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### Fish Value Addition Practices by Women Fish Vendors in Dar Es Salaam: A Case of Mackerel Fish

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Date Published: **ABSTRACT**

**04 March 2024** Fish value addition has been linked with enhanced economy for women vendors worldwide. Despite the existence of enormous benefits linked to value addition, many fish traders in Dar Es Salaam still sell unprocessed fish and fish products while a few of them sell the processed product. A number of practices for fish value addition have been identified through this study conducted in Kinondoni Dar Es Salaam. The study employed a cross-sectional design. The study population was 100 fish traders involved in the fish business. Structured questionnaires were employed. Quantitative and qualitative analysis using frequency table proportions (percentage) was used to interpret the data, and descriptive statistics was used to analyse the data. The study established the fish vendors in Dar es Salaam were involved in fish cleaning (14%), grading (23%), processing (52), and packaging (11%). This implies that the majority of fish vendors were engaged in processing fish. Further, the study revealed that 5% of respondents were preserving fish in frozen devices, 77% of respondents were frying them, 7% were drying fish in the sun and 11% were packing them. This implied that there are a number of methods used to ensure the quality of fish, but the most common one used by women fish vendors was to fry them. It was concluded that Value addition plays a crucial role in enhancing economic returns, expanding market opportunities, reducing waste, improving nutrition, and promoting food security.

**Keywords:**

*Fish,  
Value  
Chain,  
Women,  
Vendors*

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## INTRODUCTION

Fishing as an economic activity employs a very large number of people. Fish is a source of protein and also a source of income for people living close to the water bodies around the world. According to FAO (2022), an estimated 58.5 million people were engaged as full-time, part-time, occasional, or unspecified workers in fisheries and aquaculture, and of these approximately 21 percent were women. Out of this fishing community, 35 percent were employed in aquaculture and 65 percent in capture fisheries. The number of people engaging in fishing in Africa is also said to be increasing as in 1995 only 2,812,000 people were involved in this industry and by 2020 the number had increased to 5,641,000 people. Currently, a quarter of Tanzania's population depends on coastal resources or inland lakes for their livelihoods. Over 180,000 people are employed in the fisheries sector, with a further 19,000 people involved in fish farming (World Fish, 2022).

The fish industry has progressed from traditional post-harvest practices to value-addition practices for many reasons. Value addition to fish plays a crucial role in enhancing economic returns, expanding market opportunities, reducing waste, improving nutrition, and promoting food security. It plays a vital role in the sustainable development of the fisheries industry and the well-being of coastal communities. Most of the developed countries such as Italy, Germany, and the United Kingdom add value to the fish by observing value processes such as cleaning the fish and packing them in clean containers, and preserving the processed fish using cold rooms (Kyule *et al.*, 2014). In Africa, value is added to fish and fishery products depending on the requirements of different markets. Fish is traded live, fresh, frozen cured, canned, and smoked. In Nigeria, one of the best ways of adding value to catfish is smoking. Fish smoking is a way of preserving fresh fish using smoke and heat. Although there are several

other methods of fish preservation such as freezing, canning, sun-drying, salting, and others, smoking is of high preference. Value addition is added to a number of fish species, but the common fish species vended by women vendors are Mackerel fish because of availability, accessibility, and affordability. The value addition process of Mackerels fish includes the processes associated with fish and fish products from the time fish are caught or harvested to the final product delivered to a customer (Olusola, 2017).

Women contribute to value chain of fisheries. According to Preez (2018), Women play an important role in fisheries. In Asia and West Africa, women represent 50% of inland fisheries' workforce and 60% and 80% of the market of all seafood respectively. In 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's abilities in the fishery value and are branded as informal contributors in many developing countries to which African 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). Other barriers women in the fish industry face include limited access to resources, technology, and credit, as well as gender-based discrimination.

