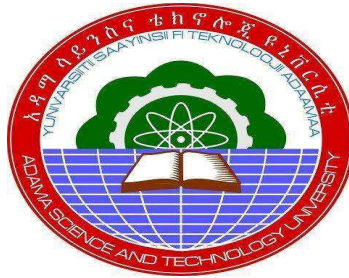


ANALYSIS OF FACTORS AFFECTING HOUSEHOLDS' FISH DEMAND IN
GAMBELLA REGIONAL STATE: THE CASE OF GAMBELLA TOWN AND
ITANG TOWN, ETHIOPIA.



A Thesis Submitted to the School of Graduate Studies

ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY

DEPARTMENT OF ECONOMICS

By: GEBREMEDHIN GEBREHIWOT TESFAYE

JUNE 2016

ADAMA, ETHIOPIA

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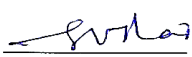
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As Thesis Research Advisor, I hereby certify that I have read and evaluated this thesis prepared, under my direction, by GEBREMEDHIN GEBREHIWOT TESFAYE, Entitled: DETERMINANT OF FISH PREFERENCE IN GAMBELLA REGIONAL STATE “ THE CASE OF GAMBELLA ADMINISTRATIVE COUNCIL AND ITANG SPECIAL WOREDA”, Ethiopia. I recommend that it be submitted as fulfilling the Thesis requirement.

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As member of the Board of Examiners of the final M.Sc. Thesis open Defense Examination, We certify that we have read and evaluated the thesis prepared by Gebremedhin Gebrehiwot Tesfaye and examined the candidate. We recommended that the thesis be accepted as fulfilling the Thesis requirement for the Degree of Master of Science in Development Economics.

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Sincerely



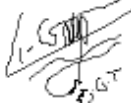
Gutu Tesso (PhD)

DECLARATION

I hereby declared that this is my work and that all sources of the materials used for the thesis have been rightfully acknowledged. This thesis has been submitted in partial fulfillment of the requirements for Master science in development economic at Adama science and Technology University and is deposited in the university library to be made available to users or borrowers under the rules of the library.

I solemnly declared that this thesis is not submitted in any other institution anywhere for the award of any academic degree, diploma or certificated. And brief quotations from this thesis are available without special permission provided that accurate acknowledgement of the source is made.

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ABRIVATION OF TERMS

CSA	Central Statistical Authority
FAO/UN	Food and Agricultural Organization of United Nations
FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic of Ethiopia
FPME	Fish Production and Marketing Enterprise
GBPED	Gambella Bureau of Planning and Economic Development
GDP	Gross Domestic Product
HHs	House Hold
GPNRS	Gambella Peoples' National Regional State
MOA:	Ministry of Agriculture.
SDPRP	Sustainable Development and Poverty Reduction Program
SNNPR	Southern Nations, Nationalities and Peoples' Region

ABSTRACT

This study analyzed factors that affect the demand of fish in Gambella administrative council and Itang special wereda. Fish demand is an important factor in production and marketing decisions. Fish demand plays a great role because fishermen and distributors recognize their purchase choices as a determinant to their operation. And hence, the study was aimed at providing information on factors that affects fish demand and choice on fish forms among household.

Primary data for the study was collected using structured questionnaires from a total household of 371 randomly during period of September – October, 2015. And from direct observations on the traditional fish markets were also made and the available fish species were captured using photographs and videos.

Results were analyzed using descriptive statistics and econometric model. The logit regression model result indicated that out of eighteen variables, 12 of them were statistically significant at 5% level of significance. Educational level, respondents' demand on to fresh fish and dry fish, occupational status and ethnicity had a positive impact on the demand of fish consumption. Lack of awareness, fear of hygiene, fear of fish bone and lack of ability to cook were found as some of the major constraints of fish demand faced to non fish consumers.

Modern retailers such as supermarkets has to be involved so that they can power to promote more about fish and fish products than traditional markets to boost the fish demand, especially for the group of society with higher income and higher educational background. Appropriate intervention by the local authorities should be made to secure and maintain the safety and hygiene of fish market places. Training about market strategies needs to be provided to the fishers and fish sellers so that they can develop techniques of selling to attract fish buyer and improve their market outlet.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The concepts of fish market varied in relation to the scholars perspectives. According to website of free encyclopedia accessed, Fish market is described as place used for marketing fish and fish products. It can be referred to whole sale trade between fish man and fish merchants, or to the sale of sea food to individual consumers, or to both. Retail fish markets is a type of wet market, often sell street food as well. On the other hand, fish market range in size from small fish sells to the great Tsukiji fish market in Tokyo, turning over about 660,000 tons per a year (Bestor, 2004).

Regarding to the fish market, Theodore (2004), argued by saying that the term fish market can refer to the process of fish marketing in general but this article is concerned with physical market places. Fish and seafood is spoiled easily, hence the Markets of fish were near to seaside or near to the catching places. Since the development of technologies; such as refrigerator and rapid transport become available in the 19th and 20th century, fish markets can technically be established at any places. Consequently, its concept argue by Clover (2008) that the major fish markets now mainly deal with wholesale trade, and the existing major fish retail markets continue to operate as much for traditional reasons

As FAO (2014) is states that the total fish vessel in the world was estimated about 4.72 million in 2012, in which Asia consists the largest fleet (68%), followed by Africa (16%) , Latin America (8%) , North America (2.5%) and Europe (2,3%). FAO (2014) describe that in year 2012 more than 86 percent (136 million tonnes) of world fish production was utilized for direct human consumption. The proportion of fish product type indicate that 46 percent (63 million tonnes) of live fish, fresh or chilled forms, 12 percent (16 million tonnes) dried, salted, smoked or other cured forms, 13 percent (17 million tonnes), preserved forms, and 29 percent (40 million tonnes) frozen form of fish was marketed. Globally, the total fish production for export is

projected to reach 187 million tonnes in 2030, in which China is the largest exporter. Since 2011, china becomes the third largest exporting country next to USA and Japan. In line with this; Turkey contributes 25% to the European fish markets; it is estimated to exceed its supply more than 80 million tonnes in the periods.

Beside to the economic benefits of fish market it also has social benefits as it was argued by scholars in the discipline. For instance, FAO recognized that the important contribution that small scale fishery make to global poverty alleviation and food security. In addition to this 58.3 Million people were engaged in the primary sector of capture fish and aquaculture in 2012, (ibid).

Even though Africa is the second in the world in fish content, the trend of extracting and exporting fish and the fish market were not active. However, now days the developing countries have shown patterns of increasing in exporting fish and fish products. As FAO, (2014) stated that some developing nation accounts half of their total value of traded communities. In which grows from 25 to 37 percent from the year 1976 to 2012. Low trade tariffs and bilateral- multilateral agreements among the members of World Trade Organization (WTO) encourage developing countries to increase their share in the international fish export, FAO (2014).

Ethiopia is known for its fresh water bodies. Lakes (Tana, Chamo, Awassa, langano, Abay, Zaway,) and River (Baro, Omo, wabisheble etc) are some of the well-known fishing areas in the country (Lamma, 2010). According to Hussein, et al. (2010) found that about 85% of fish production of Ethiopia is from lake and the remaining 15% is from rivers.

Furthermore, Lamma (2010) describes that among the rivers and lakes in Ethiopia; Lake Tana generated about 8.42 million Birr from export of fish market and 51 million birr from domestic fish market. Thus, the Contribution of the fisheries to Amhara regional GDP and nutritional security of the rural poor communities is increasing.

As most researchers describe the fish market practice in Ethiopia differed from one geographical area to another. Fishing has been an important source of income for fishery communities. Ann,

et al (2014) indicated that households including women (600 household) of Amhara Regional state in *Fogera* community have been employed in fishing on the *Lake Tan*, and added that the fishing sector has been showing significant development of the livelihood of the indicated communities. Now days it is possible to get fish and its products at any time in some Hotels of Addis Ababa, for instance one of the hotel in Addis Ababa around Semen hotel has written in its' poster ' we serve 365 days of fish and *kitifo*.

According to Gambella people's National regional state investment bureau booklet published in 2010, Gambella has 25,640 million meter cube of ground water and 1,284 million meter cube of surface water resources. It is indicated that about 100 species of fishes exist in the region in which 15 of them are commercially important. Moreover, it was stated that those fish are found in the four major rivers (Baro -Akobo, Gilo, Alewero and Jikow), swamps and lakes. Further, it was indicated that from these rivers about 250,000 tons of fish per a year can be produced.

1.2. Statement of the Problem

According to FAO (2014) fisheries and aquaculture are sources not just of healthy but also of wealthy. In this sector the employment has grown faster than the world population. It provides jobs to tens of millions and supports the livelihood of 100 million. Therefore, it stated that fish continued to be one of the most consumable food commodities around the worlds wide. Hence, there are many arguments that; world annual per capital fish food consumption is projected to rise from 18.9 kg to 20.7 kg by the year of 2022, however the annual growth rate will declined from 1.8 to 0.6 percent. Per capita fish consumption will increase in all continents, except Africa due to population growth which affects the supply and this is due to an increasing price, high transport cost and slowing aquaculture expansion (FAO, 2014)

When we come to Africa, as FAO (2003) also states that the total fishery potential of inland water bodies' is estimate to produce about 2.1 million tons of fish per year and this 24% of the share are for global market. Assefa, (2014) added that that fisheries in Ethiopia is similar as any other African countries, expressing the fish sector in Ethiopia is generally not utilized even though there are some circumstances in which fisheries areas has been overexploited due to

inappropriate fishing practice. The reason suggested was due to underdevelopment and poor management at federal and regional level.

It was indicated the fish production potential of Ethiopia was stated as 51, 481 tones but only 15,389 tones (30%) has been utilized. Fish prices are lower in nearer distance to the production areas due to low cost of transportation and continuous supply. In addition, there is an average price reduction of 50 % between morning fresh fish and late afternoon spoiled fish, because sellers are obliged to sell or lose the product due to low demand (FAO, 1998). Inadequate preservation and storage practices have been estimated to have 15 % in lakes and 50 % loss for remote fisheries areas (Sileshi, 2004). According to the surveys Drewes (1993) and COMESA (2004), cited by Sileshi (1998) was also indicated that at Lake Tana about 30 % of all catch was estimated to be spoilt and the sellers were forced to sell at low price or loss the fish at all. Most researcher have indicated that the high post harvest losses are mainly due to lack of handling, lack of processing infrastructure, poor access roads and low eating habits in population around the fish ground.

According to Hussein, et al (2010), study made on the assessment of fishery development program in Gambella regional state; described that fish is alternative income source for the livelihood of the household of specially Nuer and Anywa tribes. Even though 96,388 highlanders are living in the region that come from different part of Ethiopian, CSA (2007), Hussein, et al, (2010) had shown that, the fishing activity is utilized by the native people of Gambella, whereas the highlanders who lived in the area are not accustomed to eat fish.

Demissew (2007), stated that the traditional fish markets Gambella region were limited to the type of fish, fisher were suffered of loss due to lack of good preservation, high temperature and insect infection. Moreover, same time Fishers were forced to traveling carrying their fish load on foot to nearby village, even conduct house to house to sale their fish. Furthermore, Demissew (2007) also indicated that there were no modern hotels and investors involving in fishing activities.

In general, fish demand and consumption in Gambella are stimulated through the natural process. Hence, fishers did not invest anything for the reproduction and sustainability of fish. The only cost is the time that the fishier spent to catch, transporting and preserving fish. Moreover, most researchers indicated neither regulation nor investment is made in sector, and hence the fish market is running in traditional way were the local fishers were limited to the villages and local markets. It was indicated that the fish market is not attracting demand and fishers were facing a great loss. Due to such factor the fish market is facing serious challenges to expand and contribute in the growth of regional GDP. Hence, this study tries to analysis the fish demand among the households based on the following questions.

1.3. Research Questions

Even though researchers' have listed several factors that determines the fish demand and consumption, this researcher was mainly attempt to answer the following leading question:-

What are the critical factors affecting demand for fish in the study area?

What does the preference of fresh and dry fish consumption among household look like?

1.4. Objective of the Study

By taking the case of Gambella and Itang Special Town, the overall objective of the study was to asses and identifies factors that determine the demand of fish consumption.

On the other case, the specific objectives of the study were:

- To analyse factors determining HHs' demand for fish in the study area,
- To analyse factors affecting the preference of fresh and dry fish consumption among the HHs in the study area

1.5. Significant of the Study

Most researchers indicate that Gambella region has vast and large fresh water. And it was stated that this large fresh water holds a high potential on fishery.

This study has analysis the factors that affecting households' choice of fish and fish forms. Therefore, it may help as a bench mark for policy makers, planners, researchers, principal, investors, traders who want to participate in the fishing sector and other concerned bodies. Moreover, due to its detail information about the behaviours of fish and non fish consumers, fishing community can use this information to develop their market strategies to attract fish buyers.

1.6. Scope of the Study

The research was geographical limited to in Gambella town and Itang Town only. This was because of high potential of fish caught, the largest river in the region, which is Baro River (i.e. major source of fish), passes through these two towns. On the other hand, the sites were selected because of the existence of more fishery cooperative along the river between the two towns than the others. Moreover, this two towns have larger population with different ethnicity groups compared to the other towns of the region.

1.7. Limitation of the Study

This study was limited to the households' choice of fish and fish forms (fresh and dry). It means that, the study was limited to either an individual household is consumer of fish or not and analysis factors affecting on his/her choice of fish (Demand). The study also limited to the market situation of Gambella and Itang Town during period September - October, 2015 of the research area.

