

**ANALYSIS OF GROUNDNUT MARKET PERFORMANCE IN  
LIMMU SEKA DISTRICT, JIMMA ZONE**

**MSc. THESIS**

**BY**

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Seka District, Jimma Zone**

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in Agri-Business and Value Chain Management*

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**March 2020**

**Jimma, Ethiopia**

## **DEDICATION**

I dedicate this thesis manuscript to the whole family members especially to my father and my mother, for growing me up with love and being a constant source of inspiration as without their effort and encouragement the thesis work would not be completed.

## **STATEMENT OF AUTHOR**

First of all I would like to announce that this thesis is my original work and that all sources of materials used in this thesis have been duly acknowledged. This thesis will be submitted in partial fulfillment of the requirements for M.Sc. degree at Jimma University College of agriculture and veterinary medicine and will be deposited in the university library to be made available to borrowers under the rule of the library. I solemnly declare that this thesis will not be submitted to any other institution anywhere for the award of any academic degree, diploma or certificate. Brief quotations from this thesis are allowable without special permission provided that accurate acknowledgement of source is made. Request for permissions for extensive quotation from manuscript in whole or in part may be granted by the head of department of agricultural economics and Agribusiness and Value Chain Management or the dean of the school of graduate studies based on his or her judgment when the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

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## **BIOGRAPHICAL SKETCH**

The author was born in Limmu Seka Woreda, Atnago kebele, Jimma zone, Oromia region in November, 1975. He attended his elementary education at Atnago primary school; secondary education at Limu-Genet senior secondary school. After that, he joined Alpha University College in October, 2006 and graduated with B.Sc. Degree in economics in June, 2009. After his graduation, he joined Limu Seka Finance and Economic Development office as Department head of budget and planning for five years. In January 2012, he joined Techno serve and worked as a business advisor for four years. After that, he joined Keta Muduga Union as export manager from October 2016 till now. Finally, he joined the School of graduate Studies of Jimma University in 2015 for attended his MSC degree in Agribusiness and value chain management.

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## LIST OF ACRONYMS AND ABBREVIATIONS

|         |  |
|---------|--|
| ARD     | Agriculture and Rural Development  |
| AMA     | American Marketing Association   |
| CIAT    | Centro International de Agricultural Tropical                                      |
| CSA     | Central Statistical Agency   |
| DCG     | Dry lands Coordination Group   |
| EIAR    | Ethiopian Institute of Agricultural Research                                       |
| FAO     | Food and Agriculture Organization of the United Nations                            |
| FAOSTAT | Food and Agricultural Organization Statistics Food Security and Livelihood project |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics                   |
| IFAD    | International Fund for Agricultural Development                                    |
| IITA    | International Institute for Tropical Agriculture                                   |
| ILO     | International Labor Organization   |
| ITC     | International Trade Centre   |
| LWF     | Lutheran World Federation  |
| RUTFs   | Ready to Use Therapeutic Food  |
| SID     | Support Integrated Development   |
| SNNP    | Southern Nations Nationalities and People  |
| SSA     | Sub-Saharan Africa   |
| TLII    | Tropical Legumes Project   |
| UNDP    | United Nations Development Programme   |

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## ABSTRACT

*Groundnut is an important crop from the perspective of food and nutrition security of poor smallholder farmers in developing countries, where it is grown widely. It also generates considerable cash income for several small scale producers and foreign exchange earnings through export for Ethiopia. If market performance is inefficient, the sustainability of the production becomes questionable and, as a result, a steady supply of a commodity for the market may become difficult. Few studies have been done on groundnut profitability but adequate information on performance of groundnut market is not well identified. Hence this study analyse groundnut market performance in Limmuseka District, Oromia National Regional State, Ethiopia. The overall objective of the study was to evaluate groundnut market performance. Primary data were collected from 147groundnut producers and 40 trader sand consumers using semi structured questionnaire with three stage sampling technique in 2018/19. The data were analyzed using descriptive statistics; gross-margin analysis, measures of market concentration and regression analysis. Concentration ratios (4-firm) were employed in measuring the market concentration structure of groundnut market and multiple linear regression models was employed to identify factors that affect groundnut quantity supplied. Results revealed that the market structure for groundnut is strongly oligopolistic with Concentration ratios (4-firm) of 73.02%. Groundnut marketing is profitable in the study area though in the face of few constraints. Result of multiple linear regression model revealed that family size, land size, market information, average lagged price and extension contact were the main determinants of market supply of groundnut at household level. The presence of suitable soil and agro ecology Experience of producers' in groundnut production & marketing, Willingness of producers' to use new groundnut production & marketing technology, Availability of market demand throughout the year, Availability of supportive government policies and government offices organized at all levels to implement the policies are the main opportunity for groundnut producers in the study area. Howe ever some constraints like using local seeds, Disease and pest, groundnut weeds, unfair weighing scale, deduction, and quoting of lower prices than actual Poor market access roads that makes movement of produce to markets expensive etc the main problems for groundnut producers in the study area. Using high Yielding variety of groundnut, Access to Market Information Promoting and strengthening of cooperatives, strengthening extension contact, Proper utilization of land resource the main recommendation for concerned bodies.*

**Key words:** Groundnut, Marketing performance, Marketing margin, Multiple linear regressions,

# 1. INTRODUCTION

## 1.1. Background of the Study

Groundnut (*Arachis hypogaea*) is a major oil seed crop grown in about 100 countries covering 26.4 million hectares with a total of 36.1 million tons of nuts in shell. The major producing countries are China, India, Nigeria, U.S.A., Indonesia and Sudan (ICRISAT, 2007). As explained by Wood roof (2005), groundnut contains 48-50% oil and 26-28% protein, and is a rich source of dietary fiber, minerals, and vitamins. It is the 13th most important food crop of the world. It is the world's most important source of edible oil and the 3rd most important source of vegetable protein. Developing countries constitute 97% of the global area and 94% of the global production of this crop. The production of groundnut is concentrated in Asia and Africa (56% and 40% of the global area and 68% and 25% of the global production, respectively) (ICRISAT, 2007).

Groundnut is widely cultivated as staple food in tropical and sub-tropical developing countries. However, there is scope for export as most of the groundnut producers do not grow groundnut varieties best adapted to specific export market use. However, yields per hectare are low in Africa because of a combination of factors: unreliable rains, mostly non irrigated cultures, traditional farming with little mechanization, outbursts of pests and diseases and use of low yielding seed varieties and increased cultivation on marginal land (ITF, 2001).

Agriculture is the mainstay of the Ethiopian economy and contributes 41.4% of the country's Gross Domestic Product (GDP), 83.9% of the total exports, and 80% of all employment in the country (Matousa *et al.*, 2013). The growth of Ethiopia and food security is driven by agriculture which is the foundation of the country's economy and contributes 15 to 17 percent of the government expenditures. Groundnut is an important crop from the perspective of food and nutrition security of poor smallholder farmers in developing countries, where it is grown widely (Nedumaran *et al.*, 2015). It also generates considerable cash income for several small scale producers and foreign exchange earnings through export for Ethiopia (Geleta *et al.*, 2007).

Under rain-fed conditions, it is generally grown and is utilized for extracting cooking oil, and also for confectionary in Ethiopia (Kudama, 2013). Besides, this crop helps small scale producers in getting significant revenue and also helps Ethiopia in getting foreign money earnings through export (Geleta *et al.*, 2007). Lumpy' nut (groundnut nutritional product used for treating malnutrition in children below 2 years) marketing in countries like Ethiopia benefits groundnut producers (Pazderka and Emmott, 2010).

The role of markets in reducing poverty and achieving food security in rural areas has been getting increasing attention from development scholars and institutions. Strong links to markets for poor rural producers are essential in increasing agricultural production, generating economic growth and reducing hunger and poverty. Improving market links creates a virtuous circle by boosting productivity, increasing incomes and strengthening food security. Better access by small producers to domestic and international markets means that they can reliably sell more products at higher prices. This, in turn, encourages farmers to invest in their own businesses, increase quantity produced, improve quality and diversify their produce (IFAD, 2011).

The lowland areas of Ethiopia have considerable potential for increased oil crop production including groundnut. The estimated production area and yield of groundnut in Ethiopia in 2010/2011 cropping season were 49,603 hectares and 716,068 quintals, respectively, the largest groundnut production areas are found in Oromiya (32967.8 ha), Benshangul-Gumuz (9968.73 ha), SNNPR (635.04 ha) and in Amhara (344.57 ha) regional states (CSA, 2011). Somalia and Gambela regional states also produce a considerable amount of groundnuts. As (FAO, 2009) groundnut production hold fourth rank in volume among oil seeds produced in the country. Currently ground nut is also cultivated in Jimma zone especially in Limmu Seka, Limukossa and Nonobenja Weredas. According to Limmu Seka Wereda Agricultural office report of 2006-2009 ground nut production was increased and farmers were cultivated more than their previous land. Hence, yearly production of groundnut was increased as average by 150 kg per ha. According to (Wijnands *et al.*, 2009) reports markets are an important for economic growth and sustainable development of a given country, but, emphases in development policies in agrarian countries especially Ethiopia have usually been placed on increasing agricultural production to serve as a base for rural



development. In the absence of well-functioning markets, agricultural production can experience several drawbacks. Under traditional market structure and conduct which is characterized by failure to reflect market signals, absence of quality, excessive intermediaries and imperfect competition, it is difficult to exploit the opportunities from groundnut production. Therefore, it is necessary to study the market chain from production to end consumers to identify gaps. Therefore, this study was aimed at evaluation of groundnut market performance.

According to Jimma Zone Agricultural office report of 2017/18 in Jimma Zone, particularly Limmuseka Wereda have good potential in ground nut crop production for which smallholder farming have diversified from staple food subsistence production into more market oriented and higher value commodities. Despite this production potentials and importance of ground nut crop for the country as well as the study area, there is a limited study with regard to the performance and determinants of groundnut market.

## **1.2. Statement of the Problem**

One of the fascinating features of agricultural and food marketing systems in market economies is that their structure is determined or influenced by a wide range of factors. These include economic, demographic, social, legal and climatic factors as well as the characteristics of the raw materials and consumer products. Effective marketing systems are shaped by these influences and will tend to change as these underlying influences change. Thus they are often well adjusted to the environment in which they operate. Sometimes, however, it is possible to intervene in the marketing process in ways that improve the functioning of the system or accelerate changes that are already underway (Lawrence, 2003). Thus, if market performance is inefficient, the sustainability of the production become questionable and, as a result, a steady supply of a commodity for the market may become difficult. The crucial role of market-oriented agriculture and, hence, an efficient agricultural marketing system, is also apparent from the pivotal role that agricultural growth must play in driving overall economic growth of Ethiopia.

Market chain analysis is useful studies because it helps us determine whether the market system through which households sell their surplus products or services, and through which they access basic staples and production inputs is efficient and reliable (i.e. competitive). It helps to construct framework at the point when we wish to understand marketing constraints and opportunities for households either for items sold or items they need to purchase (Spilsbury *et al.*, 2004).

Farmers in the study area revealed that, the increases of the price of groundnut steadily make groundnut production profitable. Nevertheless, farmers do not directly deal with buyers about the price because of the interference of brokers. The establishment of big groundnut factories for paste production in Addis Ababa is an opportunity for groundnut producers to sell their products at reasonable prices and they may get training in managing groundnut production, post-harvest handling and other supports as planned by Hilina Enriched Food Processing Factory (Alemayehu *et al.*, 2014). This shows that without efficient marketing system, farmers can not enjoy the opportunity of getting fair price and this will affect the desire to produce more at household level. Thereby, it will be difficult to satisfy the required demand of the big groundnut factories else were in the country. Recently, few studies have been done on groundnut profitability but adequate information on performance of groundnut market is not well identified. Hence, this study attempts to fill this gap by generating adequate information to make an intervention in the sector and to generate reasonable benefit for all the stakeholders involved in production and marketing of the product.

### **1.3. Research Questions**

This study was answered the following research questions:

1. What is the role of market actors looks like in Limmu Seka district?
2. What is the structure, conduct and performance of groundnut markets looks like in the study area?
3. What are the major determinants of groundnut marketed supply in the study area?
4. What are the major challenges and opportunities of groundnut production and marketing in the study area?

### **1.4. Objective of the Study**

#### **1.4.1. General Objective**

The general aim of this study was to examine the ground nut marketing performance in the Limmu Seka district.

#### **1.4.2. Specific Objectives of the Study**

Specifically, the study was achieved the following objectives,

1. To identify groundnut market actors and their role in the study area,
2. To Examine the structure, conduct and performance of groundnut markets,
3. To analyze the major determinants of groundnut marketed supply in the study area and
4. To identify the major constraints and opportunities of groundnut production and marketing.

### **1.5 Scope and limitation of the Study**

Attempting to analyze the entire ground nut markets are an impossible action given the limited resources and human skill. Thus, the research was narrow down to focus on the production area of Limmu Seka district. The study limit to ground nut crop only for its increasing coverage and the marketing problem it used to face. The study was delimited to those variables mentioned in specific objective. Different market levels, determinants of marketed supply, constraints of marketing, discovery and bargaining characteristics of producers, buying and selling strategies, and traders' behavior in the marketing process will be studied.

## **1.6 Significance of the Study**

The primary significance of the study is to all actors in the marketing system. Analysis of the whole system and identifying clearly the challenges will benefit policy makers and implementers in indicating the area of advantage for what should be done to improve ground nut marketing. The study will also help ground nut farmers to identifying marketing constraints that hinder their production of groundnut; it also helps traders, to have accessed of marketing information.

## **1.7 Organization of the Study**

This study is structured in five chapters. Chapter one is the introduction and provides the background of the study, problem statement, research objectives, research questions, significance of the study, scope and limitation of the study as well as the organization of the study. The next main section reviews detailed literature on relevant topics on the study of production, marketing, and performance of groundnut. The third chapter deals with the research methodology starting with description of the study *area and sample technique and method of data collection, analytical tools and definition of variables*. Chapter four explains results and discussions, including data presentation on respondents' socio economic characteristics, and econometric analysis of detriments groundnut marketed supply of market. The final section obviously summarizes the findings of the study with some recommendations

## 2. LITERATURE REVIEW

### 2.1. Definition and basic Concept of agricultural Market

The term marketing has a variety of meanings by various stake holders. All the concepts reflect the different aspects of the marketing process. Basically marketing may be defined as the process of satisfying humane needs by bringing products to people in the proper form and at proper time and place. Marketing has economic value because it gives form, time, and place utility to products and services Thus; marketing consists of efforts that affect transfer of ownership and creating time, place, and form utility to commodities. Time utility is added to commodities by storage. Place utility is added to commodities through transportation services. Finally, form utility is added to a commodity through the processing function. By the creation of these utilities, marketers are productive and add value to raw agricultural commodities that consumers want. Because consumption is the purpose and end result of production and marketing activities, it is necessary for marketers to focus their activities toward satisfying consumer wants and needs. It is difficult to successfully market something consumers do not desire, even with massive promotional endeavors. Production is incomplete without marketing, especially in modern economies. For example, the fundamental economic questions (what to produce, how to produce, how to distribute, how to adapt to the changing environment, and how to promote progress) cannot be addressed (Amsalu, 2015).

According to American Marketing Association Board of Directors approved new definition for marketing on June 2013 as ‘Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.’

**A marketing chain:** Defines the flow of commodities from producers to consumers that brings into place economic agents who perform complementary functions with the aim of satisfying both producers and consumers (Islam *et al.*, 2001). A marketing chain may link both formal and informal market agents.

