WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

DETERMINANTS OF AVOCADO MARKET CHAIN ANALYSIS IN CASE OF BURSAWOREDA, ETHIOPIA

Senior research submitted to department of agricultural economics, college of agriculture and natural resource

By: ASHENAFI FIKADU

ID NUMBER: -NSR/0322/14

ADVISOR: -MOTI D. (Msc)

APRIL: - 2025

Wolkite, Ethiopa

ACKNOWLEDGEMENT

I want to express my heartfelt gratitude to Almighty God for His constant guidance and support throughout this journey. I am deeply thankful to my advisor, Moti D. (Msc) whose valuable insights and constructive feedback have been a guiding light; his commitment and willingness to invest his time in reviewing every detail of my research proposal, from the very beginning to the end, have truly inspired me. I also extend my appreciation to everyone who played a role in this journey—your support, encouragement, and belief in me have made this accomplishment possible. Thank you for being a part of this experience; I couldn't have done it without you all.

TABLE OF CONTENTS

LISTOFTABLES

LIST OF FIGURE

LIST OF ABBREVIATION AND ACRONYMS

CIAT	Centro International Agricultural Tropical
CSA	Central Structural Agency
FAO	Food and Agriculture Organization
HH	Household
MM	Marketing Management
VIF	Variance Inflation Factors

ABSTRACT

This study investigates the determinants of the level of avocado supply in a given agricultural region. Avocado production has been receiving increased interest due to the demand for it in global markets and its health advantages. The research compares various independent variables like producer traits (age, gender, marital status, household size, and educational level), financial variables (incomes derived from off-farm activities and farm land size), and access to market information with the purpose of assessing their effects on quantity supplied. With the use of quantitative analysis and regression, the research identifies key determinants that shape levels of production. Evidence shows that factors such as educational levels, farm sizes, and availability of market information have direct relationships with increased supply of avocados, whereas family size and internal demand structures can be used to reduce market availability. With the research, vital information for farmers, policy makers, and stakeholders in agribusiness comes forth, talking about how to enhance avocado production as well as optimize the supply to accommodate increased consumer demands.

Key words: Determinants of the level of avocado supply

1. INTRODUCTION

1.1 Background of study

Avocado (*Persea Americana*) is native to Central America and the West Indies. It has been farmed extensively since the early 1500s when Spanish conquistadors overran the Aztec and Inca empires and discovered the fruit. The avocado was first introduced to Florida, California, and Hawaii in the early 1800s, and it can now be found anywhere with suitable growing conditions (Clarke *et al*., 2011).The avocado belongs to the Lauraceae family, which includes related species such as camphor, sassafras, cinnamon, and laurels. The size, shape, color, texture, and flavor of cultivated species' fruit vary widely. The flesh between the seed and the skin is edible and ranges in color from cream to yellowish green, achieving a consistency similar to soft butter when fully ripe. Each avocado contains only one seed (Bost *et al*., 2023).

In Ethiopia, avocados are significant due to their potential for both internal and international markets, as well as for industrial processing. The most commonly produced and exported fruits in Ethiopia include bananas, citrus fruits, mangos, avocados, papayas, and grapefruits (Baye & Bekele, 2019). Ethiopia became the 20th avocado-producing country globally in 2017, with a production of 571,200 quintals (FAO, 2017). However, avocado production is primarily focused on the distribution of mixed materials due to the lack of superior varieties. Consequently, the local seed system has emerged as a common method for seedling distribution (Ayelech, 2011).

Despite the avocado's economic and social importance, its production faces several challenges, including fruit degeneration, disease, and a lack of agronomic practices (Teshome *et al.*, 2022). In Ethiopia, avocado products are typically sold unprocessed, as there are no value-adding operations at the levels of farmers, brokers, or wholesalers in the market chains. When avocados are brought closer to high-demand markets, their value increases (Teshome *et al*., 2022). Avocados were first introduced to Ethiopia in 1938 by private orchardists in Hirna and Wondo-Genet, and their production gradually spread into various agro-ecological zones. Currently, avocados rank second in total production volume after bananas, with annual production reaching 25,633.16 tons. The crop is cultivated by 1,149,074 farmers across more than 8,938.24 hectares of land (Teshome *et al.*, 2022).

1.2 Statement of the Problem

The avocado market chain in Bursa Woreda, Ethiopia, is facing significant challenges that impact its growth and efficiency. While global demand for avocados is rising and their health benefits are well recognized, local production struggles to keep pace. Many farmers encounter barriers such as limited access to quality seeds and fertilizers, insufficient market information, and inadequate infrastructure (Baye & Bekele, 2019; Teshome *et al*., 2022).

These challenges often leave farmers feeling overwhelmed and under-resourced, which can lead to low production levels that do not meet market demand (Dawit & Hailemariam, 2009). Additionally, the market is dominated by a small number of traders who have limited financial resources, diminishing the bargaining power of farmers and creating inequalities within the supply chain (Wiersinga & Jager, 2009).

Moreover, without value-added processing and effective post-harvest handling, many avocados lose their quality and marketability (Teshome *et al*., 2022). This situation prevents the avocado sector from reaching its full potential, which could significantly contribute to economic development and poverty alleviation in the region.

Avocado production in Bursa Woreda is significantly impacted by several challenges, including production seasonality, seasonal price fluctuations, poor pre- and post-harvest handling, prevalence of pests and diseases, and inadequate storage facilities. These issues critically hinder avocado marketing in the district. The product's characteristics—such as surplus availability at harvest—often lead to low producer prices, which stem from both the nature of the product and the absence of a well-organized marketing structure (Teshome et al., 2022; Dawit & Hailemariam, 2009).
Moreover, the avocado tree is recognized not only for its economic value but also for its environmental benefits (Baye & Bekele, 2019).

This research aims to explore the key factors affecting the avocado market chain in Bursa Woreda, identifying both the constraints and opportunities that could help improve production and marketing strategies.

1.3. Research Questions

What factors affect avocado market chain in bursa woreda?

What are the major opportunities and challenges of avocado market chain in the bursa woreda?

1.4. Objective of the Study

1.4.1 General Objective

The General objective of this study is to analyze the determinants of Avocado marketing chain in case of Bursa woreda.

1.4.2 Specific objectives

To identify the factors that affects the market chain of avocado in bursa woreda.

To identify challenges and opportunities associated with the production in marketing chain of avocado in bursa woreda.

