ANALYSIS OF FISH PRODUCTION DETERMINANTS IN LAKE ZIWAY, OROMIA REGION, ETHIOPIA

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ABSTRACT

Lake Ziway, is one of the most northern parts of Rift Valley Lakes and is located in Oromia Regional State of Ethiopia. The main objective of the study was to analyze the determinants of fish production in Lake Ziway. The data was collected from both primary and secondary data sources; primary data obtained by open and close ended questionnaire. The secondary data were obtained from different written documents (Journals, Books and internets) and woreda agricultural offices. Focus group discussions (FDG) were undertaken to identify the major value chain process and problems or challenges in the process that face the main actors in the study area. According to the result, competition with illegal fishers, pollution of water by farms and flower farming, lack of enforcement from the government, overfishing and reduction in fish resources, poor post harvest handling practices were determinants that affect the fishers to produce fish and fish products badly. Therefore, it is recommended that the responsible bodies like the woreda agriculture office and research centers need to have a plat form to discuss on the problems facing the Lake and fishers then give them access to technologies and or quality inputs.

Key words: Lake Ziway, Determinants, Production, Ethiopia

INTRODUCTION

In Ethiopia, the agricultural sector will continue to play a major role in the economic development of the country given the high proportion of the population actively involved in agriculture-based activities. And fishery sector can be taken one of these activities (Alebachew Tilahun, Adamo Alambo and Abebaw Getachew, 2016; Urgessa Tilahun Bekabil 2014).

Ethiopia is a land-locked country which has a number of international rivers, major lakes and reservoirs that are of great national and international importance located in different ecological zones (Habtamu Kefelegn 2013). So far, there are 200 different species of fish in Ethiopia. However few are commercially known in the country. And the total annual fish potential production of the country's major inland water bodies is estimated to be 90,500 metric tons per year (Gashaw Tesfaye and Matthias Wolff 2014; SOS SAHEL ETHIOPIA and National Fishery and Aquatic Life Research Center 2015).

Fish and fishery products play an important role in Ethiopia's food security. Despite the increase in domestic production of fish during the past years, Ethiopia still faces a deficit in meeting consumption needs (Hayelom Berhe and Eyob Bezabeh, 2021; Eyob Bezabeh 2021). The national demand for fish is continuously increasing; it is currently estimated at 85,000 tons per year, and would increase to about 120,000 tons by the years 2015 respectively. Although the total domestic fish production from various fisheries has increased in recent years as a result of capture fisheries, still consumption needs are constantly increasing and a fish food gap in quantity and value has been raising over time due to the increase in population, the increase in consumption as a result of the change in traditional attitude of preference form meat and poultry to fish, the importation of low priced fish species, and the increasing in purchasing power of some sectors of population who consume high quantities of fish (Eyob Bezabeh 2021; Selamu Abraham and Lelise Mitiku 2018).

However the capture fishery sector is facing a challenge from natural and manmade disasters (Abdulhakim Hussen Hebano and Alemayehu Abebe Wake 2020). As we explained on the above paragraphs, major source of fish and fish products are from capture fishery, of different major lakes, reservoirs and rivers. And these constraints need to be studied by researchers to come with valuable recommendations so the concerned bodies get information to tackle the problem early. Therefore, this study is going to analyze the determinants of one of the major lakes-Lake Ziway that affect the production of fish.

METHODOLOGY OF THE STUDY

The study was completed by two teams: data collection (four individuals) and data entry (three individuals). Two main target groups were identified in this study: fishers and traders (whole sellers and retailers).

The work for this study consisted of three main stages: planning, data collection and data entry.

Planning:

The study team carried out the following activities during the planning stage:

- The study team leader made presentation on value chain analysis to the rest of the team

- The team designed and drafted (in English) two questionnaires to be used in the study-one for fishers and one for traders

- The study team tested and revised the questionnaires-

- The team discussed and agreed on a detail activity and travel schedule and finalized

Sampling Population

The total population size of this research was 65.

Sample size Determination

Sample was selected from the total population using random sampling technique. It was prepared questionnaire for the fishermen were interviewed. Among 65 respondents all were male.

The sampling Techniques

Random sampling techniques utilized to the respondents. This gives equal chance for each and every fisher men.

Data collection

The data was collected from both primary and secondary data sources; primary data obtained by open and close ended questionnaire was applied to the fishermen. The secondary data were obtained from different written documents (Journals, Books and internets) and woreda agricultural offices.

Focus group discussions (FDG) were undertaken to identify the major determinants or challenges in the process that face the main actors in the study area.

Data entry and analysis

The response to the questionnaires was entered into SPSS. Each completed questionnaires were reviewed and checked by the corresponding interviewer and the assigned person for this purpose. The data was then analyzed to generate the outputs presented in this report. The data were analyzed using tables percentage and figures.

Overview of the lake Ziway

Lake Ziway, is one of the most northern parts of Rift Valley Lakes and is located in Oromia Regional State of Ethiopia. It is situated about 160 km south of Addis Ababa ($7^o52'$ to $8^o8'$ N latitude and $7^o52'$ to $38^o56'$ longitude, The lake is situated at an altitude of 1636 m above sea level with a surface area of434 km2 and mean depth of 2.5 m (Girma Tilahun and Gunnel Ahlgren 2009). The lake is fed by rivers, Maqii from the north-west and Katar from the east and it has an outflow through Bulbula River, draining into Lake Abijata (Yonas Mebrate and Aemro Worku 2020). In addition to supporting commercial fishery of the country, the lake water is also used for **irrigation and drinking water**. The Lake is surrounded by farming communities and small and medium scale irrigation farms which utilize water from the Lake. Support a wide variety of aquatic life playing a significant role in helping the surrounding fishing communities sustain their livelihoods.

