Dagaa to the international market such as the European Union. Of the 166 men, 74 (39.8%) sold to the local market, 91 (48.9%) sold to the national market, while only 1 (0.5%) sold to the international market. No female traders dealt with the international market; but 4 (2.2%) of the respondents who sold Dagaa to the national market were women. The rest of the women 16 (8.6%) sold Dagaa to the local market. The finding gives an implied that both national and

international Dagaa fishery value chains were dominated by men as opposed to women who can only take part in local markets. This disparity is a limiting factor to women hence affects their role in Dagaa fishery value chain. Gender theory is therefore quite relevant for the study because it agitates for gender equality thus provides a platform for women active participation in the Dagaa Value Chain.

These findings agree with those by the Lake Victoria Fisheries Organization Secretariat (2016) that found that in Kenya, the majority were traders who processed and sold at the beach, followed by those who sold elsewhere but within Kenya. Okello, (2017) also indicated that the national trade in Dagaa was more pronounced while there was limited international trade, apart from occasional demand by relief agencies to supplement or add nutritive value to relief food. Lake Victoria Fisheries Organization Secretariat (2016) also observed that most processors lake-wide sold their Dagaa at the beach (71.7%) and only a few delivered it to buyers away from the beach but within the country (26.1%) or took it to another country (6.7%). While this pattern for selling away from the beach was true for Uganda, Kenya and Tanzania, a slight majority (51.2%) in Kenya sold Dagaa away from the beach, but within Kenya.

The adoption of Sarah Longwe's Gender Theory is relevant to this study because it advocates for substantive gender equality. In this study, the theory gives women opportunity to seek for interventions that can promote women development which in return can enable women to overcome social, political oppressions and to act to initiate change they desire. Achieving gender equality promotes women's

empowerment through active participation in fishery trade, accessing ownership of fishing gears and ownership of refrigeration facilities within the beaches. Through this women engage in production activities that earn them more than the basic needs (food, shelter and clothing).

4.4.4 Strategies of Addressing Factors Influencing Gender Roles in Dagaa Value Chain

The fourth objective of this study was to establish the strategies that could be used to address the challenges influencing gender roles in Dagaa Fishery Value Chain among fishing communities in Bondo Sub-County, Siaya County. This study established strategies that could be used to address the skewed gender roles in Dagaa fishery value chain. Opinions of respondents were sought on how the identified skewed gender roles could be solved, and the results were as presented in Table 4.14.

Table 4.14: Strategies of addressing Factors Affecting Gender Roles

Questions	Strategies of Addressing Factors Affecting Gender Roles in Dagaa fishery value chain.	Freq	%
What is the most effective strategy in addressing minimum access of credit facilities that affects gender role in Dagaa value chains among the fishing communities in Bondo Sub-County?	Encouraging formation of groups for ease of access to credit services	61	32.80
	Encouraging saving with financial institutions that offer loans	41	22.04
	Joining cooperatives	82	45.16
	Total	**186**	**100.00**
How can high interest rates from banks that affect women involvement in Dagaa fishery value chains among the fishing communities in Bondo Sub-County be addressed?	Through Provision of loans and grants from governments at low interest rates	74	39.78
	Through Provision of loans from SACCOs	112	60.22
	Total	**186**	**100.00**
How can poverty among female headed households that affect women involvement in Dagaa fishery value chains among the fishing communities in Bondo Sub-County be addressed?	By empowering women financially	99	53.23
	Through Provision of soft loans to increase business	87	46.77
	Total	**186**	**100.00**
Does reduction in taxes on fuel help address minimum benefits and remuneration generated in Dagaa fishery value chain?	Yes	152	81.72
	No	34	18.28
	Total	**186**	**100.00**
Does weakening of patriarchy promote women participation in Dagaa fishery value chains among the fishing communities around Lake Victoria?	Yes	167	89.78
	No	19	10.22
	Total	**186**	**100.00**
Can reduction in Dagaa drying time and provision of proper storage facilities minimize delays by brokers in selling produce?	Yes	149	80.11
	No	37	19.89
	Total	**186**	**100.00**
Can sensitization of gender roles among fishing communities address unfriendly customary beliefs that discriminate against the women?	Yes	104	55.91
	No	82	44.09
	Total	**186**	**100.00**
Can provision of security by government encourage participation of women to take part in Dagaa fishery in the lake at night?	Yes	95	51.08
	No	91	48.92
	Total	**186**	**100.00**

Source: Field Data, (2018)

Table 4.14 shows responses from the participants on the strategies that can be used to address factors affecting women roles in Dagaa fisheries value chains among fishing communities in Bondo Sub Counties. Findings of the study showed that majority of participants 82 (45.16%) indicated that joining cooperatives was the most effective strategy followed by 61 (32.80%), Encouraging formation of groups for ease of access to credit services in addressing minimum access of credit facilities that affected gender role in Dagaa value chains among the fishing communities in Bondo Sub-County. In addition, 112 (60.22%) indicated that high interest rates from banks that affect women involvement in Dagaa fishery value chains can be addressed through Provision of loans from SACCOs.