1.5. Significance of the Study

The research is beneficial in facilitating Avocado marketing conditions for future development projects, as well as serving as a foundation for investors who want to invest in this activity and strengthen the Avocado marketing system in Bursa woreda, Avocado market chain analysis is not well done in the research domain. As a result, this research will contribute by recommending some suggestions for improving the avocado market chain in the study area.

1.6. Scope and Limitations of the Study

This research will focus on the Avocado market chain and market channel within the study area. This encompasses everything from producers (farmers) to consumers in the research region, as well as everything from producers to retailers and other significant players in the channel. The study will be conducted in order to identify opportunities and potential constraints in the Avocado market chain.

Also covers the important issues and factors that influence avocado supply to the market. Due to budgetary and geographical constraints, information will be collected from sample families and marketing actors for one potential producer in Bursa woreda.

2. LITERATURE REVIEW

In this chapter the basic concepts of markets, Agricultural marketing, marketing system ,market channel,the approaches and methods to evaluate the efficiency of agricultural markets have been discussed.

2.1 Theories and Basic Concepts

2.1.1. Marketing and marketing concepts

Market:A market can be defined as a setting where buyers and sellers interact to exchange goods, services, or assets (Kotler & Keller, 2022). This exchange can occur in a physical location, such as a traditional marketplace, or through virtual platforms like e-commerce websites. The market is the arena where the forces of supply and demand come together to determine the prices and quantities of traded commodities (Mankiw, 2021). The most observable features of a market are its pricing and exchange processes; it is more than just a physical place. There is no need to meet physically for a market to operate, especially in today's information and communication technologies.

Agricultural Marketing: Agricultural marketing refers to the set of activities and processes involved in the movement of agricultural commodities and products from the point of production to the point of consumption (Kohls & Uhl, 2022). This includes the planning, organization, direction, and control of the flow of agricultural goods and services to consumers in order to maximize profits for producers and provide value to customers. Agricultural marketing encompasses a wide range of functions, such as market research, product development, pricing, promotion, distribution, and customer relationship management. It involves the coordination of various stakeholders along the agricultural value chain, including farmers, processors, wholesalers, retailers, and end-consumers (Srivastava *et al*., 2021).

Marketing System: It can be defined as the network of institutions, agencies, and functions that facilitate the exchange of goods and services from producers to consumers (Kotler & Keller, 2022). It encompasses the various channels, intermediaries, and supporting infrastructure that enable the flow of products, information, and payments within a given market or industry. In the context of the agricultural sector, the marketing system comprises the set of interrelated actors, processes, and supporting services that enable the efficient movement of agricultural commodities, such as avocados, from farms to end-consumers (Shashi *et al.*, 2021). This includes input suppliers, producers, processors, wholesalers, retailers, logistics providers, and various regulatory and support institutions.

2.1.2. Marketing channel

It is a business structure of interdependent organizations from the point of product origin to the consumer with the purpose of moving products to their final consumption destination (Kotler and Armstong, 2003). The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (consumer). This knowledge is acquired by studying the participants in the process, i.e. those who perform physical marketing functions in order to obtain economic benefits (Getachew, 2002). This channel may be short or long depending on the kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam *et al*., 2001).

2.1.3. Market chain analysis

The marketing chain is used to describe the numerous links that connect all actors and transactions involved in the movement of agricultural products from the farm to the consumer (Lunndy *et al*., 2004). It is the path a good follows from its source of original production to its ultimate destination for final use. The main actors involved in the avocado market chain include farmers/producers, traders/wholesalers, processors, retailers, and consumers (Donovan *et al*., 2021; Bouamra-Mechemache *et al*., 2022). Avocado farmers and producers are responsible for the cultivation and supply of avocados. Their production levels and yields directly influence the overall availability of avocados in the market chain (Donovan *et al*., 2021).

Functions conducted in a marketing chain have three things in common: they use up scarce resources, they can be performed better through specialization, and they can be shifted among channel members (FAO, 2005). According to Hobbs *et al.* (2000), the term supply chain refers to the entire vertical chain of activities: from production on the farm, through processing, distribution, and retailing to the consumer. In other words, it is the entire spectrum, from gate to plate, regardless of how it is organized or how it functions. The market chain is the term used to describe the various links that connect all the actors and transactions involved in the movement of agricultural goods from the producer to the consumer (CIAT, 2004).

The commodity chain connects smallholder farmers to the technologies they need on one side of the chain and to the product markets of the commodity on the other side (Mazula, 2006). Market chain analysis, therefore, identifies and describes all points in the chain (producers, traders, transporters, processors,

consumers), prices in and out at each point, functions performed at each point (who does what?), market demand (rising, constant, declining), approximate total demand in the channel, market constraints, and opportunities for the products.

2.2.Approaches to the Study of Agricultural Marketing

Different circumstances involved in the demand and supply of agricultural products, and the unique product characteristics, require a different approach for analyzing agricultural marketing problems (Johan, 1988). The major and most commonly used approaches are functional, institutional and commodity approaches.6

2.2.1. Functional approach

This approach focuses on the various functions or activities involved in the agricultural marketing process, such as buying, selling, storage, transportation, processing, and risk-bearing (Kohls & Uhl, 2022). The objective is to understand how these functions are performed and how they can be improved to enhance the overall efficiency of the marketing system.The widely accepted functions are: exchange (buying and selling), physical (processing, storage, packing, labeling and transportation), and facilitating (standardizing, financing, risk bearing, promoting and market information). The exchange function involves pricing, buying and selling which is a transfer of title between exchanging parties.

2.2.2. Institutional approach

This approach examines the different institutions, agencies, and intermediaries that constitute the agricultural marketing system, such as farmers, cooperatives, wholesalers, retailers, and regulatory bodies (Shashi *et al.*, 2021). The goal is to understand the roles, interactions, and power dynamics among these entities and how they shape the marketing outcomes.An institutional approach for the marketing of agricultural product should be instrumental in solving the three basic marketing problems, namely consumers' demand for agricultural products and the price system that reflects these demands back to producers and the methods or practices used in exchanging title and getting the physical product from producers to consumers in the form they require, at the time and place desired.

2.2.3. Commodity approach

This approach analyzes the unique characteristics and marketing requirements of specific agricultural commodities, such as perishability, seasonality, and grading standards (Umberger *et al*., 2021). The objective is to develop tailored marketing strategies and policies to address the specific needs and challenges faced by different agricultural products.

