



# REVIEW ON CURRENT STATUS OF AVOCADO PRODUCTION IN ETHIOPIA

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## ABSTRACT

*The study discusses the global significance of avocado as a nutritious fruit and economically important crop. It focuses on the increasing demand for avocados and the potential for their cultivation in Ethiopia's diverse agro-ecological zones. The review article examines a wide range of peer-reviewed studies, reports, and literature up to September 2022, using various sources including electronic databases and academic repositories. Grey literature and agricultural organization reports were also considered. The review findings show that avocado production in Ethiopia has been rapidly growing. In 2021, the country produced 245,336 metric tons of avocados across 30,585.70 hectares, with a yield of 80.2 quintals per hectare. Ethiopia exported 604.5 quintals of avocados in the same year. The favourable agro-ecological diversity of Ethiopia, spanning from lowlands to highlands, supports avocado cultivation. However, the industry is still young and faces challenges such as limited access to quality seeds, insufficient irrigation systems, and transportation issues. The post-harvest phase, processing, and marketing of avocados also present difficulties, leading to lower product quality and constrained market reach. The review covers global and local avocado production trends, avocado production and management practices, constraint of avocado production and future direction have been discussed.*

**KEYWORDS:** Avocado Production, Production Constraints, Post-harvest losses

## 1. INTRODUCTION

Tropical and subtropical fruits can make a significant direct contribution to smallholder farmers' livelihoods by providing locally produced nutritious foods that are often available when other agricultural crops have not yet been harvested. The fruit is a universal product that can be eaten at home or sold as needed. The marketing of fresh produce and fruit generates revenue that can serve as an economic buffer and seasonal safety net for poor farmers. Diversification in fruit production can create jobs and allow small farmers to engage in a range of production, processing and marketing activities to complement existing income-generating businesses (Faris, 2016)

According to Asfaw et al.(2020) Ethiopia has the right agro-ecology to grow temperate and tropical fruits. Fruit growing plays an important role in the local economy, providing livelihoods for nearly five million farmers, creating jobs and generating foreign exchange earnings in Ethiopia (FAO (Food and Agriculture Organization), 2019). As a result, in its second Growth and Transformation Plan (GTP) covering the period 2015-2020, the Ethiopian government has placed greater emphasis on increasing the production of fruit crops by almost 50% of the existing ones (National Planning Commission (NPC), 2016) Among the fruits, banana, mango, orange, avocado and papaya are the main fruits grown in the country of great importance.

According to the data from (FAO, 2022) the global fruit production was about 8,685,672 metric tons in 2021 and total avocado harvested area was 858,152 hectares. According to FAO, (2022) avocado production in Ethiopia reached 245,336 metric tons in 2021 and total harvested area was 30585.70 hectares. Ethiopia exported 604.5Qt of avocados in 2021. The main avocado destinations in Ethiopia are the United Kingdom (UK), United Arab Emirates (UAE), Singapore, France, Saudi Arabia and Djibouti. Avocados are second only to bananas in total production volume in Ethiopia. Bananas, Mangoes, Avocados, Papayas, and Oranges took up 63.30%, 12.49%, 12.39%, 6.16% and 3.52% of the fruit production, respectively.

In most parts of the country, individual land holdings are extremely small (<0.25 ha) as a result of high population pressure and the land is fragmented and degraded, making commercial fruit production very difficult in terms of farm mechanization and marketing of the fruit produce. Promoting production of highly productive crops per unit area particularly, manipulation of the potential of the fruit crops remains critically essential to ensure food and nutrient security of an alarmingly increasing population of the country. Absence of improved varieties, avocado production is exclusively based on distribution of mixed materials; consequently the local seed system has come out as best-bet arena and is now a common route for seedling dissemination (Faris, 2016).