**Marketable Surplus:** The concept of marketable surplus is very important for the development of markets. Marketable surplus is different in different commodities. Marketable

surplus is a surplus which is available for sale after meeting i) family needs ii) seed requirement iii) kind wages iv) gifts to relatives and friends etc. In the case of food grains surpluses are generally low. They vary from zero (with small and marginal farmers) to 70-80 percent with large farmers and in surplus areas. In general, marketable surpluses in food grains are in the range of 45 to 50%. In cash crops and in those commodities which are raw materials of industry, surpluses are 80-100 %. In fruits and vegetables, which are grown on commercial scale, surpluses are above 90%. Thus, for the commodities which have large surpluses markets have to be well-organized and efficient ones (Ronald, 2006).

**Marketing Costs:** Theoretically, the analysis of marketing costs and margins would reveal how efficient pricing in domestic markets is, and gives an indication of the importance of transaction costs facing traders, farmers and intermediaries (middlemen) and help in identifying and solving bottleneck thus assist in reducing marketing costs. Understanding the concept of market costs and margins requires a priori understanding of the marketing chains or channels under question and a prescription of how long is it. Marketing costs are incurred when commodities move from the farm to the final market, whether they are moved by farmers, intermediaries, cooperatives, marketing boards, wholesalers, retailers or exporters. With increased urbanization and industrialization, marketing costs tend to increase relatively to the farm gate price received by the farmer, i.e. the product moves greater distances, through more intermediaries and is more sophisticated in its packaging. Marketing costs can also reflect the state of a country's development in that as standards of living increase, smaller proportions of income are expended on raw products of the farm and greater proportions are spent on additional and improved marketing services. Increasing the value added means, among other things, that more people in developed countries are involved in marketing agricultural products than in producing them.

Marketing costs include labor, transport, packaging, containers, rent, utilities (water and energy), and advertising, selling expenses, depreciation allowances and interest charges. Marketing costs vary from commodity to commodity and product to product. There are several factors that individually or collectively account for these differences. These include: the more waste the greater the proportion of customers' expenditure which goes on marketing costs the more perishable the product the greater the marketing costs the more processing of

the commodity the greater the marketing costs the greater the amount of produce handling and transportation the greater the marketing costs FAO May 2011.

**Marketing margin:** Margins represent the price charged for one or a collection of marketing services. For example, the difference between producer and consumer prices is the amount charged for all the marketing services rendered between production and consumption, including buying, bulking, transports, storage, processing, etc. In this circumstance, the market margins are the difference between prices at two market levels. Marketing margin is defined as the difference between the price paid by consumers and that obtained by producers. It is also called the ‘Farm-Retail Price Spread’. Margins can be calculated all along the market chain and each margin reflects the value added at that level of the market chain (FEWS NET 2009-b). The aim of the marketing margin analysis is to show the relative importance of the marketing costs in order to reveal real differences between and among markets (inter-market variations) to allow further market integration. The target remains the producer’s share that revolves and gears up the production and marketing mechanisms for the achievement of food security and social welfare objectives. For the purpose of this study, a distinction is made between Gross Market Margins and Price Spread. Funke (2006) cited a difference between spreads and margins. Price Spread is the difference between the retail price and the farm value of a product. Thus, the spread represents the payment of all costs involved after the product has left the farm plus the profit margins. Marketing margins on the other hand, represent the difference between the sales of a given product and the costs of the product sold. In this case the margin is typically the profit made under a given market FAO May 2011.

**Marketed surplus:** Marketed surplus of agriculture produce plays a vital role in the economic development of country. Increasing marketed surplus in an economy is one of the significant indices of economic development. Marketed surplus as compared to marketable surplus is a practical concept and refers to that quantity of produce which is actually marketed by the producer. In other words, marketed surplus is that quantity of the produce which the producer farmer actually sells in the market irrespective of his requirements for family consumption, farm needs, feeds, payment in kind and others. The concept of “Marketable

surplus” is subjective because the feature of retention by the farmer is a matter of subjective guess. On the other hand, concept of “Marketed surplus” is objective, because it refers specifically to the actual marketed quantity i.e. to the actual quantity which sells in the market. It thus, does not take into account the kind of disposal patterns of the farm households. Thus, marketed surplus includes ‘distress sale’ by farmers (majority small and marginal) owing to cash needs for discharging their immediate liabilities and for purchasing of all necessities for the family. At later, he may repurchase some quantity of the same product from the market to meet his domestic needs. However, it excludes quantity of storage done in expectation of realization of higher prices. Marketed surplus can be less, equal or even more than the marketable surplus and each of these situations has its economic and social implications. Marketed surplus will be higher when the farmer retains less of the produce than his requirements for home and farm needs. This would be true especially for small and marginal farmers. This situation of selling more than the marketable surplus is being termed as distress or forced sell. This happens under pressure of meeting immediate cash needs. In such situation, farmer either purchase grains at later stage or takes grain loan to meet his requirements. The marketed surplus is less than the marketable surplus when farmer has financial capacity and go for storage of some of his surplus produces in expectation of securing higher prices. The most important factors determining the size of marketed surplus are nature of crops, size of output, consumption habit and size of family, size of holdings, level of debt and economic status of producer; price level of the produce commodities and availability of storage facilities. The increase in production of agriculture commodities is a pre-requisite for increasing marketable and marketed surplus. However, surplus does not rise automatically as a result of an increase in productivity V. D. Shah Manish Makwana April 2013.

## **2.2. History of Marketing**

### **2.2.1 Appearance of market squares**

With the advent of village life, following the development of agriculture, specialized village craftspeople appeared. Eventually, a block of land in each village came to be designed as a market square their farmers brought products for display and sale to the villagers, and



craftspeople showed their wares to farmers or others to buy. In some places of the civilized world and in most African countries, such markets operate still today (CIAT, 2004).

### **2.2.2. Regional and national market centers**

The modern counterpart of the market square is the regional small shopping centers, housing a wide array of dealers and products under one vast roof. Auction markets and stock exchanges are other modern forms of centralized trading. The auction market is often used for agricultural products: farmers bring their products for examination by buyers, and the merchandize is sold through open bidding. At commodity exchanges, buyers and sellers call or wire in their orders. Commodities are brought or sold in a specified contract unit amounts for present or future delivery. Product quantity must conform to trading rules. Sales representatives on the trading floor match the buy and sell offers, at either stipulated or bargained prices, to consummate sales (Branson and Norvell, 1983).

## **2.3. 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.

### **2.3.1. The functional Approach**

This approach takes all the basic marketing activities that have to be performed in the agricultural commodities and at the marketing of inputs in to agricultural production. The functional approach study the different activities performed in changing the farm product into the product desired by the consumers. These activities are called functions (Cramer and Jensen, 1997). Physical distribution (i.e. functions) and economic activity (i.e. buying, selling) are two dimensions of marketing carried out by institutions or people. An analysis of these two dimensions of agricultural marketing is intimately linked to the institutions created by law or by corporate standards or simply by established procedure, that have emerged as a result of the social and economic relation between the participants in the marketing process (middlemen, consumers, and producers).

And this approach helps to compare cost and benefits of different functions. The widely accepted functions are: a) exchange (buying and selling), b) physical (processing, storage, and transportation), and c) facilitating (standardization, financing, risk bearing, and market information). Most of these functions are performed in the marketing of nearly all commodities.

### **2.3.2. The System (Institutional) Approach**

It is concerned with the number and kind of business firms that perform the marketing task. That means, it covers all market participants (producer, assembler, transporter, wholesaler, retailer and consumer). This approach includes market stabilization agencies boards of foreign trade, supermarket chains, wholesaler or retailer networks, a town's central market, or agreements between producers and millers. The effectiveness of marketing institutions depends on the involvement of the relevant people (Mendoza, 1995).

### **2.3.3. The Commodity (Individual) Approach**

In a commodity approach, a specific commodity or groups of commodities are taken and the functions and institutions involved in the marketing process are analyzed. This approach focuses on what is being done to the product after its transfer from its original production place to the consumer (Kohls and Uhl, 1985). It helps to pinpoint the specific marketing problems of each commodity as well as improvement measures. The approach follows the commodity along the path between producer and consumer and is concerned with describing what is done and how the commodity could be handled more efficiently. It is extremely useful to the person who is interested in only one product since it does allow in depth analyses (Jemaet *al.*, 2011). In a commodity subsystem approach, the institutional analysis is based on the identification of the major marketing channels. This approach includes the analysis of marketing costs and margins. Therefore, in this study commodity approach was used to evaluate groundnut market chain.

## **2.4. Role of Market on Economic Growth**

The role of markets in reducing poverty and achieving food security in rural areas has been getting increasing attention from development scholars and institutions. Strong links to markets for poor rural producers are essential in increasing agricultural production, generating economic growth and reducing hunger and poverty. Improving these links creates a virtuous circle by boosting productivity, increasing incomes and strengthening food security (IFAD, 2011).

In the realm of economic growth, markets may provide the incentives to profit maximizing participants to develop new technologies, products, resources of supply, new markets and methods on exploiting them. The role of marketing in development process could be summarized as follows: the marketing system channels the net capital surplus out of agricultural sector which could be used to strength the development of industry, infrastructure and social service; it integrates the farming community in to the market economy through communication and exchange; the provision of secured market outlets which encourage producers to increase marketable surplus and diversify production; and marketing becomes and remains as one of the most important economic sub-sector during the whole process of development (CIAT, 2004).

World groundnut production rose from 14 million tons in 1961 to 47 million tons in 2006, representing an annual growth rate of 3.2%. The average annual production growth rate was 2.1 per cent for the period 1961-1989, while it was 4.8 per cent for the 1990-2006 period. According to FAO statistics of 2008, global groundnut harvested area increased at an annual rate of 0.7%, from about 17 million hectares in 1961 to about 22 million hectares in 2006. The observed area and production annual growth rates were, however, characterized by high year to year variations.

Groundnut production accounted for 6 percent and 57.6 percent of the world oilseed production and pulses production, respectively, during 1990-2006. Although groundnut is produced worldwide, China and India dominate the global production. China is the world's single largest groundnut producer, accounting for 35 percent (in the period 1990-2006),

followed by India, Indonesia and Nigeria. The Asian region produces about 70% of the world's groundnut followed by the sub-Saharan Africa (19%), United States of America (8%), and North Africa (2.8%). In Africa, Sudan, Senegal, Congo, Chad, Ghana and Burkina Faso remain the major groundnut producers (FAOSTAT, 2008).

The worldwide groundnut yield grew at an annual rate of 1.4% from about 800 kg/ha in 1961 to about 1.6 tons/ha in 2006. Most of the groundnut production growth during this period resulted from yield growth, as the growth in harvested area stayed unchanged. There are significant productivity differences among regions due to differences in technological development, access to key modern inputs and irrigation, and farm management practices. Productivity is highest in the United States of America, China and Argentina. The bulk of agricultural production in Africa consists primarily of food crops with agricultural export crops accounting for less than 10 percent of total production. Food crops for the family, produced mainly by women, have however performed very poorly in most countries with cereal yields in Africa, in the mid-2000s for example, being less than half those in South Asia and one-third those in Latin America. This has been due to several factors including land rights for women and the environment in which farmers operate in Africa which, in general, has made them risk averse. Africa also lags behind other Regions in the percentage of cropland irrigated, fertilizer use, and labor and land productivity per worker (Nicolaset *al.*, 2012).

#### **2.4.1. Global groundnut market**

Groundnuts are processed into a number of products for the domestic and export markets.

The main categories are:

- 1) Processed products: oil and cake/meal,
- 2) Raw groundnuts: with shell and unshelled, and
- 3) Prepared nuts: coated or otherwise processed for confectionary goods or into paste/peanut butter.

Future global demand for groundnuts appears to be secure due to snack food markets in North America and the EU as well as in countries where groundnuts are a key ingredient in food preparation, such as Mediterranean, Indian and Asian cuisines. Further, there is also high

demand from local and regional markets in countries of production as groundnuts are a staple food and key source of protein for a number of SSA and Asian countries. In fact, within recent years, Ready to Use Therapeutic Food (RUTFs) has been made with a groundnut base and used to treat severe malnutrition in young children. This offers yet another opportunity for groundnut producers to sell their product and also have a positive impact on the life and development of the domestic population (ARD, 2008).

Exports for shelled groundnuts grew at a modest annual rate of 0.3% for the period 1961-2006. The exports rose from 1.2 million tons in 1961 to about 1.5 million tons in 1968 and then declined until 1980 when exports started rising again. In 2006, about 1 million tons of shelled groundnuts were exported. The annual average growth rate of shelled groundnut exports was negative between 1961 and 1978 whereas it was positive during the period 1979-2006. The main exporters of groundnut for the period 2001-2006 were China, India, the United States, and Argentina. European countries, Indonesia, and Canada were major groundnut importers (FAO, 2008).

## **2.5. Groundnut Production and Marketing in Ethiopia**

In Ethiopia, groundnut area grew by 47.99% between 2009/2010 and 2013/2014 cropping season, while actual production grew by 58.58% over the same period of cropping season. It is mainly produced in Hararghe area. But, Gamogofa, Ilubabor, Gojam, Shewa, Wello, Sidamo, and Wellega are also producing groundnut. The estimated production area and production of groundnut in Ethiopia in 2013/2014 cropping season were 79,947.44 hectares and 1,120,887.24 quintals, respectively, in 2011/2012 the estimated and production of groundnut in Ethiopia was 64,476.52 hectares and 1,0347,88 quintals respectively and the production and the production area of groundnut in Ethiopia also estimated 49,602.97 hectares and 71, 606,.84 quintals in 2010/2011. The top three groundnut producer regional states are Oromiya (682,939.31 qt), Benshangul-Gumuz (307,097.97 qt) and Somalia (55,585 qt) (CSA, 2014). In Eastern Hararghe, especially in low lands like Fedis, Babile and Atnago; groundnut is produced widely by significant number of farmers and is a source of income for a large number of small-scale farmers.

## **2.6. Review on Empirical Studies on Marketing of groundnut**

Kindie (2007) identified the major factors that affect the marketable supply of sesame of farm households at Metema district. He examined the relationship of marketable supply and the determinant factors using Ordinary Least Squares (OLS). Factors that he has identified to affect the household level of sesame marketable supply include; yield of sesame, number of oxen, number of foreign languages spoken by the head of the household, modern inputs used, sesame area and time of selling influenced positively the marketable supply as expected. Geremew (2012) examined factors affecting sesame market supply in Diga district based on the Hausman test and the post estimation tests of Durbin-Wu-Hausman endogeneity test. According to his study the quantity of sesame marketed is likely endogenous variable to the model, which may result in inefficient estimation result. Basically such problems arise if some factors explaining the variation in the dependent variable (in this case, total income generated from sesame sale) could also effect of the potential repressors (e.g. quantity of sesame marketed).

According to Gezahagn (2013), groundnut production in Eastern Hararghe is found to be profitable activity. However, presence of still unexploited potential to increase yield and returns for groundnut farm households was indicated in this source. Accordingly, the Cobb-Douglas production function result indicated positive relationship between groundnut output and quantity of seed, labor and livestock. Moreover, existence of allocative inefficiency of resources use was indicated in the same source.

The study made by (Alemayehu et al., 2014) shows that Groundnut production in Ethiopia is found to be constrained by several biotic and abiotic factors like critical moisture stress especially during flowering and after, lack of improved varieties, inappropriate production and post-harvest practices, diseases affecting both above and underground parts of the plant like aflatoxin which affect the produce in the field and at various levels from harvest to market.

