

## **The role of women in artisanal fish processing and trading on Lake Victoria (Kenya)**

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### **ABSTRACT**

This paper examines the role women in artisanal fish processing and trade along the Kenyan shore of Lake Victoria. The study was carried out with aid of a structured questionnaire administered through personal interviews. Two surveys were conducted sequentially, in which samples of fish traders and processors were interviewed. Results show that, at the artisanal level, women dominate fish trading and processing. Most female traders and processors were introduced into the fish business by their parents or spouses, while male traders have joined the fish trade mainly because the business required little initial, start-up, capital. The three main sources of financing fish businesses were: income obtained from selling farm produce or livestock, money lent by relatives and from respondents' personal savings. The most frequently traded fish was adult Nile perch, with a slightly greater proportion of men trading this fish than females, who traded mainly juvenile Nile perch. Male traders prefer to deal in fresh fish, while the largest proportion of women deal in sundried fish products. The paper concludes that there are disparities in many aspects of fish trading and processing between men and women, and recommends improved infrastructure, increased access of women to credit facilities, improved fish processing and preservation techniques to avoid spoilage, and enhancement of incomes from fish trading and processing.

### **INTRODUCTION**

Lake Victoria is inhabited by over 177 fish species, 127 of which are cichlids mostly of the *Haplochromis* species. Unregulated fishing activities, coupled with the introduction of exotic Nile perch and Tilapia species in the 1960s, are among factors that have led to a drastic change in the species composition of the lake. Currently, three species dominate the fishery: the Nile perch, (*Lates niloticus*), the *dagaa* (*Rastrineobola argentea*) and Tilapia (*Oreochromis* spp.).

Gender analysis examines the differences in women and men's lives, including those, which lead to social and economic inequality for women, and applies this understanding to policy development and service delivery. It is also concerned with the underlying causes of this equalities and aims to achieve positive change for women.

Fishing is a major economic activity for most third world countries. It is also a crucial source of food, income and employment to many people, especially riparian communities residing by the water bodies. Gender plays an important role within the fisheries where both men and women are involved in fishing activities that complement each other.

Studies carried out all over the world indicate that fisheries resources are declining due to use of destructive fishing technologies and overfishing. For sustainability of the fisheries it is important that policy makers consider the needs and strategic interest of both men and women whose livelihood is at stake.

There is the usual presumption that fishing is a predominantly an occupation of men because of the image that men go to the lake in their fishing boats. However women play an important role in fish production and marketing. Many fish traders are linked to fish capture and processing households, and either live in the community or visit it regularly. Although fish trading is a highly profitable enterprise, large-scale operations require large amount of working capital for purchase and transport of fish. Gender analysis has shown that many women in the ACP participate substantially in most of the basically household managed fishery and fishery related enterprises. Women are actively involved in fish processing and marketing that focus mainly on local markets and on low-value fish with a fairly small scale of operation. The reasons to why women have been commonly involved in going fishing with local markets is tied to the fact that they have to attend to their traditional assigned roles at home (FAO 1997).

Men dominate large-scale fish operations of high value on Lake Victoria. This is capital intensive and, relying on ice and refrigerated transport. Some traders especially women combine fish trade with other trading activities. This could be because their operation scale is small and hence more diversified.

In Nigeria, Garbon women participate in commercial fishing by buying fish from their husbands/sons for processing. If she has granted them loan to pur

chase net or boat this will be repaid with interest in form of lower-priced fish (Nauen, 1989). In many fisher communities women have been reported to be playing an important role in fish processing and marketing (FAO 1997).

Despite women's significant input of time and energy into fishing enterprise and to the household economy, there is no systematic attempt addressing their needs and issues, which would transform their participation into a power source for sector development and management.