2.3. Marketing costs

Marketing costs refer to the expenses incurred in the process of moving agricultural products from the point of production to the point of consumption (Kohls & Uhl, 2022). These costs are an integral component of the overall cost structure for agricultural producers, processors, and marketers. The importance of understanding and minimizing marketing costs cannot be overstated, as they can have a significant impact on the profitability and competitiveness of agricultural enterprises (Shashi *et al*., 2021). Effective cost management strategies, such as improving logistics, implementing technology-enabled solutions, and enhancing market coordination, can help agricultural producers and marketers optimize their marketing cost structures and enhance their overall financial performance.

Marketing Margin: The marketing margin, also known as the price spread, refers to the difference between the price paid by consumers and the price received by producers for an agricultural commodity (Kohls & Uhl, 2022). It represents the compensation for the various marketing functions and services performed by the intermediaries involved in the supply chain, such as processors, wholesalers, and retailers.

Understanding and analyzing marketing margins is crucial for identifying inefficiencies, improving supply chain coordination, and ensuring a more equitable distribution of value among the various stakeholders (Shashi et al., 2021). It can also inform policy decisions and interventions aimed at enhancing the overall performance and competitiveness of the agricultural marketing system. One of the key factors influencing marketing margins is the degree of competition among the intermediaries involved in the supply chain, such as processors, wholesalers, and retailers. In markets with limited competition, these intermediaries may have the ability to extract higher margins, potentially to the detriment of producers and consumers. Conversely, in more competitive environments, the pressure to minimize costs and maintain competitive prices can result in narrower marketing margins (Shashi *et al.*, 2021).

2.4. Empirical studies on market of avocado

Dawit and Hailemariam (2009) stated the importance of avocados for both domestic and international markets as it was increasing at increasing rate from time to time associated with the expansion of small-and large-scale irrigation facilities compounded by national and regional extension service on the production of avocados. They further reported three options for selling avocado which include selling right in the field/

farm gate; sell at nearby markets and least proportion option to access distance markets where larger (93 percent)of the total produce was sold to wholesalers.

Unavailability of standardized packing material has forced exporters in Ethiopia to import packing material from Netherlands and Israel (Wiersinga and Jager, 2009). But efforts are now commenced to produce packing material in Ethiopia. According to FAO (2006), avocado farmers in Kenya are suffering from poor post-harvest handling which affected their income where farmers are compelled to sell their product immediately after harvest. Thus hastened ripeness of avocado at room temperature has aggravated ethylene release and necessitated immediate utilization (Crosby, 2008; Stanlich, 2009).

Similarly, Bezabih and Hadera (2007) explore use of low level of improved agricultural technologies, risks associated with weather conditions, diseases and pests, as the main reasons for low productivity. Moreover, due to the increasing population pressure the land holding per household is declining leading to low level of production to meet the consumption requirement of the household. As a result, intensive production is becoming a means of promoting agro-enterprise development in order to increase the land productivity. Avocado production gives an opportunity for intensive production and increases small holders farmers participation in the market.

Production is seasonal, and price is inversely related to supply. During the peak supply period, prices decline. The situation is worsened by the perishability of the products and poor storage facilities (Teshome et al., 2022). Along the market channel, 25 percent of the avocado product is spoiled. Perishability is also one of the bottlenecks that hampers easy product flow along the chain and is reported to require fervent attention. Price negotiation while the commodity is en route to the final market has led actors to divert their destination to better price-offering markets (Teshome *et al*., 2022).

Hence, losses of trust were the main feature reported and often led to disputes among buyers and sellers. Producers are normally price takers and are frequently exposed for cheating by intermediaries.

From these reviewed literatures severe production seasonality, seasonal price fluctuations, poor pre-and post harvest handling, prevalence of pest and diseases, lack of storage are some of the critical problems encountered avocado marketing in Ethiopia.

2.5 Conceptual framework

A conceptual framework is a visual or written product that "explains, either graphically or in narrative form, the main things to be studied the key factors, concepts, or variablesand the presumed relationships

among them."