RESULTS AND DISCUSSION

Demographic and socioeconomic characteristics of sample fish producers-

A total of 65 individual respondents were randomly selected and totally all the respondents were male. 75 percent of the fisher's age in Lake Ziway was in the range of 25-54; which indicate that most of the targeted fish producer's respondents in this study area were found in the young age group. 63 percent of of the respondents fishing experience were greater than 10 years in the Lake. With regards to educational status 96 percent of the respondents were literate, read and write, grade 1- 6, grade 5-8 and grade 9-12 and above. The marital status of the total sample respondents was found to 85 percent which were married.

Table 1:- Demographic characteristics of the respondents

variable		Frequency (%)-fishers
Gender	**Ziway**	
Male	(100)	
Female	-	
Age		
<24	4(6)	
25-54	49(75)	
55-64	12(19)	
Educational level		
No formal education	4 (6)	
1 up to 6 grade	31 (48)	
7 up to 10 grade	27 (42)	
➢ 10 grade	3 (5)	
Marital status		
Married	55 (85)	
Unmarried	10 (15)	
Household size		
1-3	10	
4-5	21	
6-8	16	
>8	9	
Mean		
Experience with fishing activity		
1-10	24	
11-20	20	
>20	20	

Source; own computation from survey results

Input supply

In the Lake Ziway the government (woreda experts and development agents of lume woreda) have been supporting the fishermen in terms of providing information like about market price, advisory services and production techniques. In some instances, research centers assist fishers by investing in infrastructural facilities. For instance, Batu Fish and Aquatic Life Research Center built a processing shade at the landing site for fishers. According to the result (Table 2 below), 63 % of the respondents were getting the information from woreda experts while 37 % of them do not get any support from the government. On the other-hand they got materials like boats, fishing gears etc from the market (most of the time from the nearby town Batu).They were using wooden as well as metal boat which costs them on average 22,039.00 ETB. With regard to fishing gear utilization, survey results indicate that 8% of the respondents used monofilament while the majority (68 %) of them use beach seine.

Table 2. Input access & use of fishing technology in the lake

Inputs	Use of technology
Support service	From government institutions & Batu Fishery and Aquatic Life Research Center
Boats	Wooden & metal boats
Fishing gears	Beach seine (68%), monofilament (8%)
Input market access	Adequate access from the nearby Batu town

Source:- survey result

Fish production

Commercially important fish species are Tilapia, Carp and African catfish. However, there is variation in terms of fish species harvested in the Lake. According to the result from the survey data we can see that, 64% of the daily catch in Lake Ziway was carp species while 28% and 8% of the total catch were tilapia and catfish species.

Market, value addition and institutional linkages

In most cases, the fishers supply their catches to cooperatives. Again, cooperatives sell the whole fish to wholesale traders, and then traders add value by cleaning, sorting, filleting and gutting and market the processed fish either to retailers or supply directly to hotels, restaurants and consumers in the nearby market or in distant markets such as Addis Ababa, Atikilttera.

According to the result from the FGD, there were no any clear linkages and communication among fisheries cooperatives and the government administration. This has provided a fertile ground for illegal fishers and traders. There was no strict monitoring in terms of the use of prohibited nonselective fishing gear such as monofilament that may eventually lead to overfishing.

Post-harvest and challenges

Overall, the post-harvest practices in the study area can be generalized as very poor. Leftovers after fish processing are discarded instead of reused for other purposes such as soup, animal feed or fertilizers.

Figure 1. Fish post-harvest handling in Ziway

Analysis of critical factors and challenges

This section of the study outlines the major challenges facing the Lake and fishery. The fishery is an important source of jobs both within local communities and for those coming from farther afield. Many households are dependent on the Lake for their livelihood including the fisheries, processors and traders (Brokers, whole sellers, retailers). However from the management perspective the lake is in a fragile state. Most of the fish being caught at present are small sized and the total catches in the last five years shows a decline trend, indicating that overfishing is a serious problem. The importance of the lake in terms of jobs, income and food security, coupled with the challenges and opportunities, calls for a change in attitudes by all stakeholders towards management of the lake.

Table 2. Prioritized constraints

Identified constraints	Critical factor or problem	Severity (high, medium, low)
Input stage	✓ Quality of fishing gear	Medium

Production stage	✓ Competition with illegal fishers	High
	✓ Pollution of the water by wastes (farms & flower farming)	High
	✓ Lack of enforcement	High
	✓ Overfishing and reduction in fish resources	High
Post-harvest and marketing stages		High
	✓ Poor post-harvest handling practices	
Governance	Weak institutional linkages among actors	Medium

Source: survey results

CONCLUSIONS AND RECOMMENDATIONS

This study was conducted with the aim to analyze determinants of fish production Lake Ziway. The study revealed that most of the respondents were male. The analysis indicated that, competition with illegal fishers, pollution of water by farms and flower farming, lack of enforcement from the government, overfishing and reduction in fish resources, poor post harvest handling practices were determinants that affect the fishers to produce fish and fish products badly.

Therefore it is recommended that the responsible bodies like the woreda agriculture office and research centers need to have a plat form to discuss on the problems facing the Lake and fishers then give them access to technologies and or inputs. Also there should be alterative restriction on illegal fishing gear utilization such as monofilament with best other countries experience. And the government needs to have alternative ways to control illegal fishing and work together with research centers to implement with the recommended options to improve post-harvest handling and hygienic practices.

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