The groups that work within Kenya's Lake Victoria fishing industry are diverse and may be defined along the lines of age, ownership and target species. Perhaps the most prominent labor divisions within the fishery are defined by gender. Although fishing in the Kenyan part of Lake Victoria has always been a predominantly male domain, women have historically practiced fishing using certain techniques. The most important technique was called 'teng'o' (herding) capturing mainly catfish (*Clarias* spp.) and lungfish (*Protopterus aethiopicus*) (Geheb, 1997). *Haplochromis* species were also caught using woven traps and processed using simple techniques like sundrying, smoking and salting. These fish were always available as a source of protein. According to Abila (1995), men initially performed production and marketing activities, but have gradually men become more committed to fish harvesting. Thus, their marketing role has diminished. Currently, over 80% traders from the fishery are women (SEDAWOG, 1999). In the past, thousands of women were engaged in fish processing, most of which was carried out on the landing sites or places close to it. That fish which was not sold fresh was smoked or sundried. It was usually Lake Victoria is sold to fish processing plants. Artisanal fishmongers are left with only the juvenile and the damaged Nile perch, which the factory agents reject. During the rainy seasons, when the agents do not come to buy fish due to impassable roads, then the artisanal fish traders have a chance of selling the large and undamaged Nile perch. An increasing amount of dagaa is also being sold to fishmeal industries. Traditionally, fish traders developed relationships with particular fishers from whom they purchased most of their fish. With the factories taking an increasingly larger share of the catch, the relationships between fish traders and fishers have been severed. Fishers are under contract to deliver to purchasing agents who can also afford to pay prices higher than the fish mongers can (Abila and Jansen, 1997). Processing plants therefore have a considerable impact on, mainly female, fish traders. Men benefit more than women in the Nile perch fishery because they catch the fish and sell it directly to agents from the filleting factories.

Women are therefore forced to trade in what is left over: less profitable juvenile fish and factory rejects.

Though there exists a body of data on fish marketing (Abila, 1995; Jansen, 1997) fish utilization and marketing (Yongo, 1991) and on women's social organization and production (Gerrard, 1992) for Lake Victoria, there is little information on the role of women, especially with respect to trading practices and preferences.

This study examines the role of women in fish trade and processing in the Kenyan part of Lake Victoria. This was achieved through a number of specific objectives: first to examine the reasons why male and female fish processors and traders choose fish businesses over alternative trades. Secondly, to ascertain the species and forms of fish traded, and reasons for dealing in them. Thirdly to explore why traders substitute trading of one type of fish with another. Lastly, to investigate the sources of capital for initiating fish processing and trade.

## **METHODS**

This study was carried out at eighteen sites, consisting of six fish landing beaches and six each of small and large inland fish markets. The samples were selected purposively with each district being represented along the shores of Lake Victoria equally spread out in the northern, southern and gulf zones along the Kenyan part of the lake. At each of these sites a structured questionnaire was administered through personal interviews. The targeted respondents were local fish traders and processors who normally lived at the survey sites or who lived elsewhere but usually came to the beach or market to process, buy or sell fish. In practice, only those traders and processors who were present on the beach or market at the time of survey were involved in the study. The poor women who alone, or in small groups, processed fish. Many of the fish processors were fisher's wives (Jansen, 1997).

Most of the Nile perch landed from research team took a whole day at each site visited. Fish trading at the beach markets occurred mainly in the morning while the interior markets fish trading occurred in the afternoon, except in urban towns where trading occurred the whole day. A total of 319 respondents (50 males and 269 females) were interviewed. A second study was carried out to verify some issues arising from the first study. A sample of 21 respondents was involved.

### **Characteristics of fish traders and processors**

Results indicated that the majority of fish traders and processors were women (50 males and 269 females). Of the female traders interviewed, 80% were married, 9% were single while 9% were widowed. In comparison, nearly the same proportion of male respondents, 81%, were married while 14% were widowed. The average number of children per female trader or processor in the sample was six.

Most males and females in the target group were engaged in fish trading alone. Of the sample, 74% and 57% of male and female traders respectively were specifically fish traders. Comparatively more females (43%) combined fish trading and processing than did males (24%).

