

Review Article

Trends and Drivers of Avocado Production in Ethiopia: A Review

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Abstract

Global avocado production has seen a significant increase over the past few decades. The area harvested and production quantities have grown substantially, reflecting the rising demand for avocados worldwide. In Ethiopia, avocado production has been experiencing significant growth and the Ethiopian government, in collaboration with international organizations has been working intensively for avocado crop development in the country. These efforts have led to an increase in both the area under cultivation, production and productivity. The data from Food and Agricultural Organization indicated that the area under avocado cultivation in Ethiopia was 9,754 ha in 2000 and through up and downward fluctuations, substantial jump were seen in 2020 hitting 30,588 ha. For about more than a decade from 2000-2013, the volume of avocado production reveals a steady increase and the most significant growth were observed from 2016-2020, with production rising to 81,431.76 metric tons in 2017 and reaching 245,335.63 metric tons in 2020. The productivity of avocado in Ethiopia has experienced notable fluctuations in the last two decades. Even though there was a slight decline in subsequent years, the current productivity 5.8tons per hectare remained relatively high compared to the early 2010s. Favorable agro-ecological conditions, growing domestic demand, and government initiatives to promote and produce, high-yield, disease-resistant varieties, nutritional value, development of export markets, establishment of different processing factories in different parts of Ethiopia, government initiative and international support are factors responsible for expansion and development of avocado crop in Ethiopia. However, challenges such as limited access to quality seeds and planting materials, insufficient irrigation systems, very weak market chains, climate change, root rot and pests, low agronomic practices, lack of market and price information, perishability nature of the crop, lack of proper storage, weak access to transportation and extension services still need to be addressed. Addressing the issues, the future of avocado production and productivity in Ethiopia look promising and positive trends, with the potential to contribute significantly to the food security and economic development.

Keywords

Avocado, Trends, Area, Production, Yield, Constraints and Opportunities

1. Introduction

Avocado (*Persea Americana* Mill) is originated in southern Mexico and by the early 1500s it was widely spreading to the

western hemisphere. Due to its natural quality and economic benefits, it has been spreading all over the world. The crop can

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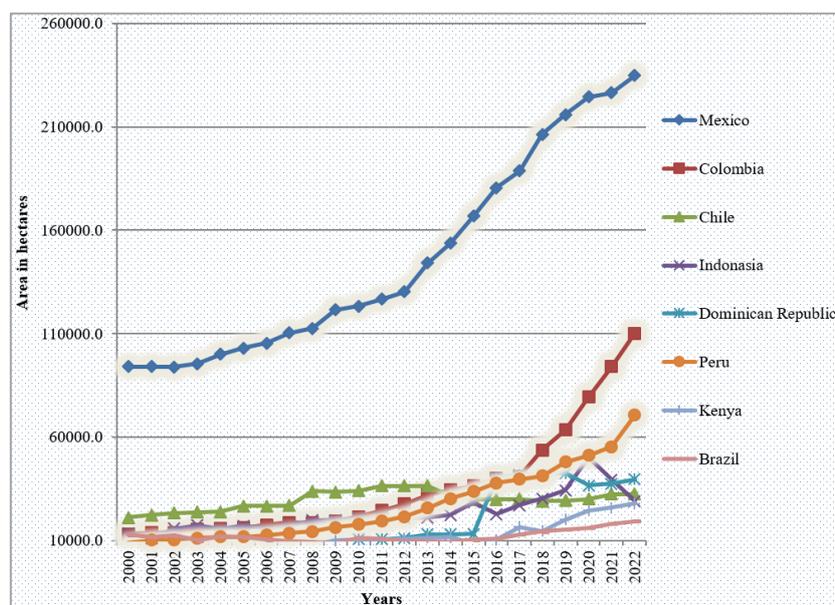
also serve as shade trees, windbreaks, posts, and ornamentals [1, 2]. Large plantations of the crop may play an important role in carbon storage and sequestration that mitigates environmental pollution [3]. Over the centuries, the crop has spread to more than 50 tropical and sub-tropical countries, especially in sub-Saharan African countries. The major avocado growing countries are Mexico, USA, Colombia, Indonesia, Chile, the Dominican Republic, Kenya and South Africa [4, 5]. In Africa, Kenya and South Africa are leading in the production and export of avocado to the global market [6]. Ethiopia is one of the five top avocado producing countries in Africa and it is now being widely distributed throughout the country [7-10]. According to the data from [11] the total world avocado production and harvested were 8,978,275.2 metric tons and 884,035.0 ha respectively. While, in Ethiopia, the total avocado production reached 167,884.1 metric tons and the total harvested area were 28,759.0 ha in 2022. Based on this background information, this review was aimed to