1.8. Organization of the Study

The study was organized in such a way that chapter one contains the background, statement of the problem, research questions, objective of the study, significance of the study and scope of the study, while theoretical literature and empirical reviews were included in chapter two. Moreover, Chapter three contains those general terms methodology. Furthermore, chapter four indicates the result with it's' discussion. Finally, conclusions and policy recommendations were presented under chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Concepts of Fish and Fish Market

2.1.1. Concepts of Fish

According to Macmillan English dictionary (2006) definition, Fish is an animal that live in water and swims. It breathes by using gills and moves by its tail and fins. Saltwater fish live in sea and freshwater fish live in rivers and lakes. Fish is eaten as food. It is stated that fish is reach in animal protein. According to Dawit, *et al* (2013), fish is used as primary sources of animal protein for over one billion people of the world.

2.1.2 History about the Practices of Fish Catch and Release

For the sustainability and conservation of fish sector; different countries and government had developed different strategies and methods. According to the website Wikipedia catch and release of have practiced since 20th century.

In United Kingdom fish catch and release were stated since the latter of the 20th century, these were done to prevent targeted species from disappearing by over fishing. The United States, fish catch and release were first introduced as a management tool in 1952 as. The Idea was accepted for fun rather than for food. That was to ensure sustainability and to avoid overfishing of fish stock, Jennifer (2014). In Australia, catch and release caught on slowly, with some pioneers practicing it in the 1960s, and the practice slowly became more widespread in the 1970s and 1980s. Catch and release are used to conserve vulnerable fish species. In the Republic of Ireland, catch and release were used as a conservation tool for Atlantic salmon and sea trout fisheries since 2003. Catch and release have been used by sport anglers for as long as these species. To encourage anglers to practice catch and release in all fisheries a number of Governments led incentives have been implemented, where as in Switzerland and Germany catch and release of fishing is considered inhumane and forbidden

2.1.3 Fishers and their Practice

As most researchers describe fishing communities have been exploited by retailer or brokers due to lack of effective marketing system. Fishermen who catch fish by laboring overnight (from common-property water bodies) do not usually sell fish in retail markets (FAO (2013)). Even though trade is necessary to every-day to day commodity but such traditional practice makes fishing communities remain to be poor. Moreover FAO (1968) stated that markets at the primary catch stage are almost completely non-competitive and therefore, exploitation is high and affects fishing community.

2.2 Preservation of Fish

A certain amount of the fish caught in the river system is consumed by the fishers themselves and by communities with a limited radius of the fish landings, but some time a surplus to local requirement is produced, and this surplus is sold elsewhere, this was explained by Welcomme (1985), cited by Reynolds. Further explains that, because of the dispersion and inaccessibility of fishing sites in the river flood plain system and the rapidity in which the fish deteriorate under tropical condition, most fishes have to be preserved by one means or another for it has to arrive at in the markets in an acceptable condition.

Fish have been preserved in all part of the world and have deferent methods of preserving. Most researchers have indicated that the salting, smoking and solar energy was used. For instance Brigitte Maas-van Berkel, (2004) stated preserved fish products in Japan, South Ameica and Africa as follow:

Japan: Sushi is a group of preserved fish products in Japan which are formed through the addition of boiled rice to fermented fish and salt. The low pH which results from the growth of lactic acid bacteria contributes to the preserving effect.

South America: Anchoa is a product found in a few South American countries, including Peru, Chili and Argentina. Whole anchovies are mixed with 35% Fermenting fish 63 salt and placed in barrels. The fermentation, a result of enzyme activity, takes place for a period of 3 to 4 months.

Africa: Momone is product from Ghana. In its general preparation, the intestines and gills of the fish are removed and the fish are washed in water. Among the several types of treatment methods used by fishers in Africa and nearly in all river systems are chilling, drying, salting and smoking, Reynolds (1993).

Ethiopia: Kuantu is the traditional drying of fish in Ethiopia is performed in remote fishing site to preserve excess catch (Breuil, 1995). And Smoking is not a traditional method and only some trials have been carried out at receiving station at Ziway for immigrate market. In addition to that, dried fish known as "kuanta" is mostly produced in Arbaminch area, and there is no similar long tradition in eating "kuanta" in other parts of the country due to its quality

2.3 Fish Demand of the World

According to FAO (2014) estimation, even though the population trends will not be uniform in all part of the world, the global population growth is generally projected to slow by 2030, in which it ranges 50 percent increase for African to a minor decline for Europe. It was also indicated that there will be 1.3 billion more people around the world (19 percent increase) by 2030. Due to other factor and population growth would have an impact on the future food demand. Moreover, it was stated that the demand for fish protein will be higher, while meat consumption is expected to decrease. Furthermore, food safety and health benefits, social concerns, production systems and innovations, sustainability and food origin will influence the consumers' preference for the food products (ibid).

2.4 Fish potential in Ethiopia

According to Issa, H. A. (2010), the potential of Ethiopia is stated as “The total annual fish production from rivers, small and large reservoirs was estimated to be 13,000 tons in 2007. The total annual production potential from different water bodies is predicted in the range of 41,000 to 49,000 tones”

Developing countries with food self-insufficient and low-income the development of fisheries resources can provide steady flow of nutritious food and household income for the population, particularly the local communities. However, the sustainability of these socio-economic benefits depends on the presence and adequate implementation of informed fisheries development management programs.

The growth of aquaculture and reducing the amount of fish that is lost between capture and consumption would to, some extent, help to alleviate the problem of diminishing supply from traditional method. However, with the rapid growth of human populations, there are significant shortfalls in the supply. It is estimated that the demand for fish for all uses will rise to 140 to 150 million tons by the year 2010 as FAO (1997) was described.

Despite the high productive of land and water potential for agriculture that is said to be available in Africa, the agriculture sector is largely depend on rain. Because of this and other reasons, agricultural productivity is very low and contributing low-income level to the agricultural population.

2.5 Fish Demand in Ethiopia

Most researchers indicate that the fish demand in Ethiopia is increasing due the rapid growth of human populations and other factors to especially in big cities, whereas the supply is decreasing due to traditional methods, (Issa, 2010). And Issa, (2010) expressed that the crisis in the livestock sector in the past has resulted to increase in price of meat at very high levels. but the willingness of the people accompanied by some purchasing power; a shift in consumption from

the high price of meat to the low price of fish product was expected in the past. On the other hand Lamma (2010) added that the Ethiopian population and their income is growing in which can increase the demand for fish but the fish demand in the country is far higher than the availability of fish in the market. As researchers stated, the fish producing areas of per capita fish consumption in Ethiopia is estimated to be 8.5kg/year (FAO, 1990). Whereas the overall per capita fish consumption of the country were estimated about 210g/year, which is the lowest in African.

Developing countries like Ethiopia are self-insufficient and in food with low-income, therefore the development of fisheries resources can provide steady flow of nutritious food and household income for the population, particularly the local communities. However, the sustainability of these socio-economic benefits depends on the presence and adequate implementation of informed fisheries development management programs.

2.6 Fish Market and Consumers' Behavior in Ethiopia

Due to the fact that most lake areas and rivers were located in rift valley and low lands, where malaria mosquitoes are widely spread and chances of survival without modern medicine are little, Fishing activities in Ethiopia were not recognize until the 1950s (Drewes, 1993). Additionally, a study by Drewes (1993) exposed that for the local people around the rift valley, fish was considered as warms and snakes, which should never be touched at all. In the same period, however, fishing in Lake Tana was introduced earlier and under different circumstances. The landless small minority tribe, the Woytos, who migrated to Lake Tana from North Egypt and Sudan along the river Nile, had operating subsistence fishing on the lake (MOA, 1995).

However, Drewes, (1993) further explains the drastic growth of population, shortage of agriculture land and depletion of natural forests caused the highlanders to migrate to low land areas and were adapted fishing and eating fish.

Lake fisheries in the Rift Valley Lakes was started in the 1950's to early 1960s when a demand for fish developed in the capital of Addis Ababa among the foreign communities and some upper class in urban Ethiopians (Drewes, 1993).

Recently, most researchers expressed that fish market in Ethiopia is generally tends to respond to a predictable mix of factors. Some studies explained that, fish marketing in Ethiopia are affected by seasonal fluctuation, lack of handling and processing facilities, poor access roads and low fish eating habits.

Demeke (1993) has stated that Ethiopians are culturally meat consumer (about 10 kg/year per capita). However, Sileshi (1998) expresses that Orthodox Christians of Ethiopia are encouraged to eat fish during fasting period.

However, Breuil (1995), argue that the major market problem in Ethiopia is the lack of traditional market network rather than the lack of fish eating habits. It was expressed that most of the time fresh fish is marketed immediately when it was caught by the fishers. There is no long tradition of smoking and salting of fish.

2.7 Empirical Review

Assefa (2014), who studied on the production, consumption and management in Ethiopia; in case of Zawy fisheries, indicated that the demand for fish increase due to population growth and rising in income. And then If Fisheries were manage efficiently then fisheries could have great contribution to the county's economy (ibid).

Hussein, et al (2010), were studied on Fishery Development Program: Reverie Fishery Assessment in Gambella Peoples' Regional State, in order to assess the fish resources and the potential fish yield in the region, the fishing method and post harvest techniques, the socio-economic and market condition/ situation of the region in relation to fish production and the market chains and actors. Finally Hussein (2010) had shown that the fish production potential of Gambella region was estimated 15,417 to 17,308 tons per year but about 3720 tons per year were

utilized. Further study was need to indentify market potential fish in Gambella regional state, (ibid).

In supporting the idea Hussien.et al (2010), Demissew (2007) studded about the Patterns of Fish Production, Marketing and Consumption and associated problems in the region in Gambella Peoples' National Regional State, pointed out that the region has a large fresh water fishery potential particularly in the large rivers. And further described the fishing industry contributes little to economic growth and to human welfare of the region. He describes as the majority of fish caught is sold (consumed) locally as fresh, whole or filleted. Finally he directed that the Governmental and nongovernmental has to encouraged the fisherman to in processing dry of drying, smoking and salting so that provision of storage infrastructures could reduce post harvest losses.

Ann (2014), studied on marketing systems for fish on Lake Tana, the Opportunities for marketing and livelihoods were described and analyzed about the frozen fish production and marketing system, for fish originating from Lake Tana, in particular from *Fogeraworeda*, and he found that the fish sector have been the dominant economic activity to fogera community in which a large number people were participated.

In addition to that, Dawit, et al (2013) has analyzed about the Impact of Fishery Cooperatives on Fishing Activity of Rural Households around Lake Ziway and Lagano in Ethiopia. The study was mainly focused on to examine fishery cooperative's performance, to assess the range of support made to members and to determine the impact of fishery cooperatives on the income of its members as compared to the non- members. Finally the study explored that due to the legal right and monitory fishing efforts; Cooperatives were effective in providing better marketing opportunities to their members. Dawit, et al (2013) also deal on Analysis of determinants of gross margin income generated through fishing activity to rural households around Lake Ziway and Langano and were find out that an open access to the fish population, loose legal enforcement, cost of fishing materials, sales price, poor access to central market and the like were the challenges facing the fishing community around Lake Ziway and Langano.

2.8 Theoretical Framework of the Study

As most scholars expressed, the traditional demand analysis is mainly focused on explaining the relationships between quantity demanded and its determinants such as consumer' income, taste, and prices which aimed to determine consumer response to income and price changes. Many approaches of demand analysis have been also developed in the field of consumers' attitudes and purchase choice. These were aimed primarily at identifying how behavioral factors might affect market dimensions and development. According to Johnson (2007), most demand studies were either through utility maximization approaches, which yields a Marshallian demand specification, or through expenditure minimization, in turn yielding a Hicksian compensated-demand function. Both formulations can be used for empirical investigations of demand models using single-equation and system approaches."

Moreover, discrete choice of demand were stated by Nairy, P. C. (2011) as follow:

Marketing researchers have used models of consumer demand to forecast future sales; to describe and test theories of behavior; and to measure the response to marketing interventions. The basic framework typically starts from micro foundations of expected utility theory to obtain an econometric system that describes consumers' choices over available options, and to thus characterize product demand. The basic framework has been augmented significantly to account for quantity choices; to accommodate purchases of several products on a single purchase occasion (multiple discreteness and multi-category purchases). Although a difficult technique to put into practice, discrete choice model (DCM) has found its way into a variety of settings. Automotive manufacturers use DCM to forecast demand for new models and alternative-fueled vehicles. Telephone companies use DCM to configure new products, bundle and design rate structures for communication services.

According to McFadden (1974), cited by Kenneth (2002) who stated about the Consumers' Behavior in decision- making to choose and purchase a certain product can be analysis using random utility theory as follow:

Discrete choice models are usually derived under an assumption of utility-maximizing behavior by the decision-maker. A decision-maker M is faces a choice among “ J ” alternatives (where $j = 1, 2 \dots, J$). The decision-maker M would obtain a certain level of utility (or satisfaction) from each alternative J . Let again the utility that decision-maker M obtains from alternative J be denoted by U_{Mj} . Being the utility is subjective to individual; the decision-maker chooses the alternative that provides the greatest utility to him/her. The behavioral model is therefore: choose alternative j if and only if $U_{Mj} > U_{Mj'} \forall j \neq j'$.

In other wards the decision-maker M will choose alternative i than alternative j , if and only if the utility that the decision- maker M obtained from alternative i (U_{Mi}) is higher than the alternative j (U_{Mj}) for every alternative j where $j \neq i$). This indicated that the consumer chooses the brand/product with the highest utility.

Nairy, P. C. (2011, May 8) also described that the goal utility-theoretic approaches to demand analysis is to describe demand for a basket of goods, $x = (x_1, \dots, x_J)$ when facing prices $P = (P_1, \dots, P_J)$. The outside good, z were also included in which the outside good represents that part of total income, y , spend on all goods other than the alternative J (inside goods). Moreover, it was stated that the outside good in the demand function is important to allow for total category demand to respond to net changes in prices, and in discrete choice models, is equivalent to including a “no purchase” option. Furthermore the direct utility was specified over the demands as $U(x_1, \dots, x_J, z)$ with linear pricing, the budget constraint $X.P + Z = Y$. And as $u(.)$ is increasing, the consumer will spend all his income, and buy at least one good.