According to Croll (1981), fish trading is an employment opportunity for divorced or deserted women in a region where they have limited property rights. The number of widowed individuals in Kenya's Lake Victoria fishery has increased significantly due to the AIDS epidemic, leaving many women in charge of households, and obliging them to turn to fish trading and processing so as to earn money to make up for the short falls that farming alone creates. It is also suggested that fisheries-related activities have been more attractive in certain types of marriages. Gerrard (1992) observed those fish traders in Tarime, Tanzania tended to be women from polygamous households or those who have older husbands or migrant husbands. The results of this study, however, indicated that most traders came from monogamous rather than polygamous families. Of 211 interviewees responding to the question, 158 were from monogamous families while only 53 came from a polygamous marriage.

### **Reasons for joining fish trading and processing**

Results displayed in Table I show that the majority of female and male traders have been involved in processing or trading the principal commercial species – Nile perch, *dagaa* and tilapia - for over five years. In the last two years, proportionately more women than men have joined the fish processing and trading sector. Several reasons have been advanced as to why people, particularly women, join the fish trade. Francis (1995) argues that the migration of men to other parts of the lake and urban centers have left women to take up duties traditionally performed by men, including fish trading and processing, as a source

of income. Labor mobility was at first stimulated by a legal requirement during the colonial period and also by new needs for cash for taxes, clothing and to purchase bride wealth (Clayton and Savage, 1974).

Table I: Number of years in which respondents have processed or traded their principal species

Gender		No. of years			Total
		<2 yrs	2-5 yrs	> 5yrs	
Male	Count	11	5	34	50
	% within Gender	22	10	68	100
Female	Count	85	34	150	269
	% within Gender	31.6	12.6	55.8	100
Total	Count	96	39	184	319
	%	30	12.3	57.7	100

Source: SEDAWOG, 1999

Geheb (1997) also reasons that people have joined fish trading and processing because of their desire for a cash income, and drawn by the very start-up investment needed by the sector. According to Francis (1995), there has been a net decline in agricultural production in Western Kenya since the Second World War. This has increased the need for cash to buy food and, alongside it, a dramatic rise in the essential number of household goods and items that can only be bought with cash. In fishing communities, Francis (1995) claims, women were traditionally involved in farming. As farm yields have therefore declined, many women have turned to trading fish.

The studies cited above, however, do not explain why fish businesses should be a favored choice of employment in an environment characterized by competing trading opportunities. This study investigated why male and females choose to deal in fish rather than in other trades. Respondents gave various reasons, which have been grouped into nine categories (Table II). The results suggest that most female respondents trade and process fish because it is a business which has run down their family lineage. Such women were introduced to the business by either their parents or husband on marriage.

Table II: Why men and women trade fish

<b>Reason for Trading/ Processing Fish</b>	<b>Women (N=45)</b>	<b>Men (N=19)</b>
Fish is highly marketable; there is high demand for fish; many people here eat fish.	4.3%	21.1%
Requires little capital to start; you start earning money immediately; the fish business is easy to start.	19.6%	31.6%
Fish is lighter and easy to transport on the head or bicycle than other commodities.	4.3%	5.3%
The fish business is very profitable; the fish business has reliable returns.	8.7%	21.1%
I come from the lake area; fish is the most readily available commodity on my beach/ market; there is nothing else to trade here.	23.9%	5.3%
Fish provides me with both cash income and food at the same time.	6.6%	5.3%
I was introduced to fish business by parents/ spouse; I inherited fish business skills; I have long-term experience in fish trade.	28.3%	5.3%
I can easily buy fish from fishers or wholesalers on credit; it is easy to relate to fish suppliers since we meet daily.	2.2%	-%
It is easy to plan fish business alongside farming activities and household duties; I can do fish trading throughout the year.	2.2%	5.3%

Source: Survey results.

The second most important reason why females choose fish processing and trading over other occupations is that in the area where they come from, particularly those living around fish landing beaches, fish is the most readily available commodity that can be traded. This group of females consider fish to be ‘their product’, which they can sell to the outside world.

