



E-ISSN: 2788-8428  
P-ISSN: 2788-8436  
ZEL 2023; 3(2): 55-58  
Received: 04-06-2023  
Accepted: 13-07-2023

**Demelash Kefale**  
Department of Animal  
Science, Alage ATVET  
College, P.O.BOX 77, Alage,  
Ethiopia

**Addisu Genetu**  
Department of Agricultural  
Mechanization, Alage ATVET  
College, P.O.BOX 77, Alage,  
Ethiopia

**Correspondence Author:**  
**Demelash Kefale**  
Department of Animal  
Science, Alage ATVET  
College, P.O.BOX 77, Alage,  
Ethiopia

# Zoological and Entomological Letters

## Review on the current status of fish production and consumption in Ethiopia

**Demelash Kefale and Addisu Genetu**

### Abstract

Africa's greatest population of livestock is found in Ethiopia. Over 51,500 tons of fish may be produced annually by the livestock industry, which also contributes over 49% of the agricultural GDP and 80% of all jobs. The purpose of this paper is to examine Ethiopia's present level of fish production, and to examine Ethiopia's present consumption patterns. Ethiopia's system of producing fish is founded on the idea of unrestricted access to resources, which are defined by a variety of fishing gear. Gillnets, beach seines, long lines, hook-and-line, and cast nets are examples of fishing gear technology that is frequently used in Ethiopian fisheries. Fish is one of the recognized aquatic species used as food by humans, and its consumption is on the rise. The protein content of aquatic animals ranges from 17 to 29%, and their amino acid profile is comparable to that of land animal flesh. Fisheries are severely hampered by the fact that main pollutants affecting Ethiopian water bodies and their fish are said to originate from the sewage of factories and agriculture. Fish production is impacted by the textile and mineral extraction sectors.

**Keywords:** Fishery, Fish production, Fish consumption, and amino acid

### 1. Introduction

#### 1.1. Back Ground of the Review

Africa's greatest livestock population resides in Ethiopia. The livestock industry can produce over 51,500 tons of fish annually, contributes over 49% of the agricultural GDP, and employs 80% of all workers. However, despite the technologies that can solve the problem of livestock and fisheries production, their exploitation and, consequently, their contribution to food security and growth in the country are negligible (FAO, 2014) <sup>[1]</sup>. In general, the protein content of aquatic animals ranges from 17 to 29 percent, and their amino acid profile is comparable to that of land animal flesh. Fish flesh can be a good addition to diets high in carbohydrates because it is easily absorbed by the body and can be used right away.

Aquatic animals contain a large proportion of edible flesh and less waste, compared to land animals (with a few exceptions, such as shellfish). Ethiopia's fish production is not in accordance with her capacity for output. There are a number of explanations given for the poor productivity, including the fact that most people don't eat fish and that fishing is not a tradition.

Due to the difficulties experienced by the fishermen, small-scale or artisanal fisheries have historically been used to describe those that were primarily non-mechanized and had low levels of productivity (Adewwumi *et al.*, 2012) <sup>[2]</sup>. The sector is further limited, per the FAO (2015) <sup>[3]</sup> study, by insufficient institutional capacity, ill-run fishermen's associations, an unreliable data collection system, the distance of fishing locations, and the depletion of natural resources, the absence of essential infrastructure and equipment, and the insufficient funding for the nation's policies, programs, and laws. According to Assefa (2014) <sup>[4]</sup> and Gebremariam *et al.* (2002) <sup>[5]</sup>, some of the cross-sectoral issues affecting Ethiopia's fisheries are inadequate value chain and infrastructure for fish marketing, inadequate institutional and management capacity, restricted resource allocation and investment, and poor policy and regulatory framework. Fish production and welfare are primarily impacted by a number of issues, including overfishing, illegal fishing, irrigation and short cultivation, deforestation, improper management, poor feed quality and feeding habits, disease outbreaks, and the use of illegal mesh sizes. Despite this, fish is an essential source of food, employment, recreation, trade, and economic wellbeing for people all over the world.