review and document trends and drivers of avocado production and major constraints and opportunities along the value chain in Ethiopia to stimulate it for future intervention.

2. Global Avocado Production Trends

2.1. Area of Production

The area under avocado cultivation in the world varies from year to year and from country to country. For instance, land allocated to avocado production was highest in Mexico which was 234,821ha and was lower than 39,629ha in all other producing countries. However, since 2018 a good progress was observed in all producing countries and for instance in Colombia and Peru since 2014, area allocated to avocado production shows an increasing trend (Figure 1).



Source: Extracted from (FAO, 2000-2022)

Figure 1. Avocado Area of production in top producing countries (2000-2022).

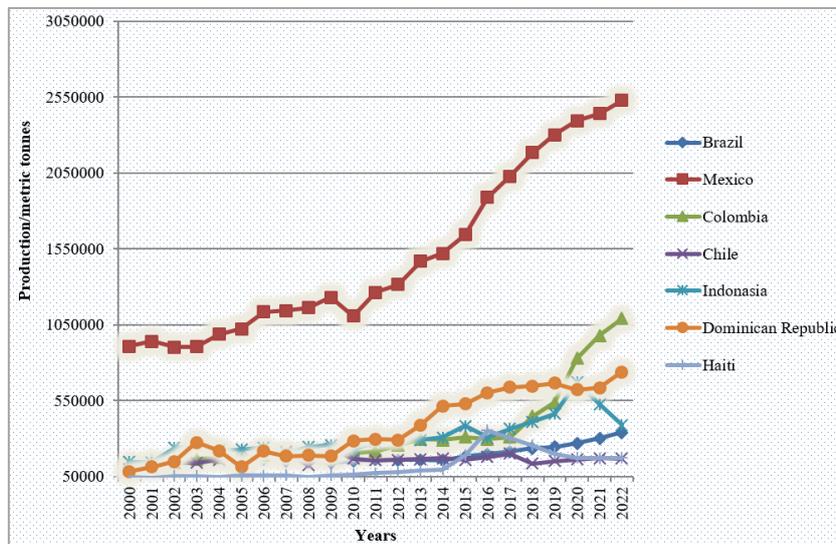
2.2. Volume of Production

Global avocado production has seen a significant increase over the past few decades. The area harvested and production quantities have grown substantially, reflecting the rising demand for avocados worldwide. Mexico, Colombia, and Peru are among the top avocado-producing countries (Figure 2). These countries have consistently expanded their production areas and yields, contributing significantly to the global supply. Different regions have shown varying trends in avocado production and while traditional producers like Mexico have maintained their dominance, newer players like

Kenya and Ethiopia are rapidly increasing their production areas and yields. Global avocado production reached approximately 9 million metric tons with average annual growth rate of 5.25% and Mexico alone accounting for over 30% of global production [5]. Several reasons are responsible for this remarkable global avocado production increase. The increasing demand for avocados, fueled by their recognized health benefits and popularity in various cuisines, the economic power of the Global North and consumption has significantly boosted its production. Similarly, the high profitability and attractive returns from avocado farming have encouraged more farmers to produce this crop globally [11, 12]. The major avocado fruits producers in Africa include

Kenya, Ethiopia, Malawi, South Africa, Cameroon and Morocco in preceding order, with annual production of

322,556, 245,336, 93,565, 84,775, 74,871, and 69,940 tons, respectively [5].