Thirdly, some females take up the fish trading business because it requires little start up capital and, once started, generate profits immediately. In comparison,

the low capital requirement is the most important reason for men who joined the fish business, followed by those who believed that it could generate rapid profits.

### Species of fish traded

The fish traded by most men and women is Nile perch. Figure 1 shows that a higher percentage of women are engaged in 'dagaa' trading compared to men. In contrast, a greater percentage of men trade in tilapia than women. The reason for Nile perch being the most traded fish could be because it is the lake's dominant fish species, it is easily available and profitable. The reasons provided by respondents for choosing to trade in one fish species over another were as follows: Nile perch traders are attracted to the species because it brings in high profits, its juveniles are easily available, and there is a high demand for the fish.

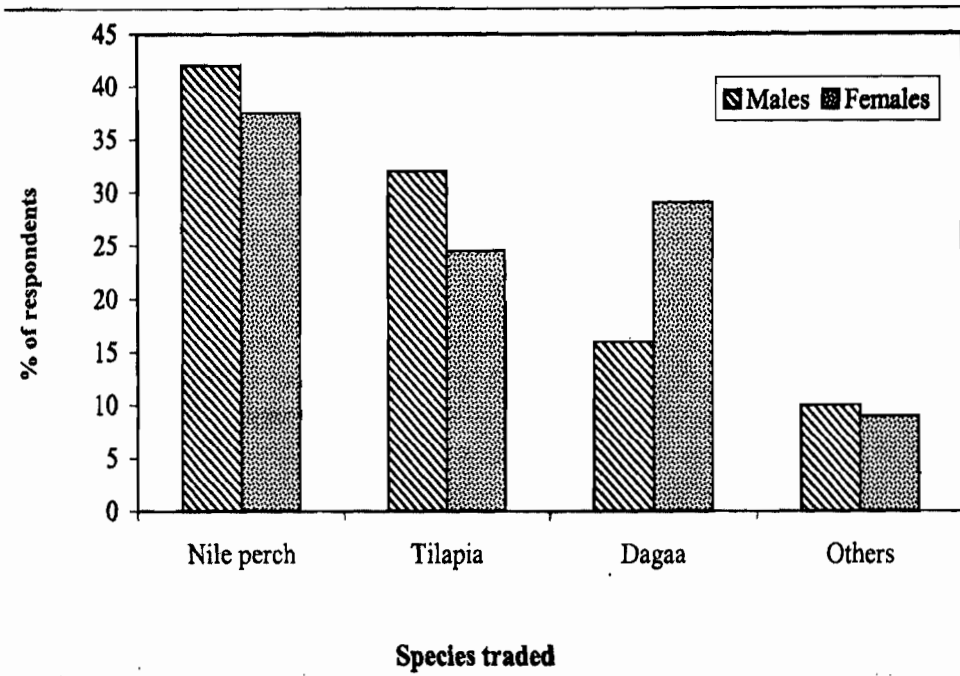


Figure 1. Principle species traded by trader's gender



The reasons why traders prefer dealing in tilapia is that it has a high demand, it is readily available and it brings in good profits.

*Dagaa* seems to have many advantages, which makes traders to choose to trade it. The fish business requires very little capital to start. Some traders interviewed had begun their businesses with as little as Ksh. 200 (US \$ 3). *Dagaa* also has a ready market since many people consume it. The *dagaa* is a very small fish, and is sold in heaps or other easily divisible units. This makes it attractive to a wide consumer base, because the unit of sale can always be divided down to a size commensurate with what consumers can afford. The fish is easy to handle, process and store. In contrast to the smoking and deep frying used to process other fish species, sundrying *dagaa* does not incur any additional processing expenses. Some *dagaa* traders are also able to buy it frequently on credit.

