



WOLKITE UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

**DETERMINANTS OF MARKETABLE SURPLUS OF CHICKPEA IN ETHIOPIA:
(The case of Anchar district)**

**A RESEARCH SUBMITTED TO THE DEPARTMENT OF ECONOMICS, IN
PARTIAL FULFILLMENT OF THE REQUIREMENT OF BA DEGREE IN
ECONOMICS**

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DECLARATION

Hassan, declare that this research entitled: “*determinants of marketable surplus chickpea in Ethiopia :(The case of anchar district)*” is outcome of my own effort and study and that all sources of materials used for the study have been appropriately acknowledged.

To the best of my knowledge, this study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the Bachelor degree in economics.

By: Hassan Hussen

Signature-----

Date-----

ADVISORS' APPROVAL SHEET

This is to certify that the research entitled: "*determinants of marketable surplus chickpea in Ethiopia: The case of anchar district*" submitted in partial fulfillment of the requirements for the Bachelor degree in Economics, of the Department of Economics, and has been carried out by Id. No233/09, under my/our supervision. To the best of my knowledge, is an original work and not submitted earlier for any degree either at this University or any other University.

Therefore I recommend that the student has fulfilled the requirements and hence here by can submit the thesis to the department.

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Date: June 18, 2019

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List of acronyms

1, CSA	Central Statistical Agency
2, EEA	Ethiopian Economy Association
3, FAO	Food and Agriculture Organization
4, FAOSTAT	Food and Agriculture Organization Statistics
5, MOARD	Ministry of Agriculture and Rural Development
6, WHO	World Health Organization

ABSTRACT

The objective of this research paper is to assess the determinants of marketable surplus and marketing outlet chosen by farmers producing chickpea in Achar district. The paper employed a commodity approach marketing to examine the factors that affect Chickpea marketable surplus. Respondents were selected based on probabilistic simple random sampling techniques. Accordingly, a sample of 94 respondents was taken. To collect relevant data, structured interviews were applied. To analyze the data both descriptive statistics (for analyzing market outlets) and econometrics models (for analyzing determinants of marketable surplus) were employed. Determinants of marketable surplus were analyzed by using multiple linear regression model. Accordingly yield, land size, variety and crop quality were significantly affected marketable surplus of chickpea. Finally the descriptive statistics result confirmed that a fairly weak preference of chickpea buyers by smallholder farmers. Therefore, farmers need to learn not only how to produce but first how to expand the size of market to improve profitability of farmer's production. In another word there is also a need for policy interventions in the product quality control as the development of market is possible only when quality based marketing systems that offer better differentiated prices for products that differ in observable quality parameters.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Chickpea is a very important pulse crop that grows as a seed of a plant named *Cicerarietinum* in the leguminous family. Chickpea has an interesting fact behind its name. It's called Chickpea because it looks like baby chick. This pulse is estimated to be at least 7,500 years old and was originally cultivated at Mesopotamia and The eastern Mediterranean. Currently, it is grown in India, Middle East South America, Canada and various parts of Africa. It contains 25% proteins, which is the maximum provided by any pulse and 60% carbohydrates. It occupies third position in the list of the food legumes which are cultivated throughout the world (FAOSTAT, 2008).

Chickpea is a less labor-intensive crop and its production demands low external inputs compared to cereals. In Ethiopia, chickpea is widely grown across the country and serves as a multi-purpose crop (Shiferaw et al., 2007). First, it fixes atmospheric nitrogen in soils and thus improves soil fertility and saves fertilizer costs in subsequent crops. Second, it improves more intensive and productive use of land, particularly in areas where land is scarce and the crop can be grown as a second crop using residual moisture. Third, it reduces malnutrition and improves human health especially for the poor who cannot afford livestock products. It is an excellent source of protein, fiber, complex carbohydrates, vitamins, and minerals. Fourth, the growing demand in both the domestic and export markets provide a source of cash for smallholder producers. Fifth, it increases livestock productivity as the residue is rich in digestible crude protein content compared to cereals.