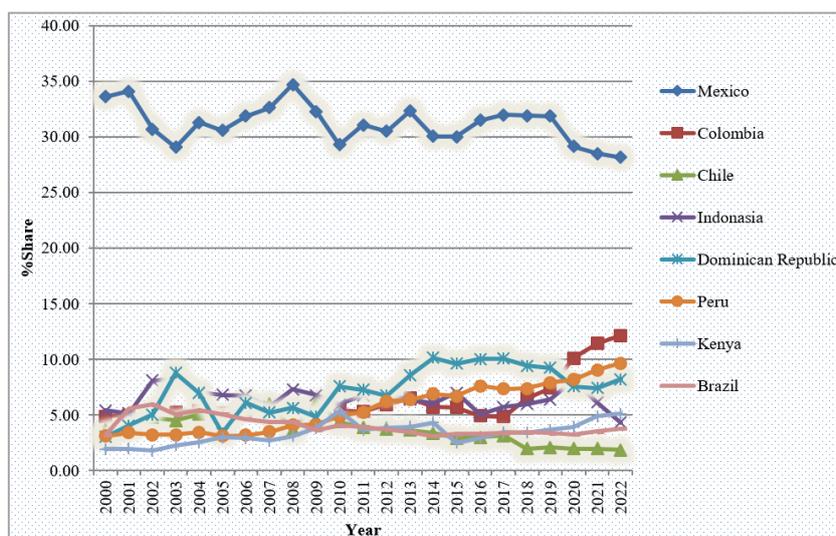
Source: Extracted from (FAO, 2000-2022)

Figure 2. Total avocado production in major producing countries, 2000-2022.

2.3. Avocado Production Shares of Top Producing Countries

In line with the remarkable overall growth of global avocado production, the concentration of the major producers has also increased dramatically. As shown in Figure 3, Mexico is the largest producer of avocados, accounting for over 30% of average global production since 2000 whereas, Colombia, Chile, Indonesia, Indonesia, Dominican Republic, Peru,

Kenya and Brazil shares less than 10% each but potentially increasing their production (Figure 3). Factors that makes Mexico to contribute a huge volume of avocado in the world is that production season lasts almost all year long, due to the country’s climate and fertile soils that make it a very suitable environment for avocados to grow. The highest volume is produced between September and December, and the lowest is between April and June. Therefore, world avocado production is considered to be highly concentrated in Mexico.



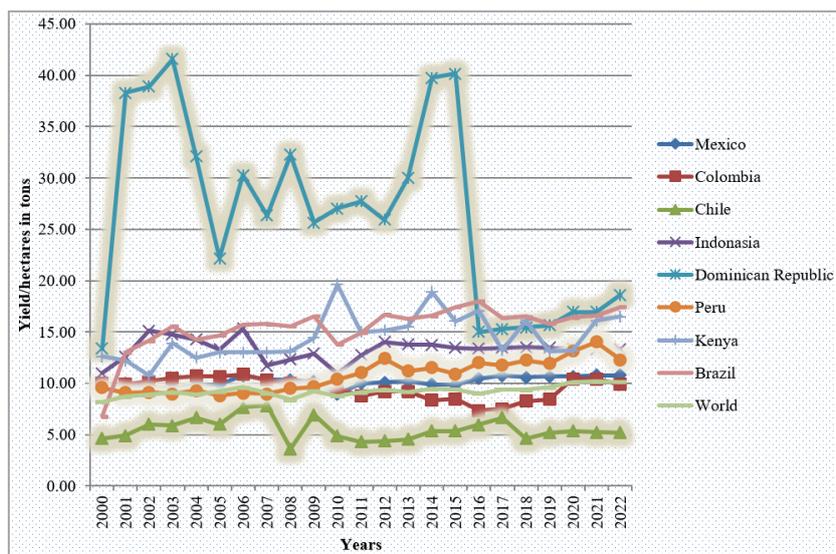
Source: Extracted from (FAO, 2000-2022)

Figure 3. Avocado production shares of top producing countries (2000-2022).