### **Why traders stop trading in a species of fish**

Irrespective of the advantages in trading any one of the fish species, some traders often stop trading a particular fish species and shift to trading another one. Each respondent was asked if he or she had attempted trading a fish species but failed, and to give a reason for why this had happened. Several reasons were advanced. Results obtained show that 87% of the female respondents and 18% male respondents had change the fish species they had traded in. Some traders of (adult size) Nile perch had stopped because it was no longer easily available since most of it is going to fish processing factories. Other Nile perch traders left it because, they said, not many consumers liked the fish. Yet others claimed that the Nile perch trade was not very profitable. Some traders who had left trading tilapia and *dagaa* also cited low profitability as the reason for doing so. Some *dagaa* traders had stopped the trade because sundrying the fish took too much time and too much space, which was often not available. Others left because too many people had joined the *dagaa* trade, flooding the market with the fish. One *dagaa* wholesaler had stopped trading the fish because he had given out too much fish to retailers on credit, until and then ran out of working capital. A common reason given for ending tilapia trading was that the fish had become very scarce.

### Sizes of Nile perch traded

There are two contrasting markets for Nile perch. The export market, which uses high quality fish, and the local market which consumes juveniles and that fish which has been rejected by factory agents due to poor quality. Demand for Nile perch in both markets has increased, causing pressure to catch even those Nile perch of less than a kilogram.

In an attempt made to verify how much of the Nile perch processed and traded was indeed juvenile fish. Out of 21 male and female Nile perch traders, 17 dealt in juvenile fish. The researchers recorded the weights of a randomly picked sample of fish traded by respondents and other traders at each survey site. Juvenile fish, in this study, was taken as Nile perch weighing less than 500 g. Therefore, although the survey involved a relatively small sample, the findings would indicate that most local processors and traders of Nile perch trade in juvenile fish much of the time.

### Fish product forms traded

Traders may sell their fish fresh or processed. Fish is mainly processed to preserve it and to improve its flavor. If not sold fresh, fish is generally sold smoked, sundried or fried. Both male and female displayed their products either on manila sacks, in wooden stalls, or on cement slabs. The amount of processed products at inland markets is often higher than at beach markets. This could be because of the distance from the source of supply, coupled with poor infrastructure, making it difficult for fish to reach these markets in a fresh state. Thus the fish is semi-processed in various ways to preserve it. Additionally, for Nile perch, some products come from urban-based fish processing factories. Table III shows the forms of fish found at inland and beach markets during the study.

Amongst the traders who sell *dagaa*, most sell a sundried product. After fishers land the *dagaa*, they sell it to, mainly, female buyers who wash, sundry, and later sell it. This process involves patience, which respondents claimed females had, and males did not. Smoked *dagaa* is a recent product form which, in some markets, is sold by men (SEDAWOG, 1999). In the case of processed tilapia, men normally sell smoked tilapia, while women normally sell sundried tilapia. Female processors and traders normally fry tilapia at the beach or the market place. Fresh tilapia that is not sold by evening is processed to preserve it for sale later.

Men mostly trade in fresh Nile perch because they own boats and sell their fish directly to factory agents who pay them immediately. Female traders cannot compete with factory agents who have a great deal of financial backing, and good fish preservation technology. Female traders have no access to credit facilities. Unlike males, they do not own assets that they can dispose of. Women prefer to deal in a diversity of fish formats, a coping strategy aimed to maximize trade.

### **Reasons for trading in various product forms**

Proportionately more men deal in fresh fish than women, while proportionately more women deal in sundried fish than men (Figures 2 and 3). This is probably due to the fact that men own bicycles, which makes it easier for them to rapidly transport their fish to inland markets before it spoils. Most women prefer to deal in sundried fish possibly because they lack a quick means of transport to get fresh fish to market. Fresh fish is also very heavy to carry. The majorities of women either walk to the market place or use public transport to get to distant markets. Most women prefer to deal in sundried fish possibly because they lack a quick means of transport to get fresh fish to market. In the latter case, they often have to walk long distances to get to places where they can board such transport. Some women also prefer dealing in processed fish since in this form fish can be preserved longer.

Table III: Fish product forms traded.