According to (Fredu et al., 2015). The supply of the country's groundnut is mostly constrained by different factors which constrain the supply at different supply chain levels

like farmers, traders, processors and exporters. Lack of capital, competition and low quality of groundnut, low or irregular quantity of groundnut supply, poor road infrastructure, low profit margin, government restriction or high taxes and lack of transportation are challenging groundnut producers in Ethiopia. (Wijnands et al., 2007 studied that inefficient marketing, improper cleaning and sometimes poor contract discipline led opportunities for oilseed export not fully exploited. Alemayehu Chala, Berhanu Abate, Mulugeta Taye, Abdi Mohammed, Tameru Alemu, and Helge, S. were stated in their studies 12 explanatory variables were hypothesized as factors affecting household level of groundnut marketed surplus. The hypothesized variables were age of the household heads, farming experience of the household heads, sex of household heads, educational level of household heads, family size, access to market information, access to credit, distance to nearest market, land size of groundnut, livestock ownership, extension contact, and access to off/non-farm income to affect groundnut marketed surplus. Based on the OLS estimation result, six variables (age, distance, farming experience, extension, credit, and size of land allocated) influenced marketed surplus of groundnut significantly.

Age of household is positively affected groundnut marketed surplus at 1% significance level as hypothesized. As age of household increase by one year, the quantity of groundnut supplied to the market increase by 0.05 quintal keeping other variables constant. Older farmers could make better production decision of allocating large size of land and supply larger volume of the product to the market than younger aged farmers. The result is consistent with Wubshet (2010) who found that, age of household head has positive effect on coffee supply. Distance to nearest market affected groundnut marketed surplus significantly and negatively as hypothesized at 10% significant level. As the proximity from the farm to market increases by one hour, the volume of groundnut supplied to the market decreases by 1.51 quintals. The farther from the market the higher would be the transportation cost and opportunity time spent so that it makes marketed surplus of groundnut to be supplied in smaller quantity. Farming experience of the household had significant positive effect on groundnut marketed surplus at 5% significance level. Accordingly, the study resulted that a one year increase of farming experience would increase the quantity of groundnut supplied to the market by 0.14 quintal keeping other variables constant. Farmer with longer year farming

experience might be equipped with the use of production inputs, produce and supply more to the market than less experienced farmers.

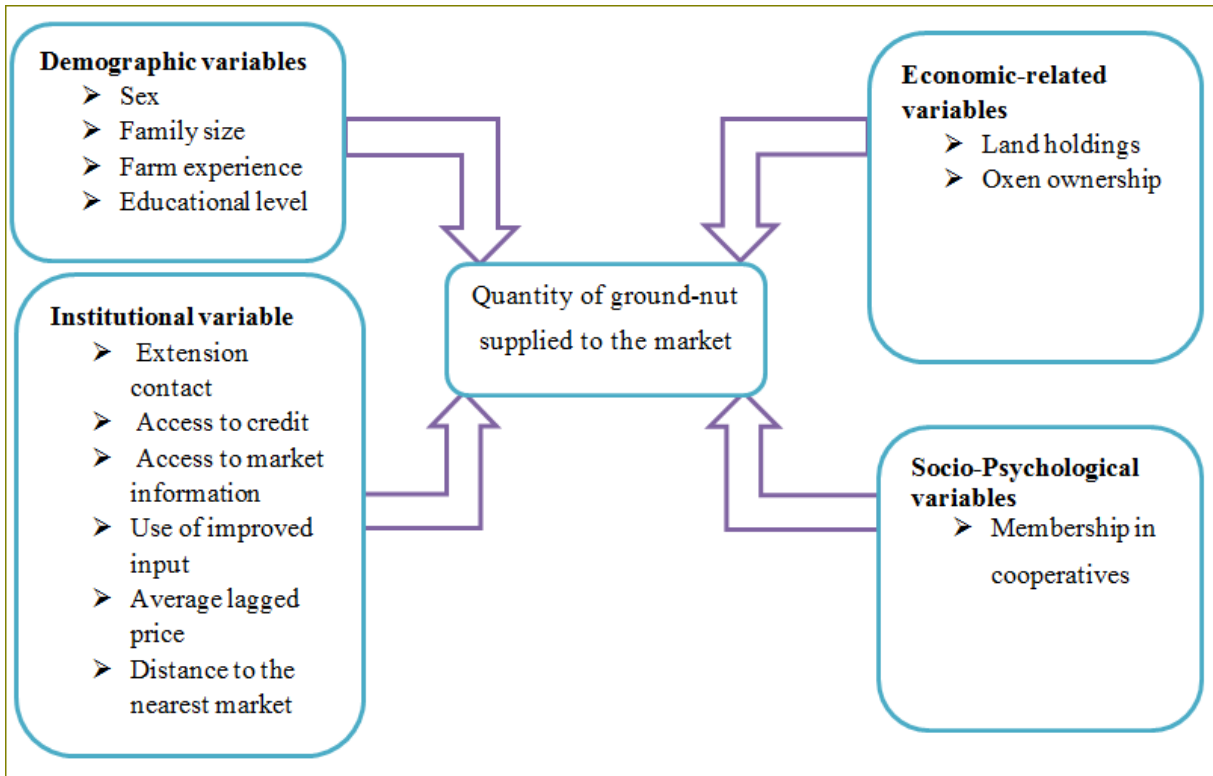
Also according to Wubshet (2010) Access to extension service as expected, has significant positive effect on the marketed surplus of groundnut at 10% significance level. This implies that farmers accessed extension service would increase the groundnut marketed surplus by 0.65 quintal per year than who did not access with extension services. This could be attributed to the fact that extension service would provide up to date information regarding agricultural technologies that might improve productivity and therefore increase the marketed surplus. The result of the study indicated that access to credit has significant positive effect on the groundnut marketed surplus as expected at 5% significance level. This implies that farmers who got credit access would increase the Size of land allocated for groundnut has significant positive effect on the quantity of groundnut supplied to the market at 1% significance level. Allocating large size of land for groundnut production increases the product thereby increases the amount supplied to market. The model output predicted that as the household's allocation of land for groundnut production increases by one hectare, the marketed surplus of groundnut would increase by 5.14 quintal keeping other variables constant.

The above mentioned studies provide useful information on how to analyze organization and functioning of markets. Based on the above literature review, this study attempted to give current information on analysis of groundnut market performance and the determinants of groundnut market supply at Limu Seka Wored.



## 2.7 Conceptual frame work

Below figure 1 shows conceptual framework of the present study that shows the hypothesized relationship between dependent and independent variables.



**Figure 1:** Conceptual framework of study

### 3. RESEARCH METHODOLOGY

This chapter deals with the research methodology that used in this study which includes description of the study area, data types and sources, sampling techniques and sample size determination, methods of data collection and analysis.

#### 3.1. Description of the Study Area

Limmu Seka is one of the woredas in the Oromia Region, which is 109km far from Jimma zone. It is named in part after the former kingdom of Limmu-Enariya, whose territories included the area this woreda now covers. Limmu Seka woreda is part of Jimma zone, bordered on the Southwest by the Didessa River which separates it from the IlluAbbabor, on the Northwest by the East Wellega on the Northeast by the Gibe River which separates it from the West Shewa Zone, and on the Southeast by Limmu kosa. The administrative center of the woreda is Atnago; other towns in the Woreda include Seka, Koma, Dame, Mero. According to the Limu Seka Woreda agricultural office data, the Woreda covers an area of approximately 1,694 km<sup>2</sup>. The total populations of the Woreda are 189,463, of whom 95,869 are men and 93,594 are women (LWOANR, 2015).

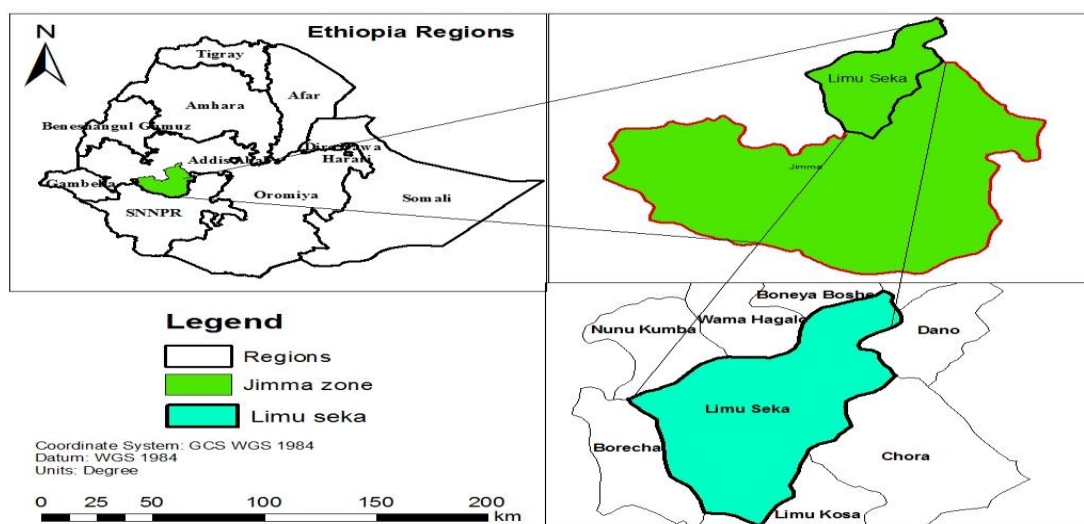


Figure 2: Geographical location of the study area

Source: Adapted from Ethiopian map

The agro-ecology is characterized by 13% highland and 55% mid-highland and 32% lowland. The altitude of the Woreda is between 1,400 and 2,200 meters above sea level (masl). In the woreda, 10,241 hectares (ha) are currently covered by forest and bush, while 38,874 ha are used for crop production. There are two distinct seasons in Limu Seka: the rainy season starting in late March and ending in October, and the dry season occurring during November to early March. The rainfall is often in excess of 1,800 mm per annum. Moderately dense vegetation coverage includes forests, bushes, scrublands and grasslands. Natural resources such as stone, sand, charcoal, timber and wild animals are also found in Limu Seka Woreda has 173,884cattle, 14,357 sheep, 47,909 goats and 5,600 mules.

The Woreda potential for agriculture is estimated to be around 42,704 ha of land. In terms of cereal crops, sorghum covers 21,538 ha and maize covers 1,266 ha. Coffee is the major cash crop produced by the majority of farmers as the main source of income and covers more than 12,964 ha of land and groundnut is the second cash crop next to coffee and covers more than 4361 ha of land and sesame, vegetables (potato, cabbage, beetroot, and carrot), *khat*, fruits and sweet potato (LWoANR, 2015).

### **3.2. Data Type, Sources and Methods of Data Collection**

Quantitative and qualitative data types were collected from both primary and secondary data sources for the study. Primary data was collected from sample household head farmers and traders using semi-structured questionnaire. The discussions made with key informant farmers, traders, and agricultural and relevant experts from government organizations. Checklist was used to guide the informal discussion conducted to generate data that could not be collected from individual interviews. Pre-testing was done in one Kebele (koma), this is not included in the randomly selected Kebeles. During the pre-testing, the questionnaire was assessed for its clarity, understandability and completeness. In addition, the sensitivity of the subject matter and pattern of response was assessed and a correction was done accordingly. Five group discussions undertaken to have general overlook about the current situation of production and marketing opportunities and problems, availabilities and functioning of services like credit, extension contact, groundnut price information and transportation.

### 3.2. Sampling Procedure and sample size determination

For this study, in order to select a representative sample a two-stage random sampling technique was implemented to select groundnut producer kebeles and sample farm households. In the first stage, with the consultation of Woreda agricultural experts and development agents, out of 10 groundnut producing kebeles of Limu Seka Woreda 5 groundnut producer kebeles were purposively selected based on the potential of production. In the second stage, using the list of households in the sampled kebeles, 147 sample farmers were selected at 92% confidence of interval based on the total numbers sesame producer selected from three kebeles using the following formulas

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

Where;

$n$  = is number of respondent farmers or sample size

$N$  = is the total number of population of the study (groundnut farmer in five kebeles) (1)

$e$  = margin of errors at 8%

$$n = \frac{N}{1+N(e)^2} \quad n = \frac{2569}{1+2569(0.08)^2} \quad n = 147$$

Accordingly, 147 respondents were selected from the total population of 2569 representing five (5) kebeles of groundnut producers. One hundred forty-seven (147) of respondents were from the five (5) kebeles by applying proportional stratified random sampling. Because it gives proportional representative sample sizes and reduces sampling bias (Gay 2009).

$(x/N \times n)$ ;

Where  $x$  is the population in the kebele

$N$  is the total population of the study area

$n$  is the sample size of the study

Therefore, the allocation of the sample size from stratum is as follows

Table 1: Number of sampled groundnut producer households

| Groundnut producer kebeles | Population number of groundnut producer in the kebele | Sample size |
|----------------------------|---|-------------|
| Dame                       | 608   | 34          |
| Deneba                     | 564   | 32          |
| Chunge                     | 562   | 32          |
| Merochisa                  | 347   | 20          |
| Maribo                     | 488   | 29          |
| Total                      | 2569  | 147         |

**Source:** Survey result, 2019

For this study, 34 traders and 6 consumers were purposively selected and data. The sites for the trader surveys were market towns in which a good sample of groundnut traders existed. The lists of traders including, retailers, wholesalers and consumers were obtained from the respective District Office of Trade and Market Development (TMD) can be summarized according to the following tables.

Table 2. Sample distribution of groundnut traders and consumers

| Market town | Retailer | Wholesaler | consumer | Total |
|-------------|----------|------------|----------|-------|
| Deneba      | 5        | 2          | 2        | 9     |
| Dame        | 5        | 2          | 4        | 11    |
| Atnago      | 5        | 3          | 5        | 13    |
| MerocChisa  | 3        | 2          | 2        | 7     |
| Total       | 18       | 9          | 13       | 40    |

### 3.4. Method of Data Analysis

In this study descriptive statistics and econometric models were used to analyze the data. Descriptive statistics method of data analysis refers to the use of ratios, percentages, means, variances and standard deviations in the process of examining and describing marketing functions, farm household characteristics, resource ownership, institutional services, market and trader's characteristics. The S-C-P model was examined the causal relationships between market structure, conduct, and performance. To study the function of markets, many

researchers have applied "structure -conduct-performance"/SCP/ paradigm. This study was employed S-C-P model to evaluate groundnut market.

### 3.4.3. Market performance

Marketing efficiency is essentially the degree of market performance. It is defined as having the following two major components: (i) the effectiveness with which a marketing service would be performed and (ii) the effect on the costs and the method of performing the service on production and consumption. These are the most important because the satisfaction of the consumer at the lowest possible cost must go hand in hand with maintenance of a high volume of farm output (Ramakumar, 2001).

The two approaches to measure marketing performance are: **marketing margin and the analysis of market channel efficiency**. A large number of studies have analyzed the marketing margins for different types of commodities to examine the performance of agricultural products marketing (Wohlengenant and Mullen, 1987; Holt,1993; Schroeter and Azlam, 1995) and (Sexton, Zharg and Chalfant, 2005 as cited in Jema, 2008) argued that even though variations in the margin over time might be attributable to marginal marketing costs under perfect competition, additional factors such as seasonality, technological changes, and sales volume may also explain the variations in the margin

#### Marketing margin

The marketing margin is a measure of the percentage of price that is paid by the consumer that is maintained by each agent in the marketing chain. These include the total gross marketing margin, producer's gross marketing margin, and net marketing margin. Algebraically gross margin can be expressed as:

$$TGMM = \frac{\text{End buyer price} - \text{First seller price}}{\text{End buyer price}} * 100 \quad (2)$$

Where,  $TGMM$  = Total gross marketing margin

$$GMMp = \frac{\text{End buyer price} - \text{Total Gross Marketing Margin}}{\text{End buyer price}} * 100 \quad (3)$$

Where:

$GMMp$  = the producer's marketing margins (Producers share)

#### 3.4.4. Determinants of farmers groundnut marketed supply

Multiple linear regression models was employed due to the nature of the product that groundnut is cash crop in the area and all sampled farmers participate in marketing of groundnut. Therefore, to identify factors that affect the volume of groundnut supplied to the market for the study the Multiple linear regression model was used. Following Green (2003), the multiple linear regression models is specified as  $Y=f$  (price, groundnut yield, access to market information, access to extension services, education level, experience in groundnut, sex, access to credit, age, marital status, etc). The econometric model specification of supply function in matrix notation is estimated by:

$$Y = \beta'X + U \quad (4)$$

Where:

$Y$  = quantity of groundnut supplied to market;  $X$  = a vector of explanatory variables;  $\beta'$  = a vector of estimated coefficient of the explanatory variables, and  $U$  = disturbance term

STATA software package version 13 was employed to estimate linear regression model.