## 2. Literature Reviews

### 2.1. Basic Concepts and Definitions

A section of the sea or rivers used for fishing is where a lot of fish are captured. The term "fisheries" describes the organized human endeavor known as "fishing," which involves catching fish or other aquatic organisms. All forms of fishing fall into two categories: aquaculture and catch fisheries. The practice of capturing viable aquatic species in the wild is known as capture fishing.

Fish, crabs, mollusks, and aquatic plants are among the aquatic creatures that are farmed in aquaculture. This method of producing food involves growing fish or other aquatic organisms in a controlled environment to yield a far larger harvest than would occur normally. Aquaculture is the controlled cultivation of both freshwater and marine organisms. Ethiopia has abundant inland rivers that are ideal for growing fish, which is an inexpensive source of animal protein. There are many lakes and rivers in it that have sizable fish populations. The majority of the fish supply currently comes from large lakes including Tana, Ziway, Hawassa, Chamo, and Abaya. And reservoirs frequently found in the nation's rivers, Koka, Fincha, etc. The production of fish from these bodies of water sustains the livelihood of impoverished farmers who reside nearby by offering them affordable, high-quality protein and a variety of revenue streams. The EU (2011) <sup>[6]</sup> study estimates that 17,000 tons of fish were caught in Ethiopia in 2008. Of that total, 74% came from the six main lakes (Tana, Ziway, Langano, Awassa, Abaya, and Chamo), with the remaining 26% coming from other bodies of water. The African catfish (*Clarias gariepinus*), the Nile tilapia (*Oreochromis niloticus*), and a few cyprinids, primarily *Barbus* species, dominate their fauna. The fauna of the two southernmost lakes, Abaya and Chamo, as well as the major rivers, Blue Nile and Omo, is far more varied than that of the Nile and the rivers and lakes of East Africa.

### 2.2. Ethiopia's Present Fishery Production System

About 86% of the water in the Nile comes from Ethiopia, which is referred to as the "water tower" of Eastern Africa. Numerous stunning lakes, reservoirs, and other tiny bodies of water may be found all around the nation, with a total surface area of roughly 13, 637 km<sup>2</sup> (Tsfaye, Wolff (2014) <sup>[7]</sup>). Ethiopia shares Lakes Abbe and Turkana with Djibouti and Kenya, respectively, where the Rivers Awash and Omo-Gibe end. The White Nile is connected to the Baro-Akobobas. The great Nile River, which flows over Egypt and into the Mediterranean Sea, is formed when the Blue and White Niles meet at Kartum, the capital of Sudan. The Blue Nile starts from Lake Tana. Analogously, Ethiopia's Great Rift Valley Lakes (Ziway, Langano, Hawassa, Chamo, and Abaya) and Lake Tana assist the nation in socioeconomic, ecological, and scientific research Wolff, Tsfaye (2014) <sup>[7]</sup>.

Ethiopia's system of producing fish is founded on the idea of unrestricted access to resources, which are defined by a variety of fishing gear. Gillnets, beach seines, long lines, hook-and-line, and cast nets are among the fishing gear technologies that are frequently used in Ethiopian fisheries, according to Brook L. (2012) <sup>[8]</sup>. Apart from the many types of traps, scoop nets and baskets composed of wires and plant materials are also utilized, especially in Ethiopia's rivers Brook L. (2012) <sup>[8]</sup>. In example, the majority of the fisheries in the Gambella region's Baro-Akobo Basin are

based on traditional gear. Furthermore, toxins that have been isolated from a variety of plant species, including *Millettia ferruginea*, have applications.

The majority of lake-captured fish in all production systems are transported traditionally and don't have any facilities for preservation before reaching the market. L. Brook (2012) <sup>[8]</sup>. To obtain quick cash, some fisherman take part of the fish to the market by hand after hooking them together with a string. Others carry the fish by hand after placing them in a basket and covering them with fresh leaves. Others gather their catch, stuff it into sacks, and ride donkeys, taxis, or pickup vehicles to the market. L. Brook (2012) <sup>[8]</sup>. The most popular methods for storing fish include the use of different sized deep freezers and, in certain situations, cold rooms in Addis Abeba, Arba Minch, Ziway, and Bahir Dar.