Therefore, consumers choose or substitute one commodity on another based on its utility. The level of substitution affects the demand for a product and for the change in demand when attributes change. If a certain pattern of substitution across alternative in this way given the researcher’s specification of representative utility, then the logit model is appropriate.

After several steps and mathematical derivations given by different scholars (McFadden (1974), Bajarly, P. March 2003, and Nairy, P. C. 2011, May 8): the conditional indirect utility functions for each commodity purchased are given in equation 2.1

$$U^*_{ij}(x_j, p_j, p_z, y) = V_{ij}(x_j, p_j, p_z, y) + \varepsilon_{ij} \text{ --- (2.1)}$$

Where;

- U^*_{ij} = be the utility of alternative j for consumer i
- V_{ij} = be is the deterministic component of alternative J for consumer i
 - o It has been assumed to have an additively separable linear form $V_{ij} = \delta + \beta x_{ij}$ where x_{ij} and β are the vectors of exogenous variables and parameters, respectively. In the hypothetical case that V contains perfect information about the determinants of utility; the consumer would simply choose the product with the highest V_{ij} .
- x_j are characteristics of baskets of inside good ((goods within the alternative) and P_j the price
- z is quantity of outside good (goods which are not included in the alternatives), and P_z its price
- Outside good (denoted $J = 0$, means that if the decision maker I did not purchase any of the given alternative j) is the non-purchase of any alternative (that is, spending entire income on other types of goods outside the given alternatives).

ε_{ij} Indicates that an event observed by agent i , not by researcher. It represents all else that affects consumers i' choosing product j, but is not observed by researcher. Because of the ε_{ij}' the product that consumer i chooses is random, from the researcher's point of view. Thus this model is known as the "random utility" model. (Daniel McFadden won the Nobel Prize in Economics for this, in 2000.) From this it follows that the Specific assumptions about the ε_{ij} s, will

determine consumer with its' choice probabilities, which corresponds to their “demand function”. The probability of those consumers i buy's commodity j shown as follow:

$$D_{ij}(p_1, \dots, p_j, p_z, y_i) = \text{prob}(\epsilon_{i0}, \dots, \epsilon_{ij}: U^*_{ij} > U^*_{ij'} \text{ for } j \neq j') \text{ --- (2.2)}$$

The logistic regression procedure is the most frequently used method to study consumer perceptions and attitudinal behavior (Mazzini, 2003), it allows the analyst to measure the effects of relative price perceptions, socio-economic and demographic characteristics on household choices of forms of products and market outlets.

As Gempesawet, *et al*, (1995), cited by Mezzine (2003), described as the logistic regression procedure is the most frequently used method to study consumer perceptions and attitudinal behavior, in which it allows to analysis the effects of relative price perceptions and socio-economic and demographic characteristics on household choices of forms of products and market outlets. Moreover they added that a choice model is specified with a dichotomous dependent variable representing the consumer's final choice to be explained by a set of variables such as demographic factors, socio-economic factors, perception, experience, and preferences. The Logit model transforms the problem of predicting probabilities within a (0,1) interval to the problem of predicting the odds of an event occurring within the range of the entire real line. It was indicated that this model follows: Choice = f (explanatory variables)

The logit demand model solves the dimensionality problem by projecting the products onto a space of characteristics not the square of the number of products (McFadden, 1973). As Berry, 1994 and Berry et al., 1995 (henceforth BLP) cited by Nevo, (2000) stated that the logit model in the discrete choice model of demand analysis restricts consumers to substitute towards other brands in proportion to market shares, regardless of characteristics and different consumers will have different rankings of the products, but this difference is due only to the independently identically distributed (i.i.d.) shock.

Scholars such as Mazzini, (2003) and Gulirati, (2004) have been indicated the analytical form of the Logit model is based on the cumulative logistic probability function where the probability

(Pi) that a consumer will make a certain choice (i) given his attributes (xi) is mathematically specified as follows

$$P_i = F(z_i) = F(\delta + \beta x_i) = \frac{1}{1 + e^{-z_i}} \text{ --- (2.3)}$$

Where

Pi is the probability that an individual will make a certain choice, given knowledge of xi. F is the cumulative probability function and Zi is a theoretical index, which is determined by an explanatory variable xi; δ and β are constants.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description and Location of the Study Area

Gambella People's National Regional State is one of the regional states of Ethiopia. According to Central statistic agency of Ethiopia (2007), Gambella has an annual population growth index of 4.01 with a population of 307,096 where 159,787 of them are males and 147,309 are females. In the region, there are 5 indigenous people with a population 64,986 Anywa, 143,280 Nuer, 12,280 Mejang, 990 Opo and 224 Komo. There are also other Ethiopians who live in the region with a population of 96,388.

Gambella region has been subjected to occasional expansion of its area mainly due to administrative reasons. It has an area of 34,063Km² (GBPED, 2000). Recently the region is known to have three administrative zone and 13 Woredas. The capital of the region is known as Gambella town, which is located at a distance of about 768 km from Addis Ababa in terms of relative location; the region is bordered by Oromiya region in the north, SNNPRS in the south, Oromiya and SNNP Regional State in the east and Republic of South Sudan in the west (appendix D).

According to CSA (2007) the total population of Gambella town is 39,022. This town has also 5 *kebeles*. It was in 03 and 04 kebele where traditional fish markets are located. The other study area was Itang town which is the capital city of Itang special woreda. Itang special woreda is located 55 kilo metre away from Gambella town to west with population of 35,686. There are also Refuges that come from south Sudan settled in this in Woreda.

The research was operated in Gambella town and Itang town. According to CSA (2007) total population of Gambella town were indicated as 39,022. Gambella town has only 5 administrative kebeles. According to the kebele authority of Gambella town the total number of household were 9747 (table 1).

The second study site was Itang town. Itang town was the capital city of Itang special Woreda. Among the five indigenous people who live in the region three of them (Anyiwa, Nuer and opo) live in this woreda and that is why called special woreda. According to the local authority, this special woreda had 23 administrative kebeles. Achiwa kebel was one of the kebeles of this special wereda with a total household of 920 in which the Itang town where located. Since Itang town is located in Achiwa kebel then Achiwa kebele were purposely selected to be a part of this study. This were due to the diversity of population in the Itang and the fish market in Itang town / Achiwa is known by the big fish species called Nile perch locally called “Gur”. During holyday and regional sport festival, the photograph of Gur is used as a symbol of the Woreda.

3.2. Types and Source of Data

Primary data were collected from the households using well structured questionnaires and direct observation on the traditional fish markets were made during October to November 2015.

3.3. Method of Data Collection

3.3.1. Sample Size Determination

The total sampling size of the study was computed from the total population (targeted household) of the study areas. The total household of the research area was 10667 households in which 9747 of them were from Gambella town and the rest 920 of them were the from Itang town (table 1 below).

Hence, the total sampling size of the study were identified by using C.R.Kothri (2004), who define the determination of the sample size for a finite population was presented in equation 3.1 as fellow:

$$n = \frac{(N)(Z^2)(P)(Q)}{E^2(N-1) + (Z^2)(P)(Q)} \text{----- (3.1)}$$

Where:

- N = population of the study area (10667 households)
- n = total sample size of the study area

- Z = standard variant for 95% (1.96) confidence level from table
- P = sample proportion of successes = (0.5), the HHs who demand fish
- $Q = 1 - P = 1 - 0.5 = 0.5$ the proportion of HHs do not demand fish
- E = acceptable error (5%)

By using the above sample size formula, the total sample size which was used in the study was obtained by substituting the values in to equation 3.1 above and the results were given as fellow:

$$n = \frac{(10667)(1.96)^2(0.5)(0.5)}{(0.05)^2(10667-1)+(1.96)^2(0.5)(0.5)} = \frac{10244.59}{27.6254} = 370.84 \text{ ----- (3.2)}$$

Where;-

$$N = 10667$$

$$Z = 95\% (1.96)$$

$$P = 0.5 \text{ and } Q = 0.5$$

$$E = 5\% (0.05)$$

It was rounded off the result of equation 3.2 and the total sample size of the study (i.e. in both Gambella and Itang town) were obtained to be 371 households.

To identify the sampling size of each town and kebeles, the proportion (ratio) of each population household of each kebeles with the total sample sized of the study were computed as fellow :

$$n_1 = \frac{(n)(\text{Total population of Gambella town})}{\text{Totala population (N)}} \text{ --- (3.3)}$$

$$n_1 = \frac{(371)(9747)}{10667} = 339$$

Where;-

- n_1 is sampling size of Gambella Town
- $n = 371$ (total sampling size of the study)

- 9747 total number of household of Gambella town
- N = 10667 total number of household of the research area

This implies that the sampling size used in Gambella town were 339 households and By having similar procedure of equation 3.3 above the sampling size of Itang town (Achiwa kebele) were rounded to be 32 households as follow:

$$n_2 = \frac{(371)(920)}{10667} = 31.70 \text{ --- (3.4)}$$

Where:-

- n_2 is the sampling size of Itang town.
- $n = 371$ total sampling size of the study
- 920 total household of Itang town
- $N = 9747$ total number of household of the research area

Furthermore, using ratio method the sample size of each kebeles' was computed from their total sample size of each town. The following table 1 describes the sample size of each kebele.

Table 1 shows the Sample Size of each kebele which were used from the two towns

NO	Name of Town	Name of the kebele	Number of Household	Sampling Size Taken from Each kebele
1	Gambella Administrative council	01	4600	160
		02	920	32
		03	1553	54
		04	690	24
		05	1984	69
		Sub total	9747	339
2	Itang Town	Achiwa	920	32
Total Sample			10667	371

Source: field survey on the kebele authorities, 2015.

3.3.2. Data Collection Instruments (Technique)

To maintain the quality of data, about 60 pre- tested questions were developed and distributed among 371 households through stratified simple random sampling method (table 1 above). The questionnaires were mainly focused about the socio- economic characteristic, about locally available food groups, about the household preference to fish forms and species. The questionnaires were prepared in English Language and translated into Amharic Language in order to make the question simple and easily understandable to the respondents. The data was collected both by the researcher and trained data collectors (appendix A1 and A2).

To strengthen the data collected from the households, Observation on two traditional fish markets were taken place and data was collected through notes, photograph and videos. The fish markets of Gambella town were visited from October 1-5, 2015 and the observation for the traditional fish market of Itang Town was done on October 11, 2015. During observation of the traditional markets, descriptions about the location, comfortableness' of the traditional markets, about the names of available fish species with their respected prices and about the general view of the traditional fish markets were discussed.

3.4. Methods of Data Analysis

The data collected from the questionnaires were reorganized and filtered into 18 variables (table 2 below). And the data were analysed using two analytical methods which include qualitative and quantitative. From qualitative methods, case narration/telling, diagrams/ observation and tuition/instruction methods are used. In quantitative method the data were analysed using frequency distribution, mean and percentages. In short, both Descriptive statistics and logit regression models were the tools employed for the analysis of data obtained from 371 households

3.4.1. Descriptive Analysis Method

In this methods mean, frequencies and percentages were used. The results were presented using tabular presentation, graphs and pie chart followed by discussion.

3.4.2. Econometric Model

3.4.2.1. Description of Dependent Variable

From the econometric analysis, the investigator was motivated to analysis the factors that affects the demand of fish. Moreover, fish demand's status where seen with choice of households' either highly on fish (fresh/dry) or highly on any other commodities in the research area.

The dependent variable (in which we call it fish demand), the dependent variable is “The demand status of households for fish”. Moreover, when attaining this variable, we can have to foster change on many determinant factors that affect the demand for fish on the households. However, the variable of a demand status of households on fish is, accompanied by two dummies. These two dummies are: the dummy of “HHs has a demand for fish consumption”, and the dummy of “HHs has no demand for fish consumption”. The household could make those choices due to his/her utility that he/she personally obtained. For every individual households selected in the study were asked, “Have you ever purchase fish and consume in your local fish markets?” Then dependent variable was defined as follow:

$$Y_i = \begin{cases} 1 & \text{if yes} \\ 0 & \text{if no} \end{cases} \text{----- (3.5)}$$

Where Y_i = the demand of randomly selected individual household

This variable focused the choice between fish and other non observable alternative. If the household (Y_i) answered Yes (1), it means that the households usually buys fish: however, this correlated to choice among the alternatives of fish products such as fresh and dry fish. Therefore the demand status was computed with joint probability of fish forms (inside goods). But if the

household (Y_i) answered no (0), it means that household did not usually demand fish at all. In other words, if the household did not demand any fish forms means that the household demand other commodities which are not observable in this study “outside goods” (i.e. like shiro, other non fish meats ... etc.).

Hence, going through these analyses, Logit Model derived from a random utility theory in which individual choose to be the best model that fit to refutes the inferential relationship of these two prerequisites.

