Factors Influencing the Economic Performance of Women Fish Processors: The Case of Small Scale Omena Fish Processors in Lake Victoria-Homabay County, Kenya

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Abstract: In Homabay County, women are predominant in fish marketing and processing. However there are bottlenecks towards women economic progress. Socio-economic and demographic characteristics are indicators of performance in the society. A study was undertaken to understand the constraints to economic performance among women fish processors. Structured questionnaires were administered randomly to 120 women fish processors. Descriptive statistics was used for data analysis. Results indicate that poor environmental condition and poor personal hygiene contribute to poor quality of fish. The study recommends that there is the need for awareness creation on food safety regulations and implementation of environmental management systems.

Keywords: Women, Fish Processing, Economic performance, Sanitation, Environmental Systems

1. INTRODUCTION

All over the world, women contribute in multiple ways to the production, processing, marketing and management of fish and other aquatic resources (State of World Fisheries 2018). In Lake Victoria fisheries, women make up to 85% of the workforce in fish related jobs such as fish processing, marketing, net-making and mending. This qualifies the norm that women are not just marginal players but active participants in the fisheries production process (FAO 2018). But discriminatory gender norms of women's choices over domestic roles, financial resources, other assets and binding labour constraint pose bottlenecks to women's progress. Along the Kenyan waters of Lake Victoria, fish plays a significant role in the livelihoods of the fisherfolk in terms of employment, especially among women.

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In many developing countries, fish processing has been evolving from traditional to more advanced value added processing methods (FAO 2018). Lake Victoria fishery has evolved to an industrial level (Omwega, 2000) and many fish landing sites have grown over the last 30 years in the wake of a boom in Nile Perch (Pearson et al. 2013). It is documented that as soon as the fish landed, they were removed from the canoe and handed over to the women to sort out, clean and scale out. In terms of gender roles, men would assist the women in carrying logs of firewood and in felling big trees used for smoking fish. However, in the 21stcentury, both genders have become educated and both occupy leadership positions, institutions and families (Okello 2017) and the roles that only men traditionally played are now females' roles too. In the fishing industry changes in culture in terms of gender roles is slowly and reluctantly being embraced (Okello 2017).

The participation and extent of importance of women in fisheries contribution to fish supply has been recorded (FAO, 2018). In Lake Victoria women have dominated fish processing and trade while men dominated transportation. With this long cultural background and involvement, it is expected that the current women fish processers have inherited the traditional knowledge and thus produce high quality products and distribution levels of fisheries resources (Omwega, 2000). But to-date, women fishers cry about poor economic performance in the fish processing sector. Cases of lack of accessibility to credit, difficulties in accessing technological innovations and time poverty are common conditions women face along the shores of Lake Victoria, Kenya (Okemo et al. 2017). Other problems the women face include marketing problems and poor working conditions.

A gendered labour division concentrates production in the hands of fishermen while women dominate post-harvest processing and retailing (Andy et al. 2014). Gender roles in fishing among the local communities along the Kenyan sector of Lake Victoria dictate that men dominate the primary sector while women are mostly engaged in the processing (Madanda 2003). Among the Luos of South Nyanza in Western Kenya, the fishing culture was exclusively male (Okello 2017). Thousands of women have been working in the fishing industry throughout history and thus the more women involved in fish processing than men (Onyango et al. 2017). This is the same case prevailing in Homabay County where women dominate the marketing and processing with their involvement estimated to be 1.5 to 1.7 times higher than men's (Abwao and Jane 2019). Income earned by women has a stronger, more beneficial impact on household incomes (FAO 2018). It is against the background of sector dominance that this study assessed the state of women and not men in fish processing in Homabay County. Specifically, the study assessed the socio demographic characteristics of women fish processors and challenges facing women in the value chain. The environmental conditions of the landing

beaches were also assessed to understand the sources of persistent low prices of fish from the women fish processors in Homabay County, in Kenya.

2. METHODOLOGY

The study was conducted in Homabay County, which is located in South Western Kenya along Lake Victoria, Kenya. Homabay County was selected since it records the highest catches of *R. argentea* (omena) in the shores of Lake Victoria. Purposive sampling technique was used to select the fish villages for the study. The fish village selected was based on the number of women fish processors. To be selected the fish village had to meet the criteria of having more than 50 permanent small scale women fish processors. The fish villages of Nyachebe, Kolunga, Tabla and Litare met this criterion. Although these four fish villages were not representative of all the beaches in the study area, they were selected since they have high numbers of small scale women processors and also have higher production levels of R. Argentea.