Regarding how to address poverty among female headed households that affect women involvement in Dagaa fishery value chains, 99 (53.23%) participants said this could be attained by empowering women financially; giving them loans as well as through capacity building. This finding supported Bosma, et al. (2019) study in Asia which showed that gender action plans have been a political issue for human rights and welfare for many decades. Most countries have therefore embraced gender equality in order to facilitate fair access for both sexes to education, work and finance. Furthermore, 152 (81.72%) participants indicated that reduction in taxes on fuel can help address minimum benefits and remuneration generated in Dagaa fishery value chain.

Concerning how to address patriarchy factor, 167 (89.78%) indicated that weakening of patriarchy can promote women participation in Dagaa fishery value

chains among the fishing communities around Lake Victoria. This finding was in support of Xheneti, et al., (2019) which showed that the weak patriarchy enables women to be flexible and negotiate their roles in fishery value chains as well as other economic engagement. Similarly, 149 (80.11%) participants showed that reduction in Dagaa drying time and provision of proper storage facilities minimizes delays by brokers in making sales.

Lastly, 104 (55.91%) participants showed that sensitization of gender roles among fishing communities could address unfriendly customary beliefs that discriminate against the women. In addition, 95 (51.08%) indicated that provision of security by government encourage participation of women to take part in Dagaa fishery in the lake at night. Results of this study concurred with Harper, et al., (2017) study which indicated that in Vietnam, sensitization on gender roles of in the marketing of fish significantly led to rise in women involvement in fishery value chains.

4.5 Analysis of Findings from Fisheries Department and Beach Management Unit Officials

4.5.1 Dagaa Fisheries Quantities Catch by Category of Boat

The researcher sought information from the Fisheries Department's officials on the amount of Dagaa caught by fishers. It was established that the Dagaa fishery catch varied with season, and also depending on the category of the boat used; motorized or paddled boats. The results presented in Table 4.14 show the seasonal Dagaa catch by category of boat.

Table 4.15: Seasonal Catch of Dagaa by Category of Boat

Season	Gender	Category of Boat			
		Motorized		Paddled	
		Daily catch (Kg)	Monthly catch (Kg)	Daily catch (Kg)	Monthly catch (Kg)
Low Season (average fresh Dagaa landing on the beach per fishing trip in kg)	Male	200	4,200	120	2,520
	Female	200	1,800	120	1,080
High Season (average fresh Dagaa landing on the beach per fishing trip in kg)	Male	400	8,400	240	5,040
	Female	400	3,600	240	2,160
Average (kg)	**Male** **Female**	**300** **300**	**6,300** **2,700**	**180** **180**	**3,780** **1,620**

Source: Field Data, (2018)

The study results showed that fishers with motorized boats caught between 200kg and 400kg on every fishing trip made, while those with paddled boats made a catch of between 120 and 240 kg per trip. On average, fishers with motorized boats caught 300kg while those with paddled boats 180kg. Further, the study established that while males made a monthly catch of between 2,520 and 5,040kg, women made a catch of between 1,080kg and 2,160kg in a month. According to the fishers, the difference is attributed to the ability of the motorized boats to go deep into the lake while the paddled boats are limited on the far they go fishing.

The monthly difference in Dagaa catch between males and females was due to the higher number of trips males made than their female counterpart. The monthly average catch for male and female was 5040kg and 2160kg respectively. A study done by Lake Victoria Fisheries Organization Secretariat (2016) also found out

that catches in Lake Victoria were 122kg and 400kg per trip by gender for female and males respectively. This reveals that males were producing more than their female counterparts.

4.5.2 Returns from Dagaa to Fishers Selling at the Beach

This study also sought to establish returns to fishers who sell their Dagaa at the beach by interviewing two officials from fishery department. Fishery officials furnished the researcher with random data on average monthly income. The interviewee indicated that fishers either sell the fish wet or dry at an average of Ksh.50 and Ksh.100 per kilogram respectively. This study adopted a wet-to-dry conversion ratio of 1:0.6.

Table 4.16: Dagaa Returns from Beach Sales

Gender	Monthly catch (Kg)	Unit cost (Ksh)	Total monthly returns (Ksh)
Male	5040	Wet @ 50	252,000
		Dry @ 100	302,400
Female	2160	Wet @50	108,000
		Dry @100	129,600
	7200 (100.00%)		

Source: Field Data, (2018)

The study results indicate that males made an average of Ksh. 302,400 (excluding investment and operational costs) for dry Dagaa while their female counterparts made an average of Ksh.129,600 which was slightly below half of what men got. The study also showed that for wet Dagaa, men made Ksh. 252,000 while females

made an average of Ksh. 108,000 per month. This reveals that due to the limited number of the number of days that women went fishing, they earned much less than what men earned monthly. This is further coupled with limited resources for purchasing motorized boats and raised racks to avoid post-harvest losses. This study considered the net income that fishers made at the end of the month after all deductions have been made.

The investment costs included boats, engines, fishing gears, and other equipment; while the operational costs included fuel, license, and food for crew, labor/loading levy, and transport.

4.5.3 Returns from Dagaa to Traders Selling away from the Beach

Researcher also examined returns to traders who sold their Dagaa away from the beach. Interviewed official from fishery department indicated that most of the Dagaa that are always sold away from the beaches are sold to traders who later transport them to other towns within the country such as Nairobi, Ruiru and Thika and processors within the towns. The fishers/traders who sell dry Dagaa to other traders or consumers do it at an average of Ksh.125 per kilogram whereas fish sold to consumers away in other counties go at Ksh.130 and Ksh. 170 per kilogram.

