

## Fish Consumption Pattern and Its Relative Importance for Improving Nutritional Security in Ethiopia: A Review

Minalu Demilew<sup>1\*</sup>, and Abebaw Abebe<sup>2</sup>

<sup>1</sup>Department of Animal Science, Raya University, Maichew, Tigray, Ethiopia

<sup>2</sup>Department of Agricultural Economics, Raya University, Maichew, Tigray, Ethiopia

\*Correspondence to: Minalu Demilew, Department Animal Science, Raya University, Maichew, Tigray, Ethiopia, Tel: 251915869036; E-mail: minalutt248@gmail.com

Received date: August 02, 2021; Accepted date: August 16, 2021; Published date: August 23, 2021

Copyright: © 2021 Demilew M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

Feeding a hurriedly increasing human population is a foremost concern for researchers and any development partners in the world. Fish production plays a great role and it can be even a fate in providing global food requirement. In Ethiopia, fisheries are accredited as an important strategy in the drive for achieving food security and means of livelihood. The country has endowed with over 7, 400 km<sup>2</sup> of lakes and 7, 000 km of rivers with production potential of 51, 500 tons per year. However, only 30%-38% of this potential is currently used and contributes only 0.02% to its GDP. The current contribution of fish is still far below the estimated potential, this suggests that reviewing its production, consumption pattern, role and challenges that faced in subsector is much more important. Therefore, this review paper was conducted to; review production and consumption pattern of fish, relative importance of fish for improving nutritional security, identify the determinants of consumption pattern of fish and to analyze the challenges of fish production and marketing in Ethiopia. Fish has a relative importance for improving food and nutritional security due to its climate, nutritional, accessibility and health aspects. In Ethiopia the subsector contributes far below the expected potential due to both production and marketing constraints such as lack of proper knowledge, weak institutional support, poor market linkage, seasonal fish consumption pattern, aquatic pollution and poor harvesting system.

**Keywords:** Constraints; Consumption; Fish; Nutrition; Ethiopia

### Introduction

By 2050 the world's population will reach 9 billion, 34% higher than today. Feeding this an expected global population is a daunting challenge that is engaging researchers, technical experts, and leaders the world over. In order to feed this larger population food production must increase by 70% and particularly meat production will need to rise to about by over 200 million tones to reach 470 million tons. Fish is one of the key nutrition sensitive interventions to balance global food demand. Fish has significant potential to contribute to the goal of reducing food and nutrition insecurity. It plays an important role in global food provision, accounting for about 20% of animal protein and 6.7% of all protein consumed by humans. It plays also a unique role in providing a range of micronutrients and essential fatty acids, especially long-chain polyunsaturated fatty acids, which cannot be easily substituted by other food commodities [1].

In addition to food and nutrition security, fish is an important contributor to other development goals. It plays an important role in the livelihood security of the community through both direct consumption and income generation. The sector contributes by promoting socioeconomic growth, alleviating poverty, income, job creation and improving the livelihoods of marginalized communities. Current trends in fish production, consumption and market suggest that fish is among the most traded food commodities and fish trade is playing an increasingly important role to improve the welfare of local and global fish food systems for developed and developing countries. Fish provides 16% of animal protein in the world which is 19% in

Africa, 22% in Asia, 7% in Latin America, 7.5% in northern America and 11.3 in Europe [2].

### Literature Review

Fish is a critical source of animal protein, mineral, and micronutrient supplies in Africa where more than 200 million people are reported to eat fish regularly. Despite the increasing demand for fish, its production growth in Africa is low. In Ethiopia, fisheries are acknowledged as an important strategy in the drive for achieving food security and means of livelihood. In country about USD 14 million from its capture fishery while a total of 40 000 livelihoods were positively impacted upon by the fishery. The country has endowed with over 7, 400 km<sup>2</sup> of lakes and 7,000 km of rivers with production potential of 51,500 tons per year. However, only 30%-38% of this potential is currently used and contributes only 0.02% to its GDP. The per capita fish supply is around 200 g, significantly below the mean 2.6 Kg per capita per year for the East African sub region and its demand is very low that only takes 0.4kg/person/year and 0.1 g/person/day due to strong tradition with other animal meat consumption and religious influences. All in all, the existing contribution of fishery subsector is almost insignificant in the country's overall economy because the fishery sector in the country is far below its potential [3].