2.1 Data Sampling Techniques

This study was based on the fish processing activities of Homabay County and specifically in Mbita division. Systematic sampling technique was used to sample the small scale women fish processors. The sample size of 30 from each fishing village of 30 was found appropriate. This Equal representation in all the fish villages was the guiding criteria. Equal representation was found to be appropriate since the fish villages share a lot of similarities in relation to membership, migration in-between fish villages and the same working environment. To limit sources of bias, the fish processors were selected randomly from the women fish processers' register. A sample of 120 out of a total population of 346 of small scale women fish processors was selected for the study.

2.2 Data Collection

Questionnaire schedules were used to collect primary data from the fish processors**.** The questionnaires administration were structured in such a way that only one respondent could be interviewed at a time. The enumerators were also positioned within a range of distance to avoid information sharing between/among the interviewees. Oral interviews and discussions were also carried out especially with the women fish processors who were committee members. The second part involved oral interviews and discussions with the focused group/key informants which included Fisheries Officers, Beach Leaders and the Fishing Committees. The information gathered was qualitative based on opinions relating to the environmental problems facing the women

small scale fish processors in the study area. Other sources of qualitative data included; annual fisheries reports, published and academic unpublished material and relevant resource journals. Descriptive statistics was used to summarize data.

3. RESULTS AND DISCUSSIONS

3.1 Socio-demographic Indicators

Table 1 show that 54.4 % of the respondents were adults in the age bracket of 40 to 55 years. This finding implied that the respondents' age is skewed toward the very young and energetic population. It also shows that those women in fish processing activities were in their middle ages of marriage. This is also the childbearing age and partly explains the large family sizes. The findings agree with Abha et al. (2014) who also found that the mean age of fish processors in the coast of Odisha was 38 years.

In terms of education attainment, 75.0% had primary level, 14.3 % had attained secondary and 10.7% of the fish processors had no formal education. This shows that majority of women fish processors are semi illiterate and therefore can barely read or write. Similar conditions are found among the women in the fishing sector in Gambia who have limited education and thus lack special programmes for training in technological improvements (Garcia 2006).

As well illustrated by Waikhom et al. (2015), education increases a woman's understanding and awareness of the situation in which she lives, as well as increases her cognitive and psychological realm of empowerment. With low level of education, women would automatically be excluded from decision making process. Medard et al. (2002) also noted that where fisher groups existed, lack of education among women was a source of stagnation in the groups. According to MacAlister Elliott and Partners Ltd (MEP) (2002), education and training are likely to be critical in any move to improve women's status in fisheries.

Table 1(one) also show that 75% of the women were married. The study findings reveal that in 85.8% of the families, there were 5–10 and even more members in the household (Table 1). Thus, most respondents had larger family sizes. As explained by one respondent, women with children are more discouraged from entering fisheries compared to the women without children. This is because the women with children have more child care responsibilities. As argued by Davis (2000), economically independent women have no time to fulfill family roles such as looking after children and family. Thus parenthood can also be a major cause of reduced labour supply among women fish processors. This implies that family size is positive determinants towards lack of

adequate participation among young women in the fishing activities in the Kenyan sector of Lake Victoria.

Literature has documented the effects of parenthood and family size on the labour supply among women. Cools et al. (2017) noted that there is a negative but significant effect of additional children on labour supply among women. Childbearing/rearing have a direct effect on mothers' labor supply thereby impeding mothers' accumulation of human capital (Cools et al. 2017). A large family also translates to an increase dependency ratio in the family.

The respondents in the study area noted that family networks is a cultural and may not be easy to remove. These dynamics have implications in women's quality time. According to Medard et al. (2001) children are sole responsibility of women and that women with more children will be less productive and consequently less successful Cool et al. (2017). Sara et al. (2017), Tabitha and Tisdell (2003) and MacAlister Elliott and Partners Ltd (MEP) (2002) observe that childcare facilities are a potential important factor in liberating women to take on a more active role in fisheries.