Key informants also indicated that, “Dagaa is always sold at between Ksh.400 and 600 per Kg in the supermarkets in major towns like Nairobi, Nakuru, Eldoret and Thika. This is after they are well packaged to improve the value. That implied that

middlemen and other traders from other regions of the country supply Dagaa to the supermarkets and animal feed industries. From the prices of Dagaa per unit measurement compared to the prices at the beaches, it is realized that they always more than three times higher. This means that Dagaa fetches much higher returns in the higher levels of the value chain." This is supported by a study conducted by Kizito, Kimani and Lodiaga (2017) which revealed that access to formal capital, credit, access to strategic information on entrepreneurship, adequate distribution of labour resource and representation in leadership and decisions by fishing communities can greatly help them improve Dagaa fishery chain value.

In addition, supply chain theory helped the researcher to identify gender roles in the fisheries and assisted in modifying/establishing specific supply chain of Dagaa fishery for this study. From the model, fishers and boat owners sell the Dagaa directly to factory agents, middlemen, traders or consumers (on low scale). The cohort takes to the processors and market which sell to retailers and consumers. Middlemen also sell Dagaa to the international, regional and domestic market.

4.5.4 Gender Role in Dagaa Fisheries

In response to the question why there is gender role variability between men and women from the fishing communities in Bond Sub-County, one of the official from fishery department said that there are factors that contribute to that. First and foremost, he said that;

"In traditional patriarchal societies, women are expected to be home before nightfall and therefore night duties like Dagaa fishing can only be done by men," (FO, 02, 2018).

When asked on why very few women were willing to take up fishing as a job like in any other profession, the official from the Ministry of Devolution and National Planning said:

"*Fishing is generally viewed as a male job and therefore women are discouraged from fishing especially in situations where they have to go to the lake at night. Most married men cannot permit their wives to accompany them or other fishermen/women to go fishing at night on the lake. This has made Dagaa fishing a male affair,***"** *(FO, 02, 2018).*

The above excerpt shows that women are greatly limited by social beliefs and responsibilities in society. This makes them have inferior equipment and inability to undertake fishing as an economic activity like their male counterparts.

The officer from the fishing department responded that:

"*Fishing is assumed to be a male job due to its masculine demand on the lake. Fishing requires energetic people to lay and pull the nets with Dagaa. It is therefore obvious that most women may get this kind of job challenging,***"** *(FO, 02, 2018).*

Views held by the key informants highlight the cause of low involvement of women in Dagaa fishing on Lake Victoria in the study area. This gives implication that fishery activities are considered mainly a preserve for men because they are involved in all value chains. As a result, they gain more from fisheries activities as opposed to women. In order to promote women participation in Dagaa Fishery value chain, there is great need to adopt Sarah Longwe Gender Theory for women empowerment. This will enhance women access to more resources.

4.5.5 Factors Influencing Gender Roles in Dagaa Fishery Value Chain

One of the official from fishery department indicated that there were different factors that affect gender roles in Dagaa Fishery Value Chain.

> *"Different factors influence women participation in Dagaa value chain: cultural; social; economic and political factors. It was believed among the local community that women are not allowed anywhere near the lake when in the menstrual period as they would contaminate the lake and affect its productivity. Women are key home and children caretakers in most homes. Breastfeeding and other responsibilities bestowed upon them by the society keeps them home. It is relatively hard for women to access financial services. These factors hamper women participation in Dagaa fishery value chain," (FO, 02, 2018).*

When reached for comment on why men dominate most of the Dagaa fishery value chain especially in production, the official at the ministry of fisheries said that, "*Fishing is tasking and hence not suitable for most women.*" The response indicated that there were several factors that affected gender role participation in Dagaa fishery value chain among women.

4.5.6 Strategies of Addressing Factors Affecting Gender Roles in Dagaa Fishery Value Chain

In regard to strategies appropriate for addressing factors affecting gender roles in Dagaa fishery value chains, Beach Management Unit officials were asked and their responses in line with specific strategies were recorded as shown below;

> *"Lack of financial empowerment and capital among men and women is best addressed through formation of groups. The fishing community ought also to be advised to keep money in financial institutions that could offer loans to them. Moreover, through government initiatives women involvement in fishery value chains can be enhanced through supporting SME cooperatives within Bondo Sub County Beaches," (BMU official 1 and 2, 2018)."*

In regard to addressing societal expectations and Social responsibilities one of the BMU officials said that;

"Sensitization of gender roles and gender balance in the fishing communities in the study area and financially empowerment to the women can help them make decisions concerning their roles in the fishery industry," (BMU official 5, 7 and 8, 2018).

According to key leaders of BMU, price fluctuations especially during high seasons, high fuel demands during fishing and high taxation are factors that can be addressed to promote gender roles in Dagaa fishery value chains.

"Dagaa price fluctuations especially during high seasons can be addressed through creating organizations for Dagaa traders that will be able to speak and regulate prices especially during high seasons to avoid lose. In addition, developing preservations and storage services that can be able to handle more Dagaa caught during high seasons as well as establishing regional storage facilities where Dagaa can be stored just like it is done with cereals are in handy to address these factors," (BMU official 10, 11 and 12, 2018).