The fish is either sold fresh by the women or processed by smoking. In the aquaculture sector women also play key roles in buying and processing (UNIDO, 2010). In Tanzania, small-scale fisheries are the most important fishery as they land almost all the freshwater and most of the

marine catches. They contribute about 98 percent of the country's total catch and generate income, provide food for local, national, and international markets, and make important contributions to nutrition. Small-scale fisheries employ over 90 percent of the world's capture fishers and fish workers, about half of which are women (EMEDO, 2017). The common fish products sold in most fish markets in Tanzania include fresh, salted, hot smoked, and fried fish (Olusola, 2017). Value addition for fish is an important strategy that will add economic value and possibly widen the market performance while reducing the problem of post-harvest losses (Kyule *et al.*, 2014; Mohamad *et al.*, 2011).

In spite of the significant contribution of women's efforts in social and economic activities and the fact that they start working before the sun rises until the sun sets throughout the year, the contribution of women's efforts to their livelihood is not well captured (Mahmud, 2021). This has resulted to get a large number of customers that could enable them to sustain their household livelihood. This situation is common to women fish vendors who carry out their businesses in Dar es Salaam region and elsewhere in Tanzania. The study intended to find out what value addition practices are added to mackerel fish sold by these women vendors around Dar es Salaam.

## Definitions of Key Terms

### *Value Addition*

Value addition according to Kim and Lalancette (2013), refers to a product resulting from growth in abilities, skills, and knowledge, plus other qualities the staff have added from practice in the respective field over time. Benefits associated with value-added measurement include but are not limited to a fair estimation of that input businesses due to the production process observed within a period of time and providing more accurate estimate of the business's effort associated with production levels and potential.

Value addition would refer to processing and packing provided to fishery resources in order to reduce waste and hence increase the final value or

raw form (IBF, 2011). With regard to the value addition and for the purpose of this study, value addition is a change in the state or form of fish by way of processing or further processing to improve its value and offer it to an expanded customer base for enhanced producers' income or revenue.

### *Women Fish Vendors*

With regard to the fish vendors and for the purpose of this study, women fish vendors are defined as women who are engaged in selling fish. In this study women fish vendors are those women who sell fish including fish that is graded, cleaned, frozen, fried, sun-dried, and packed (Mwakabonga, 2015).

### *Mackerel Fish*

Mackerel is a popular and widely consumed type of fish that belongs to the family Scombridae. It is known for its distinctive flavour, oily flesh, and rich nutritional content. Mackerel is found in both saltwater and freshwater environments, and it is a common catch for commercial and recreational fishermen around the world. Mackerel fish are rounded and torpedo-shaped fish with a slender, keeled tail base, a forked tail, and a row of small finlets behind the dorsal and anal fins. They are carnivorous fishes and feed on plankton, crustaceans, molluscs, fish eggs, and small fish (Olusola, 2017).

### *Cleaning of Fish*

Cleaning of fish is the process of removing unwanted things such as guts and organs. Others remove skin and visible fat, and cut away back, side, and belly fat, including the belly flap, the line along the middle of each side of the fish. Also, it involves a cutting V-shaped wedge to remove any dark, fatty tissue along the length of the fillet (Zohar *et al.*, 2015). The study defines the cleaning of fish as the process of removing out all unnecessary materials in order to add value.

### *Grading of Fish*

Grading/sorting of fish is a common management practice in fish farming which involves the distribution of fish into groups of similar

individual sizes in ponds. Apart from sorting fishes into sizes, fishes can also be sorted based on sex intended for specific purposes like breeding (FAO, 2015). For the purpose of this study, fish grading is a process of sorting and categorizing fish based on certain qualities. Many fish are sold by size or grade.

### ***Processing of Fish***

The term fish processing of fish refers to the processes associated with fish and fish products between the time fish are caught or harvested, and the time the final product is delivered to the customer. Although the term refers specifically to fish, in practice it is extended to cover any aquatic organisms harvested for commercial purposes, whether caught in wild fisheries or harvested from aquaculture or fish farming (Zohar *et al*, 2015). For the purpose of this study, fish processing involves preparing fish and delivery to consumers. The process includes ensuring a quality of fish produced for preserving in ice, frying, drying in the sun, and packing.

