

The Contribution of Artisanal Fisheries towards Livelihoods and Food Security among Communities of Chanyanya Fishing Camp in Kafue District of Lusaka Province

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Abstract: *A study was conducted to assess the contribution of artisanal fisheries towards livelihoods and food security among communities of Chanyanya fishing camp in Kafue district. With the help of members of staff from the Department of Fisheries, fifty households were randomly selected and administered with semi-structured questionnaires and personal interviews. The data was analysed using statistical package for social sciences (SPSS), while graphs and charts were done in Microsoft Excel. Results have shown that an artisanal fishery has immensely contributed towards improved livelihoods of many households in Chanyanya. It has provided employment, income and food security, both to the local people and the nation at large. The study revealed that, 94% of them derived their livelihood from fishing, which provided them with the much needed income and employment. Other fishers, over the years developed fishing skills such as net mending, fish processing and boat making. The money realised from fishing was used to build houses, buy fishing equipment and household needs, and pay for their children's school fees and health care, which thus contributed to their improved livelihood and food security. The study further revealed that all the fishers ate and shared some of the fish they caught amongst their kinsmen. In the same vein, fish was the most abundant, cheap and readily available source of protein amongst the consumers. It can therefore, be concluded that artisanal fisheries, contributes significantly towards livelihoods and food security among communities of Chanyanya fishing camp.*

1. INTRODUCTION

The fisheries sector has been growing very rapidly with 120 million people estimated to be partly or totally dependent on fisheries related activities by 1990, 95% of which are in developing countries (FAO, 2005). This rapid growth has led to fears of a world-wide fisheries crisis (Mc Goodwin, 1990). This has caused particular concern for the food security of the poorest people as prices are pushed up and supply per person falls (Kent, 1997). Fish and fish trade are thus important sources of both direct and indirect food security (Kurien, 2005).

Artisanal fisheries are small-scale fisheries for subsistence or local, small markets, generally using traditional fishing techniques and small boats; they occur around the world particularly in developing nations and are vital to livelihoods and food security (Schorr, 2005). Collectively, these fisheries catch about 30 million tons of fish for human consumption annually the same amount as commercial fisheries, and an estimated 150 million people directly depend on these fisheries for protein and income, artisanal fishing includes 90% of all fishing jobs worldwide, approximately 45% of the world's fisheries, and nearly a quarter of the world catch (Schorr, 2005). Cost associated with artisanal fishing tend to be lower than those of commercial fisheries due to lower fuel consumption and running costs for boats, which tend to make shorter trips close to shore, yet artisanal fisheries employ 25 times the number of fishers over 12 million people and use an eighth of the amount of fuel used by industrial fisheries annually (Jaquet and Pauly, 2008).

Fish production is an important occupation in rural Zambia, with about 25 000 artisanal fishers and 30 000 others active in fish processing and trading, all estimated to derive their livelihood directly from fishing (Global Fish Alliance, 2009). Main areas of employment associated with the fishery sector are boat building and repair, net manufacturing, fish processing, fuel wood supply, power supply, transportation and marine workshops. Millions of people from rural areas are seasonally or occasionally dependent on fisheries related activities (Bene *et al.*, 2006) because fish is a highly cherished source of animal protein (Fagade *et al.*, 1986).

From the 1970s to 1980s, per capita consumption of fish in Zambia was 12.0kg /person/annum. Recent estimates have put per capita consumption at 7.0kg/person/annum (Mwitwa, 2012). The drop in the per capita consumption is attributed to the decline in fish stocks in some of the fisheries as a result of excessive fishing and use of bad fishing methods, as well as an increase in demand due to the increase in the human population. This increase in demand has resulted in increase in fishing pressure to the extent of using environmentally unsound methods of capturing fish and emergence of non-traditional fishes on the market (ACF/FSRP, 2009).

Artisanal fishers use simple dugout canoes or fibre glass banana boats with outboard engines, while the operations of industrial fishers involve larger vessels operated by inboard engines, with better on board storage facilities (Bene *et al.*, 2006). Among artisanal fishers, it is common to find fishing fleets that are owned by absentee landlords who purchase the fishing equipment and boats and then engage workers to do the fishing (Global Fish Alliance, 2009). Artisanal fisheries can greatly benefit the poor through meeting their social needs, including food security, poverty reduction, sustainable livelihood and community development (FAO, 2002). This research looked at the contribution of artisanal fisheries towards the livelihood and household food security among communities of Chanyanya fishing camp in Kafue district.