Ethiopian consumers prefer whole fresh fish, yet traditional fish drying takes place in isolated fishing locations. One of the major contributors to the nation's potential fish production is Ethiopia Lake, namely Lake Tana. Before 1986, there was only artisanal reed boat fishing in Lake Tana, mostly for subsistence. Both commercial and artisanal fishing is conducted in the Lake Tana fisheries, using a combination of motorized gill net, conventional reed rafts, gillnet, chase, and trap fishing methods. Fish from Lake Tana is offered in three different forms: dried, filleted, or gutted whole (Alayu Y., 2012) <sup>[9]</sup>. Similar to this, fish is mostly produced using a traditional approach in Ethiopia's central rift valley. Historically, tiny-There are five-scale or artisanal fisheries.

### 2.3. Demand for Fish

Ethiopians have historically relied on fish as a food source. On fasting days, in major cities, near towns and production centers, particularly in Zeway, a lot of people eat fish. Addis Ababa, Bahir Dar, and Arbaminch. But the domestic fish market is negligible outside of these places. The following are the reasons that contribute to the low level of fish consumption in the area.

1. To begin with, most people do not incorporate fish into their diets.
2. Secondly, the demand for fish is only seasonal due to the influence of religion on eating patterns. For instance, Christians who give up meat, dairy, and eggs during Lent eat seafood.
3. The product's high price and restricted supply are other reasons that lead to the low level of consumption. The lakes of the Great Rift Valley and several other northern regions of the nation produce fresh fish. In terms of pricing, fish is also more expensive per unit weight than local costs for cereals and vegetables, but it is typically less expensive than other forms of animal protein. The current level of demand for fish products might be greatly raised with enhanced marketing efforts and expanded supply. Particularly during Ethiopia's fasting season, there is a greater demand for fish than there is supply; otherwise, supply is higher. The reason for this is that consumption habits are influenced by religion; there is a seasonal desire for seafood. As fish is a meat substitute, Christians who fast from meat, dairy, and eggs during Lent eat fish instead of meat (Assefa, 2013) <sup>[10]</sup>.

### 2.4. Ethiopian Fish Consumption

The consumption patterns of one of the known aquatic

animals used as food by humans is the fish. The majority of aquatic animals have a high protein content (17–29%) and a profile of amino acids that is comparable to that of land animal flesh. Fish meat is very easily absorbed by the body and may be used right away, making it a good addition to diets heavy in carbohydrates. In contrast to terrestrial creatures (except from a few, aquatic creatures, like shellfish, have a large proportion of edible flesh and minimal waste. Minerals including calcium, iron, and phosphorus, as well as trace elements and vitamins, can be found in aquatic species. Marine life is especially abundant in iodine.

The fatty acid content is high in polyunsaturated fats, especially those thought to lower blood cholesterol. Additionally, there are some suggestions that specific fish fatty acids could offer defense against kidney damage. In any nation, raising the per capita consumption of fish and shellfish can improve health standards. Most homes, especially in larger cities, enjoy eating fish that has been properly prepared, preserved, and presented. When smoked or dried, fish and shellfish are frequently used as soups and condiments, substantially enhancing the allure of an otherwise boring diet. When certain religious organizations fast and avoid eating meat products, like the Coptic Orthodox Church in Ethiopia, fish is a staple food.

The country's yearly fish consumption per person is under 0.5 kg, despite an estimated 51,481 tons of fish produced there; the recommended annual fish consumption per person is between 12 and 17 kg. Ethiopians have a preference for meat, consuming roughly 10 kg of it annually on average per person. This is caused by cultural norms and, in large part, by the fertile central highlands that support a high degree of cattle raising. (FAO) "The State of Fisheries and Aquaculture" report, 2020.

### 2.5. Ethiopia's Fishery Production Systems Face Difficulties

Ethiopia, like other African nations, faces a variety of challenges that seriously impede the system of fish production and overall fish development.