Since the dependent variable is dichotomous (i.e. it takes a value of one if the respondent is consumer of fish and zero otherwise). The primary data was analyzed by using conditional Logit regression model. According to Gujarati, (2004), the Logit model for this study is specified in equation 3.6 and 3.7 respectively:

$$Y_i = X_i' \beta_1 + e_i \text{ --- 3.6}$$

$$\text{Prob } (Y_i = 1/X_i) = \frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}} \text{ --- (3.7)}$$

Where:

- Y_i = is the “The status for fish demand among the HHs”
- x_i' is the factors that determines the demand status for fish by the Huaseholds
- β_i = is the "Ccoefficient/parameters of that determines
- e_i = is an "error term

3.4.2.2. Description of Explanatory Variables

Household fish demand is the effects of relative price perceptions and socio-economic and demographic characteristics on choices of forms of products and market outlets. Some of this independent/explanatory variable and the expected sign are given bellow:

- ◆ **Gender of household head:** is a dummy variable 1 if male and 0 if female and is expected to determine the difference in purchasing decision making of fish between male and female household heads. Males are expected to have a high probability of making decision as compared to females because they make the final decisions in the households. On the other hand women may have positive in purchasing food items than male. In this case it was also expected positive sign.
- ◆ **Marital status:** is a dummy variable 1 if married 0 otherwise. Due to joint decision making, married households are expected to have a higher probability of participation in decision making compared to single headed households, hence divorced and widow were treated as single in this study.
- ◆ **Educational status:** is a continuous variable indicating formal completed years in schooling. Education is accepted to create awareness and information about the nutritional value of fish food and hence expected to have higher probability to demand fish.
- ◆ **Household family size:** is a continuous variable indicating the number of people who live and eat together. Scalars have stated that the availability of family labour provides the household head the opportunity to share responsibility and save time for other development activities but also larger households could spend more on food and other household needs for external support. Therefore it was expected high fish demand for small family size otherwise low.
- ◆ **Household heads Occupation:** is a categorical variable taking the value of 0 if the household being unemployed such as student depend on family fund, 1 if the household is civil servant, 2 if the household is merchant, 3 if the household involved in fishing activities, 4 if the household involves in farming and 5 if the household involved in other

job such as NGOs. A positive relationship is hypothesized for this variable. Positive outcome is expected for those who are employed.

- ◆ **Household monthly income:** it continuous variable and expected to have higher demand as the monthly income of the consumer increase. As the higher the income the higher purchasing power.
- ◆ **Preference to fresh fish:** is dummy variable the value 1 if the household usually purchase and consume fresh fish 0 if the household did not demand fresh fish at all. It is expected o have a positive outcome for the demand of fish since fresh fish does loss favour.
- ◆ **Preference to dry fish:** is dummy variable with value if the household have a habit of buying and coarsening dry fish, 0 otherwise. It is expected to have negative outcome as it loss the favour during drying process.
- ◆ **Ethnicity:** is dummy variable the household being indigenous to the study area gets value 1 and the households who are not gets 0. It expected to have positive sign as the indigenous are expected to have access and information about the supply and availability of the fish.
- ◆ **Religion:** is dummy variable 1 being Christian and 0 being Muslim
- ◆ **Believe:** is dummy variable if the household believed that fish is eatable gets 1 and 0 otherwise. It is expected to have positive outcome as fish is popular on its nutrition
- ◆ **Fish species:** is assumed to have positive outcome and it is dummy variable. The household gets 1 if the household purchase any available fish species for consumption and gets 0 if the household is fixed to specific species. It is expected to have positive outcome and being purchaser of all species indicate that the household is most familiar and with high demand.
- ◆ **Price of fish compared to other non fish meats:** it is categorical variable, if the household indicate that the price of fish compared to other fish is expensive get 0, if the household indicated that the price of fish compared to non fish meat is moderate gets 1 and if the household indicate that the price of fish compared to other meat is cheap gets 2. The excepted sign was positive.

Table 2 list of dependent (y) and independent (X_i) variables

Symbol	Variables Name	Measurement	Description	Expected sign
Dmafish	Fish demand	Discrete	The household have ever consumed fish food (gets 1 if yes, otherwise 0 if no). HHs has no demand for fish (gets 0 if yes, otherwise 1 if no)	
Dfresh	The choice for fresh fish	dummy	HHs chooses to consume on fresh fish (gets 1 if yes, otherwise 0 if no)	+
Ddry	The choice for dry fish	dummy	HHs chooses to consume fresh fish (gets 1 if yes, otherwise 0 if no)	+
Sex	Household Sex	dummy	If the sex of is male gets 1 if yes, 0 otherwise (1=male and 0 = female)	+/-
Age	Household Age	Year	Numeric	
Marital	Marital status	dummy	the household is mirage gets 1, otherwise 0 (gets 1 if yes, otherwise 0 if no)	+/-
Ethni	Ethnicity	dummy	the household is Native gets 1, otherwise 0 (gets 1 if yes, otherwise 0 if no)	+/-
relig	Religion	Dummy	1= being the household is Christian; 0 = otherwise	
fsize	Family Size	Continuous	Numeric	-/+
Gravelev	Educational status	Continues	Numeric	+/-
Hincome	Income	continuous	Numeric	+/-
Occup	Occupation	reference	0= being Unemployed/ Student, depend on	-

Symbol	Variables	Measure	Description	Expected sign
	Name	ment		
		category	family funds/other; otherwise (reference category)	
	Civil servant	dummy	1 = being Civil servant ; 0 = otherwise	+
	Merchant	dummy	2 = being Merchant; 0 = otherwise	+
	Fisherman	dummy	3= being Fishery; 0 = otherwise	+
	Farming	Dummy	4= being in farming; 0 otherwise	+
	Other jobs	dummy	5 = being employed in other jobs /NGOs, priest, farming,; 0 = otherwise(gets 1 if yes, otherwise 0 if no)	+
Believe	Believe	dummy	1= the household believed that fish is eatable; 0 otherwise	+
species	Knowledge on fish food and fish group	dummy	1 = if the household able to consume all available species in the market; 0 = otherwise (1 if yes and 0 if No)	+
price	Price of Fish compared to other red meat	Reference category	0 = If the household respond that the price of fish is expensive compared to other non fish meat	-
	moderate	dummy	1 = If the household respond that the price of fish compared to other non fish meat is moderate	+
	cheap	dummy	2= If the household respond that the price of fish is cheap compared to other non fish meat	+
e			Error term	

Moreover, additional data were collected about the respondents perspective on the local fish food, the table 3 below shows the list of variable that were used to identify the constraints of faced by non fish food consumption in the study area.

Table 3 Constraints for the loss of fish demand

S/n	Variable name	Variable Description	Measurement	Expected signs
1	Lack of awareness	Unable to consume fish due to lack of awareness	Yes = 1, No = 0	+
2	Unfavorable Test	Unable to consume fish due to unfavorable test	Yes = 1, No = 0	+
3	Lack of Hygiene	Unable to consume fish due to lack of hygiene	Yes = 1, No = 0	+
4	Fear of Bone	Unable to consume fish due to fear of bone	Yes = 1 , No = 0	+
5	Unable able to cook	Unable to consume fish due to lack of ability how to cook	Yes = 0 No = 1	+
6	Family influence	Unable to consume fish due to family influence	Yes = 0 , No = 1	+
7	Other	Stated by the household		

CHAPTER FOUR

RESULTS AND DISCUSSION

The first subsection is devoted to the analysis of socio-economic characteristics of respondents and their choice to fish food through the descriptive method (i.e. percentage, mean ... etc.). The second sub-section also discusses about socio-economic characteristics of respondents with their choice of fish through logit regression (coefficients and odds ratio). While the third sub-section presents about major constraints for the local fish food. The last sub-section was discusses about the physical situations of traditional Fish Markets.

4.1. Descriptive Analysis

The Sex and their location of respondent: it was found that from the total respondents about 74.66% of them where the male and the rest 25.34% o where females. This implies that majority of the respondents were male.

Table 4 Sex and research area composition of respondents

	Male	Female	Total
Resident of respondent	Freq.(%)	Freq.(%)	Freq.(%)
Gambella Town	255 (68.73)	84 (22.64)	339 (91.37)
Itang Town	22 (5.93)	11 (2.96)	32 (8.63)
Total	277 (74.66)	94 (25.34)	(100)

*Source; Computed from the survey of 2015

*The numbers in the parenthesis represents percentage

Result table 5 below reveals that from the total respondent about 75.53% (280) of them were found to be consumer of either fresh or dry form of fish while the rest 24.47% (91) of them were not consumer of fish at all. From this one can conclude the number of fish consumer were higher than non fish consumer

Table 5 Frequency Distribution of Total Respondent on their Demand to fish

Total Respondents	Frequencies	Percentage
Fish consumer	280	75.53
Non fish consumer	91	24.47
Total	371	100

Source: Computed from the survey 2015

Fish Consumers with their Preference to Fish Forms

The result of table 6 also shows that, from the total fish consumer about 56.07 % (157) and 8.57% (24) of them responded as they were consumers of only fresh and dry fish respectively, while the rest 35.36% (99) of the total fish consumer were indicated as a consumer of both fresh and dry forms of fish.

From this one can understand that the demand for fresh fish was higher than the demand for dry fish. This implies that fresh fish were more preferable than dry fish in the study area.

Table 6 Frequency of Respondents Base on their preference to fish and fish forms

Respondents Categories	Frequencies	Percentage
Only Fresh fish consumer	157	56.07
Only Dry fish consumer	24	8.57
Consumer of both forms (fresh/dry)	99	35.36
Total	280	100.00

Source: Computed from survey 2015

Socio economic profile of the fish consumers

Result table 7 below indicated that out of the total fish consumer 75.71% of them were male and the rest were female. This table also indicated that about 75.63 % of the total fish consumers were married and the rest 24.54% were not. Moreover this table also reveals that 60.36% of the

total fish consumers were found to be indigenous respondents. Furthermore the table indicated that out of the total fish consumers about 77.86 % of them were found to be Christian and the rest 22.14% were Muslim.

Table 7: Frequency of fish consumers based on their Socio- economic variables

No	Socio- Economic Variables	Characteristics	Fish Consumer		
			Frequencies	%	Com.
1	Sex of Household head	Male	68	24.29	24.29
		Female	212	75.71	100
		Total	280	100	
2	Household Marital Status	Single	69	24.64	24.64
		Married	211	75.36	100
		Total	280	100	
3	Household Religion	Muslim	62	22.14	22.14
		Christian	218	77.86	100
		Total	280	100	
4	Household Ethnicity	Indigenous	111	39.64	39.64
		highlander	169	60.36	100
		Total	280	100	
5	Household Occupational Status	unemployed	2	0.71	0.71
		Civil servant	117	41.79	42.5
		Merchant	91	32.5	75
		Fishery	10	3.57	78.57
		Farming	46	16.43	95
		Other job	14	5	100
		Total	280	100	

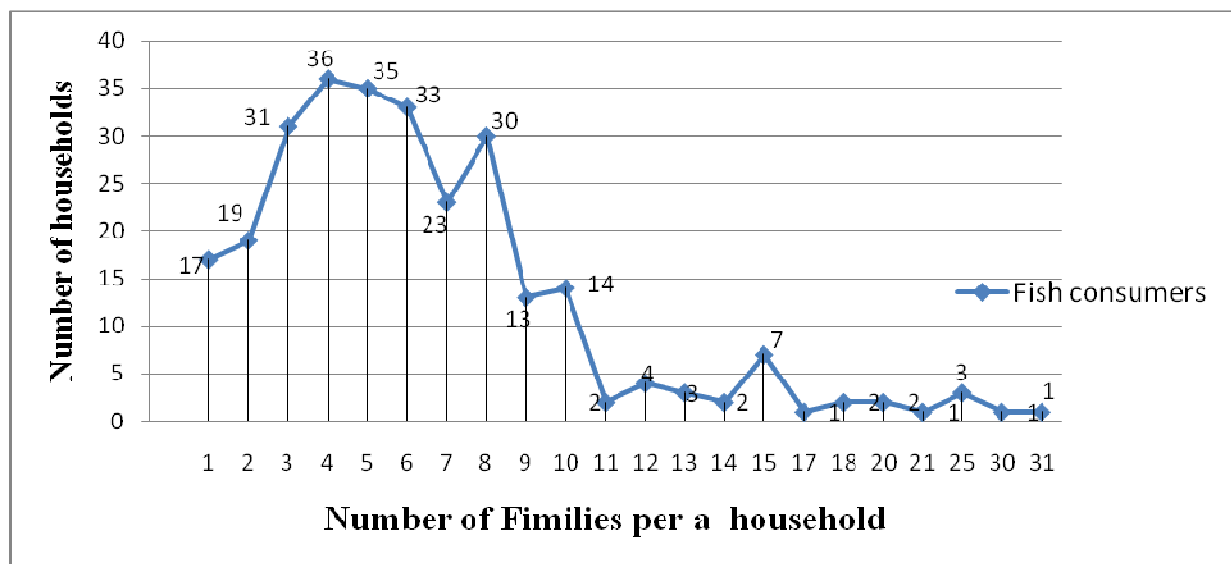
Source: Computed from the survey 2015

Occupational status: As the result table 7 above shows that, the proportions of respondents based on their occupational status indicated that 0.71%, 41.79%, 32.50%, 3.57%, 16.43% and

5% were found to be unemployed, civil servant, Merchant, fishing, farming and other Jobs respectively. The majority of fish consumers and respondents on this study were found to be the civil servants followed by the merchants and farmers. Even though, the fishers had less proportion from the total respondents all of them were found to be fish consumer.

Consumers' family size: The following figure 2 below shows about the frequency of fish consumers' and their family size. As the line graph reveals that the family size of the respondent ranges from 1 to 31. And the graph shows as the number family size increase above Nine (9) household preferences to fish decrease. This implies that household with small families sizes were more consumer of fish than those household with larger family size of in the study area.