2. MATERIALS AND METHODS

2.1. Study Site

The study was conducted in Chanyanya fishing camp of Kafue district, which lies between longitude 25 degrees Celsius and 30 degrees Celsius East and 15 degrees Celsius South of the equator. The district has a landmass area of approximately 6000 square kilometres, representing 3% of Zambia total surface area (Kanyamuna, 2010). Chanyanya fishing camp (15°42'40''S, 28°00'42''E), is a lagoon on the banks of the Kafue river and characterized with slow water gradient and slow water velocity, with high vegetation, a suitable habitat for the *Oreochromis* species (Skelton, 2001). It is about 70km South of Lusaka and 30km, West of the administrative town of Kafue district, with 1557 households (Kanyamuna, 2010). According to Chimba and Musuka, the total number of fishers in stratum I, where Chanyanya falls, was 600 while those who had registered with the Department of Fisheries in various fishing villages/camps were only 136.

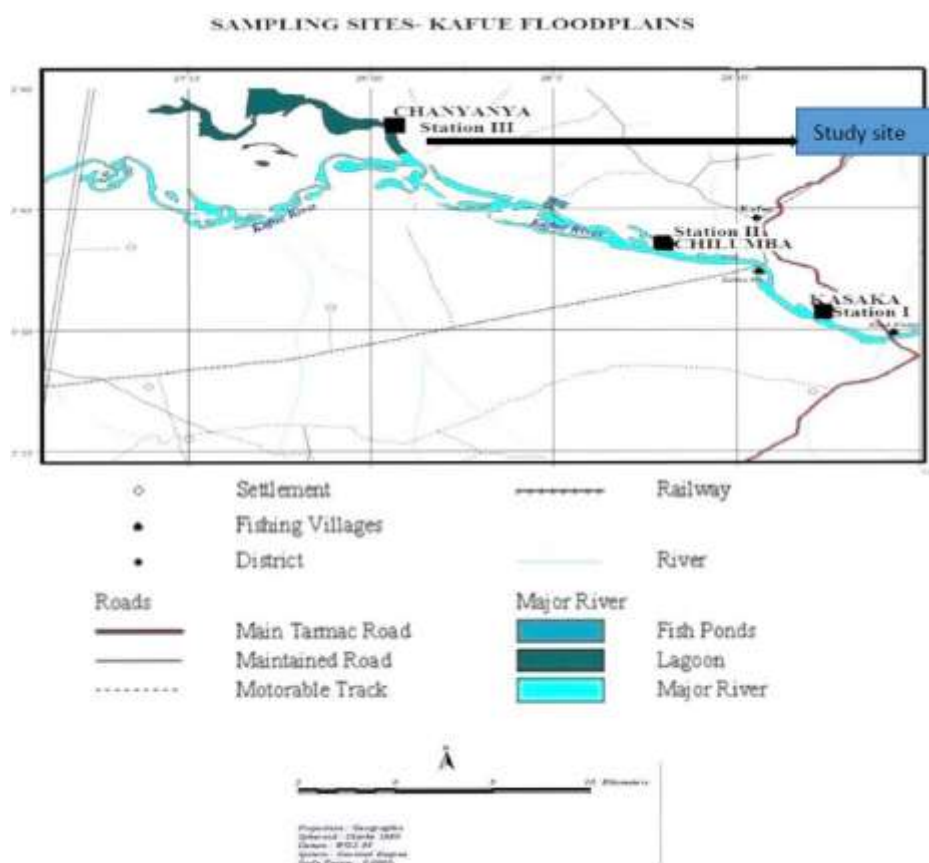


Figure1. Map of Kafue river with Chanyanya fishing camp (Source: Chikopela, 2011)

3. DATA COLLECTION

3.1. Sampling Design

This research involved the collection of both primary and secondary data. The first part of the study was consultation with management from the Department of Fisheries (DoF) in Kafue district. Personnel from the Department of Fisheries in Kafue district were interviewed to get more information on the number of households that comprised artisanal fishers.