Table 1: Socio-economic of Respondents (N=120)

Variable	**Percentage(%)**
Age	
20-30	26.4
40-55	54.4
More than 55	19.2
Education Attained	
No formal education	10.7
Primary education	75.0
Secondary	14.3
University/college	0.00
Marital status	
Married	75.0
Single	14.3
Separated	3.6
Widowed	7.1
Family Size	

Less than 5	14.2
5-10	46.4
More than 10	39.4

***Source*:** Field Survey Data 2017

Figure 1 reveals that women are on a low income bracket with 50% interviewed showing that they earn between Shs.5000 and Shs.10, 000 per month

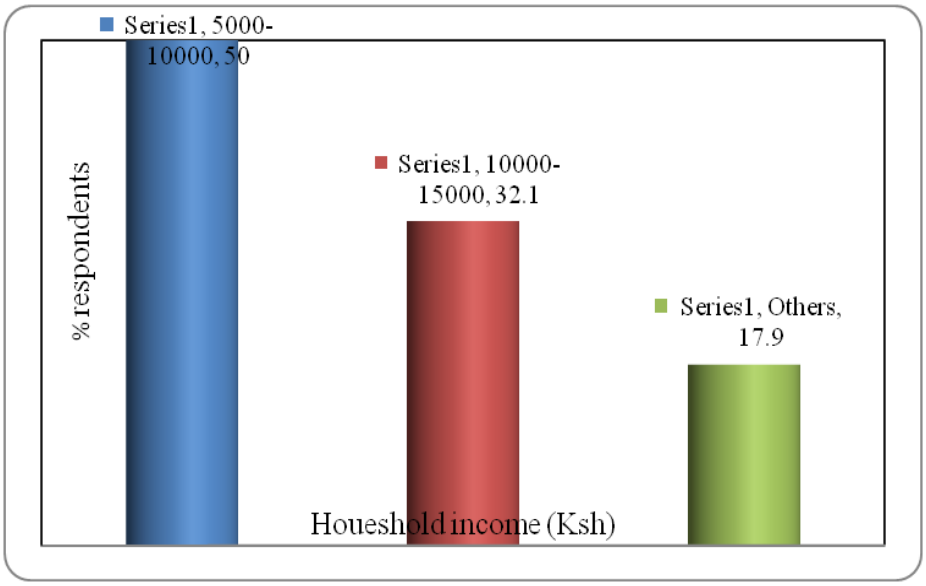

Figure 1: Women Income Bracket

Source: Field Survey Data 2017

Table 2 below shows that most family income expenditure of the fish processors was spent in education. 42.9% of the respondents had their family income consumed by education, 35.7% had their income consumed by food while 3.6% spent their family income on leisure.

Table 2: Expenditure Family Income

What consumes most of family income	%
Education	42.9
Food	35.7
Leisure	3.6
Others	17.9

Source: Field Survey Data 2017

Table 3 shows the constraints small scale women fish processors face during their in fishing activities. Notably is the fact that women need men approval or help to carry out their fishing or processing activities. Table 3 also revealed that most women lack opportunity to receive training and that women have less time available to take advantage of the growing opportunities. This could be based on the women's low level of education and the responsibilities of large families (table 1).

Table 3 also shows that 82% of the respondents indicated that they lack access to tools and credit to enable them increase investment in their fish processing activities. This is further explained by the fact that75% of women indicated that women's fish processing activities are regarded to be an extension of household (family) activities. Thus with large family sizes of 5-10 and with a monthly income of shs.5000-1000 (figure 1), most of the money earned ends up being used for subsistence upkeep of the family. It is said that countries with bigger dependency ratio tend to develop slower compared to those with smaller ratios. This boils down to family level and the higher the ratio the lower the abilitv for that family to feed and also to save and invest (World Economic Forum (2017).

As a result, 82% of the women indicated that they lack access to fish processing tools and credit (table 3). This is explained by the finding that only 32.1% of the women fish processors were members of funding Organizations related to the fish processing activities (Figure 2). The local funding organizations include Cosamo savings and Self-help groups that provide credit and finance to the fish processors. Table 3 shows that women have less time available to take advantage of the growing opportunities, lack representation in community fishing committees and thus there are less extension work targeted for women. Since women processing activities are considered an extension of household activities women have less time available to take advantage of the growing opportunities (Table 3). Large family sizes would mean that women are also subject to greater time constraints with obligations to care for the family and run the household additional to her work. As noted by Okello

(2017), women are the basic fish traders who trade around their homes and cannot go far because of the nature of their duties and responsibilities in the homestead.