### ***Packing of Fish***

Packing is the act of grouping items into a container, especially for storing or moving the items. Packing can also describe the container or wrapping itself (FAO, 2015). The study considers packing as the preparation of a product or commodity for proper storage and/or transportation ready for sale to the customers.

## **RESEARCH METHODOLOGY**

### **Research Design and Sampling**

The study employed cross-sectional design. This design was chosen because of its flexibility in methods of data collection and analysis (Bailey, 1994). The study was carried out in Dar es Salaam region. It is a coastal area with a large number of its people depending on the fishery. Among people in the fishery business are women who deal with the value addition of fish and vending.

The population for this study was women fish vendors available in Dar es Salaam region. Matata *et al*. (2010) indicated that, having 80 - 120 respondents are adequate for most social-

economic studies in Sub-Saharan Africa. Selection of this sample size relied on the degree of study precision, standard of accuracy, confidence level to be applied, and a sample dimension to facilitate information adequacy and representative. The study involved 100 women fish vendors considering the fact that there is no exact number of fish vendors in Dar es Salaam the number selected based on the point of saturation

Snowball sampling and purposive sampling were used by the researcher to select the participants from Dar es Salaam region. For the case of snowball, the research team visited the workplace of the respondent and afterward the respondent mentioned and showed the research team another respondent doing similar business. The reason behind using snowball sampling was because it was easier to find the respondents through other respondents since the district office had no database of women fish vendors operating in their area.

The purposive sampling was employed by the researcher to select two market managers and four fishery officers. The method was employed because it helped the research team to be detailed and also the method was useful in selecting the right respondents in the field area.

### **Data Collection Method**

#### ***Survey Method***

In this method, a questionnaire as a tool was designed to capture information related to fish value addition practices among women fish vendors in Kinondoni District, the questionnaire was used on 100 respondents. The researcher administered questionnaires both in person and through the help of a research assistant by visiting the respondents who were women fish vendors. This helped to increase the response rate. The use of questionnaires was justified because they are an effective way of collecting information from a large sample in a short span of time and at a reduced cost than other methods (McLeod, 2023).

### Interviews

Interview was employed with six (6) key informants (two market managers and four fishery officers) by using a checklist guide that complement or supports the questionnaire. The interview was conducted to get an in-depth view by probing information related to the contribution of fish value addition among women fish vendors in household livelihood.

### Data Processing and Analysis

The filled in questionnaires were edited for consistency and subjected to proper recording. The information was then punched into the computer using Statistical Package for Social Sciences (SPSS). Qualitative information was transcribed. As such a complete script was produced for each interview conducted. For quantitative data descriptive analyses was done using SPSS (Version 20) computer programme. Descriptive statistical analysis employed

frequencies, percentage, mean and measures of variations. For qualitative data, content analysis was used involving thematic exploration (based on words, concepts, literary devices, and nonverbal cues) and exploration of the interconnections among themes.

## THE FINDINGS

### Demographic Information of Respondents

This section includes the preliminary information such as age, sex, education levels, and experience of the respondents who are women fish vendors. *Table 1* reveals the findings from 100 respondents.

The age of respondents ranged from a minimum of 18 years to above 42 years. Of which 17% of them were aged between 18 – 25 Years, 22% of the total respondents were aged between 26 – 33 years, 27 % of the total respondents were aged 34 – 41 years and 34% percent of the total respondents were aged above 42 years.

**Table 1: Demographic information of respondents (n=100)**

Variable	Category	Frequency	Percentage
Age	18 – 25 Years	17	17
	26 – 33 Years	22	22
	34 – 41 Years	27	27
	Above 42 Years	34	34
Education level	Primary	48	48
	Secondary	31	31
	Tertiary	19	19
	Adult	2	2
Marital Status	Single	32	32
	Married	48	48
	Widow	7	7
	Divorced	13	13
Experience	Below 5 Years	7	7
	6 – 10 years	8	8
	11 – 15 years	29	29
	16 – 20 years	31	31
	Above 21 years	25	25
Source of capital	Personal savings	27	27
	From relatives and friends	21	21
	Loan from financial institutions	13	13
	From microfinance institutions	39	39