The fishers were randomly selected to be interviewed. This method was used in order to minimize the notion of biasness during sampling and to eliminate the probability of clustered selection. Using sampling design, an independent sampling unit from the total population of sampling unit, was used to provide an equal opportunity of being selected. The single household were treated as a sampling unit and the total population were the total number of households where artisanal fisheries were practiced. When the number of households that participated in artisanal fisheries was obtained, each household was assigned a number. The numbers were put in an enclosed box, the numbers helped us in coming up with household to be interviewed, and then a raffle draw was done. The desired numbers were picked one at a time and not replaced to avoid biasness. After each draw, the box was shaken to allow all the remaining numbers to stand an equal chance of being selected. The simple random sampling was achieved by the lottery method (Watt *et al.*, 2007). Primary data was collected through questionnaires by interviewing the randomly selected artisanal fishers in Chanyanya fishing camp. The semi-structured questionnaires were made in a way that effective and relevant summary of information was collected and other addition information was obtained from the community through observation. Secondary data was obtained from the internet, text books, the journals, publications from the Department of Fisheries and other relevant sources related to the study.

4. DATA ANALYSIS

Data was analysed using statistical package for social sciences (SPSS) and Microsoft Excel was used for graphical and chart presentations.

5. RESULTS AND DISCUSSION

Some of the characteristics captured that influenced the respondents' perception and response included: age, sex, marital status, level of education, children, average catch, monthly income and usage of money.

5.1. Age and Gender

The study revealed that, most of the respondents were between the ages of 20 and 30 years followed by those who were between the ages of 31 and 40 years. It was not a surprise that just 26% of the respondents were between the ages of 40 and 60 years because fishing is physical in nature (Figure 2) and demands energetic men.

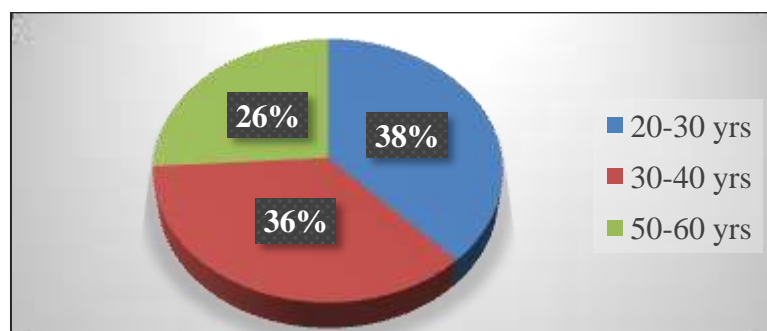


Figure2. Age of the respondents

Furthermore, the study revealed that, all the respondents involved in artisanal fisheries were males by virtue of the nature of the job. Gender plays a role in influencing the type of activities males and females will engage themselves in. Women, usually avoid masculine type of jobs even in their quest for power and access to resources. Furthermore, it was a known fact that the majority of women took up fish trading and marketing because they felt comfortable to do so. This could largely be attributed to their upbringing as well as cultural beliefs.

5.2. Marital Status and Household Size

Almost all of the respondents were married and only 2% of them were divorced as revealed by the study. Their livelihoods did not differ much regardless of their status, except as a matter of food security, and other related challenges, they kept their families as small as possible, with the number of children, ranging from 3 to 6 (Figure 3 and 4). However, the observations made by Tosan (2002), indicated that the household structure in the fishing communities was usually large due to the polygamous nature of the marital status of the fishers. This may not be true in that many of the fishers belonged to a number of ethnicities, and religions that did not subscribe to polygamous marriages.

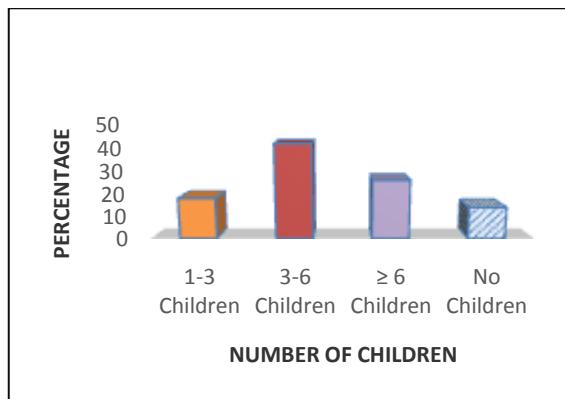
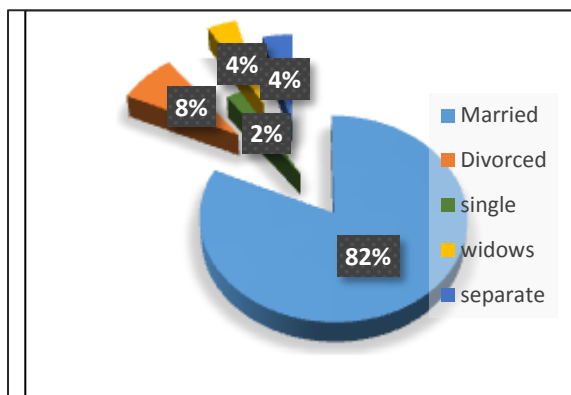