Figure 1 Frequency of fish Consumers as their family size increases



Source: Computed from the survey of 2015

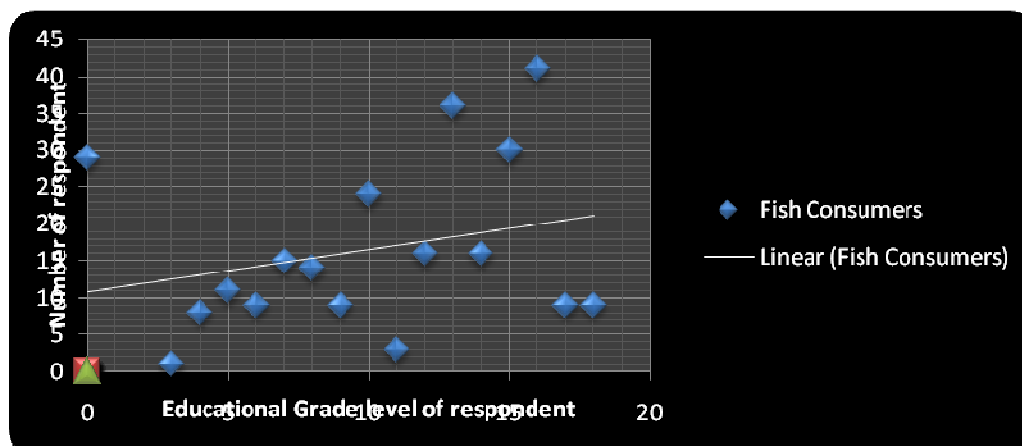
Educational background of Consumers: table 8 and figure 4 below presents, the total fish consumers about 10.32% of them were not able read and write (zero educational grade level) and the rest about 89.68% of them were found to be literate. From this one can understand that the demand in fish consumption is higher with those respondents who were able to read and write.

Table 8 Respondents frequency with their Grade level and their choice to fish demand

Respondents' Grade Level	Fish Consumer	
	Freq.	%
0 (Illiterate)	29	10.32
1-4	9	3.20
5-8	49	17.44
9-10	33	11.74
10 ⁺	160	57.30
Total	280	100.00

Sources: computed from the survey of 2015

Figure 2 Frequencies of Fish consumers as their educational grade level increases



Source: Computed from the survey 2015

The linear (fish consumer) in figure 4 above indicate that as the educational grade level of the respondent increase, the choice for fish also increases (i.e. in figure 4 the linear line of fish consumers indicated upward slope). This implies that the education background have a positive impact on the preference of fish and as the educational grade level increase the demand to fish increase.

Table 9 below reveals that the monthly minimum income of the fish consumers was 200 birr and the maximum income recoded was 10, 000 birr. The mean incomes of the consumers were found

to be 3,504.464 birr. In addition to that the average monthly income spent for purchasing fish food was about birr 40 which range from 0.00 birr to 103.00.

Table 9 Summary of income and monthly expenditure on fish

Variables	Obs	Mean	Std. Dev.	Min	Max
Respondents' monthly income	280	3504.464	1770.055	200.00	10000.00
Respondents' monthly expenditure	280	39.96786	31.58505	0.00	103.00

Source: Computed from the survey of 2015

Respondents' believe about fish food: The information or cultural believe about the important of fish food is stated in table 11 which about 98.57 % of the total fish consumers knew about the important of fish food and fish were culturally eatable. And 1.43% of the fish consumers indicated as fish were not culturally eatable and they have adapted eating fish from the indigenous and other fish consumer. This implies that cultural believe on the demand of fish do not have any negative impact in the research area.

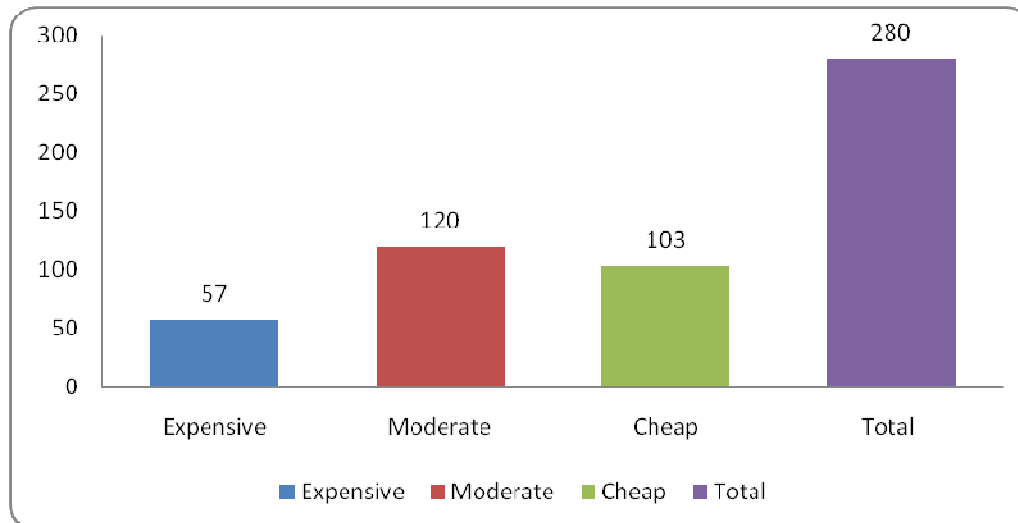
Table 10 believe and awareness frequency of respondent

Respondents believe fish food	Freq.	Percent	Com.
Believe fish food is eatable	276	98.57	98.57
Believe fish food is not eatable	4	1.43	100
Total	280	100	

Source: Computed from the survey of 2015

Price of fish compared to other red meat: As the result in figure 6 below shows, from the total fish consumers 57(20.36%), 120 (42.86%) and 103 (36.79%) of them indicated that the price of fish compared to the price of other non fish meats were expensive, moderate and cheap respectively. From this one could concluded that the price of fish in the research area were fair.

Figure 3 frequency distribution of fish consumer to the price of fish compared to other red meats



Source; Computed from the survey of 2015

Consumers' preference on fish species: In assessing the type of fish species that have been known by the by consumers, respondents were also asked whether they could consume all species available in their local market or not. And the result found in table 12 below indicated that about 92.50% of the total consumer were responded as they could not buy and consume any fish species which is available for sale in the market and were sensitive to the species they accustomed with. Only about 7.50 % of the total consumers were able to buy any types of fish species from the market. This implies that the demand of fish in the research area was determined by the types of available fish species.

Table 11 consumers' perspective to fish species

Do you consume all types of fish species available in your local market?	Freq.	Percent	Cum.
Yes	259	92.50	92.5
No	21	7.50	100
Total	280	100	

Source; Computed from the survey of 2015

Consumers' preference for different species of fishes

And the result table 14 revealed that among the fish species, Nile perch was most preferred (100%) in which all consumers were able to eat this fish. The fish species Tiger and Catfish were also the most preferred fish species (71.79%) next to the Nile perch followed by Tilapia and Lizard fish (69.64%) and Barbs (Ukura), Electric fish and other fishes (61.79%)

Table 12 frequency distribution of fish consumer with their choice to fish groups (species)

Did you prefer to consume the following fish species regularly?					
No	Name of Fish Species	Response	Frequencies	Percentage	Cum.
1	Nile perch/Gur/	No	0	0	0
		Yes	100	100	100
		Total	280	100	
2	Tiger and Catfish fish	No	79	28.21	28.21
		Yes	201	71.79	100
		Total	280	100	
3	Tilapia and Lizard fish	No	85	30.36	30.36
		Yes	195	69.64	100
		Total	280	100	
4	Barbs (Ukura), Electric fish and other	No	107	38.21	38.21
		Yes	173	61.79	100
		Total	280	100	

Source; Computed from the survey of 2015

Constraints faced by Non fish consumers

The constraints faced by the non fish consumers are presented in Table 14. The Table showed the distribution of respondents according to constraints to fish demand in the study area. Some non fish consumers (5.16%) believed that the most important constraint facing consume fish were due to lack of awareness followed by fear of bone (26.37%), fear of hygiene (25.27%), and

Lack of skill to cook (18.68%). As a result, people were preferred to purchase fresh fish or any other food staff in the study area. On the other hand, the table 14 indicated that non fish consumers were not affected by the price of fish and family influence.

Table 13 Distribution of the Respondents According to Constraints Faced by Fish Choices

Why you dislike eating Fish in your local area?						
No	Is it because of the following variables?	Response	Fresh Fish		Dry Fish	
			Freq.	%	Freq.	%
1	Due to high price	No	91	100	91	100
		Yes	0	0	0	0
		Total	91	100	91	100
2	Due to Lack of awareness	No	59	64.84	29	31.87
		Yes	32	35.16	62	68.13
		Total	91	100	91	100
3	Due to Fear Hygiene	No	68	74.73	65	71.43
		Yes	23	25.27	26	28.57
		Total	91	100	91	100
4	Due to Fear of bone	No	67	73.63	63	69.23
		Yes	24	26.37	28	30.77
		Total	91	100	91	100
5	Due to Lack of skill to cook	No	74	81.32	60	65.93
		Yes	17	18.68	31	34.07
		Total	91	100	91	100
6	Due to Family influence	No	91	100.00	52	57.14
		Yes	0	0.00	39	42.86
		Total	91	100	91	100

Source; Computed from the survey of 2015

From this one conclude that if awareness to non fish consumers on the fish food and about preparation of fish food created, non fish consumers could shift their demand to fish.

4.2. Results of Logit Regression and Discussions

In order to determine the factors that affecting the fish demand (Dmanfish) with its independents variables, logit regression model of estimation was made and the results were shown in table 14 below. As it is indicated in table 16 below, out of 18 independent variables, 11 of them were found to be statistically significant at the level of 5% significance. From this logit regression result, eleven variables were positively signed (Educational Grade level (Graleve), occupational status (Occup), respondents monthly income (Hincome), Ethnicity (Ethni), choice for fresh (Dfresh), the choice for dry fish (Dry) and price of fish compared to other meats (price 1) were moderate but preferences to fish species were negatively signed.

Table 14 below, the odds of fresh fish (1.dfresh) and dry fish (1.Ddry) were statistically significant at 5% level of significance. This implies that presenting fish in the form of fresh could 5.600008 times more likely higher the demand of fish and providing fish in the form of dry were 2.281241 time more likely higher the demand of fish consumption, *ceteris paribus*. From this one can understand that the odds ratio of fresh fish is higher than the odds ratio of dry fish and this leads to the choice of fresh fish were more likely higher than choice on dry fish, *ceteris paribus*. This may be due to the fact that fresh fish is more delicious than dry fish, there exists a loss in flavor and would decrease the demand of dry fish which was indicated by Joseph (2004) as cited by Dalhatu (2010).

Ethnicity (Ethni) were also statistically significant at 5% level of significance , the odds ratio 2.598656 reveals that being an indigenous to the research area respondents' choice to fish were 2.598656 times more likely able to choose fish than being non indigenous , being all other factors kept constant. This is may be as the result of fish is cultural food to the research area and being familiar with the access of information about the supply and quality of the fish.

It could be noticed from Table 14 below, that the **level of education** of the respondent (Gralelvel) were found to be statistically significant at 5% level of significance and this showed a positive relationship with their choice to fish demand, implying that an increase in the level of education of a respondent leads to an increase their probability to choose fish. The odds ratio for

the educational grade level indicated that an increasing unit grade levels were 1.073673 times more likely choose fish, *ceteris paribus*. This could be due to more awareness of the nutritive value of fish as a good protein source. This was supported by Amao, *et al.* (2006) cited by Dalhatu (2010) who had describe that consumption of fish has to do with knowing the importance of protein and the best source of it through education.

Monthly income respondents (Hincome) were also statistically significant at 5% level of significance. The odds ratio indicates that as the monthly income of respondent increase by one unit, respondents were 1.000259 time more likely higher their preference to fish consumption, *ceteris paribus*. From this one can conclude that increasing the monthly income of respondents would also increase the demand for fish. This was supported by Reuben (2012) who had indicated that the households who exposed to higher income would lead to spend more money on quality diets of fish food, as it was underlined by many researchers that fish is the most nutritious food.

Occupational status of respondent (Occup): using unemployed (0) as a base for the comparison of different occupational status of respondents for the logit regression, the odds ratio in table 14 indicated for Merchant (2), farming (4), other jobs (5) were 9.161386, 12.83868 and 19.58343 statistically significant at 5% level of significance respectively. It implies that a unit increase in the employment of Merchant would more likely increase the demand of fish by 9.161386, being all other factors kept constant. Moreover, a unit increase in the employment of farming would more likely increase the fish demand by 16.38989, *ceteris paribus*. Finally and a unit increase in the employment of other jobs like in NGOs would more likely increase the fish demand by 21.29469, keeping all other factors constant. This leads that being employed in would increase the demand for fish in the research area. This were conformed with the findings of Reuben and SA (2012) who had indicated that the households who exposed to more lucrative jobs and occupations with enhanced income would lead to spend more money on quality diets of fish meal. However the respondents with Occupation fishing (3) had no definite pattern with demand of fish as all the respondents were consumer of fish and due to all

respondents of fishers were consumer of fish 10 variables were dropped. This implies that the logit analysis result were for 361 respondents.

