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# CHANGE AND GROWTH RATE ANALYSIS IN PRODUCTION OF FISH IN ETHIOPIA

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## Abstract

The study measured the change and growth rate production of fish in Ethiopia based on secondary data during 2009-2019. Semi-log model was applied to measure the compound annual growth rate of fish production for the period 2009 to 2019. The results revealed that, the production of fish in the country was increasing satisfactorily. The compound growth rate in production of fish improved rapidly. But, the increase in production comes from predominantly from capture fishery. The production of fish from the aquaculture sector was as insignificant as the sector is at infant stage. Therefore to meet the growing demand of consumers to fish need to be met by giving more attention to the aquaculture sector in addition to optimize the production form capture fishery by mitigating the climate change and manmade and natural pollutions of fresh water bodies. On the other hand by giving attention to the fishery sector in delivering technologies and information like post harvest technologies.

## 1. Introduction

In Ethiopia what we are revealing from different studies is that the decrease in the agriculture industry in contributing to the economy of the country. But the sector is still given a priority in leading the development as well as the economy of the country (Urgessa Tilahun Bekabil 2014) . To proven this we can see the ten year (2020 to 2030) development strategy of the government. In this strategy agriculture has been taken as an engine to the growth and development of the economy. This is because, the sector is still a host of an immense amount-73 percent of the population, generates 90 percent of the export earnings and supplying 70 percent of the required raw materials for the manufacturing industry with this perspective it is continuing to be the influence of the performance of other sectors. (FAO 2019; WFP 2020).

Not only the ten year strategy of the country but also the previously implemented strategies (like the five year growth and transformation plans GTP I and GTP II) envisaged the agricultural sector as the major source of growth and thereby to lay the foundation for rapid industrialization and economic structural transformation by developing the industry sector more rapidly than the agricultural sector.

In the last two GTP periods progress has been made in alleviating food insecurity and poverty as well us unemployment rate and nutrition status of children. The prevalence of stunting in children has decreased considerably, from 44% in 2010/11 to 37% in 2019/20. Moreover, the prevalence of wasting decreased over the same time period, from 10% to 7%. The percentage of underweight children has also consistently decreased from 29% to 21% over this 10-year period. On the other hand the proportion of the population who lived below the food poverty line has declined over time.

However, providing adequate food for a rapidly increasing human population is still becoming one of the acute challenges in Ethiopia where, besides population explosion, natural and man-made calamites have aggravated the problem (Lemma A, 2017). So the country faces high level of food insecurity which labels it under one of the hungriest countries in the world with Global Hunger Index (GHI) of 29.1 in 2018 which is still serious (Feed the Future 2018). For this drought and other related disasters can be taken as a reason that triggers the increase in vulnerability to food insecurity as well as to the undermined livelihoods. On the other hand, limited opportunity for diversification of income sources and unemployment stated as the others triggers for the aforementioned problem faced by the country.

In addition to increasing food production from land agriculture, it is necessary to sustainably exploit the aquatic ecosystems to contribute towards the effort of food security by virtue of their high productivity. Ethiopia's fish resources could undoubtedly offer one of the solutions to the problem of food shortage in the country.

Fish contribute fatty acids and omega 3 that are necessary for the development of the brain and body for young, infants and pregnant (FAO, 2003). It is also one of the important sources of employment and livelihood for millions of world wide. Fishes are richest type of food with the highest protein quality, vitamins, micronutrients like zink, iron, calcium etc. (FAO, 2005). Fishery sector is another means of income generation along its value chain by hosting more women and young in the sector.

Since Ethiopia is a land locked country, the growing fish demand has largely been met through inland capture fishery and extensive aquaculture-reservoirs. As per the statistical data from faostat the aquaculture sector is also another source of fish supply but is insignificant comparing with the capture fisheries sector. It contributes only 0.2% of the total fish production of the country in 2016. Another means of fish supply comes from import of fish and fish products. According to the data from agricultural economics department of National Fish and Aquatic Life Research Center, Ethiopia imported 437 thousand kg of fish products over 2014 to 2018, with a peak of 134 thousand kg in 2014.

Ethiopia's annual fish production from water bodies (there are about 14 major rivers, 25 major lakes and 14 major reservoirs in Ethiopia) is around 94500 tons, while fish demand is projected to increase from 95000 tons in 2015 to 118000 tons in 2025. There are not less than 200 fish species in Ethiopia. But only few are commercially important in the country. This is because of consumer preference, lack of awareness by fishers, lack of awareness by extension agents and policy makers on the diversity and potential use of some species.