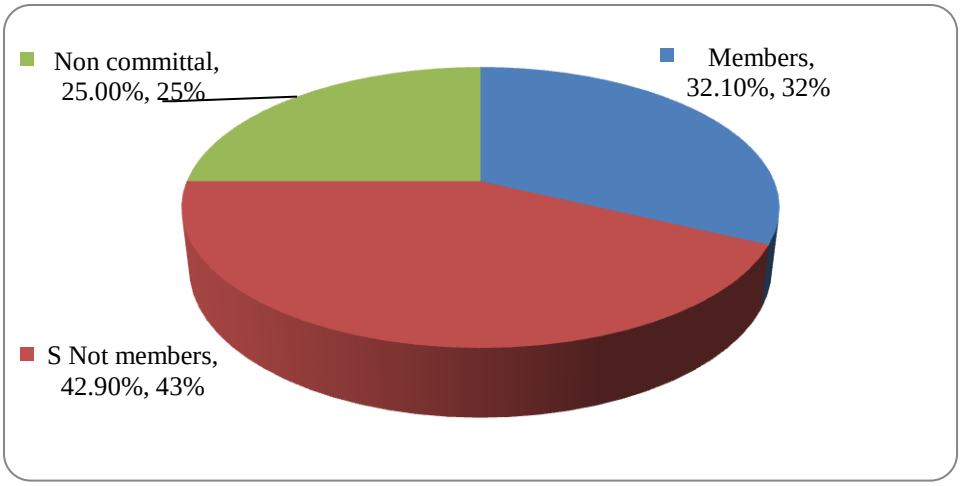

Figure 2: Fish processors members of Organizations related to the Fish Processing Activities
Source: Field Survey Data 2017

About 61% of the respondents indicated that they lack opportunity to receive training and also lack a voice in decision making about their economic activities. Among the Luos of Kenya, the culture has been patrilineal and life is centered on the male lineage (Miruka, et al. 2015). Among this community therefore, the major decision-makers are the elderly males. Culturally, women have been viewed as different from men, and that women are gentler than men. Consequently, 50% of Women respondents noted that they face sexual and physical harassments from the fishermen.

In other countries, it has also been observed that there is production bias of fisheries management programmes which have not only overlooked the role of fisher women but also marginalized the "fish mammies" in terms of resource and training (Andy et al. 2014). Case studies on fisheries Organizations reveal that women participate as members and leaders but much less than men (FAO 2018). Women usually are at greater disadvantage as they commonly have lower social and economic status thus very little input into planning and decision-making processes (Judit Kapás (2017). As noted by Makindi et al. (2019), women have a high share in agricultural activities in many developing

countries but only little decision making power or control over inputs and outputs. European Union experience also shows that despite EU being economically developed areas, there is still economic discrimination against women whereby women are paid 12% less than men for what appears to be the same work. It is even suggested in EU that women should be encouraged to exit the fishing industry. This shows how socio-demographic can negatively impact on the empowerment to women (Hedayat et al. 2010).

Cohen et al. (2016), Lawless et al. (2017) and Berling et al. (2017) argue that women's increased participation in development opportunities can result in positive benefits including increased access to financial capital, increased influence in community and decision making. Okello (2017) notes that time have changed and each gender should complement the other in development. Food and Agricultural Organization of United Nations (FAO) (2018) and Bandeira et al.(2018) calls for gender equality and the empowerment of all women and girls which is particularly relevant to the fisheries sector. Jenny (2016) also notes that women's empowerment is essential for Sustainable Development.

Table 3: Gender Concerns

Gender Concerns	**%**
Women need men's approval or help to carry out their fishing or processing activities	60.7
Most women lack access to tools and credit	82.1
Most women lack voice in decision making	60.7
Most women lack opportunity to receive training	60.7
Women have less time available to take advantage of the growing opportunities	64.3
Women lack representation in community fishing committees	46.4
Extension work has not particularly targeted women	42.9
Women processing activities are considered an extension of household activities	75.0

Women lack organizational basis	46.4
Women face sexual and physical harassments	50.0

Source: Field Survey Data 2017

The study found that bad and unpredictable weather conditions make fish not to dry are some of the environmental challenges facing the women fish processors. Discussions with the fisheries committee members also revealed that the women fish processors lack finances and ready market. In the fishing villages, oral interview with the key informants stated that the women dry fish in the sun as a method of preservation method before vendors and buyers come for the fish after a day or two. The almost near and big market available include Nakuru town. But a study revealed that although R. Argentea is among the commonly consumed fish in Nakuru (Felly et al. (2020) most consumers prefer because Nile Perch because it is sold in fillet which is easy to prepare and consume (Felly et al. (2017).