Table 14 Results of the logit Regression model estimation the fish demand

Dmafish	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]	
1.Dfresh	5.600008	1.798884	5.36	0.000	2.983721	10.5104
1.Ddry	2.44532	0.9354865	2.34	0.019	1.155309	5.175747
1.Sex	0.962294	0.3513066	-0.11	0.916	0.4704982	1.968147
Age	0.999395	0.0161932	-0.04	0.970	0.9681556	1.031642
1.Marital	1.008295	0.3751669	0.02	0.982	0.4862637	2.090755
1.Ethni	2.598656	0.8845047	2.81	0.005	1.333599	5.06375
1.relig	0.8554089	0.3719314	-0.36	0.719	0.3648142	2.005746
fsize	1.00806	0.0394588	0.21	0.838	0.9336143	1.088442
Gralevel	1.073673	0.036877	2.07	0.038	1.003774	1.148439
Hincome	1.000259	0.0001083	2.39	0.017	1.000046	1.000471
Occup						
Civil servant	8.131125	8.951092	1.9	0.057	0.9399642	70.33799
Merchant	9.161386	10.34068	1.96	0.050	1.002741	83.70155
Fishery	(empty)					
Farming	12.83868	14.79708	2.21	0.027	1.341149	122.9033
Other job	19.58343	26.07184	2.23	0.025	1.441007	266.1409
1.Believe	2.781363	2.688248	1.06	0.290	0.4183627	18.49109
1.species	0.2606611	0.098918	-3.54	0.000	0.1238952	0.5484006
price						
1	2.142548	0.8859647	1.84	0.065	0.952687	4.818488
2	1.415245	0.5835394	0.84	0.4	0.630755	3.175429
Number of obs = 361 LR chi2(18) = 127.06 Prob > chi2 = 0.0000						
Log likelihood = -140.29261 Pseudo R2 = 0.3117						

The types of fish species (species1) had shown less than one odds ratio (table 14), this indicates that respondents were 0.2606611 times less likely choose and purchase any fish species from the fish market, being other factors kept constant. This implies respondent's preference of fish depend on the types of species accustomed with. As cited by Reuben (1012), this were supported by Akeson-Samson, (2005) who Concluded that consumers usually have a natural preference for a particular fish species while acceptability may be influenced by taste, price and income of consumers (Appendix I).

4.3 Results of Observation of Fish Markets

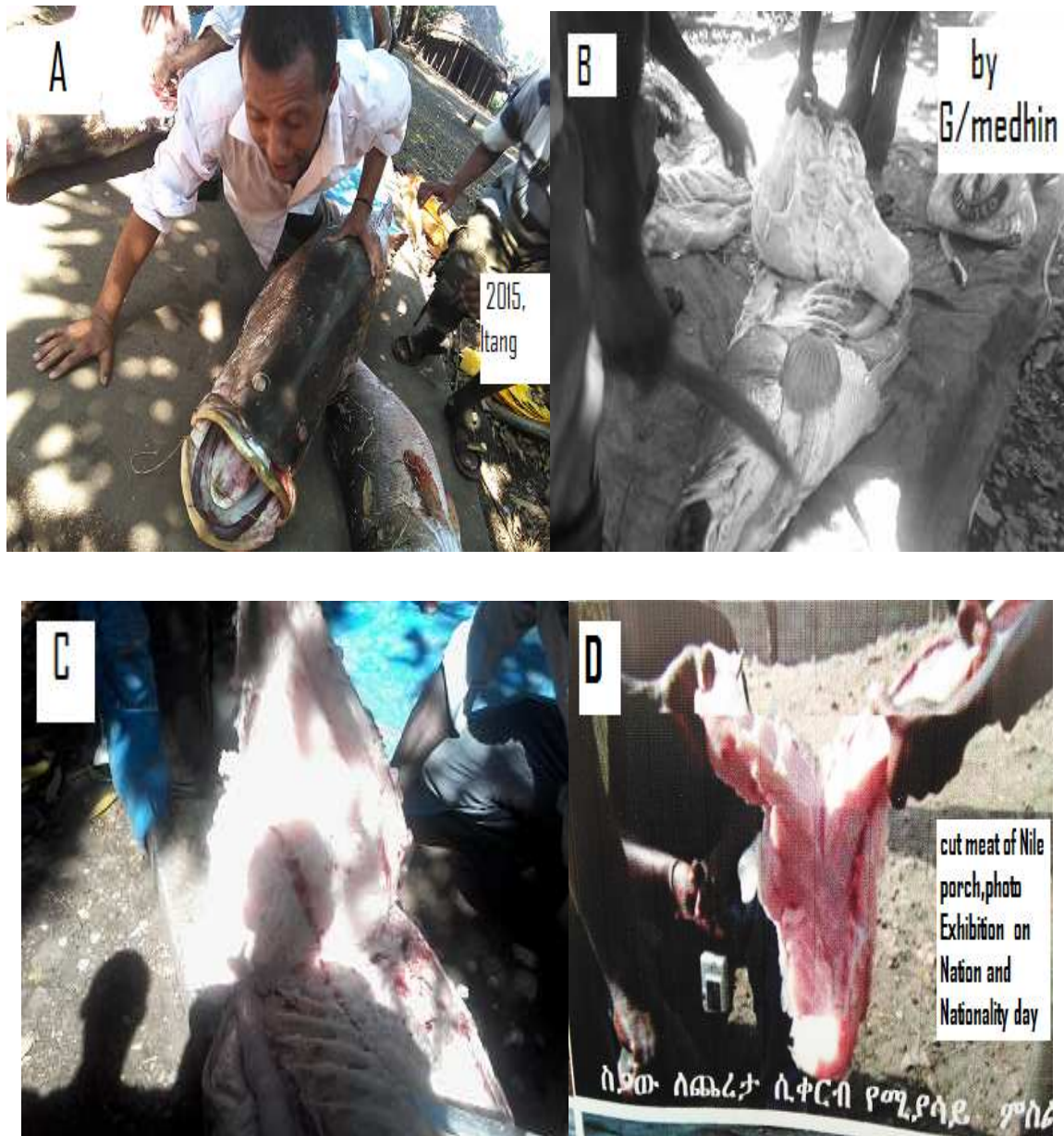
4.3.1. Observation result of Gambella town fish markets

It was observed that, the officially known traditional fish markets of Gambella town were located in 03 (Owelenga) and 04 kebele (Dojor-Olomi) about 1 kilometer away from the center of the town to the North (behind the Wibur primary and secondary school) and about 2km away from the Baro river to the north. The second traditional fish market was located in 03 kebele locally called Owilenga or Anyiwa Gebeya. The fish market was under kebele 03 and 04 administrative where most Anywa people live. The traditional fish markets were observed continuously for 10 day in October 2015. It was observed that the Dojor Olomi (Adiss Sever) have been operating in an open area under trees with about 800 m² (40mx200m), the Owilenga fish market were about 20 m² where only female dry fish sellers were participated. It was also observed that most of the sellers and buyers were young people.

Dry and cooked (like biscuit) fish were available the whole day but the market for the fresh fish starts about 10PM in the morning. As stated by the fish seller, the supplies of fish were from Gambella town, Abobo town and Itang town. Specially the fish species locally called Urretho comes from Abobo (Allwero Dump), the type of locally called Gur from Itang (Baro river) and some fish were supplied directly by the resident of Gambella town and nearby. The following photo graph shows part of the fish market in Gambella town

Types of fish species with their fresh and dry forms

On base of pilot survey and observation made on the tradition markets, the name Nile perch is the Anywa and Neur people locally called Gur and Cieal respectively . And sellers stated that it is the biggest fish found from Borro River. The figure/photo of Nile porch and others were captured during the survey from the traditional market and presented as follow.



The photo graph under “A” about shows the whole Nile porch, while the rest photos under “B” and “C” are indicating the process of preparing the fish for sale. The photos under A, B and C were taken from Itang town of fish sellers. The photo under “D” is captured during wholly day of the Ethiopian Nation and Nationality day of 2015 in Gambella.

The following photo graphs “A”, “B” and C are locally Named Wauary/lek, Agualla/Rueth and Akura



As the an observer indicated, the following photo graphs A and B Tilapia (Urrwetho/riel) and Lizard fish (wit/ jiok.lec)



Dolo /Note



Abale /Padpad

The above photo show the fish type locally name as Dolo/Note and Abale/Padpat (phot from Gambella town, 2015)

FREHS CATFISH (AGWELLA) RUETH WITH ITS DRY FORM



Dry fish of Agwella Made by Anywa, Gambella town traditional fish market



Dry fish of Agwella, made by Nuer, Gambella Town

URRETHO FRESH



URRETHO BISCUIT FORM



Sources: Directly survey on the traditional fish market of Gambella Town.



Price

Price was determined by the market. It was observed that, most of the time seller sets price and tends not to change the price. The seller usually group the fish based on amount. For instance, during the survey period the price of the species Urretho was birr 30 per a fish. Because of the fixity of price conflict among the buyers was observed to choose the biggest Urretho first. The following table 15 shows the name of fish that had been directly observed in the market during the survey and their market price.

Table 15 market price of fish species in Gambella Administrative council

No	Local Name of Fish Species	Unit price in birr	Unit	Remark
1	Okura	5.00-10.00	Per a Whole fish (piece)	
2	Warry	5-15	Per a Whole fish (piece)	
3	Adgiulla	10.00-300.00	Per a Whole fish	
4	Gur	120.00	Per a Kilogram	Pure meat
5	Wit	20-200.00	Per a Whole fish	
6	Urretho	30.00	Per a Whole fish	
7	Akurkur	5-10	Per a Whole fish	
8	Agiulla dried	50.00	Per a piece	Made by Anyiwa
9	Aguilla dried	30-50	Per a piece	Made by Nuer f
10	Aguilla powder	15	Per a tin can	Cooked made by Anyiwa
11	Urretho	15	Per a tin can	Like biscuit Made by Anywa

Source: direct observation of fish market in Gambella town 04 kebele October, 2015.

Challenges

When the sun is getting high in the sky, after the mid-day, it has been observed that the number of fish buyers who visit the market gradually decreases, even sometimes no buyer could come to the market. Only the young people who did not slept the whole night, fighting with crocodile and snick to cutch the fish were now available in the market with their unsold fish. This implies the unsold fresh fish could be taken back to home or thrown away.

4.3.2. Observation result of Itang town fish markets

The fish market of Itang town was observed on October 2015, it has been observed that, the traditional fish market was very close to the river bank of Baro (about 100m). The fish market starts early in the morning and ends about in the mid-day (as the typical visit indicate) .As some of sellers states, when a massive fish was cutch, they were able to sale their fish by traveling door to door in the Itang town and some were able to transport to Gambella town (especially when large number of Gur were caught). The name of available fish species during observation with their corresponding price were recorded in table 16 as fellow:

Table 16 list of fish species with their price in Itang special wereda traditional fish market

No	Local Name of Fish Species	Price in birr	Unit	Remark
1	Okura	5.00-10.00	Per a Whole fish	
2	Warry	5-10	Per a Whole fish	
3	Adgiulla	10.00-150.00	Per a Whole fish	
4	Gur	60.00	Cut fish (piece)	Pure meat
5	With	10-150.00	Per a Whole fish	
6	Akurkur	5-10	Per a Whole fish	
7	Agiulla dried	30.00	Per a piece	Made by Anywa
8	Agiullla dried	20-30	Per a Whole fish	Made by Nuer

Source; direct observation of fish market in Itang town, Achiwa kebele , 2015 Itang.

CHAPTER FIVE

CONCLUSION AND POLICY IMPLICATION

5.1. Conclusion

This study has focused on the household demand analysis with respect to their choice to fish and fish forms. It has generated information regarding the potential factors affecting respondents' choice between purchasing fish and any other food staff from the local markets outlets. The results indicate that about 75.53% (280) of the total respondents were customers of fish either in the form of fresh or dry form and the rest 24.47% (91) were not demand fish at all.

Moreover, the results have shown that out of the total fish consumer about 56.07 % (157) of found to be consumer of fresh fish only and about 8.57% (24) of the demand dry fish only while the rest about 35.36% (99) of them were indicated as a consumer of both fresh and dry fish. This implies that presenting fish in the form of fresh had been more preferable than being in the dry form. These preferences are results of the Demographic, socio- economic and attitudinal perception of respondents, availability of information and accessibility to the fish markets.

Ethnicity (Ethni) were also statistically significant at 5% level of significance , the odds ratio reveals that being an indigenous to the research area respondents' demand to fish were 2.598656 times more likely able to choose fish than being non indigenous , being all other factors kept constant. This is may be as the result of fish is cultural food to the research area and being familiar with the access of information about the supply and quality of the fish.

Households' education is a significant factor that affects the choice for fish or the choice to other food commodities to purchase from the local markets. This variable were found to be statistically significant at 5% level of significance and this showed a positive relationship with their choice to fish demand, implying that an increase in the level of education of a respondent leads to an increase their probability to choose fish. The odds ratio for the educational grade level indicated that an increasing unit grade levels were 1.073673 times more likely choose fish,

ceteris paribus. This could be due to more awareness of the nutritive value of fish as a good protein source. This was supported by Amao, *et al.* (2006) cited by Dalhatu (2010) who had describe that consumption of fish has to do with knowing the importance of protein and the best source of it through education.

Monthly income respondents (Hincome) were also showed significant impact on the demand of fish and were statistically significant at 5% level of significance. The odds ratio indicates that as the monthly income of respondent increase by one unit, respondents were 1.000259 time more likely higher their preference to fish consumption, *ceteris paribus*. From this one can conclude that increasing the monthly income of respondents would also increase the demand for fish. This was supported by Reuben (2012) who had indicated that the households who exposed to higher income would lead to spend more money on quality diets of fish food, as it was underlined by many researchers that fish is the most nutritious food.

Occupational status was found to be a significant determinant of the probability of respondents that make a choice to buy fish. This suggests that employed respondents usually choose and buy fish in the study area than those unemployed respondents. moreover, using unemployed (0) as a base for the comparison of different occupational status of respondents for the logit regression, the odds ratio in table 14 above indicated for Merchant (2), farming (4), other jobs (5) were 9.161386, 12.83868 and 19.58343 statistically significant at 5% level of significance respectively. It implies that a unit increase in the employment of Merchant would more likely increase the demand of fish by 9.161386, being all other factors kept constant. Moreover, a unit increase in the employment of farming would more likely increase the fish demand by 16.38989, *ceteris paribus*. Finally and a unit increase in the employment of other jobs like in NGOs would more likely increase the fish demand by 21.29469, keeping all other factors constant. This leads that being employed in would increase the demand for fish in the research area. This were conformed with the findings of Reuben and SA (2012) who had indicated that the households who exposed to more lucrative jobs and occupations with enhanced income would lead to spend more money on quality diets of fish meal. However the respondents with Occupation fishing (3)

had no definite pattern with demand of fish as all the respondents were consumer of fish and due to all respondents of fishers were consumer of fish 10 variables were dropped.