Figure3. Proportion of respondents to marital status **Figure4.** Household size Level of Education

The study also revealed that, some respondents attained some formal education, although the majority of them just went up to grade 7 and 9, with only few having completed secondary school level (Figure 5). As earlier indicated, this may to some extent have a bearing on their livelihood and food security.

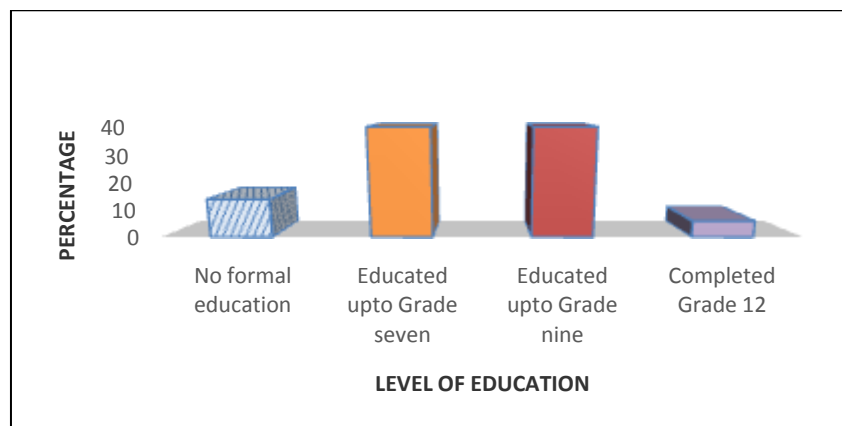


Figure5. Level of education

5.3. Source of Income, Employment and Time Spent in Fishing

According to Figure 6, about 94% of the respondents indicated that fishing was their main source of employment and income. Other than that, fish provided their main source of animal protein. This agrees with FAO (2007), which reported that fisheries are an important source of employment and livelihood for millions of people worldwide. Fish also contribute fatty acids that are necessary for the development of the brain and body. The use of fish as a central element in the diet of a population is therefore highly recommended, especially for the diets of young children, infants and pregnant women (Béné, 2006). FAO (2005) also reported that it is as important to highlight that fifty percent of all food fish originates from small-scale fisheries, and almost all fish from small-scale fisheries is used for food (FAO, 2005).

Small-scale artisanal fisheries in particular contributes greatly to employment - over 90% of fishers involved in capture fisheries operate in small-scale/artisanal fisheries (Johnson, 2014). An estimated forty-one million people worked as fishers and fish farmers as a full-time, or part-time, occupation in 2004, up from about thirty-nine million in 2000. The majority of fishers are small-scale, artisanal fishers, earning a living from coastal and inland fishery resources. The vast majority of these were from Africa, Asia and Latin America, with close to eighty-eight percent from Asia (FAO, 2007).

The Contribution of Artisanal Fisheries Towards Livelihoods and Food Security Among Communities of Chanyanya Fishing Camp In Kafue District of Lusaka Province

Although employment cannot be taken as the firm assurance of food security for people, it should be emphasized that in a significant number of cases, small-scale fisheries activities take place in rural areas, where alternative employment opportunities may be scarce or even non-existent.