The women fish processors observed that the quality of processed fish is influenced by lack of or no drying racks coupled with the environmental conditions. As fish can spoil more rapidly thus, post harvest handling, processing, storage and transportation require particular care to maintain quality (FAO 2018). As noted by Okemo et al. (2017) microbial composition of fish depends on the environmental and storage conditions with this condition facing the small scale fish processors; the fish end up being of low quality fetching low prices in the market. It was found that loitering dogs and birds are also a menace to the traders as well (Table 4).

Oral interview with key informants showed that there is poor hygiene sanitation at the landing beaches (Table 4). The key informants narrated that there are some common failings in personal hygiene among the fish processors that can result in germs being passed onto fish like: failure to wash hands before handling fish, failure to wear clean, protective clothing; failure to cover wounds and failure to wash hands after going to the toilet. Other factors include allowing finger nails to grow too long and handling fish when one is sick (diarrhoea, vomiting, skin infection).

Poor personal hygiene and dirty environments among fish processors can result to contamination of fish. Handling fish with unwashed hands in addition to the dirty environment help spread germs and bacteria. Uncovered wounds will lead to blood and other fluids getting into contact with fish. Wounds may be minor and non fatal but if left unattended may result to increased openings to infections (Ngaruiya et al. (2019). Marketing quality products and good

environmental standards are now becoming the required for trading across the globe (Michael 2003) and we are always reminded that personal hygiene is our own responsibility.

Bacteria are found in dirty places, dirty toilets, dirty clothes, animals like in the case of loitering dogs, dirty hands, insects (flies) and in the air (Ansen and Yolaine Undated). As explained by Kyangwa and Odongkara (2005) microbial proliferation increases the risk of contamination which inevitably leads to fish spoilage. Access to improved sanitation is important aspect of public health (Phylis et al. 2019). As found by Okemo et al. (2017) poor quality of fish could be a problem both locally and internationally as microbial contaminants may result in infections when fish is handled unhygienic way. Bad fish means low prices hence less profit. Good and clean environment produces good quality safe fish (Ansen and Yolaine-Undated).

Table 4: Challenges Facing Women Fish Processors

Challenges	**% Respondents**
Bad and unpredictable weather, fish fail to dry	57.1
Lack of market for the commodity	14.3
Lack of Finances	14.3
Low prices	10.7
Lack of Drying racks	7.1
Bad quality produced	3.6
Dogs and birds	3.6
No drying racks	3.6

Source: Field Survey Data 2017

Oral interviews with the respondents revealed that the fish processors would like improvement in the hygiene of the fish villages. The respondents proposed that they needed to build enough latrines along the beaches, observe personal hygiene and collect rubbish in the compounds. They also suggested that the fish processors should be educated on more hygienic ways of processing fish. Digging of more pits for dumping wastes and creation of environmental awareness would improve the sanitation of the area. While there is potential for women to experience better performance with improved economic situations,

this may not be the case with the unpredictable weather conditions that affect the products. Much forgotten aspect as highlighted by the women fish processors is the need to know the food and safety quality regulations.

CONCLUSION

Women fish processors face social, economic and environmental related issues. Faced with large family sizes and increased dependency burden, the small scale women fish processors find it difficult to save part of their income to re-investment in fish trading. However, this study concludes that environmental conditions of unpredictable weather coupled with poor sanitation and personal hygiene among these fish processors reduce the quality of their produce, hence fetch low prices and hence reduced income. Poor personal hygiene and dirty environments among fish processors result to contamination of fish. Thus, the major obstacle facing the women fish processors in Homabay County are not majorly socio-demographic related but more of environmental and poor sanitation. Since it is difficult to solve issues of unpredictable weather, improvement of personal hygiene can go along way to change the economic status of the women fish processors in Homabay County.

RECOMMENDATIONS

The study recommends the need to improve of environmental health conditions among the small scale women fish processors. In addition, there is need to assist the women fish processors with the modern and hygienic ways of fish processing.