Chickpea production works well in rotation with cereals such as wheat and teff widely grown in relatively well-drained black soils. Globally, chickpea is adapted to black soils in the cool semi-arid areas of the tropics, sub-tropics as well as the temperate areas. It is the third most important pulses grown in the world after dry bean and pea and constitutes 20% of the world's pulse production (Joshi et al., 2001). Chickpea was first produced in the Middle East about 7, 000 years ago. At present, it is produced in over 40 countries represented in all continents. However,

there are two types of chickpea produced globally, namely Desi and Kabuli chickpeas. Kabuli chickpeas have a larger cream-colored seed with a thin seed coat whereas the Desi type has a small reddish brown-colored seed and thick seed coat. On average, world production consists of about 75% of

Desi and 25% of Kabuli types (Agricultural and Agro- food Canada, 2004). Although Kabuli types can be profitably adapted in the country, Ethiopia traditionally produces largely the Desi types. Morphologically, Desi types have pink flowers while the Kabuli types are characterized by white flowers. It is grown at the end of the main rainy season using residual soil moisture. This allows farmers to practice double cropping, which in turn increases productivity of scarce land resource and serves as an additional source of income.

Chickpea marketing system in Ethiopia is under- developed and poorly organized. The export market outlet is relatively new and highly variable depending on production conditions in the major importing countries in South and West Asia and competitiveness with strong competitors' exporter countries such as India, Pakistan and Tanzania (based on Birehanu Adnew's National Report, 2009). At present, the growing demand in domestic markets and low incentives for exporters resulting from low volume, poor-quality and poor price competitiveness in export markets seem to favor domestic markets. As Desi production has still been dominating; most of what is traded in domestic as well as export markets seem to be the Desi type chickpea. This display there is high expectation from government bodies and farmers to adapt production policy and marketing policy to market demand for the crop to fetch competitive prices for smallholder farmers and exporters and thereby address poverty alleviation plans. There is also need to assess marketable surplus of both types of Kabuli and desi chickpea in the distinct of anchar.

1.2. Statement of the problem

The structure and functioning of the chickpea marketing system is constrained by several factors (Bekeles et al., 2007). First, the supply originates in small quantities from several highly dispersed small producers that supply. Given the low productivity of the crop at present the marketed surplus by individual farmers and the overall traded volume are low, and hence per unit transaction costs for individual farmers and rural traders are high. Second, there is no efficient mechanism for delivering market information to the producers and traders at local markets on issues related to seasonal prices, demand, and quality requirements in different markets across

the country. This makes prices to be determined mainly through local supply and demand patterns. This aggravates the seasonal price fluctuations in local markets. Third, there is lack of a well-established system of grades and standards in the chickpea marketing system. This is despite the three grades reorganized by the Ethiopian Grades and Standards Authority and additional quality specification systems required for export.

This study is slightly differing from the previous study because they try to assess factors that determine marketable surplus of chickpea in particular study area of Anchar district by filling methodology and take in to account variable gap (crop quality) this variable is not included in the previous study and Thus, this Variable gap, most of previously conducted research were not taken place by take into account appropriate explanatory variables to investigate a problem in study area.

Therefore I added these variables to recommend possible solution regarding the above problems of farmers' in Anchar district.

1.3 Research Question

- What are the factors that determine the marketable surplus of chickpea among the smallholder farmers in the study area?
- Which market outlets are commonly used amongst the farmers in the study area?

1.4 Objectives of the Study

The general objective of this paper is to assess marketable surplus of Kabuli and Desi's chickpeas in the districts of Anchar.

The specific objectives of the paper are:

- To examine factors affecting market supply of chickpea amongst the smallholder farmers
- To examine the key market chain outlets for chickpea in the study areas.

1.5. Significance of the Study

Information on the market performance of high value crops, such as chickpea might provide appropriate production and consumption incentives thereby enhancing agricultural productivity and reducing the food insecurity problem in the country. In a country where livelihood

diversification through production of high-value crops were given due emphasis, improvement in chickpea production and marketing can make a significant contribution to the national economy and thus brings growth. To this effect, these goals require appropriate interventions by the government and private institutions with the aim of improving the market structure, information flow and institutional infrastructures, to help the market in achieving the national policy objectives. The means of meeting these needs can be met by evaluating the economic performance of high value crops like chickpea production and marketing.