The objective of this study is to analyze the growth rate of fish production in Ethiopia.

## MATERIALS AND METHODS

The study was based on yearly time series secondary data on production of fish in Ethiopia. The secondary data were collected from published records and reports of the Ministry of Agriculture of Ethiopia (MoA). The study period was analyzed as a whole from 2009 to 2019. And the

following semi-log trend function was used to find out the trend and estimate the growth rate of the production of fish of Ethiopia.

$$\ln yt = a + bt + e$$

Where $y$ = dependent variable (production); $t$ = trend over specific period, b = coefficient of trend; ln = natural logarithm; and $e$ = error term. Here, the coefficient of trend (b) measures the constant proportional or relative change in y for a given absolute change in the value of time t. Therefore the compound annual growth rate (CAGR) can be taken as:

$$\text{CAGR} = \exp(b) - 1$$

## RESULTS AND DISCUSSION

The production in 2009 was 17,047 and reached its maximum during 2019 which is equivalent to 59,001. The change in fish production shows a positive change throughout the entire year except during 2015 (see table 1).

**Table 1: change in fish production, 2009 to 2019**

| Year | Production | Change in percent |
|---|---|---|
| 2009 | 17,047 | |
| 2010 | 18,058 | 6 |
| 2011 | 24,041 | 33 |
| 2012 | 28,721 | 19 |
| 2013 | 38,371 | 34 |
| 2014 | 50,119 | 31 |
| 2015 | 50,148 | 0 |
| 2016 | 50,421 | 1 |
| 2017 | 56,127 | 11 |
| 2018 | 57,399 | 2 |
| 2019 | 59,001 | 3 |

**Source: own computation**

As per the result it is revealed that the compounded growth rate of fish production in Ethiopia is 14 % (see table 2). The increase is positive and significant at 1%. The production from the aquaculture sector is insignificant as it is still at infant stage in the country. So, the increase in fish production is entirely from the capture fishery.

**Table 2: compounded growth rate of fish production in Ethiopia, 2009-2019**

| variable | CAGR in percent | P > \|t\| |
|---|---|---|
| Production | 14 | 0.000 |

**Source: own computation**

If we take a look at the fish production region wise, it was Oromia region which took the lion share (36 %) from the total fish production of the country, while Amhara region, SNNPR, Gambela, Benishangul Gumuz and Tigri contributes 20 %, 17 %, 12%, 12 % and 3 percent respectively in 2019. On the other hand **Tilapia species** averaged > 50%, **Catfish about 20%, Barbus (12%) & Nile Perch about 9%** of total production over the last decade (see fig 1**).**

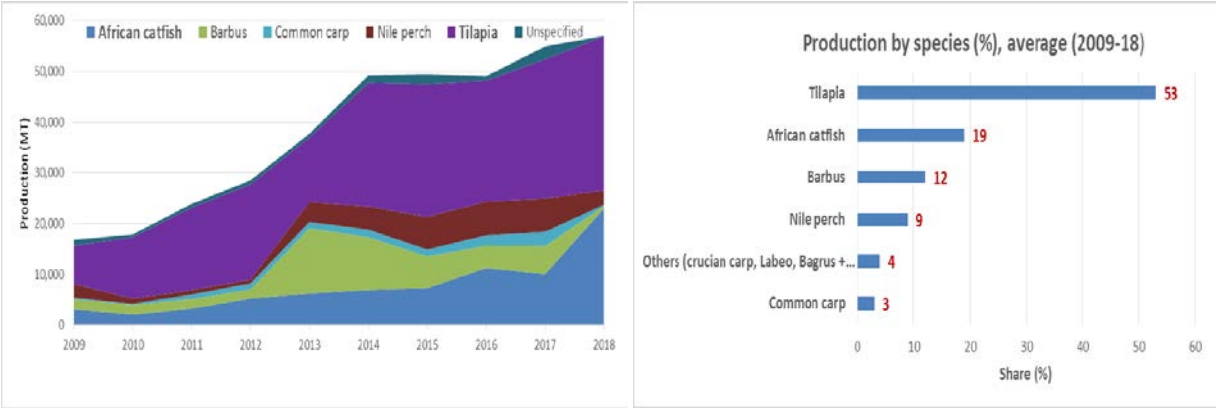
**Table 3: regression results**

```
------------------------------------------------------------------------------
       prodn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        time |   .1342773   .0157887     8.50   0.000     .0985608    .1699938
       _cons |   9.722023    .107084    90.79   0.000     9.479782    9.964264
------------------------------------------------------------------------------
```