<b>Species</b>	<b>Product forms at inland markets</b>	<b>Product forms at beach markets</b>
Nile perch	Fried fillet, juveniles, and frames; split and smoked, split and fried, fresh adults and juveniles, smoked juveniles.	Fresh, smoked and fried juvenile.
Tilapia	Fried, fresh, smoked, split sundried, split smoked.	Fresh and smoked.
<i>Dagaa</i>	Sundried and fresh.	Sundried and fresh.

Source: Survey Results.

According to Nyanja (1986), however, although processing preserves fish longer, it means additional costs, and hence a loss to the trader.

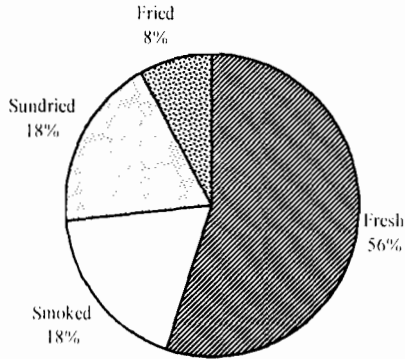


Figure 2: Product forms traded by men

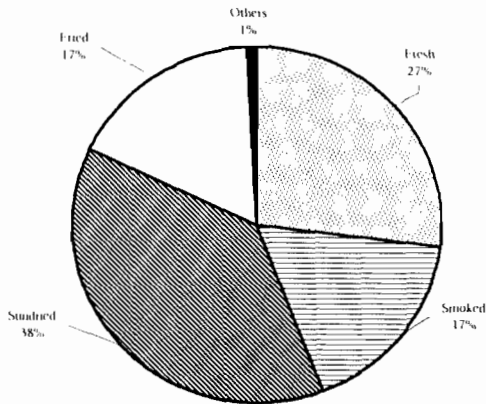


Figure 3: Product forms traded by women

There are traders who buy and sell fish at the same beach market because there is less fish spoilage since it is bought and sold within just a few hours of landing. These traders sell mainly fresh fish. This means that the traders do not incur additional costs nor spend extra time on fish processing. Thus, by selling fresh fish at the point of purchase, traders cut down on processing costs, which they can pass on as lower prices to consumers. Traders of fresh fish stated that unprocessed fish, especially tilapia, is in high demand, is readily available and is very profitable. It should also be noted that when traders sell fish at the beach side where they bought it, they lose out on the price increment they would obtain if they transported the fish further inland.

In comparison, processed fish has the advantage that it has a longer shelf life, and hence, allows fish to reach distant markets in good condition. Frying is also a fast method of preserving previously unprocessed fish that remains unsold at the end of the day. In some inland markets, most Nile perch and tilapia comes already fried. Traders at such markets therefore have little chance of buying fresh fish. On the other hand, traders of smoked fish argued that smoking is less costly than frying fish. In addition, they think that smoked fish has a longer shelf life than either fried or sundried fish.

Traders of sundried fish point out that it is the easiest and cheapest method of preserving fish. Sundrying does not require expenditure on fuelwood or frying oil. In the case of *dagaa* it is the main way of preserving the fish. Sellers of *dagaa* explained that the market for fresh *dagaa* is limited to the areas around fish landings. Consumers at inland markets only like sundried *dagaa*. Similarly, traders of sundried tilapia can also keep their processing costs down, and hence, many consumers will favor this over smoked tilapia as a result of its lower price.

### **Sources of capital for fish processing and trade**

Understanding how and where women obtain the necessary capital to start up their businesses is important because it highlights the difficulties they face in obtaining credit. Fish processors and traders were asked to state the source of their initial start-up capital (Table IV). The three main sources of initial start-up capital were incomes obtained from selling farm produce or livestock, money lent (often interest free) by relatives or friends of respondents and respondents' own personal savings over long period of time. It is also noteworthy that, in a

sample of 64 processors and traders, none had used a loan from a financial or credit institution to start the business.