#### 3.4.5. Statistical and specification tests

Before executing the final model regressions, all the hypothesized explanatory variables were checked for the existence of statistical problems such as multicollinearity problems. Multicollinearity is a situation that arises where there is strong linear association among the explanatory variables included in the model (Maddalla, 1992). Prior to running the double hurdle model, an assessment for an existence of multicollinearity was checked. Accordingly a separate test for continuous and dummy variables included in the model was undertaken using VIF and contingency coefficient procedures respectively. According to Maddalla (1992), VIF was computed by using the following formula:

$$VIF = \frac{1}{1 - R_i^2} \quad (5)$$

Where,  $R_i^2$  is the squared multiple correlation coefficient between  $x_i$  and the other explanatory variables. As a rule of thumb a VIF value of more than 10 indicates high correlation among explanatory variables, while a VIF value less than 10 indicates weak

association among explanatory variables (Gujarati, 2004). Similarly, the existence of association among discrete explanatory variables was tested using contingency coefficient method by using the formula shown below. A value of 0.75 or more indicates stronger associations while a value less than 0.75 indicates weak association among explanatory variables.

$$CC = \sqrt{\frac{x^2}{n + x^2}} \quad (6)$$

Where:  $CC$  = Contingency Coefficient,  $n$  = sample size, and  $x^2$  is chi square value.

### 3.4.6. Definition of variables and working hypothesis

Before proceeding to the detail analysis part, it is very indispensable to define and describe the variables, which are employed for the analysis. By reviewing the existing theory and past findings of empirical research, a number of independent variables were chosen to be included in each model explained previously. Descriptions of these variables, their measurements, and expected hypotheses to have influence on the volume of supply are explained as follows:

#### 3.4.6.1. Dependent variable

**Quantity of groundnut supplied to the Market (Y):** Is the dependent variable that represents the actual supply of groundnut by household to the market in 2018/19 harvest seasons which was measure in quintals.

#### 3.4.6.2. Independent Variables

**Education (X<sub>1</sub>):** This is a continuous variable measured using formal schooling of the household head and hypothesized to affect market supply of groundnut positively. It took value of 1 if the household attend any formal education and 0 otherwise. The study by (Gezahagn. 2013) supported education has a positive effect on groundnet sale quantity per household per year. This is due to the fact that a farmer with good knowledge can adopt better practices than illiterates that would increase market supply. Hence, it is hypothesized that level of education and marketed supply related positively.

**Sex(X<sub>2</sub>):** This is dummy variable that took a value of one if the household head is male and zero otherwise. Both men and women participate in groundnut production. Male households is expected to have a better tendency than female household in groundnut production and



marketing due to shortage of labour force, less bargaining power and lack of capital by female headed households. Gezahagn, 2010 and Gezahagn. 2013 conducted Economics of Groundnut Production in East Hararghe Zone of Oromia Regional State, Ethiopia argued male headed household had a significant and positive effect on the households' volume of ground net marketed. It is hypothesized that male households and ground net marketed supply are positively related.

**Experience in groundnut production ( $X_3$ ):** This is a continuous variable, it refers to the number of years the farmer engaged in groundnut production and is expected to influence supply of groundnut to the market positively. As farmers got more experience in groundnut, the probability of increasing production and hence supply would be higher. Moreover, farmers with longer farm experience will have a cumulative knowledge of the entire farming environment. The study by Alemnew (2010), Gezahagn, 2010 and Gezahagn. 2013 showed that as farmer's experience in groundnet production increases the amount supplied to market increases.

**Family Size ( $X_4$ ):** It is a continuous variable, measured in man equivalent that is the availability of active labor force in the household. Since production is the function of labor, availability of labor is assumed to have positive relation with volume of supply. However, family size is expected to have positive impact on volume of sales, but larger family size requires larger amounts for consumption, reducing market supply. In this context family size is expected to have positive or negative impact on volume of sale.

**Size of Land allocation for ground nut production ( $X_5$ ):** This variable is a continuous variable measured in terms of hectares of land a farmer has and will expected to affect the household level of groundnut supply positively. This is because, producers who own large area of land can produce more than a producer who own less area of land and thus supply more to the market. According to report of Bosen (2008), Gezahagn (2010), and Gezahagn (2013), area of land covered by cotton affected market supply of cotton positively and significantly.

**Oxen Ownership ( $X_6$ ):** This is a continuous variable measured in the number of oxen owned by the head of the household and expected to affect the supply of groundnut positively. This is

due to the fact that producers who own oxen are more likely to till in time than producers who own no oxen

**Use of Improved seeds of groundnut (X<sub>7</sub>):** This was dummy variable taking a value of 1 if a farmer use improved input and 0 otherwise. This variable was expected to affect the household market supply of groundnut positively due to the fact that if a producer use improved seed and fertilizers, this increase production and productivity thus, increase the market supply. Bucheykiet *al.* (2008), Gezahagn (2010), and Gezahagn (2013) showed that low yield variety and drought were serious groundnut productivity problems in Tanzania.

**Number of extension contact (X<sub>8</sub>):** This is a continuous variable that will be measured by number of days that household head has contact with a development agent. Extension is expected to have positive effect for quantity supplied through its stimulation of production and productivity. Farmers that have frequently contact with DAs may have better access to information and could adopt better technology that would increase their market supply of groundnut. According to Muhammed, (2011), the higher access to the extension service, the more likely that farmer adopts new technology and innovation which increase productivity there by market supply.

**Distance to the nearest Market (X<sub>9</sub>):** It is a continuous variable measured in kms from the household residence to the market center. The closer to the market the lesser would be the transportation cost and time spent and the more would be market supply. As stated in Gezahagn (2010), and Gezahagn (2013), if the households found in near vicinity to the market they get marketed inputs information easily.

**Access to credit(X<sub>10</sub>):** Access to credit is measured as a dummy variable taking value of 1 if the farmer has access to credit for groundnut production and 0 otherwise. This variable was expected to influence the market supply of groundnut positively on the assumption that access to credit improves the financial capacity of farmers to buy modern inputs, thereby increasing production which is reflected in the market supply of groundnuts.

Diagne and Zeller (2001) observe that access to credit also reduces the opportunity costs of capital-intensive assets relative to family labour, thus encouraging labor saving technologies and raising labor productivity.

**Access to Market Information ( $X_{11}$ ):** It is a dummy variable taking value of 1 if the farmer has access to market information for groundnut production and 0 otherwise. Farmers marketing decisions are based on market price information, and poorly integrated markets may convey inaccurate price information, leading to inefficient product movement. Therefore, it is hypothesized that market information is positively related to market surplus. According to Gezahagn (2010) and Gezahagn (2013) market information access was found to influence marketable supply of groundnut positively.

**Average lagged price of groundnut ( $X_{13}$ ):** It is a continuous variable which measures annual average lagged price per quintal in the year 2015/2016 and is expected to affect the market supply of groundnut positively. Because, prices of 2015/16 can stimulate production, and thus market supply of groundnut for 2015/16. The study by Wolelaw (2005), Gezahagn (2010), and Gezahagn (2013) also revealed that the lagged price had also affected marketable supply of groundnut.

**Membership in a Cooperative ( $X_{14}$ ):** It is a dummy variable which can take a value of 1 if the farmer is a member of a cooperative and 0 otherwise. This variable will have expected to affect the supply of groundnut positively. Because, producers who are members of cooperatives are likely to get inputs and market information, thus could supply more groundnuts to the market than non-members. Conley and Udry (2003) as cited in Phillips (2008) shown farmers adjustment of their activities in line with the successful experimentation of others, such that social networks which are important for information sharing and consequently for adoption to occur.

Table 3: Description of dependent and independent variables

| Independent variables          | Measurement                             | Type of variable | Expected sign |
|--------------------------------|---|------------------|---------------|
| Sex                            | Male=1 otherwise=0                      | Dummy            | +             |
| Education                      | Number of schooling years               | Continuous       | +             |
| Experience in farming          | Number of years                         | Continuous       | +             |
| Family size                    | Number in man equivalent                | Continuous       | -ve/          |
| Size of land holding           | Number of hectares                      | Continuous       | +             |
| Oxen ownership                 | Number of oxen                          | Continuous       | +             |
| Use of improved inputs         | Use improved input=1Otherwise = 0       | Dummy            | +             |
| Number of extension contact    | Number of contact days                  | Continuous       | +             |
| Distance to the nearest Market | Distance in kilometers                  | Continuous       | +             |
| Credit taken                   | Amount of birr                          | Continuous       | +             |
| Access to market information   | Have market information=1Otherwise=0    | Dummy            | +             |
| Average lagged price           | Annual average lagged price per quintal | Continuous       | +             |
| Membership in a Cooperative    | Member =1Otherwise=0                    | Dummy            | +             |

## 4. RESULTS AND DISCUSSION

This chapter presents the findings of descriptive and econometric analyses. The descriptive analysis made use of tools such as mean, percentage and standard deviation to describe the general characteristics of the sampled farm households and groundnut traders, and the groundnut marketing chains. The econometric analysis is used to identify factors that affect market supply of groundnut in Limuseka District. The role of the actors in the marketing chain, the Structure\_ Conduct\_ Performance of groundnut market, and major constraints and opportunities in groundnut marketing are analyzed and discussed.

### 4.1. Descriptive Analyses

#### 4.1.1. Demographic characteristic of sample groundnut producers

In an agrarian society, household members are the major source of labor for agricultural activities. The household characteristics such as age, sex, marital status, educational levels etc. differ from one household to the others. Out of the 147 sample respondents 121 (82.3 percent) were males and the rest 26 (17.7 percent) were female. Most of the time women become the head of the household when she is divorced, her husband has health problems which prevent him to be the head of the family, or if she lost her husband. With regard to marital status from the total sample respondents 73.47 per cent, 14.28 per cent and 12.24 per cent were married, divorced and widow respectively.

Table 4: Description of demographic characters for groundnut producers for categorical variables

| N=147                 |                  | Frequency | Per cent |
|-----------------------|------------------|-----------|----------|
| <b>Sex</b>            | Male             | 121       | 82.3     |
|                       | Female           | 26        | 17.7     |
| <b>Education</b>      | Illiterate       | 95        | 64.6     |
|                       | read and write   | 28        | 19.04    |
|                       | formal education | 24        | 16.4     |
| <b>Marital status</b> | Married          | 108       | 73.47    |
|                       | Divorced         | 21        | 14.28    |
|                       | Widows           | 18        | 12.24    |

Source: Survey result, 2019

Educational background of the sample household heads is an important variable that determines the readiness of household heads to accept new technologies. With respect to the educational status, 64.6 per cent of the sample respondents were illiterate, 19.04 per cent can read and write through informal schooling like religious school and 16.4 per cent of the sample respondents were those who attended formal schooling. As the data shows most of the respondents were not give attention to education and almost more than half of the groundnut farmers didn't have formal education. The average age of sample respondent was 35.27 years of sample households ranged from 19 to 64 years. The data shows that average family size of sample households being 7 members and the household size ranged from 1 to 14 members.

Table 5: Description of demographic characters for groundnut producers for continuous variables

| <b>Variable</b> | <b>n</b> | <b>Minimum</b> | <b>Maximum</b> | <b>Mean</b> |
|-----------------|----------|----------------|----------------|-------------|
| Age             | 147      | 19             | 64             | 35.27       |
| Family size     | 147      | 1              | 14             | 7.02        |

Source: Survey result, 2019

The level of groundnut production experience is taken to be the number of years that an individual was continuously engaged in groundnut production. Majority (65%) of the respondents had about 8-16 years of groundnut production experience (Table 6). The average years of experience for the entire sample households was about 16 years, the minimum and maximum years of experience was 2 and 17 years, respectively. This may show that groundnut production started in the study area some many years ago.

Table 6: Distribution of respondents by groundnut production experience

| Variable             | Year category | Dame   | Deneba | Chunge | Merochisa | Maribo |
|----------------------|---------------|--------|--------|--------|-----------|--------|
|                      |               | (n=34) | (n=32) | (n=32) | (n=20)    | (n=29) |
|                      |               | %      | %      | %      | %         | %      |
| Groundnut experience | 2-8 years     | 34.5   | 12.09  | 18.41  | 32.24     | 44.07  |
|                      | 8-16 years    | 52.62  | 49.02  | 22.95  | 39.11     | 32.26  |
|                      | 17-25years    | 12.88  | 21.03  | 32.83  | 19.91     | 15.24  |
|                      | >25           | -      | 17.86  | 25.81  | 8.74      | 8.43   |

Source: Survey result, 2019

#### 4.1.2. Farm size and land allocation pattern

Farm size refers to the total area of farm land that a farm household owned in hectares. In agriculture, land is one of the major factors of production. The availability of large farm size enables the owner to earn more agricultural output, which implies more income from agricultural activities. As elsewhere in Ethiopia the farmers in the study area have a land fragmented and small in size. The farm size of sample households varies from 0.25 to 3.125 hectares with an average farm holding of 1.01 hectare.

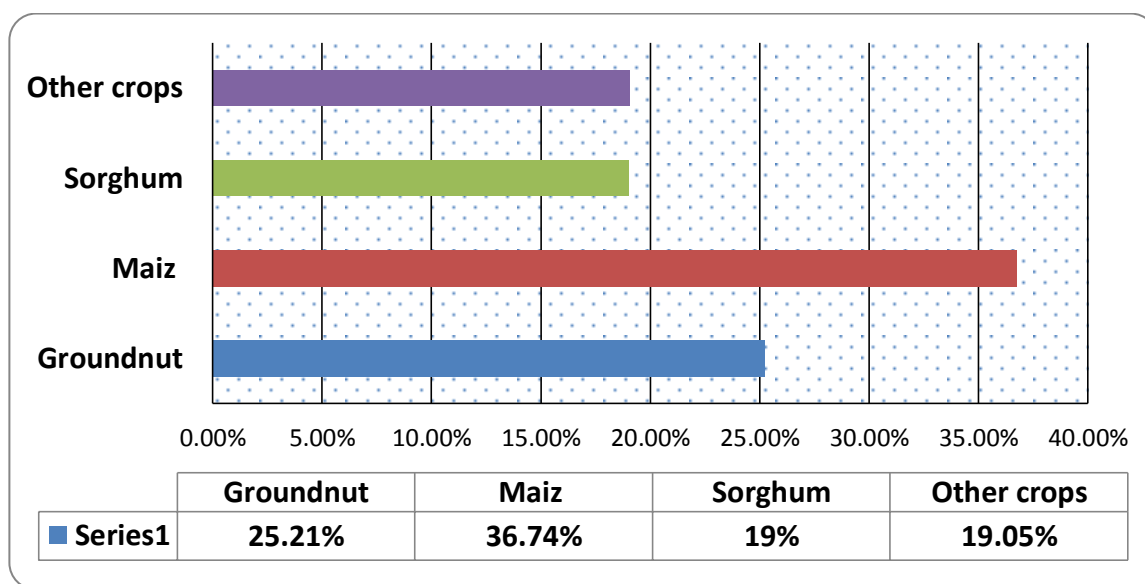


Figure 3. Land allocation pattern

Farmers’ grow groundnut as pure stand either as mono-crop or rotated with sorghum and maize, and intercropped groundnut with sorghum, maize. The cultivated land allocation pattern of the households in Limmuseka District in 2018/ 2019. As the figure indicates, the highest proportion of the cultivated land in the cropping year was allocated for maize. The figure shows that the land allocated for groundnut in the production year was 25.21 per cent with an average allocation of 0.33 hectares. About 36.74 per cent of cultivated land was allocated to maize. Sorghum shares about 19 per cent of the cultivated land. The remaining 19.05 present of cultivated land was allocated for different crops

#### 4.1.3. Livestock production

Livestock are important assets for rural households in Ethiopia. They are used as sources of food, draft power, income, and energy. Moreover, livestock are indices of wealth and prestige in rural areas. All of the sample households reared livestock, which constitute oxen, cows, sheep, goat and donkey. Oxen are the main source of farm power for ploughing, harrowing, and threshing. About 87.74 per cent of the total respondents owned oxen. The sample respondents on average have a pair of oxen (1.84).