**Source: own computation**

```
Source |       SS           df       MS      Number of obs   =        11
-------------+----------------------------------   F(1, 9)         =     72.33
       Model |   1.9833431         1   1.9833431   Prob > F        =    0.0000
    Residual |  .246789317         9  .027421035   R-squared       =    0.8893
-------------+----------------------------------   Adj R-squared   =    0.8770
       Total |  2.23013242        10  .223013242   Root MSE        =    .16559
```

**Fig 1. Fish production trends species wise**




## Conclusion

The compound growth rate analysis indicated that the production has been increased over time. The increase in the production was mainly from the increase in capture fishery fish production. The aquaculture fish production in the country was insignificant as it is at infant stage. But to meet the demand created in the country could not be met with the only capture fishery as the sector is with great manmade and natural disasters problems. As per some literatures Alemayehu H and A.J. Solomon Raju 2010, Gashaw Tesfaye and Matthias Wolff 2014, Abdulhakim Hussen Hebano and Alemayehu Abebe Wake 2020, Abebe Ameha Mengistu, Chalachew Aragaw, Minwyelet Mengist 2017, Agumassie Tesfahun 2018, Selamu Abraham and Lelise Mitiku 2018, Tola Meko, Abriham Kebede Abdela Hussein and Yobsan Tamiru 2017; in efficient fishing gear, lack of motorized boat service, poor transportation access, lack of value adding facilities, lack of fish handling facilities, poor postharvest handling, gear theft and marketing problems were commonly stated major problems which encumber the fish production from capture fishery sector. Despite the fact of this as we can see from the results of the study still fish production is increasing. So the aquaculture sector needs to be given more attention to boom the fish production in the country. And also responsible sectors need to deliver technology and information that is crucial in minimizing those manmade and natural disasters and also the development sectors are expected to train and popularize the technologies. The government on the other side needs to implement the rules and regulations on the water bodies.

## Reference

Abdulhakim Hussen Hebano and Alemayehu Abebe Wake 2020. Overview of Ethiopian fisheries production system and its challenges in different fish potential area: A review. International Journal of Fisheries and Aquatic Studies.

Abebe Ameha Mengistu, Chalachew Aragaw, Minwyelet Mengist 2017. The Fish and the Fisheries of Lake Tana. Springer international publishing swizerland.

Agumassie Tesfahun 2018. Review in current problems of Ethiopian fishery: Incase of human and natural associated impacts on water bodies. International Journal of Fisheries and Aquatic Studies.

Alemayehu H and A.J. Solomon Raju 2010. Challenges and opportunities of chamo lake-etland biodiversity, Ethiopia. J. Naton.

Alemu, A. E., S. M. Nuru, and D. T. Gebremeskel. (2015). Livelihood effects of fishing and constraints affecting participation in Fishing in Tigray. Res. J. Soc. Sci. Manag., 9: 318–324.

FAO. 2019. National gender profile of agriculture and rural livelihoods – Ethiopia. Country Gender Assessment Series, Addis Ababa. 84 pp. Licence: CC BY-NC-SA 3.0 IGO

Ethiopian Growth and transformation plan I and II

Faostat 2020. Statistical data.

Food and Agricultural Organization (FAO, 2005). Trade reforms and food security. Food and Agriculture Organization: Rome

Food and Agricultural Organization (FAO, 2003). Trade reforms and food security. Food and Agriculture Organization: Rome

Gashaw Tesfaye and Matthias Wolff 2014. The state of inland fisheries in Ethiopia: a synopsis with updated estimates of potential yield.

Ministry of Agriculture, Ethiopia 2019 statistical report.

National Fishery and Aquatic Life Research Center agricultural Economics department report 2020.

Selamu Abraham and Lelise Mitiku 2018. Challenges and Socio-Economic Importance of Fish Production in Ethiopia:Review. Journal of Economics and Sustainable Development.

Tola Meko, Abriham Kebede Abdela Hussein and Yobsan Tamiru 2017. Review on Opportunities and Constraints of Fishery in Ethiopia. International Journal of Poultry and Fisheries Sciences.

Urgessa Tilahun Bekabil 2014. Review of Challenges and Prospects of Agricultural Production and Productivity in Ethiopia. Journal of natural science research.

WFP. 2020. Ethiopia coumtry strategic plan

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