Fisheries in Ethiopia are severely hampered by the fact that main contaminants affecting Ethiopian water bodies and their fish originate from factory and agricultural waste (FAO, 2015) <sup>[3]</sup>. Fish production is impacted by the textile and mineral extraction sectors. Furthermore, a rise in water turbidity and a faster pace of water body drying up could be consequences of the increasing incidence of deforestation. Poor fishery resource utilization has been mostly caused by inadequate legal and policy frameworks, and this has occasionally led to the overfishing of some significant species. Even though there are presently laws and regulations pertaining to fisheries, they are not being applied enough. Ethiopia's fishing industry likewise faces a severe scarcity of skilled workers due to a lack of human resources. The limitations on the management of fisheries, services for technical and extended support. Fisheries and aquaculture get little public and private investment, and their infrastructure is deficient (FAO, 2015) <sup>[3]</sup>. Increased growth in subsistence farming, deforestation, industrial and municipal effluents, and human encroachment on the coastline have resulted in nutrient loadings into the lake that have never been seen before (Verschuren *et al.*, 2002) <sup>[12]</sup>.

The major causes of resource depletion, rising competition for open-access resources, unequal resource use, natural

disasters like storms, over-reliance on one type of asset, and lack of options are what limit and make fishing communities vulnerable. Fishing communities are also vulnerable to poverty due to a number of other issues, including a lack of government assistance, rural locations, inadequate services, low literacy and innumeracy, and a weak organizational ability (FAO, 2001) <sup>[13]</sup>.

Significant changes in the global climate that are occurring now and, in the future, include rising mean air temperatures, altered precipitation patterns, and an increase in extreme weather events. Different effects of climate variability and change will be felt by inland fisheries and aquaculture productivity (FAO, 2010) <sup>[14]</sup>. Diseases and inadequate quality and quantity of food are further factors limiting Ethiopian fisheries. The physical characteristics of the feed dictate how much it influences the quality of the water and the fish's rates of eating. The feed's constituents ought to be finely ground.

### 2.6. Losses following harvest

Fish losses occur after harvest because they are perishable goods that deteriorate rapidly in hot weather due to the increased activity of bacteria and enzymes in fish meat. Fish deterioration upon death is mostly due to biochemical and microbiological changes, which result in post-harvest losses. Live fish possess inherent defense systems that aid in preventing spoiling. However, enzymatic, oxidative, and microbiological spoiling start to cause quality degradation as soon as a fish dies since its defined systems stop working. based on Getu and colleagues (2015) <sup>[15]</sup>. It is estimated that 10 to 12 million tons of fish are lost annually worldwide to spoiling, making up 10% of the world's total fish production.

### 2.7. Ethiopia's Fish Production Opportunities

The presence of a variety of fish species, the locals' traditional knowledge of fishing and good consumption habits, and the attractive fish pricing at the local market for more profit are all said to be contributing factors to the sector's growth. Furthermore, got era/kefo, a locally produced fishing using pieces of gear with a structure like a hive is the best way to catch fish. Because while they are gathering their catches, fishermen release little fish into the body of water. Fishermen can use this technique to be selective or non-selective, based on their size and personal preferences. When there is a market for fish, fishermen process the catch either fresh, gutted, or sun-dried. This is an excellent practice. FAO (2015) <sup>[3]</sup>.

Furthermore, the pastoral communities in the future fishing villages will be more homogeneous and less dispersed, making them perfect for social mobilization efforts aimed at reducing poverty. Reservoir fisheries yield quicker returns with less initial investment than other forms of economic pursuits. The rapid development of fisheries, particularly for the benefit of women and adolescents, will consequently be encouraged by access to microfinance institutions, which have garnered significant internal and foreign support.

Additionally, it does not call for highly developed abilities or knowledge to enter and manage small-scale operations. Ethiopia has a 94,000-ton fish potential, but only 60,000 tons are produced annually; this does not account for the most recent dams built for various uses. in summary, the nation has set aside a minimum of 77 million birr for the import of fish goods. FAO (2020) <sup>[11]</sup>.