According to Faris (2016) the main obstacles in Ethiopian agricultural markets are the limited number of traders who have



little capital, as well as the large number of farmers, which gives farmers little bargaining power. In addition, limited information systems, poor transportation, high service costs and an underdeveloped industry are other constraints of the market. Although the avocado plays an important economic and social role, its production is subject to a number of constraints; - is the degeneration of the fruit, the problem of diseases and the lack of agronomic practices. In Ethiopia, there is no value-adding activity at the farmer, intermediary or wholesaler level in the supply chains and the products are sold unprocessed. The value of fruit increases when the product reaches high-demand markets. Therefore this review is aimed to review the current status of avocado production in the country to incite it for future policy implication.

## 2. OBJECTIVES

- To review current status of avocado production and management practices.
- To review avocado production constraints and avocado post-harvest losses.

## 3. REVIEW OF RELATED LITERATURE

### 3.1 Production status of avocado fruit crops in the World

The recent (FAOSTAT, 2022) data revealed that avocado is produced globally on 858, 152 ha and production of 8,685,672 million tons showing about the productivity of 7 tons per ha. Besides this, the last ten years data shows avocado production and area coverage worldwide is increasing linearly (Fig 1). About 70% of production comes from Latin American countries followed by Africa (12%), Asia (14%), Europe (1.7%) and Oceania (1.4%) (Fig 1) (FAOSTAT, 2022). This indicates globally the production of avocado is increasing.

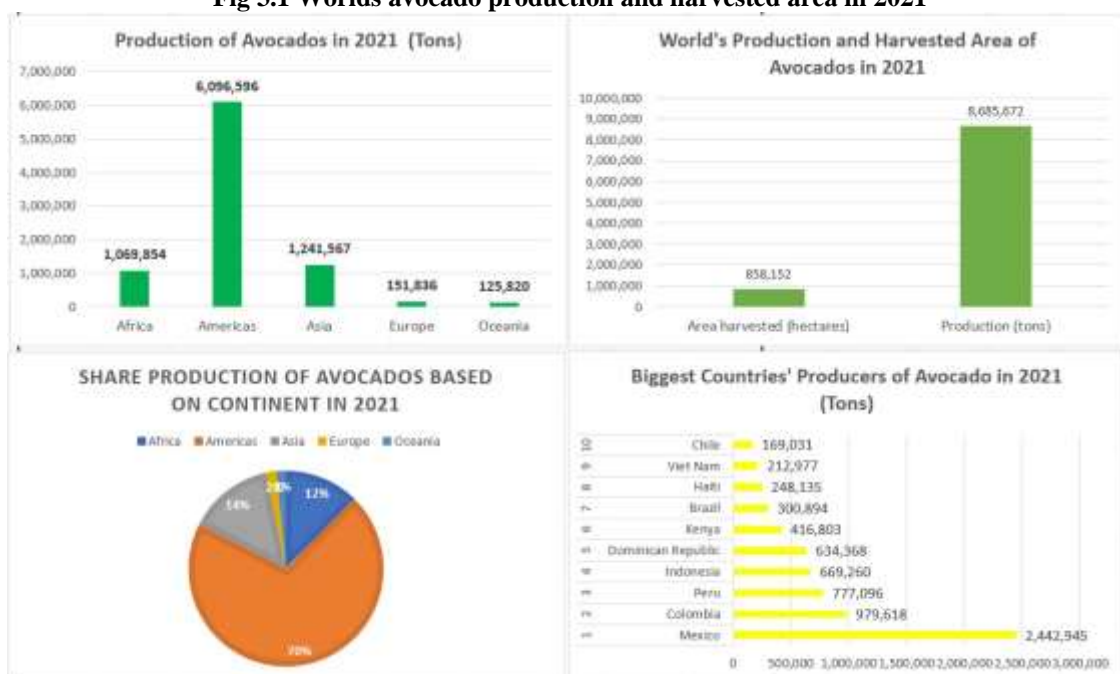
Moreover, the (FAOSTAT, 2022) data indicated that the world 10 top largest producers of avocado include Mexico followed by Colombia, Peru, Indonesia, Dominican Republic Kenya, Brazil, Haiti, Vietnam and Chile (Table 3.1). The area coverage and production in Mexico is significantly higher than the other producing countries.