The study would generate valuable information on chickpea marketing which may help policy makers to take relevant decisions and intervene in the development of chickpea marketing. In general, governmental and nongovernmental organizations that are interested in high value crops market chain may use the result of this study to take appropriate policy measures or can be used as a base line information for further study.

It would also provide a clear picture on how chickpeas are marketed (the environment of suppliers, buyers and facilitators that affect the farmers' ability to develop and maintain successful transactions with target customers), so that an understanding of these markets and intervention.

1.6. Scope of the study

The study aims to analyze the determinants of marketable surplus of Kabuli and Desi chickpeas as well as market outlets chosen by particular farmer in three district of Anchar.

1.7. Limitation of the study

One limitation of the study was that large numbers of sample households were unwilling to give information on amount of production and supply, on information related to financial issue. Moreover, lack of proper documentation on the required information is another limitation. This ultimately reduces the number of valid data case in the analysis. Other limitations of the study are that it does not include informal moneylenders and urban borrowers.

1.8. Organization of the Paper

This paper contains five chapters. Chapter 1 presents background of the study, statements of the problem, objective of the research, limitation of the study, scope and organization of the paper. Section 2 presents review of relevant literature. Methodology describing the study areas, sampling methods, methods used in data collection and the actual type of data collected and analytical methods adopted follows in section 3. Section 4 presents results and discussion which identify determinants of market supply and identify the main production and marketing problem, and opportunities. Section 5 presents a conclusion and recommendation of the key findings and the policy implications of the study.

CHAPTER TWO:

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, definition of basic concepts approaches to study marketing; market outlet and marketable supply are discussed. In relation to these issues, the chapter highlights about the production and marketing surplus of chickpea in the World, Africa and Ethiopia. Review of empirical literature determinant of smallholder market participation in Ethiopia and other parts of the world will also include.

2.2 CONCEPTS AND DEFINITIONS

Market: Originally the term market stood for the place where buyers and sellers are gathered to exchange their goods, such as village square. Market is an area in which one or more sellers of a given products/services and their close substitutes exchange with and compete for the patronage of a group of buyers. The term market means the place where buying and selling takes place, an area in which a good is sold, a group of people carrying on buying or selling, or the commodity traded (kotler,2013).

According to (Kilingo and Kariuki, 2012) **market** is defined as an institution within which the forces of demand and supply operate; sellers, and consumers are in constant communication, and there is change of title to goods and/or services. Potential consumers make up a market, which is people with the desire and with the ability to buy a specific product (Eric and Kerin, 2011). (Kotler 2013) also defined market as a place that consists of all potential customers sharing a particular need or wants who might be willing and able to engage in exchange to satisfy that need/want.

Marketing: Marketing is the process of bringing sellers and buyers together for the purpose of exchanging title to goods and services (Kilingo and Kariuki, 2012). According to Kotler (2003) marketing is defined as a social and a managerial process whereby individuals and groups obtain what they need and want through creating and exchanging products and value with others. Marketing has basic productive value, in that it adds time, form, place and possession utilities to products and commodities. Through the technical functions of storage, processing and transportation, and through exchange, marketing increases consumer satisfaction from any given quantity of output.

The American Marketing Association representing N marketing professionals in the US and Canada states that marketing is the process of planning and executing the conception, pricing, Promotion and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives (Eric and Kerin, 2011).

Marketing system: Is defined as the sequential set of kinds or types of business firms through which a product passes during the marketing process. Also they define marketing system as the totality of product channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. It is usually seen as a “system” because it comprises several, usually stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process.

Agricultural marketing: Consumers spend a large amount of income on basic foods hence with the growth of urbanization the agricultural marketing system is expected to play a great role in linking the rural and the urban population. Agricultural marketing covers all the activities associated with the agricultural production and food, feed, and fiber assembly, processing, and

distribution to final consumers, including analysis of consumers' needs, motivations, and purchasing and consumption behavior (Eric N. and Kerin, B., 2011.)