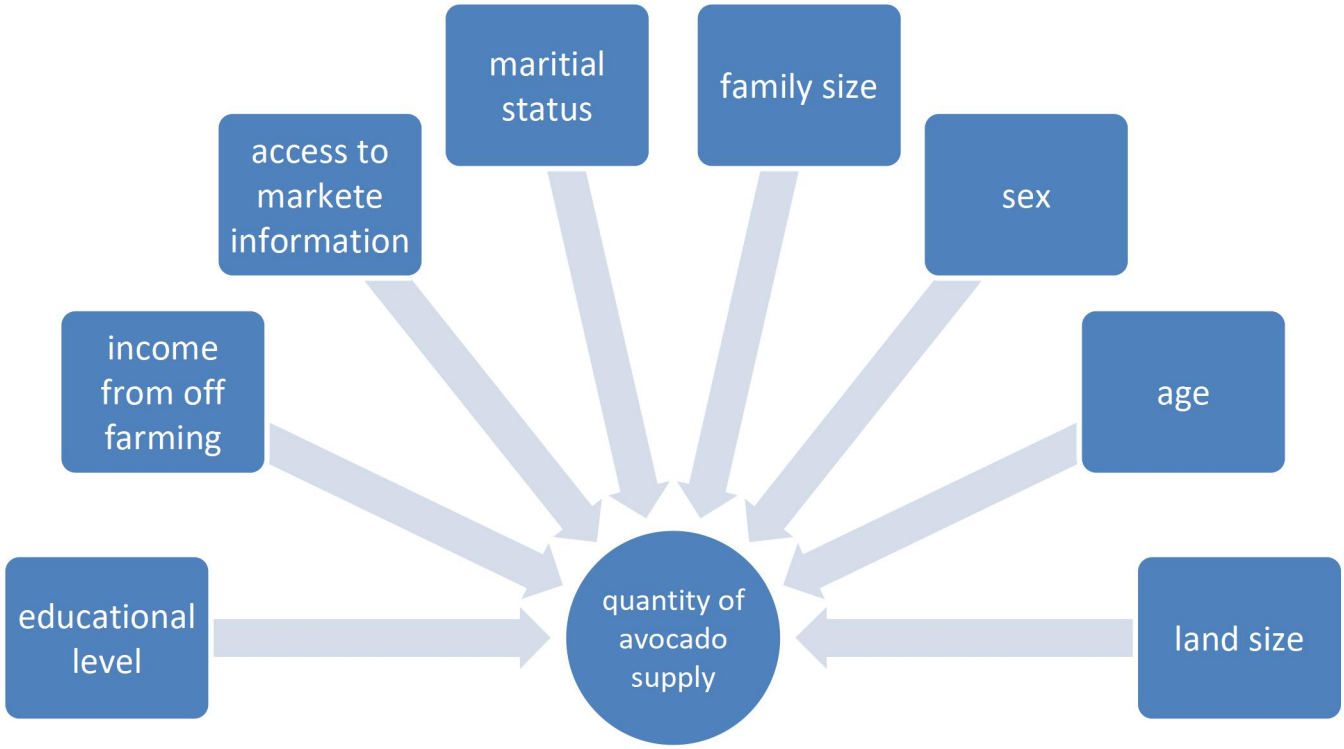

Figure 1:Conceptual framework of the study

3. RESEARCH METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Bursa Woreda, Sidama region ,Ethiopia .Bursa is one of the wored as in the Sidama National Regional state of Ethiopia. Part of the Southern Sidama Zone ,it is border on the south by Hula, on the west by Aleta Wendo, on the northwest by Wensho, on the northeast by Arbegona, and on the southeast by Bona Zuria The region is located between 6°14' and 7°18' N and 37°92' and 39°14' E with altitudes ranging from 1,200 m to 3,211 m The major crops grown are inset, avocado , mango, coffee, and chat; maize, barley, wheat, and bean coffee are cash crops. Based on the 2015 Census conducted by the CSA, this woreda has a total population of 103,631, of whom 51,731 are men and 51,900 women; 2,304 or 2.22% of its population are urban dwellers. The majority of the inhabitants were Protestants, with 88.63% of the population reporting that belief, 6.25% observed traditional religions, 2.18% were Catholic, and 1.77% were Muslim.

3.2 Source of Data and Method of Data Collection

Both primary and secondary types of data were used to write the report. Primary data collection was conducted by interacting or communicating with the producers and customers who had deep indigenous knowledge. More specifically, data on the level of production, consumption, value of sale (income), costs of production, and marketing of avocado at the producer and traders were collected and utilized to produce the report. In order to address the objectives of the study, both primary and secondary data were used.

The primary data were collected using three interview schedules (for farmers and the other for traders). The primary data were collected from farmers focused on factors affecting avocado market supply, size of output, market information, credit access, access to market, number of avocado trees owned, extension service, and demographic characteristics of the household. Moreover, the interview schedule for traders included: types of traders (retailers and local collectors, etc.), buying and selling strategies, source of market information, and demographic characteristics. Secondary data were collected from different sources, such as governmental institutions, the woreda agricultural office, annual reports, and websites.

Published and unpublished documents were extensively reviewed to secure relevant secondary information.

3.3 Sampling Design/Technique

By employing multi-stage sampling techniques, Bulancho kebele was selected based on production potential as well as accessibility for data collection. Secondly, Shigado kebele was selected using the simple random sampling method, and avocado-producing farmers were selected to achieve the desired objectives. From this area, 910 households were selected.

Therefore, Bulancho had a total of 520 households, and Shigado had a total of 390 households. In order to take a total sample size relevant to the target study, the Yamane formula (1967) of $n = N / (1 + N(e)^2)$ was applied. In addition to this, proportionate sampling was used to enable the selection of samples from each sub-strata, which were to be selected from the target population. From these, 91 respondents were selected using simple random techniques, and the determination of sample size was resolved by means of Slovin's sampling formula with a 90 percent confidence level

Formula: $n= \frac{N}{1+N(e)2}$

$n= \frac{910}{1+910(0.1)2} =91$

From 910 total population from both kebele;

where, N = the total number of households

e = the margin of error

n = the total sample size of households

ns= the total sample size of households of Shigado kebele

nb = the total sample size of households of Bulancho kebele

$ns= \frac{Ns}{1+N(e)2}$

$ns= \frac{390}{1+910(0.1)2} =39$

$nb = \frac{520}{1+910(0.1)2} = 52$

Table 1:Sample size of the selected kebeles

No	Kebeles	Total number households	Number of samp household
1	Bulancho	520	52
2	Shigado	390	39
Total		910	91

3.4 Definition of variables

Dependentvariable

Quantity of Avocado Supply (QAS): The total amount of avocados available for sale in the market, typically measured in kilograms or tons. It is influenced by all the independent variables.

Independent variable

Sex (S): Refers to the gender of the producer (male or female). Gender may influence roles and responsibilities associated with avocado cultivation. For instance, male producers may have different access to resources or networks compared to female producers. This will affect how many avocados are supplied because access to information and availability of resources lead to effective cultivation practices(Doss, C. R. (2018).

Age (A): Age of the producer, usually measured in years. More experienced and knowledgeable older producers would be better able to incorporate improved agricultural methods, which could increase the supply of avocados. Younger producers may be more willing to adapt to methods of change, which would impact supply differently(Pender, J. (2020).

Family Size (FS): Refers to the number of individuals living in a single household. It encompasses all the members, including parents, children, and any other relatives. Family size, in a farm context, can affect labor supply, resource allocation, and consumption levels(De Janvry, A., & Sadoulet, E. (2016)

Marital Status (MS): Producer's marital status (single, married, divorced, etc.). Married producers may experience increased stability and support, thus better avocado production management. This stability could lead to increased supply, while single producers may face a variety of resource allocation challenges and priorities (Quisumbing, A. R. (2019)

Educational Level (EL): The level of education attained by the producer. Higher education can contribute to a better understanding of farming practices and market situations, which will encourage higher avocado production. Educated producers are likely to be more willing to adopt new methods of production that optimize supply (Binswanger-Mkhize, H. P. (2018).

Income from Off-Farming Activities (IL): The income generated by the producer from non-farm activities. Higher income can provide producers with the means to invest in better farming inputs and technology, which can boost avocado production. Conversely, lower income can limit such investments, thereby negatively impacting supply(Barrett, C. B. (2021)

Land Size (LS): The total size of land used or owned for cultivating avocados, typically measured in acres or hectares. An avocado tree plantation may occupy larger land areas, which, in turn, has a direct influence on the quantity of avocados harvested and brought to the market. Small land may restrict the ability to produce(Deininger, K., & Jin, S. (2020).