Table 7: Number of livestock owned by the sample respondents on average

| <b>Types</b>    | <b>Mean</b> |
|-----------------|-------------|
| Oxen            | 1.84        |
| Cow             | 1.92        |
| Donkey          | 1.30        |
| Sheep           | 1.66        |
| Goat            | 1.96        |
| Total livestock | 2.81        |

Source: Survey result, 2019

#### 4.1.4. Input utilization

According to the recommendation of research institutes, the main input required in the production of groundnut is improved groundnut seeds released from research centers. Despite this fact, however, groundnut producing farmers don’t get improved groundnut seeds and don’t use such seeds. Rather, they use traditional varieties of seeds retained from their own



previous production and/or by purchasing it from other farmers within their, or/and in their surrounding kebeles. The study affirmed that all sample respondents in the District used local seed. About 87.54% of sample respondents don't apply any chemical fertilizers in the production and applying chemical fertilizer is not recommended by the District Agriculture Office since groundnut fixes nitrogen by itself. However, 12.46% of the sample respondents use chemical fertilizer due to very poor fertility of their land.

#### 4.1.5 Access to Services

##### 4.1.5.1. Location and infrastructure

**Location:** Agricultural production is affected by the availability and utilization of inputs and services used such as credit, agricultural extension, market information, access to road and transport facility. In the study area, groundnut producing farmers travel a maximum of 20Kms and a minimum of 12Kms to reach to their nearest market center with average distance of 16.8 Kms. The distance to the local extension office (developmental centers) is an important factor since the interaction of the farmers with the extension office is crucial in making information available. The mean distance required to travel to the extension office was about 2.25 Kms with standard deviation of 1.23.

Table 8. Distance to development centre and nearby market

| Variables                 | N   | Minimum | Maximum | Mean |
|---------------------------|-----|---------|---------|------|
| Market distance           | 147 | 12.00   | 20.00   | 16.8 |
| Extension office distance | 147 | 2.00    | 5.00    | 3.6  |

Source: Survey result, 2019

**Infrastructure:** Atnago town's which is the capital of Limmu-seka District is 110.7Kms with bad road from Jimma town. The road from Atnago to those all study areas is very bad and uncomfortable to transport. It is difficult to transport seeds, fertilizers and produces of groundnut especially during the rainy seasons to farmers' area. However, about 76.4% of the respondents pointed out that there is absence of transport problem while the problem is sever for Dame kebele, also 87.5% Deneba kebele respondents were point out that there is transport problem of transporting seeds and other inputs during cultivating time. The same to Chunge,

Merochisa and Maribo kebele farmers said that a huge transport problem as the data shows respectively. (84.4%, 90% and 86.2%). The average market transportation cost is about 30 Birr per quintal.

Table 9. Access to transport service by kebele

|                   |     | Dame | %    | Deneba | %    | Chunge | %    | Merochisa | %  | maribo | %    |
|-------------------|-----|------|------|--------|------|--------|------|-----------|----|--------|------|
| Transport problem | Yes | 26   | 76.4 | 28     | 87.5 | 27     | 84.4 | 18        | 90 | 25     | 86.2 |
|                   | No  | 8    | 23.6 | 4      | 12.5 | 5      | 15.6 | 2         | 10 | 4      | 13.8 |
| Total             |     | 34   |      | 32     |      | 20     |      |           | 29 |        |      |

Source: Survey result, 2019

#### **4.1.5.2. Cooperatives**

The Limuseka District cooperative promotion office is established to organize and register cooperative societies and to give training, conduct research and provide other technical assistances to cooperative societies. The study found that absence of cooperative in all sample kebeles, though there are 39 farmers' multipurpose cooperative societies in the District organized to promote integration of economic activities such as mobilizing capital to provide credit, inputs of production and other services to members. During focus group discussion, the farmers responded that they are losing the benefit from marketing of groundnut due to less bargaining power with traders and also shortage of input supply for better production which can be minimized if there are strong and active cooperatives in their kebeles. Also there are no primary cooperatives specializing in marketing activity in the district as this activity is believed to be undertaken by multipurpose cooperative societies. Due to absence of strong farmers' cooperative in their kebeles almost all of the farmers were lost the benefit from groundnut production as of their expectation.

#### 4.1.5.3 Extension service

The average number of contacts farmers have with extension officers is about two times per month. The study shows that 53.5% of respondents had a monthly contact with extension agents, 26.4% had contact weekly, 9.7% of farmer respondents can contact an extension agent any time they want and 10.4% of them have no contact at all. About 44.5% of the sampled respondents get advice on cultivation practice, 40.6% of sample farmer received information about crop choice, fertilizer and chemical application, postharvest handling method, soil and water management.



Figure 4. Extension service

Source: Survey result, 2019

#### 4.1.6. Production, storage and marketing of groundnut

Groundnut is the major cash crop produced ones in a year during the *meher* season in the study area. The crop is cultivated in rain-fed by small-scale farmers using traditional agronomic practices. It plays a major role in the economy and livelihoods of smallholder farmers in the District in terms of a subsistence food crop as well as a source of cash income.

Table 10.: Area cultivated, production and productivity of groundnut

| For shelled groundnut        | Minimum | Maximum | Mean |
|------------------------------|---------|---------|------|
| Area cultivated (ha)         | 0.15    | 1.25    | 0.43 |
| Output per HH(qt)            | 1.00    | 14.50   | 4.08 |
| Productivity per ha(qt)      | 4.00    | 17.00   | 9.47 |
| Sold quantity per HH(qt)     | 0.64    | 9.25    | 2.94 |
| Consumed quantity per HH(qt) | 0.00    | 2.75    | 0.41 |
| Left for seed per HH(qt)     | 0.00    | 2.50    | 0.73 |

Source: Survey result, 2019

Table 11 depicted that the average quantity of groundnut produced per sample households was 4.08 quintals but the average productivity of groundnut per hectare was 9.47 quintal (shelled/with pod). According to FGD and key informant interview the conversion factor to change 1 kg of shelled groundnut to unshelled one is 0.657. Hence, the average productivity of groundnut per hectare for unshelled groundnut was 6.22 quintal which is low compared to the national average. According to Alemayehu *et al.*, (2014), the farmers in the study area are not getting the benefit they should get from it because the average productivity of groundnut per hectare is less than the national average which is 11 qt/ha.

#### **4.2 Groundnut market participants, their roles and linkages**

Groundnut of the study area passes through different channels. The channels are generally vertical chain of enterprises that transforms groundnut into different products and delivers them to consumers as finished goods or intermediate goods for end buyers. In this study, different stakeholders were involved in bringing groundnut from the point of production (farm gate) to the final destination (consumers). According to the data obtained, groundnut marketing participants in the study area includes producers/ farmers, village collectors/ assemblers, urban assemblers, brokers, wholesalers, retailers, road side traders, processors and final consumers of the product.

**Producers:** These are the starting point for the chain and act as marketing agents who participate both in production as well as marketing of surplus commodities they produce. At

the same time, they transport groundnut to the nearest markets by themselves, either using pack animals, or animal driven carts, or else medium-size Isuzu trucks. They had several options to sell their product, selling directly or selling through broker to village collectors/assemblers, urban collectors, brokers, wholesalers or retailers. As the finding of the study revealed, most farmers sell groundnut straight from the field to wholesalers and brokers at *Atnago* town. But sometimes farmers sell groundnut at the farm gate to brokers and other better off farmers to meet their immediate financial need of holly days and other basic needs. They sell at the farm gate at a time of shortage of supply and/or at a time when they are in a problem of cash.

**Village assemblers:** Village assemblers are farmers or part time traders who collect groundnut from farmers at farm gate for the purpose of reselling to wholesalers, retailer and consumers. There are few village collectors who compete with wholesalers. When it is imposible to them to meet quantities of their demand, they employ brokers to collect groundnut by paying a commission.

**Urban assemblers:** These assemblers play important role in the system of assembly and they reside in towns or cities regionally. They consolidate the produce of individual farmers produce and prepare it for marketing. Assemblers not only know the areas of surplus well, but also speak the local language well. Although regional wholesalers are the main buyers from urban assemblers; assemblers also sell the product to retailers and road side traders.

**Wholesalers:** are those who have sufficient funds to purchase hundreds of quintals of groundnuts. They are major market participants of the marketing system in the study area who usually buy groundnut of larger volume than any other actors in the marketing system.

**Brokers:** are middlemen who facilitate transaction by linking producers with traders, a wholesaler with another wholesaler and wholesalers with retailers. These are unlicensed legally but in reality they are doing like wholesaling activity and paid for the service they delivered per quintal bases. They reside in terminal markets and do not invest their own capital. They often disseminate price and other information to the market participants and play a key role in influencing groundnut transaction and price information mainly in terminal markets of *Atnago*. Sometimes they go beyond facilitation of transaction and tend to control

and fix prices, create price symmetry and make extra benefits from the process.

**Retailers:** are persons that sells commodity to end users (consumers and processors). They reside in the terminal market and mostly buy groundnut from wholesalers and sell to urban consumers. Sometimes they could also directly buy from the producers. Consumers usually purchase the product from retailers as they offer according to the requirement and purchasing power of buyers. Beside buying and selling groundnut they often provide processing service by changing shelled groundnut to unshelled one.

**Road side traders:** Most road side traders hold roasted groundnut. Now a day, roasted groundnut renders significant livelihood source for many poor throughout the country in general and Limmuseka District in particular. They usually purchase between 10 and 12 kg, which they finish selling in 2 to 4 days and most of the time they buy groundnut from wholesalers, or assemblers, or other retailers.

**Consumers:** They are the last link for groundnut market chain. From the consumers' point of view, the shorter the marketing chain, the more likely is the retail price going to be affordable. Consumers for this particular study mean those households who directly bought and consume groundnut. They are individual's households that bought the commodity for their own consumption only.

#### **4.2.1. Demographic characteristics of traders and consumers**

The demographic characteristics of traders summarized in terms of sex, marital status, education level and average experience in groundnut trading. The survey result indicates that, 79.6% the sample groundnut traders are males and about 88.02 percent of them were married. With regard to education, about 47.58 per cent and 39.6 percent of the sample traders were within the level of Primary and Secondary School education, respectively, and only 5.1 percent of the traders have some kind of degree certificate. The result also indicates that groundnut traders had 6.68 years of experience.

Table 11: Demographic characteristics of sample traders and consumers

| Variables      |             | Frequency | per cent |
|----------------|-------------|-----------|----------|
| Sex            | Male        | 32        | 79.6     |
|                | Female      | 8         | 20.4     |
| Education      | Primary     | 19        | 47.58    |
|                | Secondary   | 16        | 39.6     |
|                | High school | 3         | 8.0      |
|                | Degree      | 2         | 5.1      |
| Marital Status | Single      | 5         | 12       |
|                | Married     | 35        | 88       |

Source: Survey result, 2019

### 4.3. Groundnut market chain

According to Islam et al. (2001), market chain is the flow of groundnut from producers to consumers that brings into place economic agents who perform complementary functions with the aim of satisfying both producers and consumers. The groundnut market channel drawn based on the data collected from different sources. The total quantity of groundnut produced by sample farmers was about 914.34 quintal and the total quantity supplied to the market was 767.34 quintals.

Thirteen lines of market channels were identified. As can be understood from Figure 8, the main receivers from farmers were wholesalers, rural assemblers and retailers with an estimated percentage share of 63.7, 20.72, and 11.66 respectively. During the survey, the following groundnut marketing channels were identified.

1. Farmer → Wholesalers → Out of District
2. Farmer → Wholesalers → Retailer → Road side trader → Consumers
3. Farmer → Wholesalers → Road side trader → Consumers
4. Farmer → Wholesalers → Retailer → Consumers
5. Farmer → Assemblers (rural) → Wholesalers → Out of District
6. Farmer → Assemblers (rural) → Wholesalers → Retailers → Consumers
7. Farmer → Assemblers (rural) → Wholesalers → Road side trader → Consumers
9. Farmer → Assemblers (rural) → Retailers → Road side trader → Consumers
10. Farmer → Retailers → Consumers
11. Farmer → Retailers → Road side trader → Consumers
12. Farmer → Assemblers (urban) → Road side trader → Consumers
13. Farmer → Assemblers (urban) → Wholesalers → Out of District

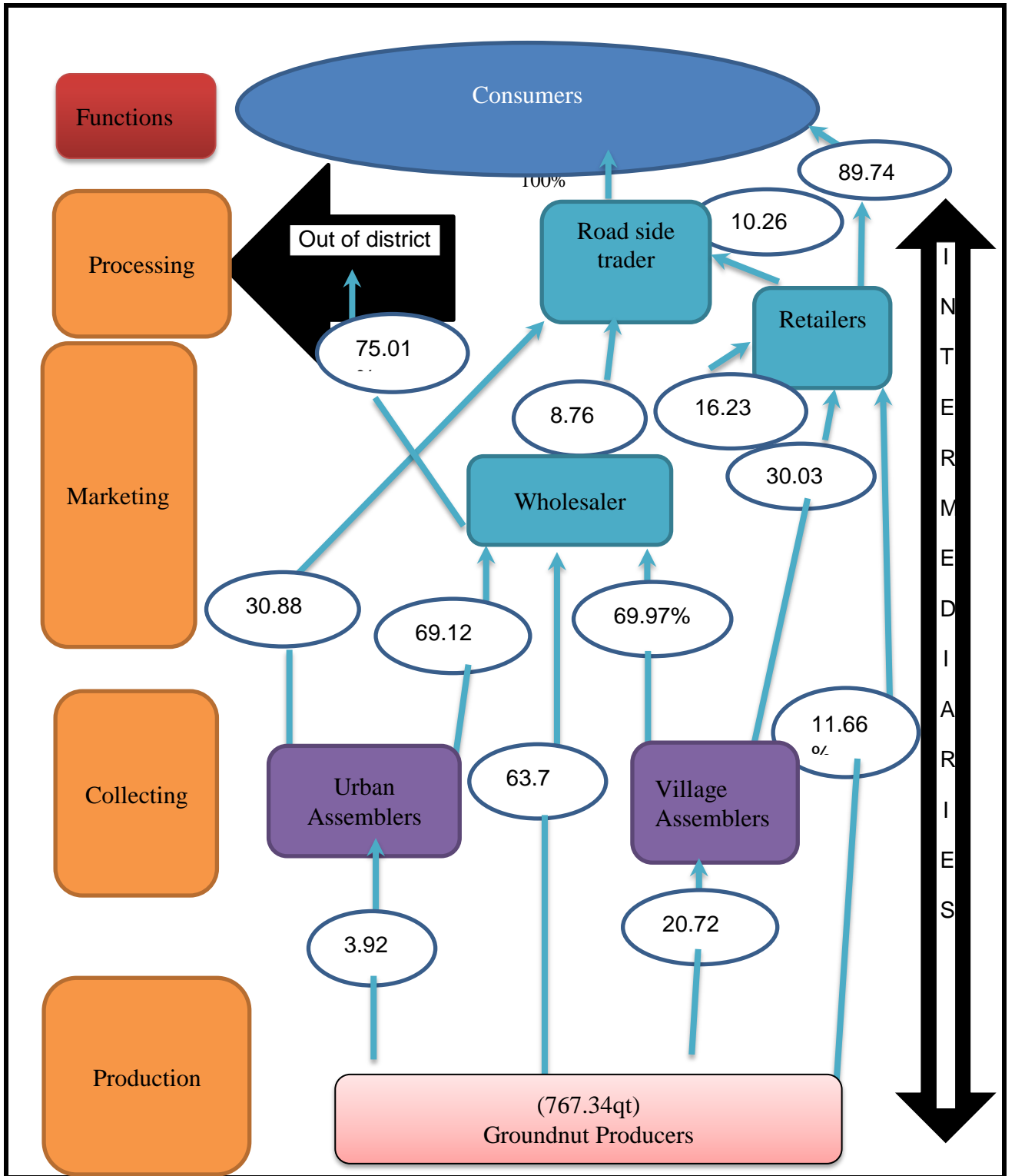


Fig 8. Groundnut market channel

Source adapted and modifying from A senan 2017



## 4.4 Structure- Conduct - Performance of the groundnut Market

### 4.4.1 Structure of the groundnut market

In this study, the structure of the groundnut marketing system was evaluated in terms of the degree of market concentration, barrier to entry (licensing procedure, lack of capital and know how, and policy barriers), and the degree of transparency as indicated in Pender *et al* (2004). In this study the structure of groundnut marketing was characterized using the following indicators: market concentration and entry conditions (licensing procedure, administrative problem and lack of capital).