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REFERENCES

Abha Sigh, P.K. Sahoo, Krishma Srinah, Anil Kumar, S. Tanuja, J. Charles Jeeva and Rajshree Nanda .(2014).Gender Roles and Livelihood Analysis in Coastal Odisha. *Fishery Technology*, Vol. 51 (2014): No. 267-273

Andy Thorpe, N. Pouw, A. Baio, R. Saudi, E. T. Ndomahina and T. Lebbie (2014): "Fishing Na Everybody Business". Women's Work and Gender Relations in Sierra Leone's Fisheries. *Journal-Feminist Economics* Vol *20, 2014, Issue 3 (53-77)*

Ansen Ward and Yolaine Beyens. (Undated). Smartfish Working Papers No. 001. Fish Handling, Quality and Processing. Training and Community Manual. FAO funded by European Union-3

Bandeira Oriana, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul and Munshi Suleiman. (2018). Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa. *JEL Classifications: I25, J13, J24.*

Berling M. Sospeter, Domitilla R. Bashemera and Grace Benedict (2017): The Dynamic Role of Women in Transformed Fisheries of Lake Victoria. *International Journal of Research in Social Sciences,* Vol. 7. Issue: 2249-2496

Cools Sara, Simen Markusenn and Marte Strom.2017. Children and Careers. How Family Size Affects Parents' Labour Market Outcomes in the Longrun. Demography 2017 Oct. Vol. 54(5): 1773-1793

D. M. Onyango, Sifuna A. W., Otuya P., Owigar R. Kowenje C. and Oduor A. O.(2017). Evaluation of Fish Processing and Preservation systems along the Shores of Lake Victoria towards Enhancement of Sun Drying Technology. International Journal of Food Sciences and Nutrition Engineering 2017, Vol. 7 (5) 111-118

Davis A .(2000). On the Sexuality of Town Women in Kampaki. Africa Today, 47 No (2000), 29-60. Doi: 10.1353/at 2000.0065

Elizabeth A. Okello. (2017). Changing Gender Roles in the Fishing industry in Homabay County, Kenya 1900 to 2012: A Descriptive Study; Unpublished Masters Thesis Egerton University

Faith W. Ngaruiya, G.M. Ogendi and M.A. Mokua. (2019).Occupational Health Risk Hazards Among the Fisherfolk in Kampi Samaki, Lake Baringo Kenya. Environmental Insights, Vol. (13) 1-11. Available at: online Publication-http://doi10.1177/1178630219881463

Felly Esilaba, W. Moturi and M. Mokua. (2017). Urban Consumers' Fish Preferences and the Determinants influencing Fish selection and Consumption: Case Study of Nakuru Town, Kenya. International Journal of Fisheries and Aquatic Studies .2017-. Vol.5(3) 356-360

Felly Esilaba, W. Moturi, M. Mokua and T. Mwanyika.(2020). Human Health Risk Assessment of Trace Metals in Commonly Consumed Fish Species in Nakuru Town, Kenya: Environmental Health Insights. Sage Journals-14(1)2020. Available at: Online Publication-https://doi.org/101177/1178630220917128

Food and Agricultural Organization. (2018). The State of World Fisheries and Aquaculture. Meeting the Sustainable Development Goals. Rome (2018)

Garcia-Vazquez V.S. (2006). Subsistence, Fishing and economic Change-A Comparative Study in Southern Veracruz, Mexico, Department of Rural Development, Cologiode Postgraduate, Mexico Vol. 14 No. 1-September 2006-In Eunice

A. Okello (2017). Changing Gender Roles in the Fishing industry in Homa bay County, A Thesis Submitted to the Graduate School in Partial Fulfillment of the Requirements for the Degree of Master of Arts in History of Egerton University

Georgina Pearson, Caroline Barratt, Janet Seeley, Ali Ssetaala, Georgina Nabbagala & Gershim Asiki.(2013). Making a Livelihood at the Fish-Landing Site:Exploring the Pursuit of Economic Independence amongst Ugandan Women. Journal of Eastern African Studies, Hedayat Allah Nikkhah, Ma'rof

Redzuan and Asnarulkhadi Abu-Samah. (2010). The Effect of Women's Socio-demographic Variables on their Empowerment. American Journal of Science, Vol.6 (11)

Ivan Kyangwa and Konstantine Odongkara. (2005). Sanitation, Fish Handling and Artisanal Fish Processing Within fishing Communities-Socio-Cultural Influences .Socio-economic Research Report 6.Lake Victoria Environmental management Project: Fisheries Resources Research Institute National Agricultural Research Organization, Jinja Uganda

Jacob Abwao and Jane A. Fonda. (2019). State of Women in the Fisheries and Aquaculture Value Chain in Homabay County, Kenya. Towards Enhancing Sustainable Livelihoods and Economic Empowerment Livestock Research for Rural Development, Vol. 31 (12) 2019

Jenny Hawley. (2016). Why Women' Empowerment is Essential for Sustainable Development: International Institute for Environment and Development.