Further, the study sought to establish the education level of the respondents. The study findings indicated that 48% of respondents attained a primary level of education 31% attained

a secondary level of education and 19% attained tertiary education. The marital status of respondents was also considered so as to find out whether women fish vendors are mostly single,

married, widows or divorced. Findings show that 32% of respondents were single while 48% were married followed by 7% who were widows and only few respondents with 13% were divorced (*Table 1*). This implies that most of the women fish vendors included in this study were married and they were involved in fishing activities to support their household. It is also not surprising to find out that women are nowadays breadwinners, supporting their families to survive through their fishing business activities.

These findings concurred with the observation by Zainudin (2019) who reported that there are various type of work for fisherwomen and their contribution is very important in meeting the needs of fisherman and their households in the village of Pasie nan Tigo.

### **Experience in the Fish Business**

The majority of the respondents (31%) had 16 to 20 years in the fish vending business. While 7% of respondents had little experience in business, they had an experience of less than 5 years in the vending business. With an experience of one or more years in a business it is enough to say that all the respondents have experience in the business since they have encountered a number of challenges and successes in this line of business. They could explain how the business runs and what they have successfully achieved as a result of conducting this business.

### **Sources of Capital**

The source of capital is considered to be one of the most important factors for a business to flourish. In that regard, the size of a business is determined by the amount of capital that has been invested. Based on this argument, the researcher wanted to know the source of capital for the fish vending enterprise by women fish vendors. Findings as indicated in *Table 1* showed that 27% of respondents said to get from personal savings, 21% said to get from relatives and friends 13%

said to access loans from financial institutions and the last with 39% said to access loans from microfinance institutions. From that point of view, findings indicate that there are different sources of capital however; the majority is personal savings and loans from microfinance institutions. In recent years, microfinance institutions have been playing a significant role in supporting entrepreneurs including women's fish vendors since they do not have strict conditions unlike financial institutions. However, the amount they get is not sufficient to support the big businesses and that is why, they still end up with the low investment. This is also acknowledged by McCormick (2001) who observed significant differences in the performance of women's enterprises compared to those of men; where women's enterprises are often smaller, less likely to grow, less profitable, and often begin with less capital investment as compared to those owned by men. The study findings were similar to those of Kantor (2001) who observed that many entrepreneurs particularly women, are located in low-value markets due to less capital where there are fewer policy requirements for trade. Most of their entrepreneurial pursuits often in service and entertainment tend to be crowded due to fewer barriers. This situation results in saturated markets with little room for growth to large scale and to competitive levels of value addition.

### **The Fish Value Addition Practices**

The study intended to identify fish value-addition practices conducted by women fish vendors in Dar es Salaam. Value addition is one of the important aspects of fish vending. Value addition starts when a fish is caught, sorted, graded, peeled, gutted, sliced, etc. *Table 2* revealed that the practices the fish vendors in Dar es salaam were involved in included fish cleaning (14%), grading (23%), processing (52), and packaging (11%). This implies that the majority of fish vendors were engaged in processing fish.

**Table 2: Practices of women in fish value addition**

Item	Frequency	Percentage %
Cleaning of fish	14.0	14.0
Grading of fish	23.0	23.0
Processing of fish	52.0	52.0
Packing	11.0	11.0
Total	100.0	100.0

Findings with regard to the value addition activities performed by women are supported by a number of scholars. For example, the study by Manyungwa *et al.* (2017) assessed women's participation in fish value chains and value chain governance in Malawi and found that women are relatively integrated in all the nodes and activities of the value chain in order to increase benefits in their fishing vending activities. In contrast, De Silva (2011) revealed that, in general women are involved more in the lower levels of the fishery value chains having less access to resources and decision-making. In contrast, women having higher education levels or having access to resources are involved in the higher levels of the fishery value chains enjoying better benefits. Regardless of gender-role differences, wealthier groups of both women and men play a dominant role in the value chain, and they focus more on high-value ends. Deprived members have weak bargaining power, and little control over resources and prices in the value chain, and they are more vulnerable. Generally, men invest in fishing vessels, nets, other gears, and pond construction and are involved more in production. On the other hand, women invest more in processing equipment and they are responsible for fish purchasing, processing, and retailing however, this differs in every fishing area and country.