To address economic insecurity, Low catches, Theft and insecurity and Post-harvest losses such as rotting, the BMU officials suggested the following strategies;

"Specific factor has its own strategy to address it, for instance, economic factors can be handled through provision of loans and grants from governments and non-governmental organizations. Low catches on the

other hand is best addressed by the establishment of better storage facilities to cater for storage during low season. To address theft cases, government ought to step in to ensure that security is provided for fishers and Dagaa on the beaches. Lastly, Post-harvest losses such as rotting of Dagaa can be addressed through reduction in drying time and provide proper storage facilities," (BMU official 4, 6, 9 and 13, 2018).

Strategies of promoting women participation in Dagaa Fishery and value chains encompass implementation of policies and legal frameworks to entrench gender equality. For instance, in Kenya, article 27 of the 2010 Constitution guarantees equality and freedom from discrimination thus giving women the right access resources they need such as access to loans and grants from government and NGOs.

4.6 Cross Tabulation and Chi-Square Test Results.

This study performed a Chi-Square test to examine the relationship between gender and various roles of men and women in Dagaa Fishery Value Chai; determining the relationship between education level of the respondents and various roles of men and women in Dagaa Fishery Value Chain. The Chi-Square test was performed to validate and show the association between the key study variables.

4.6.1 Gender of Respondent

A cross tabulation of gender against various roles of men and women in Dagaa fishery value chain was run and the results presented with the intersections of the categories of the variables appearing in the cells of the table.

Table 4.17: Gender*Men and Women Roles Cross Tabulation

		Various roles of Men and Women in Dagaa Fishery Value Chain				Total
		Dagaa fishing and supply	Dagaa Distribution	Dagaa Marketing	Dagaa Processing	
What is your Gender?	Male	42 (95.45%)	78 (96.30%)	25 (86.21)	21 (65.63%)	166 (89.25%)
	Female	2 (4.55%)	3 (3.70%)	4 (13.79%)	11 (33.32%)	20 (10.75%)
Total		44 (100%)	81 (100%)	29 (100%)	32 (100%)	186 (100%)

Table 4.18: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.506[a]	3	.000
Likelihood Ratio	15.130	3	.000
Linear-by-linear association	2.155	1	.000
N of Valid Cases	186		

a. 3 cells (37.50%) have expected count less than .05. The minimum expected count is .07.

There is an association between various roles of Men and Women in Dagaa Fishery Value Chain and fishers' gender in Bondo Sub County. Dagaa fishing and supply and Dagaa Distribution is mostly considered as an affair of men since

(95.45%) and (96.30%) men engage in such activities. Only (4.55%) and (3.70%) women participate in Dagaa Fishing & Supply and Dagaa Distribution respectively. The *p*-value (α=0.01) indicates that gender and roles are dependent of each other. There is a statistically significant relationship between the categorical variables.

4.6.2 Education

A cross tabulation of Education Level against men and women roles in Dagaa fishery value chain was run and the results presented with the intersections of the categories of the variables appearing in the cells of the table as shown in table 4.19.

Table 4.19: Education Level* Various Roles of Men and Women Cross Tabulation

		Various roles of Men and Women in Dagaa Fishery Value Chain				Total
		Dagaa Fishing and Supply	Dagaa Distribution	Dagaa Marketing	Dagaa Processing	
What is your highest level of education?	No Formal Education	15 (34.88%)	1 (2.63%)	1 (1.61%)	1 (2.33%)	18 (9.68%)
	Primary School	20 (46.51%)	23 (60.53%)	30 (48.39%)	20 (46.51%)	93 (50.00%)
	Secondary School	8 (18.60%)	11 (28.95%)	24 (38.71%)	10 (23.26%)	53 (28.49%)
	Middle College	0 (0.00%)	2 (5.26%)	4 (6.45%)	9 (20.93%)	15 (8.06%)
	University	0 (0.00%)	1 (2.63%)	3 (4.84%)	3 (6.98%)	7 (3.76%)
Total		43 (100.00%)	38 (100.00%)	62 (100.00%)	43 (100.00%)	186 (100.00%)

Table 4.20: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.756[a]	12	**.001**
Likelihood Ratio	7.792	12	**.003**
Linear-by-linear association	3.138	1	**.000**
N of Valid Cases	186		

a. 12 cells (60.00%) have expected count less than .05. The minimum expected count is .14.

From table 4.20, there is an association between various roles of Men and Women in Dagaa Fishery Value Chain and educational level of fishers in Bondo Sub County. Dagaa fishing and supply is mostly performed by both men and women with the following level of education; (34.88%) respondents had no formal education, (46.51%) respondents had primary level education and (18.60%) respondents' secondary level education. Results show that (6.45%) and (20.93%) respondents with middle college level engaged in Dagaa marketing and processing, whereas (4.84%) and (6.98%) respondents with university education level participated in Dagaa marketing and processing.

None of the respondents with college and University education engaged in direct fishing of Dagaa from the Lake. The *p*-value indicates that the education level and various roles of men and women are not independent of each other and that there is a statistically significant relationship between the categorical variables. This implies that gender theory is relevant to this study since education promotes awareness and understanding of women's rights.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the main research findings, conclusion, and recommendations. The chapter also provides suggestions for further research as discussed under the research objectives.