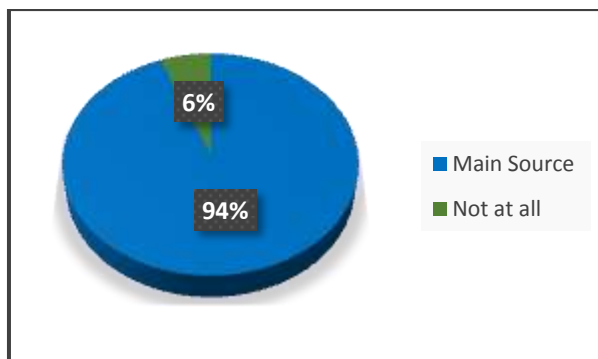


Figure6. Fish as main source of income

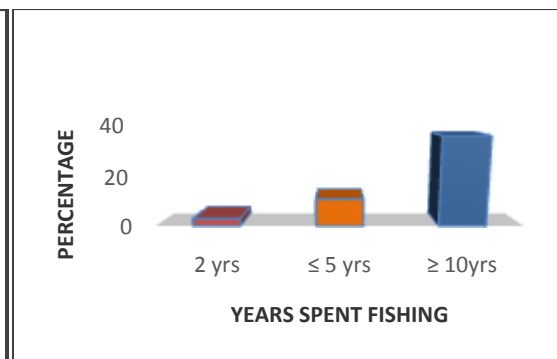


Figure7. Period spent in fishing

People in Chanyanya fishing camp were dependent mostly on fishing activities, which helped them in attaining food security. Often times, most of these fishers spent more than 10 years fishing with the assistance of other family members since they were unable to hire workers (Figure 7) and their livelihood were solely dependent on the proceeds of the fishery. According to Béné (2003), fishers sold the fish they caught to earning income, thus the fishery provides an economic safety valve or livelihood of last resort for the poor.

5.4. Fish Catch per Month and Fish Consumption

Findings reveal that 60 % of the respondents' catch ranged between 50Kg and 62.5Kg, which was sustainable for their livelihood (Figure 8). In these circumstances, access to harvesting of fishery resources, and their associated processing and trading activities, may represent the only option available to make a living and maintain food purchasing power, where fisheries is their main source of employment, it strengthens the role of small-scale fisheries in food security (Béné, 2006).

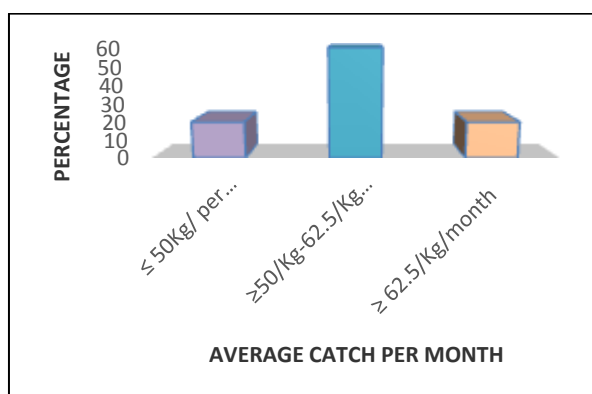


Figure8. Average catch per month.

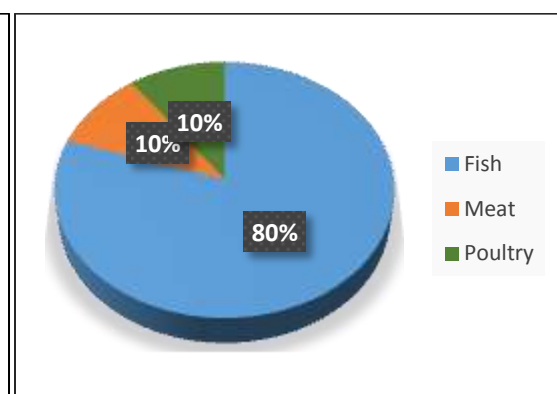


Figure9. Source of proteins

During the 1950s and 1960s there was a five-fold increase in world fisheries as technology improved. Since the 1970s, production from capture fisheries has remained more or less on a plateau of 80–90 million mt (FAO, 2005). In recent years, developing or emerging countries have been taking an increasing proportion of the catch, with China and India featuring increasingly, so that now these countries take more of the world catch than the developed nations (Payne, 2000). Inland waters also have significant capture fisheries. They are often difficult to record, owing to their relatively diffuse nature, but they currently produce at least 10 million mt each year. With regard to rural development, generally inland fisheries can have the most impact (Payne, 2000).

The study also revealed that fish provided the much needed proteins, which was much cheaper than beef and poultry. Over and above they stayed near the river, where they easily accessed the commodity (Figure 9). Worldwide, more than 1 billion people rely on fish as an important source of animal proteins especially where other sources of animal protein are scarce or expensive (Béné, 2006). Fish is essential in East Asia and Africa for instance where it supplies more than 50 percent of

the animal protein intake in the diet of the 400 million living in some of the poorest countries of the world (Béné, 2006). In the rest of the world, more than half the human population (56 percent) derives at least 20 percent of its animal protein intake from fish, this can be compared to the findings where consumers had fish as their main source of protein compared to poultry and meat (Figure 9). Nutritionally, fish is therefore one very important source of dietary protein especially in the developing countries (Béné, 2006). Fish provide a wide variety of vitamins and minerals, including phosphorus, magnesium, selenium and iodine from marine fish (Thilsted *et al.*, 1997). Even a small amount of fish caught every day can be an important dietary supplement for the poor people who cannot always afford variety of different sources of food (Béné, 2006).