**Table 3.1: Top ten Avocado production countries in the world**

No	Country	Harvested area	Proportion of global planted area	Production	Proportion of world production	Rank
1	Mexico	226,534	26%	2,442,945	28%	1
2	Columbia	94,111	11%	979,618	11%	2
3	Peru	51,800	6%	777,096	9%	3
4	Indonesia	50,510	6%	669,260	8%	4
5	Dominica Republic	37,468	4%	634,368	7%	5
6	Kenya	26,000	3%	416,803	5%	6
7	Brazil	18,106	2%	300,894	3%	7
8	Haiti	42,723	5%	248,135	3%	8
9	Viet Nam	16,538	2%	212,977	2%	9
10	Chile	32,363	4%	169,031	2%	10

Source :FAO STAT, 2022

**Fig 3.1 Worlds avocado production and harvested area in 2021**



Source: FAOSTAT, 2022



### 3.2 Production status of avocado fruit crops in Ethiopia

The avocado production in Ethiopia is largely limited to the domestic market characterized by low farm gate prices, which has together with a lack of technical production competences, hampered investments in seedling and fruit productions. Based on CSA, 2021 meher season data the area coverage and total production of avocado during the last five years showed in (table 3.2) increment trend. In the 2016/2017 production year, 649,821 quintals of avocado was produced in the country and in the 2020/2021 production year, 2,453,356.30 quintals of avocado was produced in the country. The production increments for avocado were 20%, 25.3%, 4.12%, 23.2%, 134% in 2016/17, 2017/18, 2018/19, 2019/20 and 2020/21, respectively in Ethiopia.

According to (FAO, 2022), Ethiopia has produced 245,336 metric tons of avocados from an estimated area of 30,587.70 hectares, with a yield of 80.2Qt/ha in 2021. Therefore, the current avocado acreage, production status and productivity are very low compared to the country's existing production potential. Overall, the data shows a large yield gap versus the global average, requiring improvements across all dimensions. Existing land race varieties produced in Ethiopia have low yield potential, poor quality and fail to meet consumer demand in the local and global market. This requires the replacement of land races with improved varieties with high yield and quality potential.

**Table 3.2, Avocado area coverage, production (Qt), Yield (Qt/Ha), HH Consumption(Qt), Domestic sale (Qt) and Export (Qt) in Ethiopia.**

Year	Area coverage in Ha	Production (Qt)	Yield (QT/Ha)	HH Consumption(Qt)	Sale (Qt)	Export (Qt)
2016/17	17,834.60	649,821.00	36.4	347,004.40	285,401.4	940
2017/18	18,021.13	814,318.00	45.2	434,438.70	362,127.20	513
2018/19	19,758.75	847,936.48	42.9	457,885.70	373,092.10	200
2019/20	20,875.80	1,044,919.20	50.1	475,542.70	529,251.60	840
2020/21	30,587.70	2,453,356.30	80.2	1,118,485.10	1,211,958.00	604.5

Source: CSA, 2016/17 to 2020/21, FAO, 2022

### 3.3 Avocado Production and Management Practices in Ethiopia

Choosing the right place is of great importance. Avocados are extremely susceptible to root rot. No avocado rootstock is completely immune to this disease. Trees of most avocado varieties grow quite tall if the canopy is not properly maintained. If there is enough soil, a larger distance is preferable. Plant spacing is a hotly debated topic. Higher planting densities result in higher yields in the early years of planting, but can also lead to more canopy management problems in later years. (Dirou, 2003) Ethiopian farmers usually did not pay attention to the distances. The growing orchards are not sufficiently spaced, some orchards are closer together and others are very far apart depending on the age of the trees. Most farmers were not aware of the distances. Space plays an important role in all activities, the lack of adequate spacing creates difficulties in production (Seid and Zeru, 2013). (Zekaria, 2010) has pointed out in his research that the difference in distance is related to the different size and type of distribution of the cultivars used. In this agricultural practice, farmers follow local practices from seed propagation to harvest. According to Orva et al. (2009), planting spacing depends on soil type and fertility, current technology, and economic factors. In commercial coppice, trees are planted every 5–7 m in rows and 7–9 m between rows. Pruning in the first 2 years encourages lateral growth and multiple branching. (Ayelech, 2011) emphasized that agricultural manure is transported from farm to field and distributed in a circular fashion at the base of each tree, mainly during the dry season. The use of chemicals was completely avoided in both fertilization and pest control. Therefore, the dose of garden fertilizer only minimally improves soil fertility, but has a positive effect on the environment, i.e. H. soil pollution as well as air and water