Another important observation is that traders' or fishers' groups are not an important source of funds for initiating the fish business. Traders may form small groups (locally known as '*nyaluoro*') in order to benefit from a revolving fund contributed to by its members. Women are only slightly more likely to be members of such a group than men. 48% of women belonged to traders' or fishers' groups compared to 45% of male respondents.

### Gender involvement in Nile perch frames processing

This study did not cover the artisanal processing of Nile perch frames. Previous studies have indicated, however, that women dominate the Nile perch frame-processing sector. A survey carried out in 1994 revealed that 75% of frame processors and traders in Obunga in Kisumu town were women (Abila, 1994).

Table IV: Source of initial start-up capital for respondents' fish business

Source of finance	Number of respondents obtaining funds from source	Percentage
Own savings	19	29.6
Loan from relative or friend	20	31.2
Sale of farm produce or livestock	21	32.8
<i>Nyaluoro</i> traders' group	1	1.6
From another business	1	1.6
Other sources	2	3.1
<b>Total</b>	<b>64</b>	<b>100</b>

Similar numbers of women are employed in frames processing in Homa Bay and Migori. ABILA and JANSEN (1997) have outlined the problems facing women engaged in this sector.

### The main problems experienced in fish processing and trade

Both male and female traders and processors experienced various problems in their occupation (Table V).

Table V: Problems experienced by respondents in their occupation

Problems	% of respondents	
	Male n=50	Female n=269
Lack of credit facilities	33	30.7
Transportation	15	18.8
Insufficient fish supply	10	4.1
High market taxes	6	8.2
Low demand	3.7	6
Other problems	30	30.5

Some of the problems faced by traders and fish processors are lack credit facilities to expand their business. Many female fish traders do not own property, which they can use as collateral to obtain credit from the banks. Transporting fish is also a major problem as most of the road infrastructure along the Kenyan part of Lake Victoria is poor. During the rainy seasons, transportation of fish to the market becomes very difficult.

An additional problem faced by traders is the fees that they have to pay on each occasion that they visit a market. The fee is pegged to the amount of fish that they bring with them, and traders complain that it is too high.

Other problems included that of difficulties in processing during the rainy season as fish cannot dry and firewood is scarce and, if available, damp. This causes fish to spoil, and has repercussions on fish prices, as during the rainy season the harvest from the lake is good but the prices are low. Many *dagaa* fish traders experience product spoilage during the rains because their *dagaa* does not dry sufficiently.

## CONCLUSIONS

This study has shown that women dominate fish trade and processing sectors. Despite their importance and contribution to this artisanal industry, women have received little attention in terms of technology development, either from the government or Non-governmental organizations. The negligence of this sector is probably a matter of priority since with limited funds, priority is always

given to activities, which will bring greatest immediate gains especially fish harvesting sector, which is dominated by men.

Further this study has shown that technological development of the artisanal processing and trading is still very crude and minimal, unlike in the fishing sector, where much development has occurred. These technological deficiencies ensure that fish often spoils before it reaches the consumer. Processors incur losses when the fish deteriorates in quality and extra costs have to be incurred to preserve the fish. The increase in fish landed during the rainy season is wasted as access roads to landing sites are usually very bad, and sometimes rendered impassable. These losses contribute to losses to the national economy, and are a waste of the resource. Technology must be improved to solve the problem of post-harvest losses.

Credit should be made available to female traders so that they can invest in, and improve, their fish trading and processing activities. Women need money so that they can buy the large and the good quality fish, which is profitable. They also need to invest in transportation means like bicycles and vehicles with cooling facilities so that they can get to market quickly to deliver quality fish.

It is important ecologically, socially, and economically to ensure that, once caught, fish is marketed in the most efficient manner possible, and that the final sale is transacted to the satisfaction of both the consumer and the seller. From the study, there is need to improve infrastructure that will enhance quick and efficient transport of fish to markets.

There is need to empower women traders economically, so that they are also able to trade in adult fish. From the study it was evident that quite a number of traders trade in juvenile fish because it can be acquired cheaply.

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