The price range of fish was from K10/Kg to K16/Kg. Fish therefore, provided the much needed income for the fisher families. Most fishers had a monthly income of between K500 and K1000 (Figures 10 and 11).

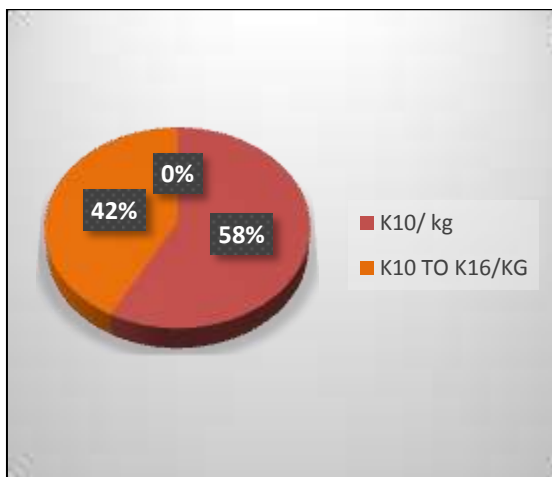


Figure10. Price of fish

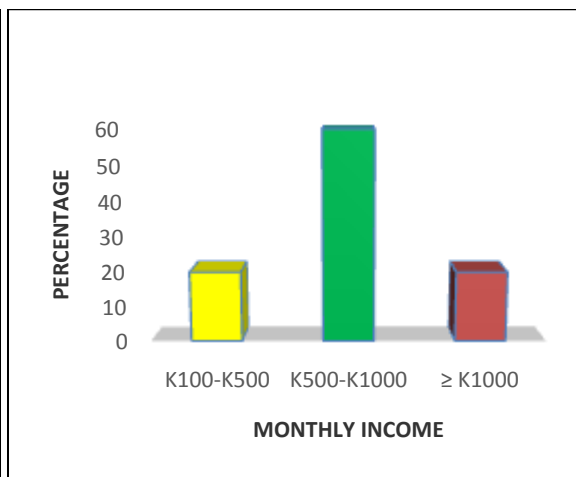


Figure11. Monthly income

Studies confirm that in coastal fishing communities where fishing is usually the main activity- the degree of dependence on fisheries for cash income can be extremely high. But they also show that it may not necessarily be 100 percent for instance (Ninnes, 2004). Similarly, research in the Zambezi floodplain for instance showed that inland fisheries' contribution to household cash income can generate more cash than cattle-rearing and sometimes more than crops production (Turpie *et al.*, 1999).

5.5. Usage of Money From Fish Sales

Findings reveal that money realised from fish sales was mainly for household use, such as paying school fees and health care for their children and extended family members, procurement of other household requisites like food, clothing and fishing equipment (Figure 12).

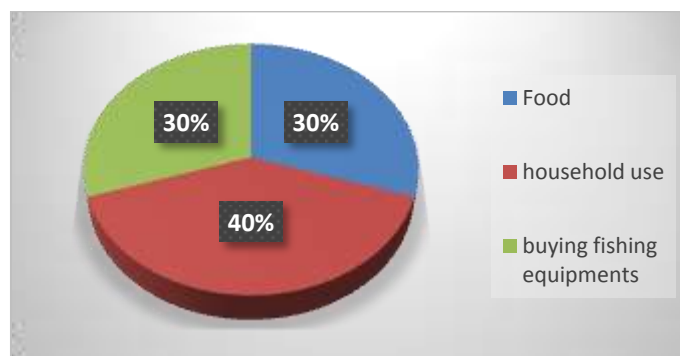


Figure12. Usage of money

Reports that the contribution of fisheries to cash income in Southern African coastal households is estimated at between 40 percent for Mozambique and 55 percent for Tanzania of total cash income (Béné, 2006). In other communities this contribution, however, can be 10 times that of the next most significant contributor to cash income (Béné, 2006). This cash income is used to gain access to basic services and consumptive needs that are not possible to satisfy through the household own resources.