pollution are reduced. The same study showed that small farmers in the region were early growing avocados with corn, taro, ginger, chutney, cabbage and bananas. Another study by Gilliard and Godfroy (1995) examined inter-harvested avocados with short-lived yields; This is very common in sub-Saharan Africa, using mostly empty space for the first few years.

#### 3.3.1 Input Sources

Agricultural inputs are important elements for production and productivity. As a result the typical inputs utilized for production of the Avocado were seed/seedling, labor, land, and compost/manure. The major sources of inputs for Avocado production in Ethiopia are farmers by, own endeavours, agricultural offices and markets. In general the sources of inputs for Avocado production are agricultural development offices, markets, agricultural research institutes, own stocks, IPMS, and other farmers (Ayelech, 2011). Woreda Agricultural offices, local planting materials purchased from unknown market sources. The Agricultural research center and self-production by farmers and sources of avocado planting materials Local seed production is the major source of seedlings for distribution ((Berhanu & Dawit, 2016). in addition Avocado production is characterized by low inputs with Farm Yard Manure (FYM) the major amendment made to soil to boost productivity and chemical inputs are not used for fertilization or pest treatment.

#### 3.4 Constraints of Avocado Production in Ethiopia

The fruit sector promises high potential, but yet it is characterized by low yields and income for farmers. The fruit sector in Ethiopia has high value products as compared to other crops and promises high returns on relatively small investments



(Timoteos and Tigist, 2012). According to Bezabih and Hadera, (2007) horticulture production is based on tradition, which is poorly supported by scientific recommendations. Although one can associate this constraint to institutional factors, it is apparent that inadequate farmer skills and knowledge of production and product management affects the supply. Farmers attempt to select varieties and practice traditional crop management. Farmers' know-how of product sorting, grading, packing and transporting is traditional, which severely affects the quality of horticultural products supplied to the market. According to Berhanu & Dawit, (2013) Constraints hindering the development of avocados are found in all stages of the production chain. At the farm level, lack of clean disease-free seedlings and grafted seedlings has compelled farmers to use inferior and low yielding varieties. Storage facilities are scarce all along the chain and absence of collective bargaining power has forced individual farmers to accept unfavourable deals.

According to Zekarias (2010) Major productions constraints are:- Vegetative growth: Most of the farmers reported that their avocado trees show only vegetative growth rather than giving yield at their fruit bearing stage. Falling down of fruits before they are mature, Pest problem. There are no improved agronomic practices. Longevity: Farmers are very much disappointed by the longer time avocado takes to bear fruit and Inadequate extension activities undertaken on avocado. Garedeu & Tsegaye (2011) also indicated that even though avocado has economically and socially play a significant role its production is confronted by a number of constraints ; - this are Degeneration of fruits, Disease problem and absence of good agronomic practices.

#### 3.4.1 Avocado Picking

According to Berhanu & Dawit (2013) fruit picking usually starts with fruit droppings, the main indicator of ripeness used by farmers, and fruit picking is mostly performed by children using picking hooks that shake trees and turn fruit. However, subsequent practice can lead to physical injury. Harvesting is largely done by children climbing the tree. But also the use of hooks, the shaking of trees and the dropping of fruit with wooden sticks is practiced. Subsequent practices result in fruit excretion, which can result in bodily harm at any time (Ayelech, 2011). An FAO study (2005) found that cuts, punctures and bruises on avocados increase ethylene production and accelerate fruit softening and eventual rotting. In other words, in order to decide when to harvest an avocado, it is important to determine the minimum ripeness.