In addition, the study by Odhon (2020) who analysed gender roles in Dagaa Fishery Value Chain among fishing communities around Lake Victoria in Bondo Sub County, in Siaya County, Kenya revealed that the majority of the boats and fishing gear 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 the processing and trading of Dagaa on 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.

On the other hand, the study was supported by the study by Beran (2018) which revealed that there were more women than men in grading, sorting, and gleaning in the fish markets. The grading, sorting, and gleaning were regarded as post-harvest activities where women played prominent roles in line with their reproductive roles and responsibilities. The activities, however, were rendered as lower-end value chains with marginal economic potentials. The activities related to grading, sorting, and gleaning occupy the centre of interest at the market areas and include the removal of scales and intestines, cleaning gills, and grading, and arranging the fish commodities based on quality and size. The reasons given for the dominance of women within this category were based on the division of labour and allocation of roles within patriarchal societies where sex was the determinant. The study findings indicated that cultural beliefs were used to limit women to post-harvest activities that included fish handling, processing, and gleaning within the value chain.

### **Preservation Practices for Mackerel Fish**

Preserving mackerel fish was found to be important for the purpose of extending its shelf life and enjoying it at a later date. From the study, there are several preservation methods the respondents reported to be using for their business. The practices included cooling, frying, drying, and packaging. *Table 3* shows this in detail.

**Table 3: Preservation methods used for Mackerel fish**

Statement	Frequency	Percentage %
Cooling in ice	5	5
Frying them	77	77
Drying them in the sun	7	7
Packing them	11	11
Total	100	100

Findings from the study revealed that 5% of respondents were preserving fish in the frozen devices, 77% of respondents were frying them, 7% were drying fish in the sun and 11% were packing them. This implies that there are a number of methods used to ensure the quality of fish, but the most common one used by women fish vendors was to fry them. However, only a few women tend to preserve them in ice, drying in the sun, and pack them. Unlike other African countries where they used to smoke and dry them as explained by Olusola (2017) who added that in Africa, value is added to fish and fishery products depending on the requirements of different markets. In Dar es Salaam women tend to sun dry them instead of smoke dry them. In Nigeria, one of the best ways of adding value to catfish is smoking. Fish smoking is a way of preserving fresh fish using smoke and heat. Although there are several other methods of fish preservation such as freezing, canning, sun-drying, salting, and others, smoking is of high preference.

In addition to that, a respondent who was a fishery officer was asked how women fish vendors are involved in fish value addition and thus quoting one of the key informants, the following statement was made: -

*"...Women fish vendors participate in various fish activities related to value addition such as cleaning fish, frying fish, and packing them for sale". (Interview Guide, Fishery Officer 1, 2022)*

## CONCLUSION

In conclusion, the study sheds light on the significant role of women in the fisheries sector, particularly as fish vendors in Dar es Salaam, Tanzania. The findings underscore the diverse and crucial value addition practices carried out by

women in the fishery value chain, including cleaning, grading, processing, and packaging of mackerel fish. Despite facing barriers such as limited access to resources, technology, and credit, as well as gender-based discrimination, women fish vendors contribute significantly to household livelihoods. The study highlights the importance of understanding the demographic profile of these women, their experience in the fish vending business, and the sources of capital they utilize. Moreover, it reveals the various preservation methods employed, with frying being the predominant practice. It also emphasizes the need for policies that address gender inequalities and promote the inclusion of women in fisheries value chain activities, ensuring their economic empowerment and overall well-being. Overall, the study provides valuable insights into the dynamics of women's involvement in fish value addition in the specific context of Dar es Salaam, contributing to the broader discourse on gender, fisheries, and economic development.

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