Supply (marketed surplus) and marketable surplus: market supply refers to the amount actually taken to the markets irrespective of the need for home consumption and other requirements whereas the market surplus is the residual with the producer after meeting the requirement for seed, payment in kind and consumption by peasant at source. Agricultural products differ from manufactured goods in terms of supply and demand. Supply is peculiar because of the seasonal biological nature while demand is relatively stable throughout the year.

Market chain and supply chain: Agricultural commodities are produced by large numbers of farmers and consumed by large numbers of households. With the exception of food stuffs consumed on-farm or sold locally, they are bought and sold a number of times between the farm gate and the final consumer. While moving between these two points, the commodity is transported, stored, cleaned, graded and processed. Market chain is the path one good follows from their source of original production to ultimate destination for final use. According to Kotler (2013) supply chain is a longer channel stretching from raw materials to final products that are carried to final buyers. He shortly put a value-delivery network. Under a free market, supply chains for a commodity develop to reflect its production, marketing and processing characteristics.

It is the overall group of economic agents (producer, trader, and consumer, Institutions or development organizations) that contribute directly in the determination of the final product (FAO, 2014). Supply chain is a sequence of firms that perform activities required to create and deliver a good or service to consumers or industrial users. It differs from a marketing channel in terms of membership

2.2 THEORETICAL REVIEW

The most important characteristics of a marketing function is that its physical process or facilitating service which must be performed one or more times within the marketing system. The main marketing physical functions are assembling, grading, storing, processing, packaging, distributing and transporting. There are also facilitating functions (market research, product

research and development, demand development, exchange services, finance and risk bearing and market information). The main approach that was applied for this research was commodity approach.

2.2.1. Commodity Approach

Commodity approach is a detailed analysis of marketing functions, system and structure from the view point of an individual product. 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. 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.

2.3 EMPIRICAL STUDY

2.3.1. Agricultural Markets in Smallholder Farming Systems

African markets are typically undercapitalized and inefficient. Some of the major factors that contribute to less-developed agricultural markets that limit competitiveness and lead to market imperfections are related to high marketing costs resulting from high transaction costs and poor Market infrastructure, low marketable surplus and poor quality products that do not meet market preferences (Fafchamps,2013; Fafchamps and Eleni, 2016).

Ethiopia is one of the sub-Saharan countries which liberalized its economies and developed poverty reduction strategies that underpin market-led strategies for broad-based agricultural development and economic growth. The centralized grain marketing activities of the 1980s where pan-territorial input and output prices were determined by the central government have given way to liberalized agricultural markets. Market liberalization means that input and output prices are determined by market forces. However, due to the weak bargaining power of producers and production fluctuations, price fluctuations in markets have been found to affect producers (EEA, 2004). Due to widespread market failures and imperfections in the marketing chain, donor agencies and government experts have realized that the idea of sole reliance on

market forces does not work, and therefore recommended institutional intervention in the price formation of agricultural products (EEA, 2004).

The Ethiopian government's agricultural policy also defines agricultural marketing as a key element of rural growth, poverty reduction, enhanced food security, and addressing the needs of a growing population in both rural and urban areas. However, nearly half of its population is food insecure or live below poverty line (WHO, 2007). The question is; why Ethiopia is unable to feed its citizens, given the huge wealth of productive land, labor, and other natural resources.

2.3.2. Determinants of Smallholder Market Participation

Agricultural produce in Ethiopia are marketed through complex marketing chains that involve a number of intermediaries and marketing agents (MoARD 2005). This increases the transaction costs and lowers the share of the consumer price that is received by the small producer. This indicates that the increased transaction costs underpin the imperfections in grain markets and contribute to the limited participation of smallholders in existing markets. A household's production technology choices fundamentally affect its productivity and by extension its market participation choices (Barrett, 2007). Households operating undeveloped agricultural productivity, technologies may participate in markets, but often only because they must use commodity markets as a way to resolve pent up demand for financial services to which they have no access. This indicates that promoting adoption of improved production technologies is essential to induce broader-based market participation.