The current contribution of fish is still far below the estimated potential, this suggests that reviewing its production, consumption pattern, role and challenges that faced in subsector is much more important. The overall objective of this paper is to review fish

consumption pattern and its relative importance for improving nutritional security in Ethiopia. Particularly the paper tries to: Review production and consumption pattern of fish, analyze the relative importance of fish for improving nutritional security, and identify the determinants of consumption pattern of fish and to analyze the challenges of fish production and marketing in Ethiopia. The data collected are from secondary data sources; particularly from country central statistical agency, empirical study, country profile, different authors and researchers written on the issue of fish; and other reports on fish production and market related reports in Ethiopia.

## Discussion

### Relative importance of fish for improving food and nutritional security

**Climate aspect:** Fish production is advantageous from a climate change perspective for two reasons. First, because their production occurs in the water do not directly drive land conversion like land-based food systems. Second, for many marine species, the greenhouse gas emissions associated with their production are comparatively low.

**Production and accessibility:** Unlike land-based food production, the suitable area for cultivating food from the sea like fish is not limited by scarce land and water resources. Fish is readily available to most coastal populations, and trade plays an important role in moving products around the world. In regions that are most dependent on seafood for consumption, food from the sea is affordable and often preferred over other animal food sources. Ocean animals like fish are particularly efficient in converting feed into food for humans. Fed aquaculture production systems convert feed much more efficiently than terrestrial production systems [4].

**Nutrition aspect:** Fish contain protein, essential vitamins, minerals, long chain omega-3 fatty acids and other nutrients not found in plant-source foods or other animal proteins. These nutrients are

essential for cognitive development and particularly important for children, pregnant women and nursing mothers. Micronutrients such as vitamin B12 are limiting nutrients in the diets of many households and critical for preventing micronutrient deficiencies (malnutrition). A recent study finds that nutrients in the wild marine finfish caught in some countries exceed dietary requirements and thus could play an important role in addressing existing malnutrition.

**Health aspect:** Fish meat can decrease risk of heart diseases, asthma, alzheimer’s disease, cancer, obesity, and diabetics and others. Moreover, fish consumption has been stated to reduce the risk of cardiovascular diseases and have beneficial effects on fetal development during pregnancy. Fish consumption is associated with causing low blood cholesterol, positive pregnancy outcome, and better child cognitive test performances. Fish contains omega-3 fatty acids that reduce higher cholesterol levels, reduces heart diseases, blood pressure, heart stroke, and preterm delivery. Fish consumption can develop bone and teeth, sexual ability in males, decreased heart disease and blood pressure [5].

**Fish production potential in Ethiopia:** Ethiopia is endorsed with a number of lake and rivers which are believed to be promising potential of different fish stock. The importance of fisheries to the Ethiopian economy until 50 years ago was insignificant due to abundant land-based resources and a sparse population density. But, from the 1940s and 50s the rapid population growth, which resulted in a shortage of cultivable land resources and growing demand for fish throughout the country’s towns and cities forced the people to look for other occupations and sources of food from water resources. The country has more than 180 different species of fish in Ethiopia and 30 of those are native to the country. The current total fish production potential of the country is estimated to be around 51, 481 tons annually for the main water bodies, of which only around 38,400 were exploited very recently mainly from Lakes Tana, Chamo, Ziway, Abaya, Koka, Langano, Hawassa and Turkana as indicated Table 1.