The types of fish species (species1) had shown less than one odds ratio (table 14), this indicates that respondents were 0.2606611 times less likely choose and purchase any fish species from the fish market, being other factors kept constant. This implies respondent's demand of fish depend on the types of species accustomed with. As cited by Reuben (1012), this were supported by Akeson-Samson, (2005) who Concluded that consumers usually have a natural preference for a particular fish species while acceptability may be influenced by taste, price and income of consumer. This implies respondent's demand of fish depend on the types of species accustomed with and available in the markets.

The finding also concluded that the socio- demographic variables such as Sex, age, Marital status, religion, family size , price of fish compared to other non fish meats and believe on fish food seems do not have any significant impact on the demand of fish in the research area.

The observation made on the traditional fish markets show that, unsold fresh fish were found in the afternoon which were ready to spoil and leads to lost. The market prices of fish in the markets were generally low compared to the price of other non fish meats. And also the dry fish were available throughout the day time. There have been no modern fish sellers observed during the survey. The fish markets were not well organized and were not established on an open and secured to anyone who need fish can access easily.

Generally, the demand for fresh fish was found to be higher and the demand for dry fish was found to be extremely low. The results has shown that lack of awareness, fear of hygiene, fear of fish bone and lack of skill how to cook were some of the major constraints that non fish consumers were facing on their demand to fish. But majority of the total respondents have indicated that price of fish and family influences were not constraint for the demand of fish in the research area.

5.2. Recommendations and Policy Implications

The study examined about households' demand on fish and forms fish (fresh/dry) with their determinant factors that affects on their decision making process purchasing fish for consumption in the study area.

Based on the major findings of this study the following recommendations are suggested:-

- Modern retailers such as supermarkets have to encourage participating in serving fish food so as to promote more about fish and fish products. Since modern traders can create more power compared to traditional markets, this may help in attract the demand of fish consumption, especially to attract those society with higher income, such as investors, visitors, business owners, higher government officials and highlanders etc, in the research area.
- The places of fish markets have to be established or located on an open area, secured to all parties (buyer /seller), so that everyone who wants to buy fish can access easily.
- Training about market strategies have to deliver to the fishers and fish sellers so that they can develop techniques of selling and pricing to attract fish buyer and could expand their market share.
- Awareness on the important of dry fish, how to prepared fish food and about the available eatable fish species in the research area has to be advocated to the people living in the research area. And awareness on the hotel owners has to be created using different public media. (i.e. About the availability and the nutritional value of fish and fish products).
- Further study has to be made about the production of fish, preservation of methods, market channel and profitability of the (market analysis) the sector.

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Appendix I logit Regression model estimation the fish demand

Table of Logit Regression model estimation the fish demand

Dmafish		Coef.	Std. Err.	z	P>/z/	[95% Conf. Interval]	
1.Dfresh		1.722768	0.3212288	5.36	0.000	1.093171	2.352365
1.Ddry		0.894176	0.382562	2.34	0.019	0.1443682	1.643984
1.Sex		-0.0384353	0.365072	-0.11	0.916	-0.7539632	0.6770927
Age		-0.0006052	0.016203	-0.04	0.970	-0.0323625	0.0311521
1.Marital		0.0082605	0.3720807	0.02	0.982	-0.7210042	0.7375252
1.Ethni		0.9549943	0.3403701	2.81	0.005	0.2878812	1.622107
1.relig		-0.1561757	0.4347996	-0.36	0.719	-1.008367	0.6960158
fsize		0.0080276	0.0391433	0.21	0.838	-0.0686919	0.0847471
Gralevel		0.0710853	0.0343466	2.07	0.038	0.0037671	0.1384034
Hincome		0.0002585	0.0001083	2.39	0.017	0.0000462	0.0004708
Occup							
	1	2.095699	1.100843	1.9	0.057	-0.0619135	4.253312
	2	2.214998	1.128725	1.96	0.050	0.0027375	4.427258
	3	(empty)					
	4	2.552462	1.152539	2.21	0.027	0.2935268	4.811398
	5	2.974684	1.331321	2.23	0.025	0.3653418	5.584026
1.Believe		1.022941	0.9665216	1.06	0.290	-0.8714065	2.917289
1.species		-1.344534	0.379489	-3.54	0.000	-2.088319	-0.6007493
price							
	1	0.7619956	0.4135099	1.84	0.065	-0.0484689	1.57246
	2	0.3473025	0.412324	0.84	0.400	-0.4608377	1.155443
_cons		-5.322181	1.597824	-3.33	0.001	-8.453858	-2.190504
Number of obs = 361		LR chi2(18) = 127.07 Log likelihood = -140.29261					
Prob > chi2 = 0.000		Pseudo R2 = 0.3117					

ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY**SCHOOL OF GRADUATE STUDIES****DEPARTMENT OF ECONOMICS**

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Dear respondent,

The purpose this questionnaire is to collect relevant data on factors that affect fish demand in Gambella peoples Regional State, with reference of Gambella Town and Itang town. Therefore, I kindly request you to supply me your information about your demand for fresh, dry, eating habit and patterns of fish food.

Your information will be respected and helpful for assisting the fish demand in your area. Please do not write your name.

Thank you so much for your collaboration!

G/medhin G/hiwot

Table 1- HOUSEHOLD BACKGROUND INFORMATION		Response
1	Socio-economic variables	
1.1	Where do you live? Gambella Administrative council = 1 Itang town (Achiwa kebele) = 0	
1.2	If you live in Gambella Administrative council please, choose of the following. Kebele 01= 0 Kebele 02=1 Kebele 03=2 Kebele 04= 3 Kebele 05= 4	---
1.3	Would choose your Sex /gender please? Female = 0 Male = 1	
1.4	You would write your age please? (number completed of years)	-----year

1.5	Can you able to read and write? Yes = 1 No = 0	
1.6	If you say yes in question 1.5 which grade did you complete?	-----grade
1.7	In which economic activities do you involve ? Unemployed = 0 Government employee =1 Merchant =2 Fishery =3 Farming = 4 Other, please specify -----5	
1.8	What is your Monthly income?	----- birr
1.9	What is you Marital status please choose one of the following? Unmarried = 0 married = 1	
1.10	Family size? What are/is Your family members in number? -----	-----
1.11	What is your Religion? Muslim = 0 Christian =1	
1.12	Would you choose your Ethnicity please? Indigenous = 0 Highlander = 1	
1.13	Currently, Are all of your families healthy? Yes =1 No = 0	
1.14	How is the price of fresh fish compared to red meat? Cheep =2 moderate 1 expensive =0	

Table 2: consist about list of food group that you might accustomed with

		Response Yes = 1 No = 0
2	Did you consume food made of the following food items?	
2.1	like Corn, wheat maize rice... etc.	
2.2	vegetables Pumpkin, carrots, sweet potatoes, tomato, other vegetables including local vegetables	
2.3	Roots and Fruit like	
2.4	Red meat and egg, like Cattle, goat, sheep chicken, duck, etc	
2.5	Milk and milk product	
2.6	Fish and fish products	
2.7	Alcoholic like Beer, or any other local drink	

Table 3:- your information on use and important of fish food		
3	Household information on use of fish food	Response
3.1	Do you know how much fish food important for health is? Yes = 1 No =0	
3.2	According to your culture or believe is fish eatable? Yes=1 No =0	

Table 4: about your choice or preference on fish species		
4	Did you prefer to consume the following fish species regularly?	Yes = 1 No = 0
4.1	Have you ever eaten Nile perch (Gur) cial?	
4.2	Have you ever eaten ether of the following Tiger fish (waiery/ lek/ With Catfish (Agwella) Rueth, cial?	
4.3	Have you ever eaten Tilapia (Urrwedo)/riel Lizard fish (Ukuk) jiok.lec?	
4.4	Have you ever eaten Africa bichir, Electric cat fish (Adinga) /daar ?	
4.5	Please, write their Names hear if you know any other fish type----- -----	

5. Are you <u>buying</u> and <u>eating fish food</u> made of <u>Fresh Fish</u> in your area? Yes = 1 (if yes, please go to table 5) No = 0 (if No, please go to table 6)		
5 Table	If you are consumer of fish food would you choose your answer for the following questions please?	Response
5.1	Did you eat fresh fish food at your home? Yes= 1 No = 0	
5.2	Did you eat fresh fish food at hotel?	

	Yes = 1 No= 0	
5.3	With what did you commonly consume fish food? whit inejera =0 with porridge=1 with bread =2 other (please specify)-----	
5.4	How do you see the habits of eating fish food in your family? All families eat fish = 1 Some family member eat fresh fish = 0	
5.5	Do you know how to cook fresh fish? Yes =1 No= 0	
5.6	Did you like to eat all types of fish? Yes =1 NO = 0	
5.7	Did you frequently buy fresh fish from the tradition fish market? Yes =1 NO =0	
5.8	If your answer 5.7 is yes how is the price of fresh fish compared to red meat ? Cheep =2 moderate 1 expensive =0	
5.9	How do you Specify in purchasing fresh fish? Whole fish =2 Cut piece =1 As we get the fish form =0	
5.10	How often do you consume fresh fish in a month? Once in a month =0 Twice in a month =1 More than three in a month=2 Fortnightly (when I get fresh fish and money) =3	
5.11	How many Birr did you spent for purchasing fresh fish in September 2008? birr-----	
5.12	Can you get fresh fish in the fish market always? Yes =1 No = 0	
5.13	Is/ there modern fish shops that can provide fresh fish for sale in your area? Yes =1 No =0	

Why you dislike to purchase and eat Fish in your local area?

Table 6: Constraints for non fresh fish consumer		
6	Why is that you do not want to purchase and eat <u>Fresh Fish</u> ?	Response
6.1	Is it because of the fish price is high? Yes =1 No =0	
6.2	Is it due to lack of awareness? Yes =1 No =0	
6.3	Is it because of test ----- Yes =1 No =0	
6.4	Is it because of hygiene? Yes =1 No =0	
6.5	Is it because of you fearing the bones? Yes =1 No =0	
6.6	Is it because of you did not know how to cook fish food? Yes =1 No =0	
6.7	Is it due to influence of families? If any (please specify) ----- Yes = 1 No = 0	

7: Are you buying and eating fish food made of Dry Fish in your area? Yes = 1 (if yes, please go to table 7) No = 0 (if No , please go to table 8)		Response
Table 7	Only if you are buying and eating <u>Dry Fish</u> ?	
7.1	Did you eat Dry fish food in a hotel? Yes =1 No = 0	
7.2	Did you eat Dry fish food in your home? Yes=1 No = 0	

7.3	With what did you commonly consume dry fish food? whit inejera =0 with porridge =1 bread =2 Did not eat dry fish at all =3 other (please specify)-----	
7.4	How do you see the habits of eating dry fish food in your family? All families eat dry fish = 1 Some family member eat dry fish = 0	
7.5	Do you know how to cook dry fish? Yes =1 No= 0	
7.6	Did you like to eat all types of dry fish? Yes =1 No =0	
7.7	Did you buy dry fish from the tradition fish market? Yes =1 No = 0	
7.8	If your answer Q51 is yes how is the price of dry fish compared to red meat? expensive = 0 moderate =1 Cheep = 2 Did not know about the price of dry fish=3	
7.9	How do you Specify (measure) in purchasing dry fish? Whole fish = 0 Cut piece =1 By a kilogram =2	
7.10	How often do you consume dry fish in a month? Once a month =0 Twice a month =1 More than three in a month=2 Fortnightly (when I get dry fish and money) = 3 D not purchase dry fish at all =0	
7.11	How many Birr did you spent for purchasing Dry fish in September 2008? birr-----	
7.12	Can you get Dry fish in the fish market always? Yes =1 No =0	

Table 8: Constraints for non dry fish consumer		
8	If you are not buying and eating Dry Fish, Why?	Response Yes = 1 No = 0
8.1	Is it Because the fish price is high? Yes =1 No =0	
8.2	Is it because of large number of dry fish buyer in the fish market? Yes =1 No = 0	
8.3	Is it because you did not have awareness about dry fish? Yes =1 No =0	
8.4	Is it because of No dry fish in fish market? Yes =1 No = 0	
8.5	Is it because of you did not know how to cook dry fish food? Yes=1 No = 0	
8.6	Is because you fear the bones of dry fish? Yes =1 No = 0	
8.7	Is it because of test of the dry fish food? Yes =1 No =0	
8.8	Is it due to family influence Yes =1 No = 0	
If you have any reason please specify ----- ----- -----		
If you want to write something, please, write hear;----- ----- -----		

Thank you very much!

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ወደ የዚህ ጥናታዊ መጠይቅ መላሽ ሰጪዎች!

