Assessing Gender Roles in Dagaa Fishery Value Chain among Fishing Communities on Lake Victoria, A Case Study of Lake Victoria Beaches In Siaya County, Kenya

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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.

Key Words: *Dagaa Fishery Value Chain, Gender Roles in Dagaa Fishery, Women's Participation in Certain Dagaa Fishery Value Chains*

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1. Introduction

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.

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.

3. Objectives of the Study

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.
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.

4. Empirical Literature Review

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.

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.

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.

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).

5. Conceptual Framework

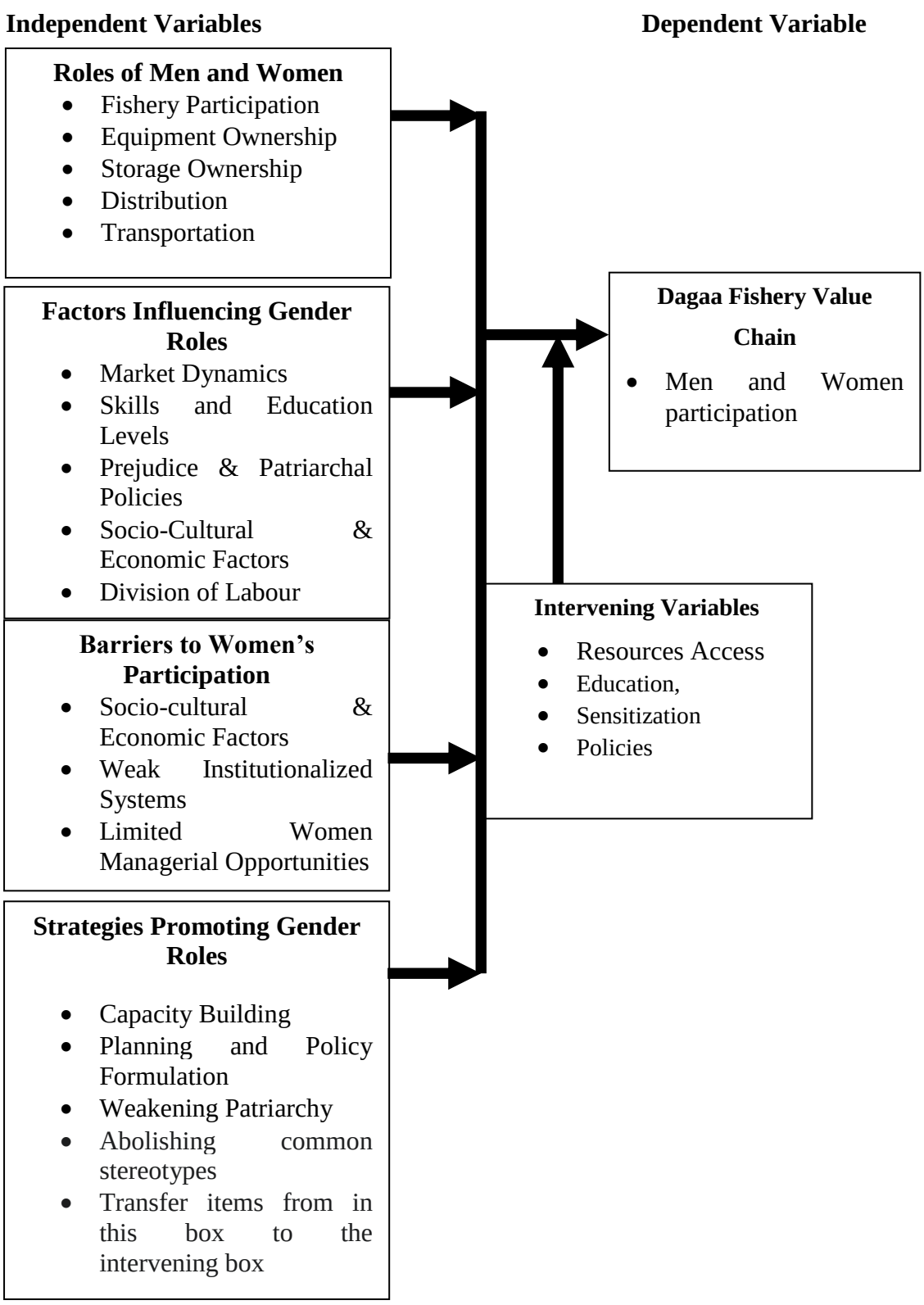

Figure 1: Conceptual Framework

Source: Author, 2020

6. Research Methodology

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). 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. 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.

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. 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. 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.

7. Results and Discussion

7.1 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 1 below.

Table 1: 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, (2020)

Findings 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.

7.2 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 2 below.

Table 2: 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, (2020)

Results in Table 2 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.

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

Table 2 shows the multiple responses from the respondents regarding problems impeding women roles in Dagaa fishery value chain.

Table 3: 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, (2020)

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.

7.4 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. 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 below.

Table 4: 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, (2020)

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.

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.

Table 5: 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 (2020)

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 6 presents the results of the category of the boats by gender.

Table 6: 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, 2020

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.

7.5 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 7.

Table 7: 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, (2020)

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.

8. 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.

9. 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. 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. 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.

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