**Measure of market concentration ratio:** The concentration ratio is expressed in terms of CR<sub>x</sub> which stands for the percentage of the market sector controlled by the biggest x firms. Four firms (CR<sub>4</sub>) concentration ratio is the most typical concentration ratio for judging the market structure as stated by (Kohls and Uhl, 1985). A CR<sub>4</sub> of over 50% is generally considered a tight oligopoly; CR<sub>4</sub> between 25% and 50% is generally considered a loose oligopoly and a CR<sub>4</sub> of fewer than 25% is no oligopoly at all according to Kohls and Uhl (1985). Since the number of traders in the District market level was few, therefore, the analysis of the degree of market concentration ratio was carried out for all traders. It was measured by the percentage share of volume of groundnut handled by the largest four traders. Here concentration ratio for four traders was meant for all groundnut traders in Limmuseka district with largest upper volume in general.

As indicated in Table 12, the result of district groundnut traders' concentration ratio CR<sub>4</sub> was found to be 51.66 percent. Kohls and Uhl (1985) suggested, as a rule of thumb, a four largest enterprises concentration ratio of 50 percent or more as an indication of a strongly oligopolistic industry. Hence, the groundnut market concentration ratio in the study area was 73.02 percent suggesting strongly oligopoly market type. The CR<sub>4</sub> measures of market concentration ratio showed that the top four or 38.45 % of the traders were controlled 73.02% of the groundnut market in 2018/19 production year'

Table 12: Groundnut trader's concentration ratio in Atnago market

| Frequency<br>(A) | Cumulative<br>frequency<br>(B) | Per<br>cent<br>(C) | Cumulative<br>Per cent<br>(D) | Quantity<br>purchased<br>in quintal<br>per year<br>(E) | Total<br>quantity<br>purchased<br>(F)=E*A | % share of<br>purchase<br>(Si=F/2233) | % cumulative<br>purchase<br>$(C = \sum_{i=1}^n Si)$ |
|------------------|--------------------------------|--------------------|-------------------------------|--|---|---------------------------------------|---|
| 1                | 1                              | 7.69               | 7.69                          | 465  | 465                                       | 20.82                                 | 20.82   |
| 1                | 2                              | 7.69               | 15.38                         | 440  | 440                                       | 19.70                                 | 40.52   |
| 1                | 4                              | 7.69               | 23.07                         | 390  | 390                                       | 17.46                                 | 57.98   |
| 2                | 6                              | 15.38              | 38.45                         | 168  | 336                                       | 15.04                                 | 73.02   |
| 1                | 7                              | 7.69               | 46.14                         | 160  | 160                                       | 7.66                                  | 80.68   |
| 1                | 8                              | 15.38              | 61.52                         | 76   | 152                                       | 6.80                                  | 87.48   |
| 1                | 9                              | 15.38              | 76.9                          | 80   | 80  | 3.58                                  | 91.06   |
| 1                | 10                             | 7.69               | 84.59                         | 50   | 50  | 2.23                                  | 93.29   |
| 1                | 11                             | 7.69               | 92.28                         | 55   | 55  | 2.46                                  | 95.75   |
| 1                | 12                             | 7.69               | 99.97                         | 65   | 65  | 2.91                                  | 98.66   |
| 1                | 13                             | 7.69               | 107.66                        | 40   | 40  | 1.79                                  | 100   |
| 13               |                                | 100.0              |                               |  | 2233                                      | 100.00                                |   |

Source: Survey result, 2019

**Barriers to entry into the groundnut market:** The barriers to entry into the market reflect the competitive relationships between existing traders and potential entrants. If the barriers to entry are low, new traders can easily enter into groundnut markets and compete with established traders. However, with the presence of very high barriers to entry, established firms are difficult to stay longer in business.

Table 13: Entry barrier in groundnut marketing of traders

| Source of barriers to entry              | Frequency | Percent |
|--|-----------|---------|
| Lack of capital                          | 3         | 23.07   |
| Information collusion                    | 2         | 15.38   |
| Administrative problems                  | 5         | 38.46   |
| Stiff competition with unlicensed trader | 3         | 23.07   |
| Total                                    | 13        | 100.0   |

Source: Survey result, 2019

Among the total trader respondents from Atnago market 42.6 per cent of them respond that there is no entry barrier to the market where as 57.4 per cent of them explained that there is entry barrier in groundnut marketing specially in wholesaling business due to administrative problems, due to shortage of capital, information collusion and stiff competition with unlicensed trader.

**Administration problems:** Most wholesalers in the study area explain that there are many checking points between Limmuseka and center market Addis ababa this tempt the Limmuseka wholesalers not to stay in groundnut business. The higher taxation condition especially in check point threat the competitiveness of Limmuseka wholesales with other area wholesalers. There is also corruption problem that forced the traders to pay to police officers at road block or check point without any official permission receipts. There is also administrative problem of trade and marketing office of the District in regulating and punishing unlicensed traders and traders with un renewed license.

**Shortage of capital:** The survey result indicated that among various barriers to entry into the groundnut business, shortage of capital being the second. To enter in the market more capital is needed because the traders have to purchase more groundnuts while farmers' regular customers are coming during harvesting (peak purchase) time. Traders should bought farmers available amount of groundnut that they brought to them, if not they will lose their customer in short period of time.

**Stiff competition:** Illegal traders were also observed while acting as licensed wholesalers. Since licensed wholesalers spend additional cost for license renewal and income tax illegal traders are favored relatively than legal trader. These situations weaken the competitive nature of groundnut marketing.

#### **4.3.2. Conduct of groundnut market**

According to Bain (1968), market conduct refers to the patterns of behaviour that firms follow in adopting or adjusting to the markets in which they sell or buy. In other words, market conduct focuses on traders' behaviour with respect to various aspects of trading strategies such as buying, selling, transport, storage, information and financial strategy.

#### 4.3.2.1 Purchasing and pricing strategy

The survey result indicated that 23.5 percent of traders attract their supplier by providing fair weighing, about 32.4 percent of trader by giving better price and 23.5 percent of groundnut trader visit suppliers in order to purchase better quality and quantity of groundnut. The remaining percent were used to purchase by broker. Thursday and Saturday are the market days for Dame Town of Limmuseka District and most traders visit these days to purchase groundnut.

Table 14: Trader's attraction method of suppliers

| Attracting method   | Frequency | Percent |
|---------------------|-----------|---------|
| Giving better price | 11        | 32.4    |
| By visiting         | 8         | 23.5    |
| Fair scaling        | 8         | 23.5    |
| Using broker        | 7         | 20.5    |
| Total               | 34        | 100.0   |

Source: survey result, 2019

The survey result revealed that about 74.3% of sample farmers reported that selling price being set by buyers of the product they offered. While 12.5% and 13.2% of the respondents said that selling price being set by seller of the groundnut and the market respectively. On the other hand, about 88.9 % of sample trader reported that the selling price being set by demand and supply, the rest 11.1% reported price being set by seller of the groundnut. This figure indicates that sample traders consider supply and demand and nearby market prices information to determine the purchase and selling price of the market but sample farmers being price takers.

#### 4.3.3 Performance of groundnut market

Market performance of groundnut markets were analyzed by analyzing the marketing margin, by taking into consideration associated marketing costs for key market participants. Hence, on the consideration of 2017/18 production year, costs and purchase prices of the main channel actors, margin at farmers, village assemblers, urban assemblers, road side traders and retailers level was conducted.

#### 4.3.3.1 Cost and profitability analysis of groundnut producer

This section of the study focused on activities related to producing groundnut at farm level. Average costs and sales prices of the producers were used. This provides an insight about the performance of groundnut market.

Table 15: Analysis of costs and profitability of unshelled groundnut production in 2018/19

| Cost items                   | Unit        | Quantity | Unit price | Total                 | Percent TC    |
|------------------------------|-------------|----------|------------|-----------------------|---------------|
| <b>Variable cost (VC)</b>    |             |          |            |                       |               |
| Price of seed per Qt         |             | 1.7      | 1037       | 1762.9                | 24.67         |
| <b>Cost of labour</b>        |             |          |            |                       |               |
| Land preparation             | Man-day/ha  | 4        | 50         | 200                   | 2.80          |
| Ploughing and sowing         | Man-day/ha  | 8        | 50         | 400                   | 5.60          |
| Drafting power (Oxen)        | Day         | 12       | 50         | 600                   | 8.40          |
| Weeding                      | Man-day/ha  | 16       | 50         | 800                   | 11.19         |
| Rooting up                   | Man-day/ha  | 36       | 50         | 1800                  | 25.19         |
| Threshing                    | Man-day/ha  | 12       | 50         | 600                   | 8.40          |
| Cost of sack                 | No.         | 6.22     | 10         | 62.2                  | 0.84          |
| <b>Marketing cost</b>        |             |          |            |                       |               |
| Broker's fee                 | Kun         | 6.22     | 10         | 62.2                  | 0.84          |
| Loading and unloading        | Man-day/Qt  | 6.22     | 3          | 18.66                 | 0.25          |
| Transportation               | Qt          | 6.22     | 10         | 62.2                  | 0.84          |
| <b>Total VC</b>              | <b>Birr</b> |          |            | <b>6368.16</b>        |               |
| <b>Fixed Cost (FC)</b>       |             |          |            |                       |               |
| Land fee                     | Ha          | 1        | 45         | 45                    | 0.63          |
| Cost of Farm tools           | Lump sum    |          | 400        | 400                   | 5.60          |
| <b>TFC</b>                   |             |          |            | <b>445</b>            |               |
| Managerial cost              | 5% of TC    |          |            | 340.66                | 4.76          |
| <b>Total cost/ha</b>         |             |          |            | <b><u>7153.82</u></b> | <b>100.00</b> |
| Total cost/Qt                |             |          |            | 1150.13               |               |
| Revenue/ha                   | Birr /Qu    | 6.22     | 1037       | <u>6450.14</u>        |               |
| <b>Gross profit(Loss)/ha</b> | <b>Birr</b> |          |            | <b>703.68</b>         |               |
| <b>Gross profit(Loss)/Qt</b> | <b>Birr</b> |          |            | <b>113.13</b>         |               |

Source: Own computation, 2019

Average productivity of unshelled groundnut and farm gate price for sample farmer in the study area was 6.22 quintal per hectare and 1037 birr per quintal. As table 14 shows,

production of 6.22 quintal of unshelled groundnut on a hectare of land costs birr 7153.82, and a farmer earns a revenue of birr 6450.14. On average, a loss of about 703.68 Birr/ha or 113.13 Birr/Qt incurred from groundnut production in 2018/19. When the financial position of producers is calculated using break-even point, the farmers have to produce additional 0.68 quintals of shelled groundnut, or a total of 1.01 quintals of unshelled groundnut per/ha to generate normal profit.

#### ***4.3.3.2 Cost and Profitability analysis of groundnut traders***

Analysis of cost and profitability of the different traders of groundnut namely rural assemblers, urban assembler, road side trader, wholesaler, retailers were analysed across the markets. During analysis of cost and profitability, the average purchased price of a quintal of the groundnut and the different average transaction costs associated with the marketing process of a single quintal until it reached the next actor was assessed. Based on the result, average transaction costs incurred across different groundnut actors varies. Accordingly, the total costs incurred by village assemblers, urban assemblers, wholesalers, retailers, and road side traders of groundnut were birr 9, 44.5, 95.25, 74.83 and 184.3 respectively. For village collectors buying and selling of the groundnut had taken place on their village market and they were not exposed to different costs associated with marketing process. As a result, village collectors exercised lowest average transaction costs per quintal than any other traders.

On the other hand, the data indicated that the amount of transaction costs per quintal of groundnut incurred by road side trader was birr 184.3 which was the highest cost of all traders. This could be due to higher costs related to processing raw groundnut into roasted one. Road side traders usually purchase between 10 and 16kg, which they finish selling in 2-4 days. With respect to the profitability of groundnut, the overall average profitability in different traders indicates that at every stage of transaction, groundnut trading business was profitable.

Table 16: Analysis of costs and profitability of unshelled groundnut for traders in 2018/19 (Birr)

| Items                     | Village assembler | Urban assembler | Wholesaler | Retailer | Road side trader |
|---------------------------|-------------------|-----------------|------------|----------|------------------|
| Purchasing price          | 1037              | 1250            | 1400       | 1385     | 1675             |
| Sack price                | -                 | 10              | 7          | 10       | -                |
| Cost of loading-unloading | -                 | 3               | 3          | 5        | 4                |
| Commission to Brokers     | -                 | -               | 25         | -        | -                |
| Cost of transportation    | -                 | 15              | 18         | 20       | 10               |
| Collecting cost           | 6                 | 12              | -          | -        |                  |
| Processing                | -                 | -               | 30         | 30       | 167.65           |
| Storage rent              | -                 | 3.50            | 5          | 3.5      | -                |
| Income Tax                | -                 | -               | 2.50       | 2        | -                |
| Other costs               | 3                 | 4.5             | 12.25      | 4.33     | 2.65             |
| Total cost/quintal        | 1043              | 1294.5          | 1495.25    | 1459.83  | 1859.3           |
| Selling price             | 1155              | 1850            | 2,350      | 2450     | 2800             |
| Gross profit              | 118               | 555.5           | 855        | 990.17   | 1125             |

Source: Own computation, 2019

#### 4.3.4 Marketing Margins

Marketing margin is a measure of the percentage of price paid by the consumer that is maintained by each agent in the marketing chain. These include the total gross marketing margin, producer's gross marketing margin. However, it may also describe price differences between other points in the marketing chain, for example, between producer and wholesale, or wholesale and retail, prices. Therefore, for this section of the study marketing margin was analyzed by considering the average sales prices of different participants in the groundnut market channel.