Access to Market Information (AM): The ability of the producer to obtain useful and timely information about market price, demand, and trends. Access to market information allows producers to make better-informed decisions regarding selling and production levels, which could, in turn, increase the level of avocados supplied. Producers lacking market information can be at a disadvantage in optimizing sales(Aker, J. C. (2019).

3.5 Methods of data analysis

All the data collected will be analyzed by using both descriptive and econometric statistical analysis methods. Those analyzed data will be presented through tabulation and explanation to illustrate numerical data

3.5.1. Descriptive analysis

By employing descriptive statistics we can compare differences among categories of sample units with respect to the desired characteristics. In this study, descriptive statistics such as mean, percentages and

frequency of occurrence will be used along the econometric model, to analyze the collected secondary and primary data. A multiple linear regression model will used to identify the determinants (factors) of Avocado market chain in the region.

3.5.2. Econometric model

Multiple Linear regression models are used to model relationships between a dependent variable and a set of independent variables

Regression Functions

The equation of regressions on this study is generally built around two sets of variables, namely dependent variable Quantity of avocado supply and independent variables sex(S),age(A),family size (FS),marital status(MS), income from off farming activities (IOFA), access to market information (AMI) land size (LS) and educational status(ES) .The basic objective of using regression equation on this study is to make the study more effective at describing, understanding and predicting the stated variables

Multiple Linear regression models;

$Yi= \beta 0+ \beta 1S+ \beta 2A+ \beta 3FS+ \beta 4MS+ \beta 5IOFA+ \beta 6ES+ \beta 7AM+ \beta 8AMI$

Where;

Yi= Dependent variable

β0= the intercept

β_i=slope of the line

Table 2 Hypothesis the relation between independent variables and dependent variable

Variable	Type	Measurement	Expectation
Quantity of Avocado Supply	Continuous	Quintal	+ve/-ve
Sex	Dummy	0=F, 1=M	+ve/-ve
Age	Continuous	Year	+ve
Family Size	Continuous	Number	-ve/+ve
Marital Status	Dummy	0=single,	+ve

		1=married,2=divorced	
Educational Level	Continuous	Number of grade	+ve
Income from Off-Farming Activities	Continuous	ETB	+ve
Land Size	Continuous	Hector	+ve
Access to Market Information	Dummy	0=no access 1=access	+ve

ETB=Ethiopian birr

4. RESULTS AND DISCUSSION

4.1 Socio-Demographic Characteristics of Producers

In this study, certain information regarding of their, sex, age, family size, marital status and educational level of the producers has been gathered and discussed briefly.

Table 3Demographic characteristics of produce

Variables	Category	Frequency	Percentage
Age	15- 30	33	36.26
	31-45	43	47.25
	46-60	15	16.48
Sex	Male	53	58.24
	Female	38	41.76
Marital status	Single	34	37.36
	Married	37	40.6
	Divorced	15	16.48
	Total	91	100
Education level	Illiterate	13	14.29
	Read and write	18	19.78
	Primary(1-8)	26	28.57
	secondary(9-12)	31	34
	Diploma and above	9	9.89
	Total	91	100
Family size	1-3	39	42.86
	4-6	27	29.67
	above6	25	27.47
	Total	91	100

Source; Own Survey data (2025)

Age of Producers: Among the 91 respondents, 33 individuals (36.26%) are aged 15-30, which reflects a youthful and energetic demographic. The largest group consists of 43 respondents (47.25%) in the 31-45 age range, representing a solid cohort of middle-aged individuals with potential stability. Only 15 respondents (16.48%) fall into the 46-60 age range, indicating that older individuals are less represented. This youthful majority suggests that products and services should cater to the interests and needs of younger adults and families, who are likely to drive trends and innovations in the market.

Sex of Producers: Regarding sex, among the 91 respondents, 53 (58.24%) identified as male and 38 (41.76%) as female, indicating a slight male predominance in the producer demographic. This male majority may influence marketing strategies for products and services targeted at producers.

Marital Status of Producers: The marital status reveals that 34 individuals (37.36%) are single, while married respondents account for 37 (40.66%), suggesting a stable family structure among this group. Additionally, 15 respondents (16.48%) are divorced, which may reflect personal challenges impacting their production activities.

Educational Level of Producers: The education level indicates that 13 respondents (14.29%) are illiterate, while 18 individuals (19.78%) can read and write. Additionally, 26 (28.57%) have completed primary education, and 31 respondents (34.07%) have secondary education. Only 9 (9.89%) hold a diploma or higher. This educational landscape suggests that further training programs could empower producers and improve their productivity, highlighting the importance of enhancing educational opportunities for community development. The educational background of producers is believed to significantly influence their readiness to accept new ideas and innovations.

Family Size of Producers: In terms of family size, 39 respondents (42.86%) belong to households with 1-3 members, reflecting a trend towards smaller family units. Households with 4-6 members account for 27 (29.67%), while 25 individuals (27.47%) come from families with more than six members. This distribution indicates varying economic pressures based on family size, which can influence financial decisions related to production. The majority of respondents come from smaller family units, which may correlate with home consumption patterns, such as an increased demand for products like avocados as family size increases.

4.2 Demographic Characteristics of Traders

In this study, certain information regarding of their sex, age, family size, marital status and educational level of the traders has been gathered and discussed briefly.

Table 4Demographic characteristics of trader

Variables	Category	Frequency	Percentage
Age	15- 30	13	32
	31-45	18	44
	46-60	10	24
Sex	Male	26	64
	Female	15	36
Marital status	Single	7	16
	Married	21	52
	Divorced	8	20
	Widowed	5	12
	Total	41	100
Education level	Illiterate	11	28
	Read & write	10	24
	Primary(1-8)	15	36
	secondary(9-12)	5	12
	Total	41	100
Family size	1-3	15	36
	4-6	13	32
	above6	13	32
	Total	41	100

Source; own survey data (2025)

Age: The trader demographic consists of 41 respondents, with 13 individuals (32%) aged 15-30, reflecting a considerable presence of younger traders. The 31-45 age group represents 18 individuals (44%), indicating a mature workforce, while 10 respondents (24%) fall into the 46-60 range. This age distribution suggests a blend of youthful innovation and experienced insight in trading activities

Sex of traders: The trader population shows a notable gender disparity, with 26 males (64%) compared to 15 females (36%). This significant male majority highlights potential barriers for women in the trading

sector. The gender imbalance suggests a need for initiatives aimed at encouraging female participation and representation in trading activities

Marital Status: Among the traders, 21 individuals (52%) are married, indicating a stable family structure. Single traders account for 7 (16%), while 8 (20%) are divorced, which may reflect personal challenges influencing their trading decisions.