Water bodies	Altitude	Surface area	Fish potential
Tana	1, 830	3, 500	24, 900
Fincha	2, 160	170	1, 700
Chamo	1, 280	550	3, 500
Abaya	1, 285	1, 160	9, 800
Hwassa	1, 710	90	600
Shala	1, 570	410	1, 100
Langano	1, 585	230	1, 700
Abijata	1,575	205	1, 700
Zeway	1, 850	435	2, 750
Koka	1, 590	255	2, 400
Turkana	365	94	750

**Table 1:** Major fish production potential water bodies in Ethiopia.

One hundred local fish species have been identified in Ethiopia; however, the bulk of production is made of Tilapine species, Nile Perch, and Barbus, Bagrus, Clarias and Labeo species. Nile perch is mostly caught on lakes Abaya, Chamo and Turkana, as well as

in major riverine fisheries. Lakes Abaya and Chamo are different from other Rift Valley lakes to the north in that they have a high diversity of the fish fauna with more than 20 species.

However, the commercially important ones are only four: *Oreochromis niloticus*, *Lates niloticus* and the catfishes *Bagrus docmak* and *Clarias gariepinus*. On lake Ziway, there are six fish species of commercial relevance, of which four are introduced species, namely *Tilapia zillii*, *Clarias gariepinus*, *Caracius caracius* and *Cyprinus carpio*.

**Determinants of fish consumption pattern:** Fish consumption preferences are affected by the consumer's geographic, social and cultural characteristics. Fish food consumption is influenced by many factors such as socio-economic background, food consumption patterns, personal health status, attitudinal dimensions, society, age, household income and education level. Indeed, feeding habits are accepted as a tradition by many developing countries. Any effort thought to be made for changing or shifting feeding tradition requires a prior appraisal on the knowledge level of the target community about the importance and benefits of the feed traditions. In Ethiopia fish is not consumed in large quantities even though there is no religious prohibition for the Christian and Muslim populations. Rather, it is because most of people are animal product consumer. The Ethiopian Orthodox Church observes several fasting periods as well as fasting days every week, when meat is not consumed. Most Christians consider. Moreover consumption is heavily biased towards quite limited geographical areas, also heavily weighted towards fasting days increasing tendency for fish to be a luxury product consumed by higher income groups.

Tigray region, northern Ethiopia and found that the availability of fish in the consumer vicinity, cost, taste and smell of raw fish, the known health benefits, and lack of appropriate preservation and knowledge of fish preparation were the major factor which determined consumption pattern of fish in study area. This is because of religious influences on consumption patterns, the demand for fish is only seasonal. During lent, for example, Christians who abstain from eating meat, milk and eggs consume fish. The other factors that contribute to the low level of consumption are the limited supply of the product and its high price.

**Fish marketing chain:** The distribution market chain of fresh fish in Ethiopia is relatively short as compared to other product due to the nature of the product, poor market linkage of subsector and poor storage/preservation methods. Different empirical study indicated that marketing channel of fish in Ethiopia mainly go through six different series of channels as indicated in Figure 1.

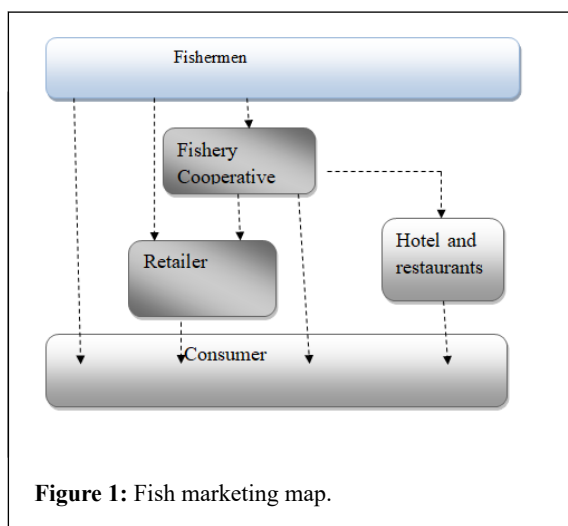


Figure 1: Fish marketing map.