#### 3.4.2 Avocado Post-Harvest Losses

Post-harvest operations must be focused on the extended range of fruit storage by slowing down the process of senescence and also control the ripening of fruit when it is harvested at a mature stage or in the unripe stage. All the harvesting, handling, and transportation to the packing houses and all other operations are needed to be done carefully i.e. no chance of mechanical loss. Damages or injuries can accelerate the ripening of fruit and can affect negatively the appearance of fruit peeling cause browning and blemishes after and before storage. Normally, avocados are very susceptible to spoilage when tenderized (Arpaia et al. 1987), so they must be transported carefully to be

displayed in markets. The quality can also decrease during softening; It is therefore important to regularly check the ripeness of the avocados and eat the ripe fruit first. If possible, all ripe or nearly ripe harvested fruit should be stored 1-6°C cooler to avoid rot. When displaying avocados in the market, avoid sprinkling and pouring ice cream (Young RE and Kosiyachinda S., 1976).

According to FAO (2014), post-harvest losses in developing countries can range from 15 to 50%. Average post-harvest avocado loss at grower level was estimated at 24.1%, of which 5.7% was due to poor harvesting practices and 4.9% to poor storage practices. Avocados and mangoes are perishable and therefore delicate and cause greater losses than perennial crops. Waste is generated from all post-harvest activities such as handling, storage, processing, packaging, transport and marketing. Losses occur throughout the supply chain due to limited resources such as infrastructure, knowledge and access to post-harvest technologies. One way to reduce post-harvest losses can be through effective supply chain management. Post-harvest losses can be measured in qualitative and quantitative losses. Losses can occur at any stage of the supply chain in activities such as harvesting, transportation, packaging and markets (Hodges et al., 2011; Squad, 2009). According to Humble and Reneby (2014), the largest avocado losses in Ethiopia occur at: - Harvesting, mainly due to inadequate harvesting techniques during transport; mainly due to loading, unloading and storage; mainly due to over ripeness.

## 4. DISCUSSIONS

The production of avocados in Ethiopia has been a topic of growing interest in recent years, as the country has emerged as a significant player in the global avocado market. In this systematic article review, we have explored various studies and research papers to gain insights into the current status of the avocado production in Ethiopia. The review covered aspects such as production, production and management practices, and avocado production constraints.

**Production and Farming Practices:** The review indicates that avocado production in Ethiopia has been steadily increasing due to favorable agro climatic conditions in certain regions. Smallholder farmers play a vital role in avocado cultivation, and efforts have been made to introduce modern farming practices and technologies to improve productivity and quality. However, challenges remain, including limited access to improved seed, agricultural inputs, irrigation facilities, and technical know-how.

**Post-Harvest Handling and Processing:** Post-harvest losses have been a major concern in the avocado value chain in Ethiopia. Inadequate handling, lack of proper storage facilities, and limited cold chain infrastructure contribute to significant losses. There is a need for investment in cold storage and processing facilities to prolong the shelf life of avocados and increase their value. Estimated fruit and vegetable losses after harvest are between 20 and 40% (Wiersinga and de Jager, 2009). Higher profits for producers can be achieved through good post-harvest management (Wiersinga and de Jager, 2009). An increase in horticultural production can help





commercialize the rural economy and create many jobs. However, the intensification of horticultural production is often hampered by lack of market access, lack of market information and many biological factors (Abay, 2007). Bezabih and Hadera (2007) also argue that seasonal production is inversely proportional to price. Information should be collected about prices, supply and demand for products, the market, buyers and sellers.