Educational level of traders: The education level of traders reveals that 11 individuals (28%) are illiterate, while 10 (24%) can read and write. A total of 15 respondents (36%) have completed primary education, but only 5 (12%) have secondary education. Empowering traders through education could significantly improve their trading capabilities and decision-making. Education is a crucial factor for skill development and enhancing marketing decisions .Education has supported the ability to acquire new ideas in relation to market information and new technologies.

Family size of traders: Regarding family size, 15 traders (36%) live in households with 1-3 members, indicating a trend towards smaller family units. Households with 4-6 members account for 13 (32%), while another 13 (32%) come from families with more than six members. This diverse family size distribution may influence traders' financial strategies and economic pressures

Econometric analysis

Econometric Analysis is a statistical method used in economics to hypothesize, estimate relationships, and forecast future directions by using statistical techniques on economic data. Econometric Analysis incorporates economic theory, mathematics, and statistical inference in analyzing real economic phenomena.

Table 5 Factors affects the market chain of avocado (econometric analysis)

Quantity of avocado supply	Coef.	Std. err.	t-value	p-value
Sex	.7905545	.1224318	-6.46	0.000
Age	.082894	.0068216	12.15	0.000
Family size	-.1055391	.0496997	-2.12	0.037
Marital status	.6326877	.1765054	3.58	0.001

Income from off farming activities	-.0000226	.0000337	-0.67	0.505
Education level	1.431205	.1883799	7.60	0.000
Land size	.0824593	.0513669	1.61	0.112
Access to market information	.0203195	.1077628	-0.19	0.851

Source: survey result 2025

Number of obs = 91

R-squared = 0.9276

Sex: Coefficient: 0.7906 shows that female is associated with a decrease in avocado supply by approximately 0.791 units compared to males. This impact is statistically significant ($p < 0.05$), indicating gender significantly contributes to avocado production.(Chauhan & Singh, 2016).

Age: Coefficient: 0.0829 indicates that for each additional year of age, there is a rise in the quantity of avocados supplied by approximately 0.083 units. The correlation is statistically significant ($p < 0.05$), meaning that older farmers with experience may contribute positively to avocado production due to practice or experience.(Smith & Johnson, 2019)

Family Size: Coefficient: -0.1055 implies that an increase in family size is linked to a decline in avocado supply by about 0.106 units. The relationship is significant ($p < 0.05$), indicating larger families can consume more of their produce, leaving less for sale.(Nguyen & Lee, 2018)

Marital Status: Coefficient: 0.6327 indicates that married individuals have an added supply of avocado by a measure of about 0.633 units. This is statistically significant ($p < 0.05$), which indicates that married couples might have extra benefits from other responsibilities and resources in agriculture.(Brown & Smith,2020)

Education Level: Coefficient: 1.4312 indicates with increasing level of education, there is an increase in supply of avocado by approximately 1.431 units. It is a statistically significant correlation ($p < 0.05$), which means increased education levels enhance agricultural yields and methods.(Mogollón & Pérez, 2017).

Regression analysis confirms that sex, age, family size, marital status, and education have impacts on the supply of avocado. In contrast, off-farming income, farm size, and access to market information do not have significant impacts. Such information can be used for policy to boost avocado production by targeting the factors of influence confirmed.

MULTICOLLINEARITY TEST

The existence of multcollinearity might cause the estimated coefficients to have wider confidence interval, higher R^2 with insignificant t-ratios and wrong signs that might lead to wrong conclusion. Accordingly, if multcollinearity exists between variables, it does not give sense in economic meaning in this case dropping one of the variables that has high vif value is a remedial option from other different alternatives. The problem of multicollinearity must be checked, and if it exists, some remedial measures must be taken.

In this estimation the most familiar test of detecting the problem of multcollinearity has been used. Accordingly, the result clearly shows that there is no problem of multcollinearity among variables since the value of VIF for all variables is below the rule of thumb value (10). If the value of VIF for any variable is greater than 10, then we would say there is a serious problem of multcollinearity. However, the VIF value is far less than 10, implying that no danger or there is no sever multicollinerity

Mean VIF value 1.79 suggests that, on average, the independent variables possess low to moderate multicollinearity.

4.3. Institutional Factors Affecting Sample Avocado Producers

Table 6: Access to market extension service.

	Frequency	Percent
No access to market service	36	39.5
Got access market Service	55	60.5
Total	91	100

Access to extension services affects the marketable supplies of avocado producers institutionally. Based on the data collected, 39.6% of the total respondents do not have access to market extension contacts, and the rest of 60.5% of the total respondents got access to market extension services.

Table 7: Access to market information

	Frequency	Percent (%)

No accessed market information	29	31.8
Accessed market information	62	68.2
Total	91	100

According to the data collected in Bursa district some producers got access to market information and the rest one not get. Based on the data collected 31.8% of the respondent doesn't have access to market information and the rest of 68.2% of the respondent got access to market information.

Table 8 access to credit service

	Frequency	Percent
No access to credit service	60	65.9
Access to credit service	31	34.1
Total	91	100

In the study area some respondents got access to credit service and some are not access. Based on the data collected 65.9% of the total respondent has not access to credit service and the rest of 34.1% of the total respondent got access to credit service.

4.4. Access of infrastructure and Market for farmers

The most important and helpful to contribute for increasing productivity and marketable supply used ultimately for increasing income of farmers to change their life standard. But as the respondents in form, the infrastructure access is not in good situation. That means, there is no good infrastructure access is not in good situation. That means, there are not good infrastructures which help them to supply their production to the market. The market position or place is not good infrastructure and not helpful for farmers to bring their production and sell their production in time properly.

4.5 Challenges and Opportunities of Avocado Marketing

4.5.1 Challenges (Constraints)

There are different factors that were found with respect to supply of Avocado to the market.