5.2 Summary of Findings

This section provides a summary of the research findings based on the objectives of the study. The objectives were: to identify the various roles of men and women in Dagaa Fishery Value Chain; to discuss the factors influencing the gender roles in Dagaa Fishery Value Chain; to analyze the barriers to women participation in Dagaa Fishery Value Chain and to examine the strategies of overcoming challenges in gender roles in Dagaa Fishery Value Chain in Bondo Sub-County, Siaya County.

The first objective of this study sought to identify various roles played by men and women in Dagaa Fishery Value Chain. The study established that selling of Dagaa is done at the beach markets by both men and women and then to local markets in different counties. Study revealed that both men and women take part in Dagaa fishing and supply, are owners of fishing vessels such as boats and nets. Fishing was generally viewed as a male job and therefore women were discouraged from fishing especially in situations where they had to go to the lake at night. However, men tended to dominate transportation and distribution sector.

Study also revealed that men and women took part in finding market for Dagaa fishery and their roles in Dagaa fishery value chain promoted families' welfare in terms of enhanced household food security and nutrition. In conclusion, the study established that Dagaa Processing was largely a women's reserve at several landing sites.

The second objective discussed the factors that influence the gender roles in Dagaa Value Chain among fishing communities on Lake Victoria in Bondo Sub-County, Siaya County. Study established that minimum access of production resources among women at household and community level had the highest influence on gender roles in Dagaa fishery value chain. The study further established that the nature of the fishing area; on-shore and off-shore fishing, routine and long hours of fishing, minimum access to credit facilities, high interest rates from banks, high poverty level, delays by brokers in selling produce among female headed household impeded women roles in Dagaa fishery value chains. Moreover, the study revealed that informal regulation as well as cheating on production by the crew members did not affect gender roles in Dagaa Fishery Value Chain among the communities living around Lake Victoria in Siaya County. From interviews, study revealed that different factors such as cultural; social; economic and political factors affected women participation in Dagaa Fishery Value Chain.

The third objective analyzed barriers faced by women in participating in Dagaa Fishery Value Chain. Study findings showed that although Dagaa harvesting was

not preserved as men's affair some cultural practices hindered women from fish harvesting. In addition, fish harvesting time was a barrier to women engaging in fish harvesting. Furthermore, boats and nets ownership has been preserved mainly to men thus disadvantaging women. These results indicate that women have not been empowered in the study area and are still economically behind their male counterparts. Concerning Dagaa drying, the study established that after landing, women had limited barriers to take part in Dagaa drying process. Women could therefore, spread Dagaa on drying surfaces such as rocks, sand, grass, nets, and in rare cases, raised racks in order to dry. On Dagaa freezing, the study established that each beach had one mobile freezer that would collect the Dagaa from the fishers and other traders. Out of a total of five freezers, 80% were owned by men, while 20% were owned by women.

Lastly, the fourth objective aimed at examining the strategies that could be used to address the factors affecting gender roles in Dagaa Fishery Value Chain among fishing communities living in Bondo Sub-County, Siaya County. The study established a number of strategies that could be used to address the factors affecting gender roles in Dagaa Fishery Value Chains. These comprised of encouraging fishers to join cooperatives, encouraging formation of groups for ease of access to credit services and offering provision of loans at low interest rates from SACCOs. The study also revealed that empowering women financially; giving them loans as well as through capacity building and reduction in taxes on fuel can promote gender role in Dagaa Fishery Value Chains. Moreover, study established that patriarchy factor, can be addressed by

weakening of patriarchy. Finally, the study also showed that sensitization of gender roles among fishing communities could address unfriendly customary beliefs that discriminate against the women.

5.3 Conclusion

This study concludes that various roles of men and women are critical in Dagaa Fishery Value Chains. However, the study established that there is less women involvement in Dagaa Fishery Value Chains due to factors such as disparity in ownership of boats and fishing gears. Currently, there are a higher percentage of motorized boats belonging to men. In addition, limited access to finances among women hinder their participation in Dagaa Fishery Value Chains thus the number of women who practice fishing is much lower than their male counterparts. This makes Dagaa fishery to be a male dominated activity in the study area.

Secondly, study concluded that among the factors that influenced gender roles in Dagaa Fishery Value Chains were minimum access of production resources, cultural; social; economic and political factors, subordinate position of women, the nature of the fishing area (on-shore and off-shore fishing), routine and long hours of fishing, minimum access to credit facilities, high interest rates from banks, high poverty level, and delays by brokers in selling produce.

The study also concludes that there are a number of barriers that limit women participation in Dagaa Fishery Value Chain. These barriers include cultural practices, fish harvesting time, and boats and nets ownership. Furthermore,

women have not been empowered in the study area and are still economically behind their male counterparts. In addition, concerning Dagaa drying, the study established that after landing, women had limited barriers to take part in Dagaa drying process. They could therefore, spread Dagaa on drying surfaces such as rocks, sand, grass, nets, and in rare cases, raised racks in order to dry. On Dagaa freezing, the study established that each beach had one mobile freezer that would collect the Dagaa from the fishers and other traders. Out of a total of five freezers, 80% were owned by men, while 20% were owned by women.