የዚህ መጠይቅ ዋና ዓላማ በጋምቤላ ከተማና በኢታንግ ከተማ ያለው የትኩስ ዓሣ፤ የዓሣ ቋንጣ ፍላጎት እና ተግዳሮት ከአባወራዎችን መረጃ በመሰብሰብ የመመረቂያ ጥናታዊ ጽሁፍ ማዘጋጀት ነው፡፡ በመሆኑም የእርስዎ መረጃ ለዚህ ትምህርታዊ ጥናት እጅግ ጠቃሚ ነው፡፡ የሚሰጡን መረጃ በጣም የሚከበርና ለዚህ ትምህርታዊ ጥናት ብቻ እንጂ ለሌላ አገልግሎት አይዉልም፡፡ በመሆኑም ትክክለኛ መረጃ እንዲሠጡ በታላቅ አክብሮት እየጠየቅኩኝ ለትብብርዎ በቅድሚያ አመሰግናለው፡፡

<< ከሠላምታ ጋር >>

መ/ር ገ/መድህን ገ/ሐይወት

ተ.ቁ	ሠንጠረዥ 1- HOUSEHOLD BACKGROUND INFORMATION	የአባወራው ምላሽ
1.1	መኖሪያ ከተማዎ የት ነው? ጋምቤላ ከተማ = 1 ኢታንግ ልዩ ወረዳ =0	
1.2	ቀበሌዎ የት ይገኛል? እባክዎን ይምረጡ 01፣ 02፣ 03፣ 04፣ 05	0 ---
1.3	የአባወራው ፆታ? ሴት = 0 ወንድ = 1	
4	የአባወራው ዕድሜ ስንት ነው?	----- በዓመት
1.5	ማንበብና መፃፍ ይችላሉን ? አዎን 0 አይ አልችልም	

1.6	በ1.5 መልስዎ አወን ከሆነ፤ ስንተኛ ክፍል አጠናቅቀዋል	_____ የክፍል
1.7	በምን የስራ ዘርፍ ተሰማርተዋል? በምንም ሥራ የለኝም 0 በመንግስት ሠራተኛ =1 በነጋዴ=2 በዓሣ አጥማጅነት =3 ግብርና= 4 ሌላ (እባክዎን ይግለፁ) ----- ----- 5	
1.8	የአባወራው ወርሃዊ ገቢዎ ምን ያህል ነው?	----- ብር
1.9	የአባወራው የጋብቻ ሁኔታ እንዴት ነው? ያላገባ (በጊዜው ካበለቤታቸው በተለያዩ ምክንያት የማይሩ) = 0 በጋብቻ ላይ ያሉ = 1	
1.10	የቤተሰብዎ ብዛት በቁጥር ሰንት ናቸው? Family size	-----
1.11	የአበወራው ኃይማኖት? Religion ክርስቲያን 1 Muslim ሙስሊም= 0	
1.12	ብሔረሰብ? Ethnicity highlander ደገኛው ብሔረሰብ = 0 Indigenous ነባር ብሔረሰብ =1	
1.13	በአሁኑ ወቅት ሁሉም የቤተሰብዎ አባላት ጤናማ ናቸውን ? አዎንYes =1 አይሉምNo =0	

ተ.ቁ	ሠንጠረዥ 2 የቀረቡት ዝርዝር የምግብ ምንጭ ይመገባሉን?	Yes =1 No=2
2.1	ጥራጥሬ በቀሎ፤ ሰንዴ ፤ ማሽላ ሩስዝ ፤ ጤፍ እና ሌሎች የእህል አይነቶች	
2.2	አትክርልት ዱባ፤ ካሮት፤ ቲማቲም፤ አሙላ ፈራፍሬማነጎ፤ ፓፓያ፤ ብርትኩዋን፤ ዘይቱና፤ ሌሎች	

2.3	ሥራ ስርና ጓሮ አትክል ስኳር ድንች፣ ካሳባ፣ ድንች እና ሌሎች የአካባቢው ስራ-ስር	
2.4	የእንስሳት ተዋዕኦና እንቁላልየከብት፣የፍየል ፣ የበግ፣ ለሎች የደሮ የዳክዬ፣ ለሎች	
2.5	ወተትና የወተት ተዋጽኦ	
2.6	ዓሣና የዓሣ ቋንጣ ውጤቶች	
2.7	መጠጦች አረቄ፣ ቢራ ወዘተ	

ሠንጠረዥ ስለ ዓሣና ስለ ዓሣ ያለዎት መረጃ እባክዎን ይምረጡ		መልስ
3.1	የዓሣ ምግብ ምን ያህል ጠቃሚ እንደሆነ የውቃሉን? Yes አዎን አውቃለው = 1 no አይ አላውቅም 0	
3.2	በእምነትዎ ወይም በባህልዎ ዓሣ የሚበላ ምግብ ነውን? yesአዎን ይበላል = 1 no አይ አይበላም=0	

ሠንጠረዥ 4 የቀረቡት የዓሣ ዝሪያዎች የሚያውቁት ከሆነና ተመግበው የሚያውቁ ከሆነ 1 ይፃፉ፡፡		አዎን =1 አላውቀውም = 0
4.1	Nile perch (Gur) cial	
4.2	Wit/piethe Tiger fish (waiery) lek Catfish (Agwella)Rueth, cial	
4.3	Bargrus (Udwara)Juäth Tilapia (Urwedo) rie/Lizard fish (Ukuk) jiok.lec	
4.4	Africa bichir(Udwella) Electric cat fish (Adinga) daar Apida	
4.5	ሌሎች የሚያውቁትና የሚመከቡት የዓሣ ዓይነት ካለ ይጥቀሱ-----	

5. ከአካባቢዎ ትኩስ የዓሳ የመግዛትና የመብላት ልምድ አለዎት ? አዎን ልምድ አለኝ= 1 (መልስዎ አዎ ከሆነ ወደ ሠንጠረዥ 5 ይህዱ) አይ ልምድ የለኝም = 0 (መልስዎ የለኝም ከሆነ ወደ ሠንጠረዥ 6	መልስዎ
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ይህዱ)		
ሠንጠረዥ 5 ትኩስ ዓሳ ከገበያ የመግዛት እና የመመገብ ልምድ ያለዎት ከሆነ እባክዎን መልስዎን ይምረጡ		
5.1	በአብዛኛው ጊዜ የዓሳን በሆቴል ይመገባሉ? አዎን 1 አይ አልመገብም ,0	
5.2	በአብዛኛው ጊዜ የዓሳን በቤትዎ ይመገባሉ? አዎን 1 አይ አልመገብም ,0	
5.3	የዓሳ ከምን ጋር ይመገባሉ? whit inejera ከእንጅራ ጋር = 0 with porridge ከጎንፎና ዳቦ ጋር= 1 other (please specify) ከሌላ ጋር የሚመገቡ ከሆነ እባክዎን ይጥቀሱ ----- 2	
5.4	የቤተሰብዎ የዓሳ አመጋገብ ልምድ እንዴት ያዩታል? ሁሉም የቤተሰብ አባላት ዓሳ ይመገባሉ = 2 የተወሰኑ የቤተሰብ አባላት ዓሳ ይመገባሉ = 1 አንድም የቤተሰብ አባል ዓሳ የሚመገብ የለም = 0	
5.5	በትኩስ ዓሳ ምግብ መሥራት ይችላሉ? Yes =1 No= 0	
5.6	ሁሉም የዓሳ ዓይነቶችን ይመገባሉን? አዎን እንደመገብም =1 አይ አንመገብም =0	
5.7	ትኩስ ዓሳ ከዓሳ ገበያ ይገዛሉ? አዎን =1 አይ አይ አልገዛም = 0	
5.8	በተ.ቁ 5.7 መልስዎ አዎን ዓሳ ገበያ እገዛለው ከሆነ የዓሳው ዋጋ ከከብት ስጋ ሲነፃፀር እንዴት ነው? የዓሳ ስጋ ዋጋ ውድ ነው=0 ተመጣጣኝ ነው = 1 የዓሳ ስጋ ዋጋ ርካሽ ነው =2	

5.9	ዓሣ የሚገዙት በምን መለኪያ ነው ? ዓሣ =1 በቁራጭ =1 በኪሎግራም=0	በሙሉ	
5.10	ትኩስ ዓሣ ከዓሳ ገበያ በወር ስንት ጊዜ ይገዛል? በወር አንድ ጊዜ = 0 በወር ሁለት ጊዜ =1 በወር ከሦስት ጊዜ በላይ =2 እንደሁኔታው (ትኩስ ዓሣ ገንዘብ ባገኘው ወቅት) =3		
5.11	በመስከረም ወር 2007ዓ.ም ለሙሉ ትኩስ ዓሣ ግዥ ምን ያህል ብር ወጪ አድገዋል? በብር ይግለፁ -----		
5.12	በቂ ትኩስ ዓሣ በገበያ ይገኛል ? =1 አይ የለም =0	አዎ አለ	
5.13	በከተማዎ ዘመናዊ የትኩስ ዓሣ አቅራቢዎች አሉ አሉ? አዎ አለ=1 አይ የለም =0		

ሠንጠረዥ 6 ዓሣ ከገበያ የመግዛት ልምድና የመመገብ ልምድ ከሌሎች ለምንድነው?		መልስ እስማማለሁ =1 አልስማም =0
6.1	የዓሣ ዋጋ ውድ ስለሆነ ነውን?	
6.2	በዓሣ ላይ ግንዛቤ ስሌሎች ነው?	
6.3	የዓሣ ምግብ ጣዕም ስለማይወዱ ነው	
6.4	በንጽህና የተነሳ ነው?	
6.5	የዓሳ አጥንት ስለሚፈሩ ነውን?	
6.6	ትኩስ ዓሣ ገዝተው በቤት ውስጥ ምግብ መስራት ስለማይችሉ ነውን?	
6.7	በቤተሰብ ተጽኖ ነው?	

7. እረስዎን ወይም ቤተሰብዎ የዓሣ ቋንጣ የመመገብና ከዓሣ ገበያ የመግዛት ልምድ አለዎት?		መልስ
አዎን = 1 (መልስዎ አዎን ከሆነ ወደ ሠንጠረዥ ቁጥር 7 ይህዱ) አይ ልምድ የለም = 0 (መልስዎ የለም የሚሉ ከሆነ ወደ ሠንጠረዥ 8 ይህዱ)		
ሠንጠረዥ 7 የዓሣ ቋንጣ የመመገብ ልምድ ካለዎት ከሆነ		
7.1	በአብዛኛው ጊዜ የዓሣ ቋንጣ ሆቴል ይመገባሉ አዎን =1 አይ አልመገብም =0	
7.2	በአብዛኛው ጊዜ የዓሣ ቋንጣ በቤትዎ ውስጥ ይመገባሉ አዎን =1 አይ አልመገብም =0	
7.3	የዓሣን ቋንጣ ከምን ጋር ይመገባሉ? whit inejera ከእንጀራ ጋር=0 with phorage ከገንፎና ከዳቦ ጋር=1 other (please specify)ከሌላ ጋር የሚመገቡ ከሆነ እባክዎን ይጥቀሱ----- --	
7.4	የቤተሰብዎ የዓሣ ቋንጣ አመጋገብ ልምድ ምን ይመስላል? ሁሉም የቤተሰብ አባላት የዓሣ ቋንጣ ይመገባሉ = 2 የተወሰኑ የቤተሰብ አባላት የዓሣ ቋንጣ ይመገባሉ = 1 አንድም የቤተሰብ አባል የዓሣ ቋንጣ የሚመገብ የለም = 0	
7.5	የዓሣ ቋንጣ ምግብ ማዘጋጀት ይቸላሉ? አዎን =1 አይ አንችለም =0	
7.6	ሁሉም የዓሣ ቋንጣ ዓይነቶችን ይመገባሉን? አዎን እንመገባለን =1 አይ አንመገብም =0	
7.7	የዓሣ ቋንጣ ከዓሳ ገበያ ይገዛሉን? yesአዎን እገዛለው =1 No አልገዛም=0	
7.8	በተቁ 7.7 መልስዎ አዎን የዓሣ ቋንጣ ገበያ እገዛለው ከሆነ የዓሳው ዋጋ ከሌላ ሥጋ ሲነፃፀር እንዴት ነው? Cheep የዓሳ ቋንጣ ዋጋ ርካሽ ነው =2 Moderate የዓሳ ቋንጣ ተመጣጣኝ ነው = 1	

	Expensive የዓሳየዓሳ ቋንጣ ዋጋ ውድ ነው=0	
7.9	የዓሳ ቋንጣ የሚገዙት በምን መለኪያ ነው በሙሉ ዓሳ =1 በቁራጭ =2 በኪሎግራም=3	
7.10	የዓሳ ቋንጣ በወር ምን ያህል ይገዛሉ? ምንም አንመገብም =0 አንድ ጊዜ በወር = 1 ሁለት ጊዜ በወር,=2 የዓሳ ቋንጣ በተገኘበት ወቅት =3	
7.11	በመስከረም ወር 2007 ዓ.ም ለዓሳ ቋንጣ ግዥ ምን ያህል ብር ወጪ አድረዋል?	
7.12	የዓሳ ቋንጣ ዘወትር በገበያ የገዥው አዎን =1 አይገኝም =0	
ወንጠረዥ 8		መልስ
ለምንድን ነው የዓሳ ቋንጣ ፍላጎት የሌሎች?		እስማማለሁ=1 አልስማማም=2
8.1	የዓሳ ቋንጣ ዋጋ ውድ ስለሆነ ነው?	
8.2	የዓሳ ቋንጣ ጊዢዎች ገበያ ውስጥ መብዛታቸው ነው?	
8.3	ግንዛቤ ስለሌሎች ነው?	
8.4	የዓሳ ቋንጣ በገበያ ውስጥ ስለሌለ ነው?	
8.5	በዓሳ ቋንጣ ምግብ መስራት ስለማይችሉ ነው?	
8.6	የዓሳ ቋንጣ አጥንት ስሚፈሩ ነው?	
8.7	የዓሳ ቋንጣ ጣዕም ምንያት ነው?	
8.8	በቤተሰብ ተፅኖ ነው?	
	ሌላ በዓሳ ቋንጣ ፍላጎት እንዳይኖረት ምክንያት ካለዎት እባክዎን ይግለጹ ?	
	እባክዎን መጻፍ የሚፈልጉት ካለ እዚህ ይጻፉ	

ለትብብርዎ እጅግ አመሰግናለሁ





Appendix VI Map of Ethiopia and Gambella



Source <http://www.meleszenawi.com/wp-content/uploads/2012/10/Ethiopia-Regions-Map-01.jpg>