2.3.3 Special Characteristics of chickpea Crops Marketing

Grain legumes like chickpea, lentils, peas and beans (of different types) are the third most important export crops in Ethiopia after coffee and oil crops (NBA, 2009). Establishing quality-based marketing systems create self-incentives for producers to adopt improved technologies (as improved technologies may help to improve quality), adapt and improve product to meet the quality and quantity requirements of consumers.

Globalization is the term used to describe the recent impact of innovations in communications and transport systems on trade and increasing integration of world markets. This process has encouraged nations to liberalize or open their economies with the aim of increasing their volumes of trade, including the international trade of agricultural products (Kaplinsky, 2001).

This implies that international markets demand large quantities of legume products because farmers across the world are now not only competing with their neighbors or their neighboring countries for access to markets but are competing with farmers across the world. According to (Kaplinsky 2001), the prices tend to increase in years of poor global production and fall in years of bumper harvests. This indicates that markets are unable to absorb rapid increasing yield from higher input farming systems and thus higher production (excess supply season) is often translated in to reduced farm gate prices.

Competitiveness in global markets would critically depend on improving productivity, grain quality and ability to consistently supply required volumes of market preferred commodities at competitive prices and at the right time (Kaplinisky, 2001). Producers also need to avoid use of certain pesticides that are not approved by FAO and the World Health Organization (WHO). MoARD (2003) provides a list of accepted pesticides for use. This indicates that global markets demand consistent supply of large-seeded Kabuli (higher quality chickpea) in a manner to create time, place and form utility in the product to receive competitive prices and to meet the standards for food quality and safety requirements.

2.4. Production and Marketing of Chickpea in Ethiopia

2.4.1. Production of Chickpea in Ethiopia

Ethiopia has suitable agro-climatic conditions for production of both Desi and Kabuli type of chickpeas. But, the country has traditionally grown Desi chickpeas both for consumption and sale. However, some small-seeded Kabuli type varieties have been released for cultivation since 1970s. Kabuli types are just beginning to be grown in some areas and are new in domestic markets (Legese et al., 2005). Along with the renewed focus on market-led agricultural development and the ongoing effort to increase export of tradable commodities, the better market opportunities and higher prices seem to have increased the much needed policy attention for Kabuli types.

The traditional Desi varieties are small-seeded and are mainly traded locally because international markets favor larger-seeded Kabuli varieties. The average yields of Kabuli varieties are low. The average yields for Desi varieties are low but higher than those in the rest of Africa, perhaps due to the good soils and growing conditions for the crop in the highlands of Ethiopia

(Bekele et al., 2004). This leads to the importance to consider the global price structures in determining whether it would be profitable to produce and export Kabuli chickpeas and whether Ethiopia would be competitive in such markets. However, large-seeded types that are more preferred in international markets have been released for cultivation in Ethiopia only recently and are not relatively well known amongst local farmers and the trading community. This shows information dissemination is very important to create better agronomic practices by cultivator smallholder farmers and to improve other factors that affect the production and marketing of Kabuli chickpeas and the competitiveness of smallholders in domestic and international markets. Farmers would only switch to Kabuli types if the new varieties have got more marginal values than Desi types and find a reliable market outlet for their produce. This implies that individual producers always have an incentive to adopt a cost-reducing technology.

2.4.2. Marketing of Chickpea in Ethiopia

Underdeveloped market linkages and problems of low economies of scale and high transaction costs often push smallholder farmers to sell their small marketed surplus at the farm-gate with lower prices (Fafchamps and Hill 2005; Shiferaw et al, 2006). This implies that in a developing country like Ethiopia the value of outputs that gained in the market is not substantial to induce producer smallholder farmers to create a good agro-economic potential. Thus, output markets and demand are important determinants to adopting improved technologies that ending in fetching high Profit for farmers. Chickpea marketing system in Ethiopia is under-developed and poorly organized. The export market outlet is relatively new and highly variable depending on production conditions in the major importing countries in South and West Asia and competitiveness with strong competitors' exporter countries such as India, Pakistan and Tanzania (Gebremeskel, Jayne, and Shaffer's, 2009).