2.4. Avocado Productivity in Top Producing Countries (2000-2022)

According to FAO data, global avocado productivity showed within a range of 8.2tons/ha to 10.2tons/ha from 2000-2022 that indicates existence of a significant change with very low fluctuations over years. However, the highest productivity was observed in Dominican Republic that ranges

from 13.40tons/ha to 40.15tons/ha with high fluctuation from 2000-2022 that was may be due to the suitable agro-ecology and input utilization. However, still there is a huge productivity between Dominican Republic and other producers putting the country on the first rank by avocado productivity in the word but low volume of production due to minimum amount of land they allocated to avocado production as compared to others (Figure 4).



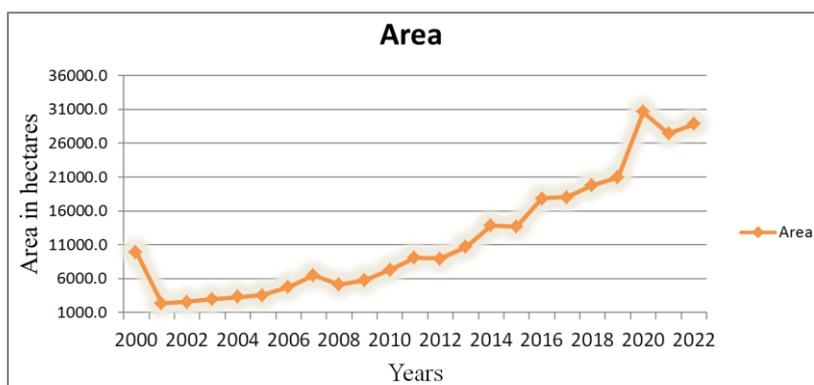
Source: Extracted from (FAO, 2000-2022)

Figure 4. Avocado productivity in top producing countries (2000-2022).

2.5. Area of Avocado Production Trends in Ethiopia

The area under avocado cultivation was 9,754 ha in 2000, seeing a slight downward fluctuation and gradually increased to 3,248 ha in 2004. Similarly, there was a steady rise in the cultivated area from 3,596 ha in 2005 to 5,694 ha in 2009. The

expansion continued, with the area increasing from 7,212 ha in 2010 to 10,590 ha by 2013. The area under cultivation saw a substantial increase, reaching 13,798 ha in 2014 and 17,835 ha by 2016. The most significant growth occurred during 2020-2022 years, with the area reaching 30,588 ha in 2020 and further increasing to 27,435 ha in 2021 and 28,759 ha in 2022[5], Figure 5.



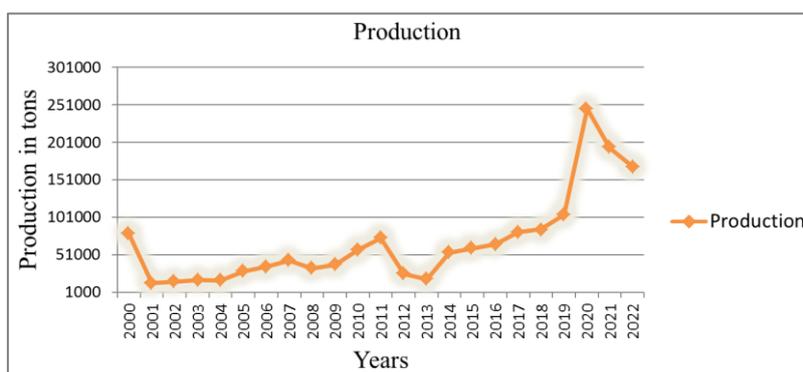
Source: Extracted from (FAO, 2000-2022)

Figure 5. Avocado productivity trends in Ethiopia.