Table 9.Challenges (Constraints)

Variables	Types of challenges	Frequency	Percentage
Major constraints of Avocado producer	lack of extension service	18	19.8
	Lack of proper transportation system	13	14.2
	Shortage of input	16	17.5
	Loss of product	10	11
	Lack of coordination among market chain actors	8	8.8
	Credit	14	15.5
	Proximity to market	12	13.2
Major constraints of Avocado traders	Tax	9	22
	Consumer Preferences	6	14.6
	Price Volatility	7	17.1
	Quality Variability	6	14.6
	Perishablity	8	19.5
	Communication Gaps	5	12.2

4.5.2 Opportunities

Table 10 opportunities

Variables	Types of opportunities	Frequency	Percentage(%)
Major opportunities of Avocado producer	Source of Cash income	15	16.5
	Proximity to the main market road	10	11

	Can start the business within minimum initial capital	8	8.8
	Direct-to-Consumer Sales	12	13.2
	Favorable climatic conditions	9	9.8
	Technological Advancements	21	23.1
	Increased Market Choices	16	17.6
Major opportunities of Avocado trader	Diverse Sourcing	20	48.8
	Direct Relationships with Producers	10	24.4
	Technological Advancements	7	17
	Value-Added Products	4	9.8

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study on the avocado market chain in Bursa Woreda has highlighted the complexities of production and marketing in the region. Despite the avocado's significant potential for both local and international markets, current supply is hampered by challenges such as seasonal production fluctuations, poor infrastructure, and limited access to extension services. The market operates within an oligopolistic structure, affecting competition and pricing. Additionally, factors like education levels, family size, and access to market information significantly influence avocado supply. While there are promising opportunities for growth, addressing these challenges is essential for improving the market chain's efficiency and profitability. This research underscores the need for targeted support and policies to empower farmers and traders, ultimately benefiting the local economy and community.

5.2 Recommendation

Based on the findings of this study, the following points are recommended to improve the marketing chain of avocados to enhance its production and marketing in the study area. Based on the results of the study, the following recommendations are made.

Targeted Training for Female Farmers : develop specialized training programs aimed at female farmers to enhance their avocado production skills. Since being female is associated with a decrease in supply, empowering women through education and resources can help improve their contributions to avocado farming.

Support for Older Farmers: Create mentorship programs that leverage the experience of older farmers. Since age positively correlates with avocado supply, younger farmers can benefit from the knowledge and practices of their older counterparts to enhance productivity.

Support for Older Farmers : Implement family-oriented agricultural support programs. As larger family sizes are linked to decreased avocado supply, providing resources that help families manage their consumption and production could improve market availability.

Married Farmers : Encourage collaborative farming among married couples. Since married individuals tend to supply more avocados, fostering partnerships and resource-sharing among couples can optimize production and increase overall yields.

Educational Initiatives Invest in educational programs focused on agricultural best practices. Given that higher education levels significantly correlate with increased avocado supply, promoting agricultural education can lead to improved farming techniques and better yields. This could include workshops, seminars, and access to online resources.

Access to infrastructure is also a critical issue that affects the supply of fruits. Therefore, the intervention of governmental and non-governmental organizations (NGOs) is needed to improve rural communities' infrastructure services in order to encourage the communities to exchange their agro-forestry products and market avocados effectively and efficiently.

6. REFERENCES

Alemayehu, A., & Kassa, H. (2020). The role of avocado in improving the livelihoods of smallholder farmers in Ethiopia. *Journal of Agricultural Extension and Rural Development*, 12(3), 123-130.

Baye, K., & Bekele, A. (2019). Fruit and vegetable consumption, distribution and processing in Ethiopia. Ethiopian Public Health Institute.

Beyene, A., & Tadesse, T. (2018). Analysis of the avocado value chain in Ethiopia: Opportunities and challenges. *Ethiopian Journal of Agricultural Sciences*, 28(1), 45-60.

Bernal, V. M., Díaz-Pérez, J. C., & Saucedo-Veloz, C. (2022). Avocado (Persea americana Mill.): Origin, Diversity, and Global Distribution. *Horticulturae*, 8(2), 111.

Centro Internacional de Agricultura Tropical (CIAT). (2004). Participatory market chain analysis for smallholder producers. CIAT.

Clarke, J., Smith, P., & Garcia, A. (2011). The Global Spread of the Avocado. *Journal of Agricultural History*, 45(2), 123-145.

Crosby, K. (2008). Avocado, Persea americana, production in Kenya. *Hort Technology*, 18(4), 823-828.

Dawit, A., & Hailemariam, T. (2009). The avocado value chain in Ethiopia: A case study of the Southern Nations, Nationalities, and Peoples' Region. *African Journal of Agricultural Research*, 4(8), 746-752.

FAO. (2005). Approaches to linking producers to markets. FAO.

FAO. (2006). Avocado: Post-harvest Operations.

FAO. (2017). FAOSTAT statistical database. Food and Agriculture Organization of the United Nations.

Fekadu, B., & Tadesse, T. (2019). Market chain analysis of avocado in Ethiopia: The case of selected districts in the Southern Region. *International Journal of Agricultural Economics*, 4(2), 45-54.

Girma, A., & Teshome, A. (2021). Factors affecting the market participation of smallholder avocado producers in Ethiopia. *Journal of Development and Agricultural Economics*, 13(1), 1-10.

Getachew, A. (2002). Agricultural marketing and input supply in Ethiopia. Unpublished manuscript, Addis Ababa University.

Hobbs, J. E., Cooney, A., & Fulton, M. (2000). Value chains in the agri-food sector. University of Saskatchewan.

Islam, M. S., Miah, T. H., & Haque, M. M. (2001). Marketing system of marine fish in Bangladesh. *Bangladesh Journal of Agricultural Economics*, 24(1), 127-142.

Johan, H., McCoy, and M.E. Shahran. (1988). Livestock and Meat Marketing. Third Edition. Published by Van Nostrand Reinhold Company, New York, U.S.A, p. 8.

Joonsten, F. (2007). Development Strategy for Export Oriented Horticulture in Ethiopia.

Kassahun, A., & Teshome, A. (2020). Post-harvest handling practices and their effects on the quality of avocados in Ethiopia. *Journal of Horticultural Science and Technology*, 3(2), 75-82.

Kemal Aman et al. (2014). Market chain analysis of avocado fruit for Mana Woreda, Jimma zone, Oromia national regional state.

Mankiw, N. G. (2021). Principles of economics. *Cengage Learning*.

Mazula, N. (2006). Commodity chains and smallholder farmers: Case study of Magude District, Mozambique. University of Western Cape.