Table 17: Marketing margin for different marketing agents

| Marketing channel<br>Participants | Price<br>(Birr/qt) | Marketing<br>cost | Gross<br>marketing |
|-----------------------------------|--------------------|-------------------|--------------------|
| Farmers                           | 1037               | 23                | 37.04              |
| Village assembler                 | 1155               | 9                 | 4.21               |
| Urban assembler                   | 1850               | 44.5              | 24.82              |
| Wholesaler                        | 2350               | 95.25             | 17.86              |
| Retailer                          | 2450               | 74.83             | 3.57               |
| Road side trader                  | 2800               | 184.3             | 12.5               |

Source: Own computation

TGMM (complete distribution channel) = 62.96%

GMM<sub>p</sub> (Producers participation) = 100% - 62.96 = 37.04%

#### 1.4 Econometric Results of OLS Model

In this study, those factors that determine market supply at farm level would be analyzed using OLS estimation method. The F test statistics is statistically significant at 1% indicating that the explanatory variables in the model explain groundnut market supply. Thirty, variables were hypothesized to determine household level market supply in groundnut market. Among a total of 13 explanatory variables (9 continuous and 4 dummy) included into the econometric model four variables were found to significantly influence market supply of groundnut positively and one variable was found to significantly influence market supply of groundnut negatively (see Table 17).



Table 18: OLS estimation results on determinants of farmers groundnut market supply

| Log of quantity sold       | Coefficient  | Std. Err. | t-value  |
|----------------------------|--------------|-----------|----------|
| Sex                        | .0542169     | .104645   | 0.518103 |
| Education                  | .0358112     | .0823034  | 0.435112 |
| Family size                | -.0957231*** | .0189501  | -5.05132 |
| No of oxen                 | .0424879     | .0350177  | 1.213326 |
| Land size                  | .8767276***  | .0890233  | 9.848294 |
| Market distance            | .0051194     | .0131627  | 0.388932 |
| Extension contact          | .0667419***  | .0212547  | 3.140101 |
| Credit taken               | .1088331     | .0886592  | 1.227544 |
| Average lagged price       | .0007387***  | .0002029  | 3.64071  |
| Input use                  | .1199008     | .0760333  | 1.576951 |
| Log of farm experience     | .0797119     | .0691989  | 1.151924 |
| Market information         | .2792339***  | .0945021  | 2.95479  |
| Membership in cooperatives | 0.432241     | 0.317021  | 1.36344  |

n=147, R-squared = 0.6188, Adj R-squared = 0.5837, \*\*\* shows the value is statistically significant at 1% level.

Before the execution of the econometric analysis the hypothesized independent variables were tested for the presence of serious multicollinearity problem. The variance inflation factor and contingency coefficient were computed to check association among continuous variables and dummy variables, respectively. The results for all VIF were ranging between 1.16 and 1.74 with mean VIF of 1.37. The result of the contingency coefficient was also less than 0.75. Therefore, Since VIF is less than 10 and CC is less than 0.75 multicollinearity cannot be suspected and would not be a problem. Heteroskedasticity test was done by using Breusch-Pagan/Cook-Weisberg test for heteroskedasticity and based on the result the null hypothesis are accepted meaning there is no heteroskedasticity problem. Omitted variable test done by Ramsey RESET test using powers of the fitted values of the dependent variable shows there is no omitted variables in the model. For details see (Appendix Table 3, 4, 5 and 6 ). The variables that influenced the market supply of groundnut were family size, land size, market information, average lagged price and extension contact.

**Family size:** It was hypothesized that family size may have positive or negative impact on volume of sale. The model output predicts that for every increase in adult equivalent in the

household, the log of volume marketed of groundnut falls by 9.57 quintal. The study found that family size influenced market supply of groundnut negatively significantly at 1% significant level which is the same result with the study by Gezehagn (2010), and Gezehagn (2013) family size had a negative effect on the household sales volume of groundnet. The negative sign implies that an increase in number of family members decrease groundnut to be marketed due to an increase in household consumption.

**Land size:** As expected land size affected market supply of groundnut positively. The result revealed an increase in the size of land by one hectare allocated to groundnut resulted in an increase in farm level market supply of groundnut by 87.6 per cent, keeping other factors constant. In support of the finding here, Gezehagn (2010), Gezehagn (2013) and Kindie (2007) indicated that the area of land allocated for production significantly and positively affected farm level market supply of groundnut.

**Market information:** Market information significantly affected groundnut market supply at 1% level of significance. The model showed a positive association between market information and market supply of groundnut. Better information leads to better decisions, which leads to greater economic growth and to more equitable participation in the market. If a farmer gets market information the amount of groundnut supplied to the market increases by 27.9 per cent. The implication is that obtaining and verifying information helps to supply more quantity of groundnut.

**Average lagged price of groundnut:** It was a continuous variable which measures annual average lagged price per quintal in the year 2017/2018 and was expected to affect the market supply of groundnut positively and an increase in average lagged price by one birr resulted in an increase in farm level market supply of groundnut by 7%. The model showed a positive association between average lagged price and market supply of groundnut. Because, prices of 2017/18 can stimulate production, and thus market supply of groundnut for 2018/19. The study by Alemnew (2010), Gezehagn (2010), and Gezehagn (2013) also revealed that the lagged price had also affected marketable supply of rice.

**Extension contact:** Result of the finding indicated that number of extension contact was positively and significantly related to the volume of groundnut supplied to the market at 2% significance level. From the result an increase in number of extension contact by one day resulted in an increase in farm level market supply of groundnut by 6.67 percent, keeping other factors constant. This suggests that extension contact avails information regarding technology which improves production that affects the market supply. The result of this study goes along with the findings of Gezehagn (2010), Muhammed (2011) ), and Gezehagn (2013) that access to extension service affected marketable supply of groundnet significantly and positively.

#### **4.5. Groundnut Production and Marketing Constraints**

The marketing constraints discussed in this section are Production of groundnut using local seeds, unfair weighing scale, lack of research institution in the study area, poor access to credit services , Absence of cooperatives organized in groundnut production and marketing, lack of up to date market information for producers and Poor market access roads that makes movement of produce to markets expensive

##### **4.5. 1. Using local seeds**

Improved seeds are very important for increased groundnut production and marketing for farmers. The majority 71.5 (%) of the farmers in FDG indicated that they did not have access to have an improved groundnut seeds for their production. Farmers indicating lack of access to improved seeds is the major constraint

##### **4.5. 2 Unfair weighing scale**

Unfair weighting scale is also the major constraints that farmers indicating during their FGD. According to their responses 87% said that they loss more benefit from marketing of groundnut through unfair weight while they trading groundnut to traders

##### **4.5.3. Market information**

The more market information a household has, the lower its transaction cost will be, increasing market participation (Makhura, 2001). 65.89 % of the farmers in FGD indicated that they did not have access to market information, especially in respect of market price.

These farmers lack information about products prices, as well as quality requirements, the best place and time to sell their products, and potential buyers.

#### **4.5.4. Lack of research institution in the study area**

Research institution is play important role on farmers' production and marketing their crops, through delivering improved seeds and also innovating different technologies that help farmers produce crops. If research institution are near to farmers production area they will access to information about weeds and diseases control and also simply access to have advices and technologies for their production. According to FGD 95 % farmers were indicated that lack of research institution in the study area is affect their production and marketing of groundnut as well.

#### **4.5.5. Poor access to credit services**

Credit is help farmers to buy seeds and others input of production while they haven't enough money by themselves. Credit utilization would enhance the financial capacity of the farmer to purchase the inputs, thereby increasing groundnut production and market share size and then the competition. According to their discussion it should have credit services by financial institutions for farmers in order to access credit to full fill production inputs on time. Majority of farmers 94.23% were agreed that lack of credit services is one of the major constraints that faces farmers to produce and marketing of groundnut

#### **4.5.6. Absence of cooperatives organized in groundnut production and marketing**

Farmers in the study area agreed that there is no any cooperative that organized in groundnut production and marketing. Absence of well-organized cooperative may affect farmers' production and marketing of their crops. If well-organized cooperative appear around farmers area they will have access to market information and they may simply deliver their production to national as well as to local market in organized way. They also have additional benefit as a dividend. According to FGD 87.21% of farmers were said that absence of well-organized cooperative regarding to groundnut marketing is affect their production.

#### **4.5.7. Poor market access roads that make movement of produce to markets expensive**

Access to transport by farmers plays a significant role in their ability to access markets. The majority 81.5 (%) of the farmers interviewed did not have easily access to transportation due to poor roads throughout production areas. They did not access like vehicle to ship their products to the markets particularly in summer. However, it has also been found that some farmers find it costly to hire transport, especially after harvesting, and consequently women often carry the produce on their heads or in cart and wheelbarrows. Farmers indicating lack of access to transport due to poor roads as the major constraint when it comes to accessing markets in towns and consequently they are forced to sell their produce to local customers at lower prices

Majority of the FGD participants were said that there are also an opportunities that helps farmers in the study area to produce and supply more groundnut crops. 79.41% of them said that the presence of suitable soil and agro ecology for groundnut production, Experience of producers' in groundnut production and marketing, Willingness of producers' to use new groundnut production and marketing technology, Availability of market demand throughout the year, Availability of supportive government policies and government, offices organized at all levels to implement the policies (e.g. District agriculture and cooperative promotion offices are the major opportunities that will help farmers in order to produce and marketing groundnut production in the study area.

## **5. SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Summary and Conclusion**

The study was conducted with the objective of explaining the marketing system of groundnut production in Limmuseka District of Oromia Regional National state, in Ethiopia. Groundnut has been an important cash crop for Limmuseka District and it generates considerable cash income for several small scale producers. Data were collected from both primary and secondary sources for this study. The data collected from sampled groundnut producers and traders was analyzed with the help of descriptive and econometric method of analysis. The primary data generated by individual interview using pre- tested questionnaires and a rapid market appraisal technique. This was supplemented by secondary data collected from different published and unpublished sources. A total of 147 groundnut producer respondents' (121 males and 26 females) were selected randomly from a list of 2569 groundnut producers' household head from five kebeles in the District and 40 groundnut traders and consumers

The result of descriptive analysis of farmers' data point out that, the average farm size for groundnut production and productivity of groundnut during the survey year were 0.43, 4.08 and 9.47 quintal for unshelled groundnut. The result also showed total groundnut produced by sample respondents was 599.76 quintal in the study area, out of the total volume, 82.1% of groundnut was supplied to the market through different marketing channels that were being identified during the survey period with an average price of Birr 1037 birr per quintal.

Quantity of groundnut supplied to the market passed through different marketing agents from farmers to consumers. The computed four-firm concentration ratio (CR4), which is the share of the largest four traders in the total yearly volume of groundnut purchased in the District, was 73.02 per cent suggesting strongly oligopoly market type. Starting from production up to marketing, every farmer produces and sold on individual basis due to absence of strong cooperative in their surroundings.

Results of econometric model indicated the relative influence of determinants of different Variables on market supply of groundnut in the study area. Among a total of 13 explanatory variables (9 continuous and 4 dummy) included into the econometric model four variables

were found to significantly influence market supply of groundnut positively and one variable was found to significantly influence market supply of groundnut negatively. Accordingly, land size, market information, average lagged price and extension contact have positive and significant influence on market supply of groundnut. On contrary, family size was found to influence market supply of groundnut negatively and significantly.

The results of the marketing costs, profits and margin analysis indicated that producers incurred the highest production cost for labour cost. Production of 6.22 quintal of unshelled groundnut on a hectare of land costs birr 7153.82, and a farmer earns a revenue of birr 6450.14. On average, a loss of about 703.68 Birr/ha or 113.13 Birr/Qt incurred from groundnut production in 2018/19. When the financial position of producers is calculated using break-even point, the farmers have to produce additional 0.68 quintals of shelled groundnut, or a total of 1.01 quintals of unshelled groundnut per/ha to generate normal profit.

There are a number of highlighted problems that impede the further development of groundnut production in the study area like low yielding varieties, drought, absence of cooperatives, and shortage of land, disease, and absence of unshelling machine, lack of effective insecticide and herbicide, and unavailability of oxen. Groundnut traders state the following problems as the main constraints against the efficient marketing of groundnut. These are corruption, adulteration, competition from illegal traders, lack of marketing information and capital were the most important problems.

Groundnut production and area coverage in Ethiopia is increasing due to groundnuts are a good source of calcium, iron and vitamins. Also significant source of cash income that contributes to food security and alleviates poverty. As a legume, it is an important pulse crop that performs well in poor soils and regions where moisture availability is unreliable or inadequate and thereby increasing productivity of the semiarid cereal cropping systems. Hence Limmuseka is moisture stress District; groundnut is widely cultivated by the small scale farmer. A number of factors may have affected volume of sales of groundnut in the Limmuseka district are family size, land size, market information; average lagged price and extension contact were the main determinants of market supply of groundnut at household level.

## 5.2. Recommendations

The major factors identified as a problem in groundnut market chain analysis were related to both groundnut production and marketing. Thus, appropriate interventions are required to alleviate these problems. To solve the production and marketing problems and increase production and market supply of groundnut, the following recommendations are forwarded: to district agriculture office ;-

1. **Average lagged price** the result of the study recommends that prices of 2017/18 can stimulate production, and thus market supply of groundnut for 2018/19. There for it is better to provide lagged price of groundnut for groundnut producers
2. **Access to Market information:** The study found that market information affect the groundnut marketing positively and significantly. Groundnut marketing in the study area currently faces inefficiency in terms of tight oligopoly nature of the market, linkage and governance due to inadequate market information and limited infrastructure, translating into significant losses to farmers through increased transaction costs. This indicates that there is a need to increase marketing efficiency through establishing skills transfer, building farmers' capacity to organize and access to information. In turn, this will ensure success for the farmers in input-output marketing, value-addition and processing.
3. **Employment opportunity:** Even though, labour is one of the main factors of production, larger family size requires larger amounts for consumption that contributed to reducing marketed surplus. Improving of employment through establishing small scale enterprise is crucial.
4. **Strengthening extension contact:** extension contact was significant to groundnut market supply because it avails information regarding technology which improves production that affects the market supply. Moreover, establishing the groundnut research–extension (transfer)–farmer linkages to develop and disseminate to farmers high yielding, disease resistant and environmentally adaptable seed varieties, market information and new technologies that can boost production and productivity of groundnut will help the farmer.
5. **Proper utilization of land resource:** The area of land allocated for groundnut at the farm level affected marketable supply of groundnut positively and significantly. However, increasing landholding size cannot be an option to increase groundnut market supply since



supply of land is limited by natural as well as socio-economic factors. Hence, increasing productivity of groundnut per unit area of land is better alternative to increase marketable supply of groundnut. This is relying on intensive cultivation rather than on extensive one through proper utilization of land resource.

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## **6. APPENDIX**



Appendix table 1. Conversion factors to compute tropical livestock unit

| Animal category     | TLU   |
|---------------------|-------|
| Calf                | 0.25  |
| Weaned calf         | 0.34  |
| Heifer              | 0.75  |
| Cow or ox           | 1     |
| Horse/mule          | 1.1   |
| Donkey adult        | 0.7   |
| Donkey young        | 0.35  |
| Camel               | 1.25  |
| Sheep or goat adult | 0.13  |
| Sheep or goat       | 0.06  |
| Chicken             | 0.013 |
| Bull                | 0.75  |

Source: Storck *et al.*, 1991.