## 5. CONCLUSION AND FURTHER RECOMMENDATIONS

The review article on the current status of the avocado production in Ethiopia sheds light on the significant developments and challenges faced by the industry. Avocado production in Ethiopia has witnessed remarkable growth in recent years, with an increasing number of farmers embracing avocado cultivation and investing in modern farming practices. The country's conducive climate and suitable agro-ecological zones offer substantial potential for further expansion of avocado production.

The study highlights the current status of avocado production, avocado production and management practices, avocado production constraints and post-harvest losses. Despite the progress made, there are several constraints and bottlenecks that need to be addressed to unlock the full potential of the avocado sector in Ethiopia. Some of the major challenges include limited access to improved technologies, lack of proper infrastructure for transportation and storage, insufficient market linkages, and inadequate value addition initiatives. For better achievement in promotion and sustainable improvement of production and productivity of avocado, consideration of the following points would be important:-

**I. Establishment of New Nursery sites:** Establishment of more nurseries and strengthening collaboration work with other organizations for easy and quick multiplication and dissemination of the improved avocado seedlings.

**II. Technology and Research Investment:** Investing in research and development is crucial to improving avocado production practices. The government and relevant stakeholders should collaborate to develop and disseminate advanced agricultural technologies, disease-resistant avocado varieties, and efficient irrigation methods tailored to the local conditions.

**III. Infrastructure Development:** Improving transportation and storage infrastructure is essential to reduce post-harvest losses and ensure the timely delivery of avocados to markets. Building cold storage facilities and improving rural roads will enhance the quality and value of the avocados.

**IV. Training and Capacity Building:** Providing training and extension services to farmers on modern agricultural practices, post-harvest handling, and marketing will enhance their skills and knowledge, leading to increased productivity and income.

**V. Public-Private Partnerships:** Strengthening collaboration between the government, private sector, and development partners can foster a conducive environment for the avocado industry's growth. This includes creating an enabling policy framework, facilitating access to finance for farmers and agribusinesses, and coordinating efforts for sustainable development.

**VI. Sustainability and Environmental Concerns:** Promote sustainable avocado farming practices to safeguard natural resources, prevent deforestation, and minimize environmental impacts. Encouraging organic farming and responsible water management will contribute to the industry's long-term viability.

In conclusion, the avocado production in Ethiopia has significant potential for growth and development. By addressing the challenges and implementing the recommended strategies, the country can capitalize on its favorable agro-climatic conditions to become a major player in the global avocado market while simultaneously improving the livelihoods of smallholder farmers and fostering sustainable agricultural practices.