On strategies to address the factors affecting gender roles in Dagaa Fishery Value Chains, the study concluded that fishers ought to join cooperatives and form groups for ease of access to credit services and offering provision of loans at low interest rates from SACCOs. The study also concludes that empowering women financially through provision of loans promotes gender role in Dagaa fishery value chains. Lastly, women need to be empowered to seize economic power in order to break patriarchy factor thus they will take part in Dagaa fishery value chains.

5.4 Recommendations

Based on the results that were presented from the data that was analyzed, the study made the following recommendations:

Gender roles in Dagaa Fishery Value Chains are characterized with male dominance on ownership of fishing equipments. This study recommends that there is need to encourage more women to take part in Dagaa fishery value chains. This should be done through making access to finances among women easier to enhance their participation in Dagaa fishery value chains.

i. Regarding gender roles, this study recommends that women ought to be empowered to take part in transportation and distribution of Dagaa. Through this they will be able to operate beyond local Dagaa fishery value chains addition. They will therefore take part in large national and international trading and processing of Dagaa.

ii. This study recommends various strategies to be put in place to ensure that factors affecting Gender roles in Dagaa fishery value chains are mitigated. For instance, joining SACCOs to access loans at low interest rates, formation of groups for ease of access to credit services and weakening patriarchy should be encouraged among women taking part in Dagaa fishery value chains.

5.5 Area for Further Research

This study proposes the following area for further research:

i. Assessing Factors Impeding Women Participation in Fishery Value Chains among Kenyan Beaches around Lake Victoria.

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APPENDICES

Appendix I: Questionnaire For Fishers

Dear Sir/Madam,

I'm Odhone Albert, a Master of Arts student at Kenyatta University, kindly requesting for your response to the questions towards my research. The questionnaire is to help in gathering information on Gender roles in the Dagaa fishery value chain. The answers you give will go a long way towards improving the situation posed by Gender differences frustrating the fishing value chain among the fishing communities on Lake Victoria in Siaya County. Please respond as honestly as you can to all the questions. You may feel free to make any further comments, and I assure you that the answers you give will be treated with utmost confidentiality.

Thank you for giving us your time.

SECTION 1: PERSONAL DETAILS

1. Indicate your sex.
    i. Male [ ]
    ii. Female [ ]
2. What is your age group? *(Please tick one)*
    i. Below 21 years [ ]
    ii. 21-30 years [ ]
    iii. 31-40 years [ ]
    iv. 41-50 years [ ]

v. Above 50 years [ ]

3. What is your marital status? *(Please tick one)*

i. Single [ ]

ii. Married [ ]

iii. Divorced [ ]

iv. Widowed [ ]

v. Separated [ ]

4. What is your highest level of your education? *(Please tick one)*

i. Primary school [ ]

ii. Secondary school [ ]

iii. A Level [ ]

iv. Tertiary/middle college [ ]

v. University [ ]

vi. Others, specify

_____

SECTION 2: VARIOUS GENDER ROLES IN DAGAA FISHERY VALUE CHAIN

5. Considering your experience, please use the following scale to indicate your level of agreement (1 =Strongly Agree; 2=Agree; 3= Disagree and 4=Strongly Disagree) with each of the identified various Gender Roles in Dagaa Fishery Value Chain.

Gender roles in Dagaa Fishery Value chain	**SA**	**A**	**D**	**SD**
Both men and women take part in Dagaa fishing and supply.				
Both men and women are owners of fishing vessels such as boats and nets				
Both men and women are dealers, transporters, distributors and customers of Dagaa fishery				
Both men and women take part in finding market for Dagaa fishery.				
Both men and women play a significant role in fishery industry				
Men and women's role in Dagaa fishery value chain promotes families' welfare in terms of enhanced household food security and nutrition.				
Dagaa processing is largely a women's reserve at several landing sites.				

SECTION 3: FACTORS INFLUENCING GENDER ROLES IN DAGAA FISHERY VALUE CHAIN

6. Considering your experience, please use the following scale to indicate your level of agreement (1 =Strongly Agree; 2=Agree; 3= Disagree and 4=Strongly Disagree) with each of the identified factors influencing Gender Roles in Dagaa Fishery Value Chain.

Factors influencing gender roles	**SA**	**A**	**D**	**SD**
Minimum access of production resources among women				
Subordinate position of women at household and community level				
Nature of fishing areas (Off-shore and on-shore)				
Routine and hours of fishing				
Loss of fishing gears				
Informal regulation/mechanism				
Cheating on production by the crew members				

Do the following factors affect women roles in Dagaa fishery value chain?

7. Minimum access of credit facilities

   □ Yes □ No

8. High interest rates from banks

   □ Yes □ No

9. Poverty among female headed households

   □ Yes □ No

10. Minimum benefits and remuneration

    □ Yes □ No

11. Patriarchal communities

    □ Yes □ No

12. Delays by brokers in selling produce

    □ Yes □ No

13. Unfriendly customary beliefs that discriminate against the women.

    □ Yes □ No

14. Lack of safety and security on the lake at night

    □ Yes □ No

SECTION 4: BARRIERS TO WOMEN'S PARTICIPATION IN CERTAIN DAGAA FISHERY VALUE CHAINS

This Section deals with factors affecting the participation of gender in fishing. Kindly tick your answer.