**Production and marketing constraints of fish:** Denbi reservoir in Bench Maji Zone, South Western part of Ethiopia and found that lack of market place to sell the fish, shortage of fishing gear, retarded growth of fish and decrease of yield potential from time to time, lack of infrastructure, lack of motorized boat, lack of supplemental feed, lack of training and support, illegal fishermen, flooding and silt formation, lack of safety cloths. The critical problem for decline of fish production in different lake and river in Ethiopia related to marketing system are over harvesting, lack of proper knowledge, lack of modern fishing gears siltation, seasonal factors temperature waste materials from industries and households in to water bodies. The production problems include use of illegal nets, net theft, poor product handling, unorganized delivery, short of specific landing sites (ports) and entrance of any individual in the Lake at anytime, shortage of legal nets, asymmetric law enforcements in the different districts and sites, conflicts among fishers based on bordering, non-defined fishery population are bottlenecks that affected sustainable utilization of the fishery resource. The marketing problems identified include imperfect pricing system where mostly the buyers set the price and the wholesalers are the beneficiaries, absence product standards and legal enforcement, lack of coordination among producers to increase the bargaining power, inadequate availability of market information and research, shortage of processing women, shortage of working sites and electric power for storage, uselessness in licensing as non-licensed also involve in the fish trade, lack of government focus for better packaging and processing, transportation problems and lack of confidence in customer relationship due to unhealthy competition.

## Conclusion

Ethiopia is endorsed with a number of lake and rivers which are believed to be promising potential of different fish stock. The country has more than 180 different species of fish in and 30 of those are native to the country. Lakes Tana, Chamo, Ziway, Abaya, Koka, Langan, Hawassa and Turkana are the major water bodies which have potential for fish production. The contribution of fishery subsector is far below its expected potential which is below \$1 in GDP. Fish consumption pattern in Ethiopia is fluctuated and influenced by socio cultural, religious and economic factors. The distribution market chain of fresh fish in Ethiopia is relatively short as compared to other product due to the nature of the product, poor market linkage of subsector and poor storage/preservation methods. Poor infrastructure, traditional harvesting system, weak institutional support, lack of knowledge, poor market linkage and inadequacies in processing and preservation technologies are the major constraints in subsector.

## Recommendations

Based on the reviewing of different empirical studies the following suggestions are made. Privatizing and modernizing the subsector through creating a conducive environment to private investors by providing infrastructures nearby by lakes. Efforts should be made through intervention to the subsector related to production, harvesting and post-harvest mechanisms. The contribution of the intact fishery resource for improving nutritional security to the country must be recognized to each level of government and then providing institutional support has to be needed as much as possible. The ministry of animal science and fishery has to potency the value chain through providing sufficient budget, training, research, modern extension service to the sub sector. There is a need to improve

marketing linkage through organizing individual fishers into fishermen cooperatives.

## References

1. Bene C, Kawarazuka N (2010) Linking small-scale fisheries and aquaculture to household nutritional security: An overview. *Food Secur* 2: 343-357.
2. Bene C, Barange M, Subasinghe R, Andersen PP, Merino A, et al. (2015) Feeding 9 billion by 2050-Putting fish back on the menu. *Food Secur* 2: 261-274.
3. Chan CY, Tran N, Pethiyagoda S, Charles C, Crissman, Timothy B, et al. (2019) Prospects and challenges of fish for food security in Africa. *Global Food Secur* 20: 17-25.
4. Golden CD, Allison EH, Cheung WWL, Dey MM, Halpern BS, et al. (2016) Nutrition: Fall in fish catch threatens human health. *Nature* 534: 317-320.
5. Hicks CC, Cohen PJ, Graham NAG, Nash KL, Allison EH, et al. (2019) Harnessing global fisheries to tackle micronutrient deficiencies. *Nature* 574: 1-4.