## REFERENCES

1. Abay A. (2007). *Vegetable market chain analysis in Amhara National Regional State: the case of Fogera Woreda, South Gondar Zone*. M.Sc. Thesis. Haramaya University.
2. Arpaia ML, Hofshi R. Preliminary report on the feasibility of 'snap'harvesting 'Hass' avocado. *Subtropical Fru Arit News*. 1998;6:7-9.
3. Asfaw, E., Erko, B., Temasgen, M., & Achamyelh, K. (2020). *Production and Marketing Constraints of Major Sub-Tropical Fruits in Jimma Zone , South West Ethiopia*. *International Journal of Recent Research in Interdisciplinary Sciences*, 7(1), 1–7.
4. Ayelech, T. (2011). *MARKET CHAIN ANALYSIS OF FRUITS FOR GOMMA WOREDA, JIMMA ZONE, OROMIA NATIONAL REGIONAL STATE*. <http://www.ainfo.inia.uy/digital/bitstream/item/7130/1/LUZARDO-BUIATRIA-2017.pdf>
5. Berhanu, M., & Dawit, A. (2013). *The Role of Avocado Production in Coffee Based Farming Systems of South Western Ethiopia : The Case of Jimma Zone*. *Journal of Agricultural Science and Applications*, 2(2 June 2013), 86–95. <https://doi.org/10.14511/jasa.2013.020206>
6. Bezabih E, Hadera G (2007). *Constraints and problems of horticulture production and marketing in Eastern Ethiopia*. *Dryland Coordination Report, G46, Osolo, p. 91*.
7. Central Statistical Agency (CSA). (2020). *Farm Management Practices (Agricultural Sample Survey) 2020/21 (2013 E.C.)*. In *Central Statistical Agency: Vol. III (Issue 12)*. [https://www.statsethiopia.gov.et/wp-content/uploads/2021/06/2020\\_21-2013-E.C-AgSS-Main-Season-Agricultural-Farm-Management-Report.pdf](https://www.statsethiopia.gov.et/wp-content/uploads/2021/06/2020_21-2013-E.C-AgSS-Main-Season-Agricultural-Farm-Management-Report.pdf)
8. Dirou, T.-O. (2003). *SPATIO-TEMPORAL DYNAMICS OF ANTHRACNOSE ON AVOCA- DO ( PERSEA AMERICANA MILL )*. 591–599.
9. FAO. (2014). *Food and Agriculture Organization Ethiopia country programming framework*. Office of the FAOR representative in Ethiopia to AU and ECA Addis Ababa, 2016
10. FAO. (2018). *World Food and Agriculture Statistical Pocketbook*. In *World Food and Agriculture - Statistical Yearbook 2018*.
11. FAO. (2019). *Food and Agriculture Organization of the United Nations*. <https://doi.org/10.4324/9781315764788>
12. FAO. (2020). *World Food and Agriculture - Statistical Yearbook 2020*. In *World Food and Agriculture - Statistical Yearbook 2020*. <https://doi.org/10.4060/cb1329en>
13. FAO. (2022). *World Food and Agriculture – Statistical Yearbook 2022*. In *World Food and Agriculture – Statistical Yearbook 2022*. <https://doi.org/10.4060/cc2211en>



14. Faris, A. (2016). Review on Avocado Value Chain in Ethiopia. *Journal of Marketing and Consumer Research*, 6(3), 33–40. <https://doi.org/10.7176/jmcr/84-01>
15. Food, W. (2021). World Food and Agriculture. In *The Lancet* (Vol. 274, Issue 7102). [https://doi.org/10.1016/S0140-6736\(59\)91820-3](https://doi.org/10.1016/S0140-6736(59)91820-3)
16. Garedew, W., & Tsegaye, B. (2011). Trends of Avocado (*Persea americana*) production and its constraints in Mana Woreda, Jimma Zone: A potential crop for coffee diversification. *Academic Journals Inc.*, 1(1)(January), 20–26. <https://doi.org/10.3923/thr>
17. Hodges, R. J., Buzby, J. C. & Bennett, B., 2011. Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use. *The Journal of Agricultural Science*, 149, S1:37-45.
18. Humble S., Reneby A. 2014. Post-harvest losses in fruit supply chains – a case study of mango and avocado in Ethiopia. Degree thesis 899, Department of Economics, Swedish University of Agricultural Sciences, Uppsala, Sweden.
19. National Planning Commission (NPC). (2016). *Federal Democratic Republic of Ethiopia Volume I: Main Text: Vol. I (Issue GTP II)*.
20. Nega, M. (2015). Market Chain Analysis of Agro-forestry Products: The Case of Fruit at Tembaro District, Kembata Tembaro Zone South Ethiopia. *Journal of Economics and Sustainable Development*, 6(13), 120–136. <https://doi.org/10.11648/j.ijber.20150404.13>
21. Philip, K., & Gary, A. (n.d.). [ PDF ] *Marketing: An Introduction*.
22. Wiersinga R, de Jager A (2009). In: *Business Opportunities in the Ethiopian Fruit and Vegetable Sector*. Wageningen University and Research Centre – LEI. p. 46.
23. Young RE, Kosiyachinda S. Low temperature storage of ripe avocado fruit. *Yearbook of California Avocado Society*. 1976;59:73-76.
24. Zekarias, S. (2010). Avocado Production and Marketing in Southwestern Ethiopia. *Trends in Agricultural Economics*, 3(4)(June), 190–206. <https://doi.org/10.3923/tae.2010.190.206>