2.6. Avocado Production Trends in Ethiopia

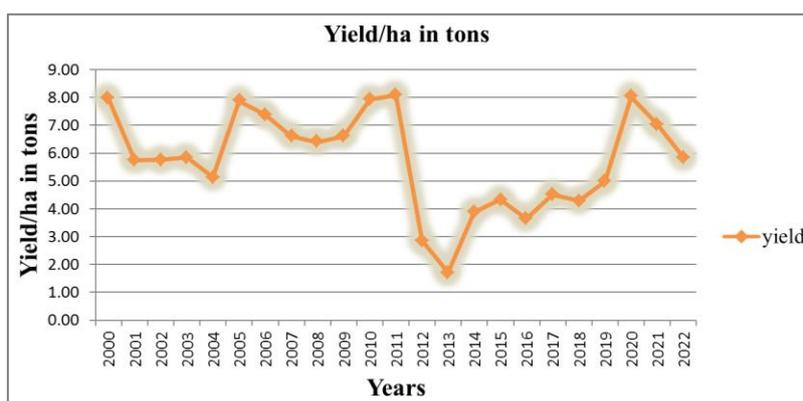
Avocado was first introduced in Ethiopia in 1938 by private orchardists in Hirna (Eastern high land of Ethiopia) and Wondo-Genet in the south of the country and then the production gradually spread to different areas and agro-ecologies in the country where the crop was adapted [8-10]. Initially, avocado farming was limited to small-scale cultivation, but over the years, it has expanded significantly due to the favorable agro-ecological conditions in different regions of Ethiopia. In Ethiopia, the production of avocado was estimated at 167,884.1 tons from 28,759.0 ha of land in the 2022 spring seasons. In the same year, the national average yield was estimated at approximately 4.2 tons per

hectare, which is far lower than the global average and potential yield of avocado 7.2 tons per hectare [5, 13]. FAOSTAT data from 2000-2013 reveals a steady increase in the volume of avocado production in Ethiopia. As shown in the figure 6, from 2001-2004 steady growth of avocados production was observed and increased from 13,888, metric tons in 2001 to 16,740 metric tons in 2004. Similarly, production continued to rise at an increasing rate with a very significant change from 28,348 metric tons in 2005 to 73,097 metric tons in 2011. However, a substantial jump and the most significant growth were observed from 2016-2020, with production rising to 81,431.76 metric tons in 2017 and reaching 245,335.63 metric tons in 2020 (Figure 6).



Source: Extracted from (FAO, 2000-2022)

Figure 6. Avocado production trends in Ethiopia.



Source: Extracted from (FAO, 2000-2022)

Figure 7. Avocado productivity trends in Ethiopia.

2.7. Trends of Avocado Productivity in Ethiopia

Avocado productivity in Ethiopia has experienced notable fluctuations from 2000 to 2022. Productivity started at 8 tons/hectare in 2000 but saw a decline to 5.2 tons/hectare by 2004 and some recovery and stabilization in productivity was observed, with values ranging from 7.9 tons/hectare in 2005

to 6.6 tons/hectare in 2009. Again, a significant productivity and fluctuated was observed with a high of 8.1 tons/hectare in 2011 but dropping drastically to 2.9 tons/hectare in 2012 and 1.7 tons/hectare in 2013. However, from 2014 to 2019 a gradual recovery and relative stability were seen, with productivity ranging from 3.9 tons/hectare in 2014 to 5.0 tons/hectare in 2019. The years 2020 to 2022 marked a period

of significant growth and stabilization. Productivity increased to 8.0 tons/hectare in 2020, with slight fluctuations to 7.0 tons/hectare in 2021 and 5.8 tons/hectare in 2022. Even though there was a slight decline in subsequent years, the productivity remained relatively high compared to the early 2010s (Figure 7). The observed a large yield gap of avocado productivity in Ethiopia was due to lack of improved avocado varieties. Because of this, recently some improved avocado varieties such as Hass, Fuerte, Ettinger, Nabal, and Pinkerton have been recently introduced and on distribution to small-scale farmers by the Ethiopian Ministry of Agriculture in collaboration with USAID [13].