### 3. Conclusion and Recommendation

#### 3.1. Conclusion

Among the most significant groups of vertebrates that humans eat are fish. They are very valuable economically, nutritionally, medicinally, industrially, and aesthetically, and they employ millions of people in Ethiopia. They support food security by offering a useful addition to varied and nourishing diets. Even though the industry has been shown to significantly improve the socioeconomic well-being of its residents, it is hindered by a number of issues, including a lack of historical fish farming practices, weak institutional capacity, competition from capture fisheries, disorganized fishermen's associations, a lack of a trustworthy data collection system, low citizen purchasing power, the remoteness of fishing areas, a lack of institutional and human capacity, a lack of basic infrastructure and equipment, the deterioration of natural resources and the scarce financial resources to execute national policies, plans, and laws; additionally, there is a dearth of extension assistance and training.

#### 3.2. Recommendation

Improving the industry requires the transmission of technology to local farmers, traders, and fish collectors through mentoring and education on modern practices for fish farming, management, and harvesting.

- For fisheries improvement to be successful, it is imperative that stakeholders be integrated at all levels, that extension services be increased, and that farmers be supported financially.
- Modern value chain-based fish production, processing, and marketing coordination must be invested in urgently in order to maximize the potential of the sector.
- Farmers must be knowledgeable about fish in order to encourage their involvement in the industry.

#### 4. References

1. FAO. The state of world fisheries and aquaculture. Fisheries and Aquaculture department of FAO of the United Nations. Rome, Italy; c2014. p. 75-76. [Online]. Available from: <http://www.fao.org/3/a-i5555e.pdf>
2. Adewumi MO, Ayinde OE, Adenuga AH, Zac-Chaeus ST. The profitability analysis of artisanal fishing in Asa River of Kwara state, Nigeria. *Int J Dev Sustain*. c2012.
3. FAO. Fisheries and Aquaculture Department. c2015. p. 76-85.
4. Assefa MJ. *Research Journal of Agriculture and Environmental Management*. September 2014;13(9):460-466.
5. Gebremariam Z, Kebede-Westhead E, Desta Z. Long-term changes in chemical features of waters of seven Ethiopian Rift-valley lakes. *Hydrobiologia*. 2002;477:81-91.
6. EU (European Union). Agriculture and Fisheries Council of European Union. Brussels, Belgium; c2011. [Online]. Available from: <http://ec.europa.eu.fisheries>
7. Tesfaye G, Wolff M. The state of inland fisheries in Ethiopia: A synopsis with updated estimates of potential yield. *Ecohydrology and Hydrobiology*. 2014;14(3):200-219.
8. Brook L. Report on the Value Chain Assessment of the Fishery Sector in Ethiopia. Food and Agriculture Organization Sub-Regional Office for Eastern Africa Addis Ababa; c2012.
9. Alayu Y. Fish production, processing and utilization in the Lake Tana fisheries; Polish development cooperation program; Implementation of Ecohydrology: A transdisciplinary science for integrated water resources and sustainable development in Ethiopia; Bahir Dar Fishery and Aquatic Life Research Center; c2012.
10. Assefa M. Assessment of fish products demand in some water bodies of Oromia, Ethiopia. *Int J Agric Sci*; c2013.
11. FAO. The State of World Fisheries and Aquaculture 2020. Sustainability in action. Rome; c2020. <https://doi.org/10.4060/ca9229en>
12. Verschuren D, Thomas CJ, Hedy JK, David NE, Peter RL, Erik TB, *et al*. History and timing of human impact on Lake Victoria, East Africa. *Proc R Soc Lond B Biol Sci*. 2002;269(1488):289-294.
13. FAO. Sustainable Fisheries Livelihoods Program: Study on the Impacts of Policies Institutions and Processes on Fisheries Livelihoods; c2001.
14. FAO. Climate change, inland fishery and aquaculture in Africa; c2010.
15. Getu A, Misganaw K, Bazezew M. Post-harvesting and Major Related Problems of Fish Production. *Fish Aquac J*. 2015;6(4):154.