Appendix table 2. Conversion factor used to estimate man equivalent

| Age Group (years) | Male | Female |
|-------------------|------|--------|
| <10               | 0    | 0      |
| 11-13             | 0.2  | 0.2    |
| 14-16             | 0.5  | 0.4    |
| 17-50             | 1.0  | 0.8    |
| >50               | 0.7  | 0.5    |

Sources: Storck *et al.* (1991)

Appendix table 3. VIF Test for Multicollinearity

| Variable             | VIF  | 1/VIF |
|----------------------|------|-------|
| Sex                  | 1.74 | 0.57  |
| Education            | 1.60 | 0.62  |
| Family size          | 1.56 | 0.64  |
| No of oxen           | 1.44 | 0.69  |
| Land size            | 1.36 | 0.73  |
| Market distance      | 1.36 | 0.74  |
| Extension contact    | 1.32 | 0.76  |
| Credit               | 1.26 | 0.79  |
| Average lagged price | 1.22 | 0.82  |
| Input use            | 1.20 | 0.83  |

|                        |      |      |
|------------------------|------|------|
| Log of farm experience | 1.19 | 0.84 |
| Market information     | 1.16 | 0.86 |
| Mean VIF               | 1.37 |      |

Source: Survey result, 2018/19

**Appendix table 4. Contingency table for dummy independent variables (CC)**

| (obs=155)          | Sex     | Education | Input use | Market information |
|--------------------|---------|-----------|-----------|--------------------|
| Sex                | 1.0000  |           |           |                    |
| Education          | 0.4422  | 1.0000    |           |                    |
| Input use          | 0.1957  | 0.2459    | 1.0000    |                    |
| Market information | -0.0005 | -0.0616   | -0.0834   | 1.0000             |

Source: Survey result, 2018/19

**Appendix table 5. Test for heteroskedasticity**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of log of quantity sold

chi2(1) = 0.66

Prob > chi2 = 0.4150

Source: Survey result, 2018/19

**Appendix table 6. Test for omitted variables**

Ramsey RESET test using powers of the fitted values of log of quantity sold

Ho: model has no omitted variables

F(3, 138) = 1.71

Prob > F = 0.1679

Source: Survey result, 2018/19

## APPENDIX II

### APPENDIX-II SAMPLE QUESTIONNAIRE

Survey Questionnaire Used to Collect Household Level Data

Study Title: **GROUNDNUT MARKET PERFORMANCE IN LIMMU SEKA DISTRICT, JIMMA ZONE**

#### CONFIDENTIALITY

**This questionnaire is being administered for research/academic purpose.**

#### INSTRUCTION FOR ENUMERATORS

Introduce yourself and tell the purpose of study before starting interview. For all closed questions put X or circle where appropriate and use the space provided for open ended questions.

-----  
Date: \_\_\_\_\_

• Name of enumerator: \_\_\_\_\_ Signature \_\_\_\_\_

• Kebele: \_\_\_\_\_

#### I. Household Characteristics

1. Name of household head \_\_\_\_\_

2. Sex of household head (M/F) \_\_\_\_\_ Age \_\_\_\_\_ years

3. Marital status: 1. Single 2. Married 3. Divorced 4. Widows

4. Education level of household head

1. Illiterate 2. Read and write 3. Formal education ( \_\_\_\_\_ Grade)

5. Age & Sex of Family members

| Sex    | Age in Years |       |      |
|--------|--------------|-------|------|
|        | < 16         | 16-65 | > 65 |
| Male   |              |       |      |
| Female |              |       |      |

6. Farming experience, how long have you produced groundnut \_\_\_\_\_ years.

7. Livestock resource

| S/N | Type of Animal | Number owned | Remarks |
|-----|----------------|--------------|---------|
| 1.  | Oxen           |              |         |
| 2.  | Cow            |              |         |
| 3.  | Heifer         |              |         |
| 4.  | Donkey         |              |         |
| 5.  | Goats          |              |         |
| 6.  | Others         |              |         |

8. Indicate the amount of land you have by source

1. Keble administration given land \_\_\_ha
2. Inherited from parent \_\_\_ha
3. Taken for share cropping \_\_\_ha
4. Parent given land \_\_\_ha
5. Rented in land \_\_\_ha
6. Other \_\_\_\_\_ha

9. Indicate the utilization of the land

1. Cultivated for maize \_\_\_ha
2. Cultivated for sorghum \_\_\_ha
3. Cultivated for groundnut \_\_\_ha
3. Other \_\_\_\_\_ha

## II. Groundnut Production

1. How many times do you produce groundnut in last production season? \_\_\_\_\_

If you produce, please provide the following key information

| Production System | Groundnut Variety(1=Improved 2=local) | Area (Ti) | Yield (qt/ti) | Quantity Consumed (qt) | Quantity used for seed(qt) | Quantity Sold (qt) | Price (Birr/kg) |
|-------------------|---------------------------------------|-----------|---------------|------------------------|----------------------------|--------------------|-----------------|
| Rain fed          |                                       |           |               |                        |                            |                    |                 |
| Irrigation        |                                       |           |               |                        |                            |                    |                 |
| Total             |                                       |           |               |                        |                            |                    |                 |

2. What is the source of labor used for groundnut production? (Multiple response is possible)

- 1) Family labor \_\_\_\_\_ Man/day
- 2) Labor exchange \_\_\_\_\_ Man/day
- 3) Hired labor \_\_\_\_\_ Man/day and Price \_\_\_\_\_

3. The source of oxen power:

- 1) Own \_\_\_\_\_ number
- 2) Rent \_\_\_\_\_ number and Price \_\_\_\_\_
- 3) Other (specify):



- 1) Oxen Shortage 2) Insects 3) Diseases 4) Drought 5) Weeds 6) Flood 7) Frost  
 8) Lack of pesticides 9) Seed shortage 10) fertilizer shortage 11) others \_\_\_\_\_

10. What are opportunities for groundnut production?  
 \_\_\_\_\_

#### IV. Marketing Aspect

1. Have you sold your produce (groundnut) recently? 1. Yes 2. No  
 2. If your answer for Q.1 is No, why you did not sell? \_\_\_\_\_  
 3. If yes, what is the total amount sold, price you have received and time of sell in 2019 and who purchase you and where did you sell it?

| Type of Produce   | Quantity Sold (Qt) | Time of Sell | To whom did You sell* | Price per (Qt) | Where did you sell ** | Terms of sell<br>1.Cash<br>2.Credit |
|---|--------------------|--------------|-----------------------|----------------|-----------------------|-------------------------------------|
| Groundnut   |                    |              |                       |                |                       |                                     |
| Code To *: 1. Direct to consumers 2. To whole sellers 3. To cooperatives<br>4. To urban assemblers 5. Village collectors 6. To retailers<br>7.To processors 8. To brokers 9.Others(specify)<br>Code To **:1. At farm gate 2.Taking to local market 3.In the cooperative store<br>4.Others(specify)_____ |                    |              |                       |                |                       |                                     |

4. What was the price of groundnut in 2018 production season \_\_\_\_\_birr/quintal?  
 5. Do you think you have received a fair price for your groundnuts sold? 1. Yes 2. No  
 6. Did you face difficulty in finding buyers when you wanted to sell? 1. Yes 2. No  
 7. If yes, in Q 6 is it due to:  
 1. Inaccessibility of market 3. Lack of information  
 2. Low price offer 4. Other (specify)\_\_\_\_\_  
 8. What did you do, when the groundnut you offered to the market was not sold?  
 1. Sold at lower price on the same market 4. consumed  
 2. Took to another market on the same day 5. Sold on other market day  
 3. Took to another market on another day 6. Other (specify)\_\_\_\_\_  
 9. Who set your selling price in 2019?

1. Yourself 2. Set by demand and supply 3. Buyers 4. Sellers 5. Other (specify) \_\_\_\_\_
10. Did you face problem in transporting the groundnut from home to market? 1. Yes 2. No
11. How did you get information on supply, demand & price of groundnut in other markets?

| For    | Use code | Source of information  |
|--------|----------|--|
| Supply |          | 1. Traders 2. Cooperative 3. Telephone 4. Personal observation 5. Radio 6. Newspaper 7. Brokers 8. Other farmers 9. Extension visits |
| Demand |          |  |
| Price  |          |  |

12. Did you face problem in production and marketing? If yes what was the cause & your suggestions to solve each problem? Multiple answer is possible

1. Fertilizer supply \_\_\_\_\_ 2. chemical supply \_\_\_\_\_
3. Seed supply \_\_\_\_\_ 4. Shortage of land \_\_\_\_\_
5. Theft \_\_\_\_\_ 6. Disease (Type of disease) \_\_\_\_\_
7. Scaling (weighing) \_\_\_\_\_ 8. Transport \_\_\_\_\_
9. Price setting \_\_\_\_\_ 10. Other (specify) \_\_\_\_\_

13. Summarized production cost of groundnut producers

| Cost items                         | Cost per quintal in | Percent from total cost |
|------------------------------------|---------------------|-------------------------|
| Land clearing and preparation      |                     |                         |
| Oxen rent                          |                     |                         |
| Labor cost for plowing and seeding |                     |                         |
| Inputs/seed, chemicals, fertilizer |                     |                         |
| Labor cost for weeding             |                     |                         |
| Harvesting                         |                     |                         |
| Rooting up (labor)                 |                     |                         |
| Threshing (labor)                  |                     |                         |
| Store rent                         |                     |                         |

|                              |  |  |
|------------------------------|--|--|
| Packing                      |  |  |
| Transport cost               |  |  |
| Loading and unloading        |  |  |
| Land rent                    |  |  |
| Taxes                        |  |  |
| Overall cost                 |  |  |
| Interest payment             |  |  |
| Selling price                |  |  |
| Net return                   |  |  |
| <b>Gross profit(Loss)/Qt</b> |  |  |

### **Traders' questionnaire**

1. Questionnaire Number: \_\_\_\_\_
2. Name of Interviewer: \_\_\_\_\_
3. Date of Interview: \_\_\_\_\_
4. Place of Interview: \_\_\_\_\_

#### **I. General Information**

1. Name of trader: \_\_\_\_\_ Age \_\_\_\_\_ Sex \_\_\_\_\_
2. Address: Region \_\_\_\_\_ Zone \_\_\_\_\_ Woreda \_\_\_\_\_ Town \_\_\_\_\_
3. Type of trade: 1) Retailer 2) Wholesaler 3) Collectors 4) Others \_\_\_\_\_
4. Marital status: 1) Single 2) Married 3) Divorced 4) widowed
5. Family size: Male \_\_\_\_\_ Female \_\_\_\_\_ Total \_\_\_\_\_
6. Educational level of the respondent \_\_\_\_\_
7. How long have you been operating in the business? \_\_\_\_\_ years
8. Why you prefer groundnut business?  
 \_\_\_\_\_ others
9. What mode of transportation did you use?  
 1) Man power 2) Animal 3) transport 4) Vehicle 5) Cart 6) Others \_\_\_\_\_
10. Are there entry barriers in groundnut trading? 1) Yes 2) No
11. If your answer to **Q.10** is yes, what are the reasons?  
 1) Capital 2) Information collusion 3) Administrative problems 4) Stiff competition  
 With unlicensed traders 5) High monopoly with prior control of farmers 6) Other \_\_\_\_\_



## II. Purchase practice

1. From which market and supplier did you buy groundnut? (\*Multiple market area is possible, multiple answers are possible)

| Market (location name)                            | From  | Quantity purchased in (Qt) | Average price per (Qt) | % of purchased groundnut | Payment type in                 |
|---|---|----------------------------|------------------------|--------------------------|---------------------------------|
| 1. Deneba<br>2. Dame<br>3. Atnago<br>4. Merochisa | 1.Producer<br>2.Retailer<br>3.Wholesaler<br>4.Cooperatives<br>5.Collector<br>6.Broker<br>7.Unknown<br>8.Other (specify) |                            |                        |                          | 1.Cash<br>2.Credit<br>3.Advance |

2. From which market do you prefer to buy most of the time?

1) Deneba 2) Dame 3) Atnago 4) Merochisa 4) Other \_\_\_\_\_

3. Why do you prefer this market?

1) Better quality 2) High supply 3) Shortest distance 4) Others \_\_\_\_\_

4. Are all your purchasing centers accessible to vehicles? 1) Yes 2) No

5. If your answer to **Q.4** is No, what proportions are accessible? \_\_\_\_\_

6. Who sets the purchase price?

1) Myself 2) Set by demand and supply 3) Sellers 4) Buyers 5) Other \_\_\_\_\_

7. Who purchase groundnut for you?

1) Myself 2) Broker 3) Commission agent 4) Family members 5) Other \_\_\_\_\_

8. How do you attract suppliers?

1) Giving better price 2) By visiting them 3) Fair scaling /weighing 4) Extending credit

5) Using brokers 6) Advertising using influential peoples 7) Other\_\_

### III. Selling Practices

1. To which market and to whom did you sell groundnut. (\*Multiple market area is possible, \*\* Multiple answers are possible

| Market (location name)                            | To   | Quantity sold in (Qt) | Average price per (Qt) | % of sold groundnut | Payment received                |
|---|--|-----------------------|------------------------|---------------------|---------------------------------|
| 1. Deneba<br>2. Dame<br>3. Atnago<br>4. Merochisa | 1.Producer<br>2.Retailer<br>3.Wholesaler<br>4.Cooperatives<br>5.Collector<br>6.Broker<br>7.Unknown<br>8.Other_____ |                       |                        |                     | 1.Cash<br>2.Credit<br>3.Advance |

2. How did you sale your produce?

1) Direct to the purchaser 2) Through broker 3) Other (specify)\_\_\_\_\_

- 3.What promotional techniques did you use to increase the number of your selling customers?

1) Offering better price 2) Extending credit 3) Fair scaling  
4) Visiting customers 5) Advertising by influential people 6) Using brokers  
7) Inherited family customers 8) Store service with no payment 9)others (specify)\_\_\_\_\_

4. .How many regular buyers do you have? Wholesalers\_\_\_\_, Consumers\_\_\_\_, Processors \_\_\_\_\_, Assembler \_\_\_\_\_, Retailers \_\_\_\_\_, exporters\_\_\_\_\_, others\_\_\_\_\_

5. Do you know the market prices in different competitive markets before you sold your groundnut? 1) Yes 2) No

6. What is your source of information? \_\_\_\_\_

7. . Are there charges (taxes) imposed by government or community officials at the market?

1) Yes 2) No

8. On average how much do you purchase groundnut per market day?

In production seasons\_\_\_\_\_ Quintals \_\_\_\_\_ Birr/quintal

In slack periods\_\_\_\_\_ Quintals\_\_\_\_\_Birr/quintal

9. Do you want to expand groundnut trading? 1) Yes 2) No

10. If your answer to **Q.9** is yes, why? \_\_\_\_\_

11. If your answer to **Q.9** is No, why? \_\_\_\_\_

12. If there is fluctuation in supply of groundnut, what are the main reasons for the fluctuations of groundnut supply?

- 1) Price change    2) Transportation problem    3) Producers production pattern  
4) Pest problem    5) Drought    6) Other (specify) \_\_\_\_\_

### III. Margin Analysis

#### 1. Marketing Costs of Groundnut Trading

| Cost Component                         | unit    | Cost for Groundnut (in birr) |
|--|---------|------------------------------|
| 1. Seller price /Purchase price        | Kg      |                              |
| 2. Brokers charge/commission fee       | Carload |                              |
| 3. Loading and unloading               | quintal |                              |
| 4. Transport cost                      | Quintal |                              |
| 5. Store rent                          | quintal |                              |
| 6. Storage losses                      | Kg      |                              |
| 7. Loss in transportation and handling | Kg      |                              |
| 8. Product container                   |         |                              |
| 9. Taxes                               | Quintal |                              |
| 10. Interest rates                     | Birr    |                              |
| 11. Other payments                     |         |                              |
| 12. Sorting Costs                      | quintal |                              |
| 13. Market Search fees                 |         |                              |
| 14. Other Overhead costs               |         |                              |
| Total cost                             |         |                              |
| Selling revenue                        |         |                              |
| Gross Margin                           |         |                              |

#### 2. The major constraints and opportunities of groundnut marketing.

1. Constraints
2. Opportunities