3. Constraints and Opportunities in Avocado Farming in Ethiopia

3.1. Constraints

Despite several constraints hindering the full realization of avocado production in Ethiopia, its production in the country has shown significant potential. These constraints range from agronomic challenges to market access issues, affecting productivity, production and profitability for smallholder farmers. The major constraints are lack of access to high-quality avocado seeds and planting materials, lack of reliable irrigation systems and rain-fed dependent, proper post-harvest handling and storage, degeneration of fruits, absence of improved agronomic practices, lack of access to extension, lack of access to market, low prices, limited bargaining power and the perishable nature of avocados, inadequate transportation infrastructure, and limited access to transportation services and climate change, pests and diseases, such as root rot and fruit fly [9, 13-15].

3.2. Opportunities

Avocado production in Ethiopia holds immense potential for expansion due to several factors such as favorable agro-ecological conditions, growing domestic demand, and government initiatives to promote and produce, high-yield, disease-resistant varieties. Similarly, one of the key opportunities for expanding avocado production is the current development of export markets. The rising global demand for avocados, particularly in Europe and the Middle East, presents a lucrative opportunity for Ethiopian producers. The establishment of different processing factories in different parts of Ethiopia for value addition to avocados product is another significant opportunity in the country. Sunvado and, YBM avocados oil factories are located in Yirgalem Integrated Agro-Industrial Park, in Southern Ethiopia while Aevo Oil and Green Gold avocados oil factories are located in Jimma Industrial Park in Jimma Zone, Oromia Region and Worabe in Silte Zone, Central Ethiopia respectively. The factories have huge processing capacity and sources organic

avocados from their own farms and from farmers, collectors and different farmer's cooperatives. The factories produce organic crude, extra virgin, refined avocado oil, and body lotion and lipstick [16]. Government and international support further amplifies these opportunities. Initiatives by the Ethiopian government, in collaboration with organizations like USAID, FAO, and MASHAV, provide essential support to farmers through training, technical assistance, and improved farming inputs. Continued investment in research and development, infrastructure improvements, and capacity-building initiatives are crucial for maximizing the potential of avocado production in Ethiopia. By leveraging these opportunities, Ethiopia can significantly enhance its avocado industry, contributing to food security, economic development, and sustainable agricultural growth.

4. Conclusion

The impressive growth of avocado production in Ethiopia underscores the significant potential of this crop to contribute to the nation's food security, job creation, foreign currency earning and overall economic development in the country. Favorable agro-ecological conditions, increasing domestic and global demand, proactive government initiatives and international support, have all contribute a lion share in driving the expansion of avocado farming in Ethiopia. The surge in cultivated area and production volumes, especially notable from the year 2016 to 2020, highlights the successful adoption and diffusions of high-yield, disease-resistant varieties and improved agronomic practices done by Ethiopian government in collaboration with different international organizations. Looking ahead, the future of avocado production in Ethiopia appears promising, provided that existing challenges are effectively addressed. The development of robust value chains, better access to quality seeds and planting materials, and investment in reliable irrigation systems are critical to sustaining growth. Addressing market and price information gaps, improving storage and transportation infrastructure, and enhancing extension services are equally essential to support farmers and maximize productivity. To capitalize on the increasing global demand, particularly in lucrative markets such as Europe and the Middle East, Ethiopia must continue to enhance its export capabilities. This involves not only meeting international quality standards but also establishing efficient logistics and marketing strategies. Additionally, fostering public-private partnerships and engaging in continuous research and development will be key to overcoming climatic and agronomic challenges. By addressing these issues and leveraging opportunities, Ethiopia can ensure the sustainable growth of its avocado industry, contributing significantly to income and food security of smallholder farmers.

Abbreviations

FAO	Food and Agricultural Organization
MASHAV	Israel's Agency for International Development Cooperation
USA	United State of America
USAID	United State Agency for International Development

Author Contributions

Efrem Asfaw Gutesma: Conceptualization, Data curation, Formal Analysis, Methodology, Software, Writing – original draft, Writing – review & editing

Zinash Nigussie Tsega: Data curation, Formal Analysis, Methodology, Visualization, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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