The Contribution of Artisanal Fisheries Towards Livelihoods and Food Security Among Communities of Chanyanya Fishing Camp In Kafue District of Lusaka Province

These include food purchases, health and education, clothing, some fishing inputs, agricultural labour (Béné, 2006).

Some fishers probably used some of these monies to start-up new businesses and build houses. According to Johnson (2014), the family, household livelihood strategy tends to combine various ways of earning a living. The most dynamic livelihood strategies rely on the largest possible range of approaches and available assets, thus reducing risks created by natural or market vagaries (Johnson, 2014).

5.6. Profitability of Fish

Figure 13 shows that 40% of the respondents viewed the profitability derived from selling fish to be fairly high, 28% rated it to be very high, 24% felt it was high, 4% graded the profit to be low and another 4% rated it to be very low and affected them differently in as far as livelihood and food security were concerned.

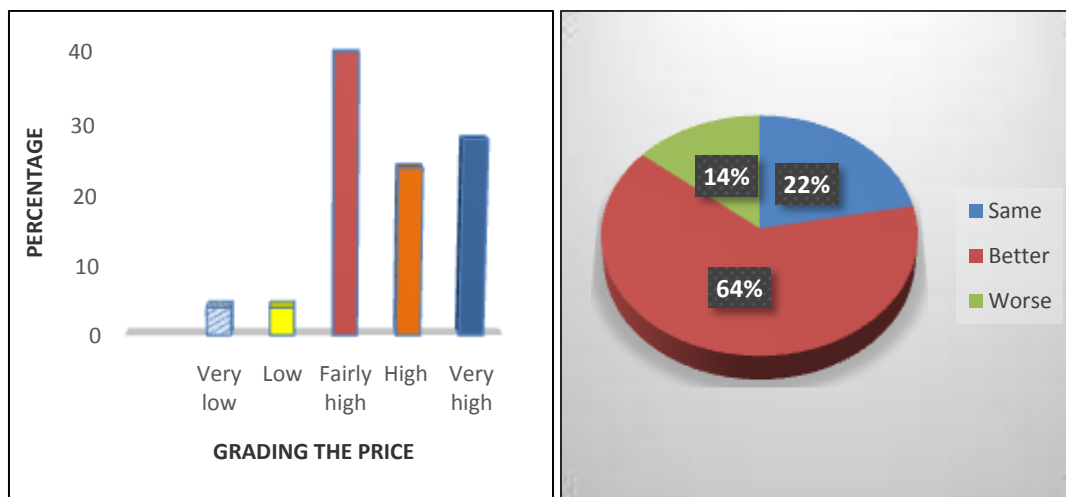


Figure13. Grading the profit of fish.

Figure14. Grading of improved livelihood

5.7. Improved Livelihood

People's lives in Chanyanya were perceived to have improved tremendously, because fishing was playing a significant role in their lives. As shown in Figure 14, 64% of the respondents indicated that their livelihood was far much better as the income they realised from fishing was satisfying their needs. Fish can contribute to food security directly, the study reveals that all the respondents ate part of the fish they caught and some fishers shared the fish with extended family members (Figure, 14). Capture fisheries provide 50 percent of fish for food production and 58 percent of total fishery production (FAO, 2009). Fisheries can also contribute indirectly to food security by providing revenue for food-deficient countries to purchase food. Fish exports from low-income, food-deficient countries is equivalent to 50 percent of the cost of their food imports (FAO, 2005a). In many African countries fisheries make a significant contribution to the overall gross domestic product (Global Fisheries Alliance, 2009). The contribution from fisheries could be higher, a World Bank study estimate that over one billion USA dollars is lost each year in sub Saharan African from illegal fishing and poor management. Small scale fisheries are also important. Fisheries contribute to African development by stimulating the growth of a cash based economy and fish caught were sold on a daily basis (Global Fisheries Alliance, 2009). The theory that economic substitution will reduce pressure on fishing resources assumes that fishing provides the primary source of income for poor households, and that when another source of income replaces this, they will have less need for the fishery (Hill and Milner, 2005).

Food security and poverty are closely linked, and eliminating hunger and malnutrition is therefore a precondition for the eradication of poverty (Béné, 2006). Fish can contribute through subsistence mechanisms, or indirectly through incomes whether individuals are self-employed or paid wages or a combination of both (Béné, 2006).