Jim Grannato, Ronald Inglehart and David Leblang .(1996). The Effects of Cultural Values on Economic Development, Theory, Hypothesis and some Empirical Tests. American Journal of Political Science. Vol. 40 No. 3: 607-631

Judit Kapás (2017): How Cultural Values Affect Economic Growth: A Critical Assessment of the Literature. UDK / UDC: 316.7:330.35 JEL klasifikacija / JEL classification: O43, Z19

Lawless, S., Doyle, K., Cohen, P., Eriksson, H., Schwarz, A. M., Teioli, H., McDougall,

C. (2017). Considering gender: Practical Guidance for Rural Development Initiatives in Solomon Islands (Vol. Program Brief: 2017-22). Penang, Malaysia: WorldFish

MacAlister Elliot and Partners Limited (2002): The Role of Women in the Fisheries Sector. Tender FISH/2000/01-LOT NO 1

Madanda A. (2003). Commercialization and Gender Roles Among Lake Victoria Shore Fishing Communities of Uganda. Research Report to the 14th OSSREA, Makerere-Kampala, Uganda

Medard Modesta, T. Ngatunga, F. Sobo and S. Chirwa. (2002). Women and

Gender Participation in Fisheries Sector in Lake Victoria

Michael Toman. (2003). The Role of Environment and Natural Resources in Economic Growth Analysis- Resources for the Future- May 2003 • Discussion Paper 02–71

Millicent Mokua and S. M. Makindi. (2018). Fishermen Migration in Lake Victoria (Kenya): Implication for Sustainable Harvesting of Fisheries Resources. / Elixir Environ. & Forestry. 122 51729 (2018) 51729-51733

P.O. Okemo, P. A. Aloo., D. M. Mukwabi, J.J. Jumbe, A. W. Sifuna, J. Munguti and M. Mokua. (2017). Contamination of the Minnow Rastrineobola argentea, through Handling at Landing Sites and Retail Markets around Lake Victoria. East African Medical Journal; Vol. 94, January 2017

Philip Miruka, Nathan Joshua, Jack Obongo. (2015). The Cultural View of the Luo People of Western (Kenya) on Widow Care and the Biblical Approach, Sociology and Anthropology 3(4): 240-250, 2015 http://www.hrpub.org DOI: 10.13189/sa.2015.030405

Phylis J. Busenei, G. M. Ogendi and M. Mokua. (2019). Open Defecation Practices in Lodwar Town: A Mixed Methods Research. Environment Health Insights. DOI: 10.1177/1178630219828370

P. Sultana, P.M. Thompson and M. Ahmed: Women-Led Fisheries Management –A Case Study from Bangladesh. ICLARM-The World Fish Center, Malaysia and Bangladesh

Reuben Omwega, N: Community involvement in fish harvesting around Lake Victoria (Kenya): Kenya Marine Fisheries Research Institute, Kisumu, Kenya

Sara Fröcklin, Maricela de la Torre-Castro, Lars Lindström, and Narriman S.(2013). Jiddawi:Fish Traders as Key Actors in Fisheries: Gender and Adaptive Management: Ambio. 2013 Dec; 42(8): 951–962. Available at: Published online 2013 Nov 9. doi: 10.1007/s13280-013-0451-1

Stanley Makindi, M. Mokua and Urmilla Bob. (2019). Integrating Gender and Conservationof Biodiversity as a Climate Change Adaption Strategy. *Elixir Environment and Forestry Journal*, Vol.132 (2019)53377-53382

Tabitha Kiriti and Clem Tisdell. (2003). Working Paper No. 31 Family Size, Economics and Child Gender Preference: A Case Study in the Nyeri District of Kenya Waikhom Tomthinnganba Meetei, Biswarup Saha and Prasenjit Pal: Factors Influencing Women's Empowerment through Fisheries Activities: A Study in Manipur Indian Res. J. Ext. Edu. 15 (4), Special Issue, November, 2015

World's Economic Forum. (2017). How Savings Circles Empower Women in Rural Africa