At present, the growing demand in domestic markets and low incentives for exporters resulting from low volume, poor quality and poor price competitiveness in export markets seem to favor domestic markets. As Desi production has still been dominating, most of what is traded in domestic as well as export markets seem to be the Desi type chickpea. This display there is high expectation from government bodies and farmers to adapt production policy and marketing policy to market demand for the crop to fetch competitive prices for smallholder farmers and exporters and thereby address poverty alleviation plans.

2.4.3 Conceptual framework

The marketable surplus analysis examines the full range of activities required to bring a product or service from its conception to its end use, the firms that perform those activities in a vertically coordinated chain and the final consumers for the product or service. The activities include design, production, marketing and support to get the final product or service to the end consumer (Kaplinsky 2001). If a market surplus analysis is conceived as examining all the farmers, channels and markets related to a specific product or service. The marketing of commodities typically involves many intermediaries: assemblers, wholesalers, retailers, and the ultimate end users (i.e. consumers). The performance of the marketing system of any commodity depends on the organization of its marketing channels. In particular, the number of actors involved and the degree of coordination and information sharing within the channel will determine the marketing supply chickpea production and their outlet.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Description of the Study Area.

Anchar district is found in west hararghe zone in oromia regional state and located about 314 km far from the Addis Ababa and 95 km from the Chiro which is capital of the west hararghe zone. Its astronomical location is 32' north latitude and 30 ° 58' east longitudes with an elevation of 2063 meters above sea level. Anchar woreda is located in tropical climate zone and its climate condition is medium that the altitude of the land is wayna dega. The relative location or visional position of the woreda has physically contacts with three woreda, namely Habro, Guba qoricha, Daro labu, and two zone namely east showa zone, Arsi zone and one region namely Afar. In terms of these woreda location, Anchar woreda is boarded in the North by Afar regional state, in

the west by East showa zone, in the south by Arsi zone, in the south by Daro labu and in the east by Habro and guba qorichaa. The total populations of Anchar woreda in rural and urban areas are 183391. From these, 91622 and 91769 are male and female respectively. About 95% of population lives in rural areas practicing mixed farming system as a means of their livelihoods. The total area of the woreda is approximately around 85,809-hectare (Anchar woreda Agricultural and Land Protection Bureau, 2018).

3.2. Sources and methods of data collection

Both primary and secondary sources of data used for this paper. The data was collected from different individuals, government institutions which had relevant information related to the subject matter.

3.2.1. Primary Data Source and Collection

The primary data source was collected from sources such as farmers, whole sellers, retailers, consumers, and district agriculture office. For primary data collection, semi structured interview, and personal observation were used as major instruments for collecting the data. The reason for using interview was: easy to administrate, flexible, it allowed to control over the environment, it allows control over the order of the question ,it gives a chance of Correction the miss understanding by the respondents and completes of the question is guaranteed.

3.2.2 Secondary data

In addition to primary data, secondary information on non-labor inputs, labor input costs, average seed and grain output prices for crops grown will be gathered from district agriculture office, cooperatives, input providers, wholesalers and retailers.

3.3 Sampling Technique and Sample Size (sampling procedure)

There are two general types of sampling methods. These are probability and non-probability methods of sampling. If probability sampling is done, each element in the population has a chance of being chosen. If non-probability sampling methods are used, not all elements or people have a chance of being included in the sample. In such instances, the results may be biased, meaning that the sample results may not be representative of the population.

Sampling means taking part of some population to represent the whole population. The alternative to sampling is enumeration; counting the entire population. The major reason for sampling is economy. To survey every individual in a population using enumeration is ordinarily much too expensive in terms of time, money and personnel. Due to the economy of expenditure (time, money, and human resources); and need for greater scope, accuracy and greater speed it is difficult to deal with the whole population.