15. a) Does your culture allow fish harvesting to be done freely by both men and women in your community? Yes ( ) No ( )

    b) If the answer is No, then who does the law of your community favor to harvest the fish from the lake? Women ( ) Men ( )

16. Which is the convenient harvesting time for Dagaa fishery?

    Night....., Day time……

17. Which instrument/method is mostly used in fish harvesting?

    Boats and nets ( ) String and hooks ( ) Others ( )

18. Who are the majority in the ownership of the instruments used in harvesting?

    Youths ( ) Women ( ) Men ( )

19. Kindly indicate who mostly does the role of Dagaa processing method from the table below.

Dagaa Processing		Men	Women
Sun Drying	Sand Drying		
	On Net Drying		
	Raised Racks		
Deep Freezing			
Trading and Marketing	Local Level		
	National Level		
	International Level		

SECTION 5: STRATEGIES OF ADDRESSING FACTORS INFLUENCING GENDER ROLES IN DAGAA FISHERY VALUE CHAIN

20. What is the most effective strategy in addressing minimum access of credit facilities that affects gender role in Dagaa value chains among the fishing communities in Bondo Sub-County?
    i. Encouraging formation of groups for ease of access to credit services
    ii. Encouraging saving with financial institutions that offer loans
    iii. Joining cooperatives
21. How can high interest rates from banks that affect women involvement in Dagaa fishery value chains among the fishing communities in Bondo Sub-County be addressed?
    i. Through Provision of loans and grants from governments at low interest rates
    ii. Through Provision of loans from SACCOs
22. How can poverty among female headed households that affect women involvement in Dagaa fishery value chains among the fishing communities in Bondo Sub-County be addressed?
    i. By empowering women financially
    ii. Through Provision of soft loans to increase business
23. Does reduction in taxes on fuel help address minimum benefits and remuneration generated in Dagaa fishery value chain?
    i. Yes
    ii. No

24. Does weakening of patriarchy promote women participation in Dagaa fishery value chains among the fishing communities around Lake Victoria?
    i. Yes
    ii. No
25. Can reduction in Dagaa drying time and provision of proper storage facilities minimize delays by brokers in selling produce
    i. Yes
    ii. No

26. Can sensitization of gender roles among fishing communities address unfriendly customary beliefs that discriminate against the women.
    i. Yes
    ii. No
27. Can provision of security by government encourage participation of women to take part in Dagaa fishery in the lake at night?
    i. Yes
    ii. No

Appendix II: Fisheries Department Officials

Dear Sir/Madam,

I am Odhone Albert, a Master of Arts student at Kenyatta University, kindly requesting for your response to the questions I have towards my research. The purpose of this interview is to help in gathering information about gender roles in Dagaa fishery value chains among the fishing communities on Lake Victoria in Siaya County. The answer you give will go a long way towards improving the situation posed by effects of gender issues on fishing roles, access to fishing resources and creating awareness on the value of Dagaa Fishery. Please respond as honestly as you can to all the Questions. You may feel free to make any further comments; the answers you give will be treated with utmost confidentiality.

Thank you for giving us your time.

Comment on the following in relation to fisheries in your area of jurisdiction:

1. Kindly provide these tables with the relevant information on quantities and their revenue value as provided in your office's records for this current year.

Dagaa Fisheries Quantities and Revenue by Category of Boat

Season	Gender	Category of Boat			
		Motorized		Paddled	
		Daily catch (Kg)	Monthly catch (Kg)	Daily catch (Kg)	Monthly catch (Kg)
Low Season (average fresh Dagaa landing on the beach per fishing trip in kg)	Male				
	Female				
High Season (average fresh Dagaa landing on the beach per fishing trip in kg)	Male				
	Female				
Average (kg)	Male Female				

Dagaa Returns from Beach Sales

Gender	Monthly catch (Kg)	Unit cost (Ksh)	Total monthly returns (Ksh)
Male			
Female			
Total			

2. Why are fewer women among the fishing communities in Bondo Sub-County willing to take role in Dagaa fishing?

_____

_____

3. Explain the factors that affect gender role in Dagaa fishery Value Chain among fishing communities in Bondo Sub-County.

Appendix III: Interview Guide for Beach Management Unit Officials

Dear Sir/Madam,

I am Odhone Albert, a Master of Arts student at Kenyatta University, kindly requesting for your response to the questions I have towards my research. The purpose of this interview is to help in gathering information about gender roles in Dagaa fishery value chains among the fishing communities on Lake Victoria in Siaya County. The answer you give will go a long way towards improving the situation posed by effects of gender issues on fishing roles, access to fishing resources and creating awareness on the value of Dagaa Fishery. Please respond as honestly as you can to all the Questions. You may feel free to make any further comments; the answers you give will be treated with utmost confidentiality.

Thank you for giving us your time.

1. Kindly state strategies that can be used to address factors that affects Gender Role in Dagaa Fishery Value Chain among fishing communities living in Bondo Sub County.