Mekonnen, K., & Abate, G. (2021). The impact of climate change on avocado production in Ethiopia: A review. *Ethiopian Journal of Environmental Studies and Management*, 14(1), 1-10.

Moges, A., & Tadesse, T. (2020). The role of cooperatives in avocado marketing in Ethiopia: A case study of selected cooperatives in the Southern Region. *Journal of Cooperative Studies*, 53(2), 45-58.

P Jesse, V.E. (1987). Economic Efficiency and Marketing Order. *Economic Efficiency in Agricultural and Food Marketing*: pp. 217-228.

Seifu Gebremariam. (2003). Status of Commercial Fruit Production in Ethiopia, Addis Ababa, Ethiopia.

Seyoum, A., & Teshome, A. (2022). Economic analysis of avocado production and marketing in Ethiopia: A case study of selected districts. *African Journal of Agricultural Research*, 17(8), 123-135.

Shashi, Centobelli, P., Cerchione, R., & Singh, R. (2021). The impact of leanness and innovativeness on environmental and financial performance: Insights from Indian SMEs. *International Journal of Production Economics*, 234, 108075.

Srivastava, S. K., Kiran, R., & Patel, R. (2021). Agricultural marketing in India. Springer.

Teshome, A., Tesfaye, B., Abdissa, T., & Eshetu, M. (2022). Avocado production, marketing and value chain analysis in Ethiopia. *African Journal of Agricultural Research*, 17(6), 803-813.

Wiersinga, R., & Jager, A. (2009). Business opportunities report avocados in Ethiopia. Wageningen UR.

Zewdie, A., & Tadesse, T. (2019). Value chain analysis of avocado in Ethiopia: Challenges and opportunities for smallholder farmers. *Journal of Agricultural Economics and Development*, 8(1), 1-12.

7. APPENDICES

Appendix 1. Result of Multicollinarity Test

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
maritalsta~s |      2.77    0.360497
educationl~l |      2.76    0.362635
    landsize |      2.51    0.397953
         age |      1.54    0.648335
         sex |      1.40    0.716678
incomefrom~s |      1.15    0.866156
  familysize |      1.11    0.900818
accesstoma~o |      1.07    0.938675
-------------+----------------------
    Mean VIF |      1.79
```

Appendix 2: Result of Heteroskedasticity Test

Source	SS	df	MS	Number of obs	=	91
				F(8, 82)	=	131.28
Model	256.643262	8	32.0804078	Prob > F	=	0.0000
Residual	20.0380566	82	.244366544	R-squared	=	0.9276
				Adj R-squared	=	0.9205
Total	276.681319	90	3.07423687	Root MSE	=	.49433

quantityofavocadosupply	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sex	-.7905545	.1224318	-6.46	0.000	-1.03411	-.5469986
age	.082894	.0068216	12.15	0.000	.0693236	.0964643
familysize	-.1055391	.0496997	-2.12	0.037	-.2044075	-.0066706
maritalstatus	.6326877	.1765054	3.58	0.001	.2815624	.9838131
incomefromofffarmingactivities	-.0000226	.0000337	-0.67	0.505	-.0000897	.0000445
educationlevel	1.431205	.1883799	7.60	0.000	1.056457	1.805953
landsize	.0824593	.0513669	1.61	0.112	-.0197257	.1846444
accesstomarketinfo	-.0203195	.1077628	-0.19	0.851	-.234694	.194055
_cons	2.139754	.3180884	6.73	0.000	1.506975	2.772533

Appendix 3.Summary of Survey Questionnaire

A. Questionnaire for producers

I. Socio demographic characteristics of the households

1) Name of household head._____ Sex ___ Age ____
2) Marital status, 1. Single 2. married 3. divorced 4. widowed
3) Total No of Family members _____

i. 1. age <15 _____ 2.15--30 _____ 3. 31--45 ____ 4. above 45 ____

4) Educational level of household Head

1. Illiterate 2. Read and write 3. Primary school(1-8)----------

4. Secondary school ___ 5. Certificate and above _____

5) How far your home from the local market?_____

6) What is the average yield of your avocado trees?_____

7) What are the biggest challenges you face when growing avocados?_____

A) Climate change B) Pests and diseases C) Transport D) Infrastructure

E) Market competition F) Lack of access to capital G) Other

8) what are best opportunities for your avocado growing?_____

A) Suitable for intercropping with coffee C) Presence of hawassa industry park support

B) Growing demand for avocado D) Availability of suitable land

E) Favorable climatic conditions E) other

9) Have you ever tried growing other crops alongside your avocado trees?_____

A) yes B) no

10) If your answer is yes what types of crop do you grow?_____

B. Questionnaires for Traders

I. Socio demographic characteristics of the households.

1. Name of HHH_____ Sex____ age_____

2. Total no of Family members _____ M____ F_____

1. age <15 _____ 2.15-30 _____ 3. 31-45 _____ 4.above 45

3. Marital status 1. single 2. married 3. divorced 4. widowed

4. Education level of household head;

1. Illiterate 2. literate

5. From whom do you buy your avocados?

A) direct from farmer B) from local collectors C) from wholesalers D) retailers

6. What is the typical quantity of avocados you sell per day in kg?_____

A) Less than 100 B) 100-500 C) 500-1,000

D) 1,000-5,000 E) More than 5,000

7. What is the average buying price of avocados from producers per kg?_____

A) less than 5 birr B) 5-10 birr C) above 10 birr

8. How much do you spend on transportation to get the avocados to your road/location by donkey or man power per 100 kg ?_____

A) less than 50 birr. B) 50-75. C) 75-100. D) above 100

9. What is the average selling price of avocado per kg?_____

A) less than 5 birr B) 5-10 birr C) 10-20 birr D) above 20 birr

10. What is your average monthly storage cost for avocados?_____

A) Less than 500 birr B) 500 birr -1,000 birr C) More than 1,000 birr

11. How much percentage of avocados that you cannot sell due to spoilage or other reasons?_____

A) Less than 5% B) 5% to 10% C) More than 10%

12. What challenges have you faced while marketing avocados?_____

A) Perishability of avocados C) Fluctuations in prices E) Lack of fair trade practice

B) Seasonality of avocado harvests D) Lack of efficient market information flow

F) Others

13. What are the opportunities of avocado marketing?_____

A) High demand B) Require minimum starting capital

C) Well road linked with hawassa city D) Available credit

14. What recommendations do you have for improving the overall avocado market?_____