Many communities of fishers are poor but it should be realised that they are not necessarily poor because their livelihood is fishing. They are often already poor and landless individuals who are able

to subsist by fishing (Dunn 1989, cited in Béné *et al.*, 2000). Poverty encompasses different dimensions of deprivation that relate to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work” (OECD, 2001). Though Zambians are highly dependent on fish as a source of protein and a large number of the population are involved in the fishing sector, fish represent less than one percent of the economically active population in the country with Zambia’s rural poverty headcount index looming above 80 percent, according to the international monetary fund (IMF, 2007) poverty reduction strategy paper for Zambia. As an open access resource, capture fisheries represent a vital livelihood option for the poor as well as an important protein source at the household level (Payne, 2000). The fisheries sub-sector in the country has potential to support livelihood although production trends have not grown consistently. Currently in the country the demand for fish out weigh supply due to unsustainable fishing practices, such as fishing in breeding sanctuaries and harvesting of immature fish. A focused effort to improve fisheries management in the country would increase long term fishing yields, generate greater income for fishers, create jobs in the fishing sector and supply needed protein to many impoverished Zambians (Global Fish Alliance, 2009). The overall objective of the Fisheries development Program is to promote sustainable utilization of fisheries resources thereby contributing to the economy through the generation of employment, income and improved availability of fish; contribute towards poverty reduction through making fish readily available as a reliable and sustainable source of protein especially for the rural communities. The expected outcome is an increase annual fish production from capture and Aquaculture from the current 70,000 tonnes to 120,000 tons by 2015 (ACP/FSRP, 2009).

5.8. Areas Where Fish Was Obtained or Sold From

The study revealed that most consumers in Chanyanya fishing camp bought fish from the harbour, which was near the river, compared to the market because it was perceived to be very fresh and did not require covering a long distance (Figure 14). The other reason for buying fish from the harbour had to do with pricing, which the consumer considered fair and low compared to the market (Figure 15).

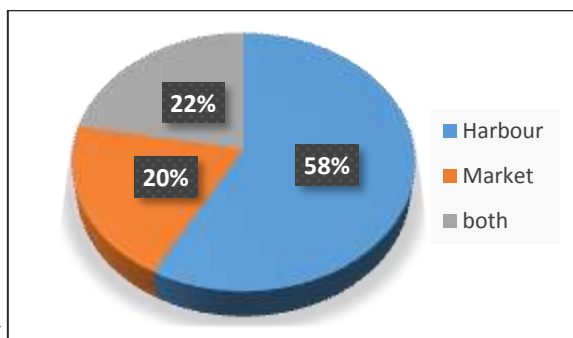


Figure 14. Where consumers bought their fish from

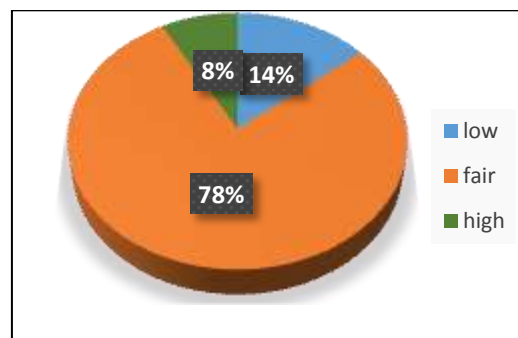


Figure 15. Pricing of fish

The contribution of capture fisheries from artisanal fisheries on food security for instance, results from a combination of different mechanisms that operate at different levels and derived directly from the economic, social and cultural dimensions of the activities. The role of fishing and its related activities such as fish processing and trading in poverty alleviation cannot be treated in isolation from the economic role of these activities and from the interactions that exist between the sector and the other rural activities (FAO, 2006). Livelihood is the job or other sources of income that gives you the money to buy the things you need (Collins dictionary, 2006).

6. CONCLUSION

According to the study, most of the respondents took fishing as their main source of employment owing to their being close to the river. Fishing was easily accessible compared to any other business undertaking. Proceeds from fish sales were used to purchase household needs, assets, built houses, acquire new fishing equipment, paid for their children’s school fees and health care. Some fishers have developed other fishing skills such as net mending, fish processing and boat making. Fish was the most abundant and cheap source of protein among the consumers. Over the many years, fishing has enabled them to attain improved livelihoods as almost all the fishers consumed and shared with their kinsmen some of the fish that they caught

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