Factors	Strategy
Lack of financial empowerment and capital among women	
Societal expectations	
Social responsibilities	
Price fluctuations especially during high seasons	
High fuel demands during fishing	
High taxation	
Sex for fish	
Economic insecurity	
Low catches	
High cost of storage and transport	
License difficulties	
Theft and insecurity	
Post-harvest losses such as rotting	

Appendix IV: Approval for Research - Graduate School, Kenyatta University

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 8th August, 2018

TO: **Mr. Albert Ogoma Odhone**
C/o Department of Geography

REF: C50/CE/28274/13

SUBJECT: **APPROVAL OF RESEARCH PROPOSAL**

We acknowledge receipt of your Research Proposal after fulfilling recommendations raised by the Graduate School Board of 25th July, 2018.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

-8 AUG 2018

JACKSON LUVUSI
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Department of Geography

Supervisors:

1. Dr. Ishmail O. Mahiri
   C/o Department of Geography
   Kenyatta University

2. Dr. Francis O. Onsongo
   C/o Department of Geography
   Kenyatta University

Appendix V: Research Authorization from Graduate School, Kenyatta University

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: C50/CE/28274/13 **DATE: 8th August, 2018**

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MR. ALBERT OGOMA ODHONE – REG. NO. C50/CE/28274/13

I write to introduce Mr. Albert Ogoma Odhone who is a Postgraduate Student of this University. He is registered for M.A. degree programme in the **Department of Geography.**

Mr. Odhone intends to conduct research for a M.A. thesis Proposal entitled, **"Gender Roles in Fishery Value Chains in Fishing Communities Along Lake Victoria Beaches Siaya County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

KENYATTA UNIVERSITY OFFICE OF DEAN – 8 AUG 2018

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

Appendix VI: Research Authorization - NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471, 2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/06830/24798** Date: **5th September, 2018**

Albert Ogoma Odhone
Kenyatta University
P.O. Box 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Gender roles in fishery value chains in fishing communities along Lake Victoria Beaches Siaya County, Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Siaya County** for the period ending **5th September, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Siaya County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Siaya County.

The County Director of Education
Siaya County.

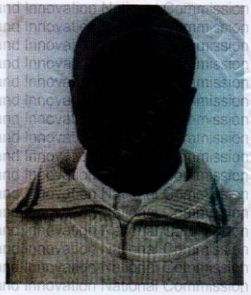
Appendix VII: Research Permit - NACOSTI

THIS IS TO CERTIFY THAT:
MR. ALBERT OGOMA ODHONE
of KENYATTA UNIVERSITY, 0-40603
Ngiya,has been permitted to conduct
research in *Siaya County*

on the topic: *GENDER ROLES IN FISHERY VALUE CHAINS IN FISHING COMMUNITIES ALONG LAKE VICTORIA BEACHES SIAYA COUNTY, KENYA.*

for the period ending:
5th September,2019

Permit No : NACOSTI/P/18/06830/24798
Date Of Issue : 5th September,2018
Fee Recieved :Ksh 1000



.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 20393

CONDITIONS: see back page

Appendix VIII: Research Authorization- County Commissioner, Siaya County

THE PRESIDENCY
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Fax No.
Tel: 0776 391011
Email: cc.siaya@yahoo.com

THE COUNTY COMMISSIONER
SIAYA COUNTY
P.O.BOX 83– 40600
SIAYA

When replying please quote Ref. & date

Ref No: CC/SC/A.31 VOL.II/135

8th November, 2018

- Deputy County Commissioner,
  RARIEDA SUB COUNTY.
- Deputy County Commissioner,
  BONDO SUB COUNTY.

RE: RESEARCH AUTHORIZATION – ALBERT OGOMA ODHONE

The person referred to above from Kenyatta University has been authorized by the Director General/CEO, National Commission for Science, Technology and Innovation vide letter Ref. No. NACOSTI/P/18/06830/24798 dated 5th September, 2018 to carry out research on "***Gender roles in fishery value chains in fishing communities along Lake Victoria Beaches Siaya County, Kenya***" for the period ending **5th September, 2019**.

The purpose of this letter therefore is to ask that you accord him the necessary support as he carries out research in your Sub County.

DENNIS OBIERO,
For: COUNTY COMMISSIONER
SIAYA COUNTY

Copy to: - Albert Ogoma Odhone,
Kenyatta University,
P.O. BOX 43844 – 00100,
NAIROBI.

Appendix IX: Research Authorization CDE, Siaya County

REPUBLIC OF KENYA

MINISTRY OF EDUCATION

State Department for Early Learning and of Basic Education

COUNTY DIRECTOR OF EDUCATION
SIAYA COUNTY
P.O. BOX 564
E-mail:cdesiaya2016@gmail.com SIAYA

When replying please quote
SCA. /URA/10 VOL.I/86

Thursday, November 8, 2018

TO WHOM IT MAY CONCERN

RESEARCH AUTHORIZATION: ALBERT OGOMA ODHONE

The above named person has been mandated to carry out research in Siaya County vide an authorization letter from National Commission for Science and Technology and Innovation Ref. No. NACOSTI/P/18/068/24798 dated 5th September, 2018. This research study ends on 5thSeptember, 2019.

The research title is "***Gender roles in fishery value chains in fishing communities along Lake Victoria Beaches Siaya County Kenya***"

Please accord him the necessary assistance in this County as he may require.

SAMUEL ONDIEKI
FOR: COUNTY DIRECTOR OF EDUCATION
SIAYA COUNTY

c.c.

County Commissioner
Siaya County