The target population for this study will be all households of Anchar woreda. The simple random sampling technique has applied for gathering necessary information for the study. The reason for selecting simple random sampling method will be the fact that the Anchar woreda has above 80% homogeneous population. The total population of the households those exists in the woreda is 22,888, and the woreda has 35 kebeles and 3 towns. From these kebeles, I want to select three kebeles. These were namely, Biyyoo, Kuss and midhaagduui, because some household in these kebele are marketable surplus chickpea as compared to the other kebeles. Therefore, Biyyoo has total household of 657, Kuss has total household of 481 and Midhaagduu has total household of 454. In order to take a total sample size relevant to target study I will be apply Yamane formula (1967) of $n = \frac{N}{1+N(e)^2}$. In addition to this, we are going to use proportionate sampling that will be enable us in taking samples from each sub strata' which are to be selected from the target population.

$$N = 657+481+454$$

where, N = the total number of households

$$N = 1592$$

e = the margin of error

$$e = 10\% \text{ or } 0.1$$

n = the total sample size of households

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

$$n = \frac{1592}{1+1592(0.1)^2}$$

$$n = 94$$

Then I have to apply proportionate sampling to obtain how many respondents are selected from each stratum by using formulas: $n_h = n(N_h)/N$

Where: n_h = Sample size for stratum h

N_h is the numbers of households for stratum h

N is the total numbers of households and n is the total sample size

$$\begin{array}{lll} n_{h1} = n(N_{h1})/N & n_{h2} = n(N_{h2})/N & n_{h3} = n(N_{h3})/N \\ = 94(657)/1592 & = 94(481)/1592 & = 94(454)/1592 \\ n_{h1} = 39 & n_{h2} = 28 & n_{h3} = 27 \end{array}$$

So that, $n_{h1}=39$, $n_{h2}=28$, and $n_{h3} = 27$ are the sample size of the strata to the kebele Biyyo, Kuss and Midhagduu, respectively.

3.4 methods of data analysis

Both descriptive and econometric methods are used to analyze the data. Descriptive statistics was used to identify key marketing outlets. The objective of identification of marketing outlets is to draw a systematic knowledge why farmers prefer certain outlets. For objective 2, econometric model was used to estimate determinants of marketable supply of chickpea.

3.4.1. Descriptive statistics

Descriptive data analysis methods such as percentages, means and standard deviations were used to identification of marketing outlets is to draw a systematic knowledge why farmers prefer certain outlets.

3.4.2 Econometric Analysis and Model Specification

I was using the multiple linear regression models. Because of the dependent variable is a continuous variable and the independent variable either continuous variable or dummy variables. It was an essential method of econometric analysis to recognize and realize patterns of the influencing factors. It should be noted that in the course of analyzing the factors affecting market supply of chickpea in Anchar districts. It could be an essential method of econometric analysis to recognize and realize patterns of the influencing factors.

Multiple Linear Regression Analysis

Linear regression is a method of estimating or predicting a value on some dependent variable given the values of one or more independent variables. Statistical regression examines the association or relationship between variables. They added multiple regression analysis, which means more than one predictor is jointly regressed against the criterion variable. This method is used to determine if the independent variable was explaining the variance in dependent variable.

Regression Functions

The equation of regressions on this study is generally built around two sets of variables, namely dependent variable (quantity supply) and independent variables. The basic objective of using regression equation on this study is to make the study more effective at describing, understanding and predicting the stated variables. The model used for the analysis was specified as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + U_i$$

Where: y is response or dependent variable

X₁=crop quality, x₂=land, , x₃=variety, x₄=yield, x₅=extension, X₆=credit, x₇=market information, .

U_i = disturbance term

β_0 is the intercept term-constant which would be equal to the mean if all slope coefficients are 0. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$, are the coefficients associated with each independent variable which measures the change in the mean value of Y, per unit change in their respective independent variables. Accordingly, this statistical technique was used to explain the following relationships. Regress performance (as dependent variable) on the selected linear combination of the independent variables using multiple regressions.

3.4.3. Definitions of variables and Hypothesis of setting

Hypothesized variable expected to influence marketable supply of chickpea in the study area are explained in the manner

Dependent variable:

Quantity Supplied (QUA SUPP): It is a continuous variable which represents the amount of chickpea supplied by the household to the market measured in quintals.

The Independent variables are:

1. **Yield (YIELD):** Farmers who produce higher output are assumed to supply more to the market than those with lower product. It is a continuous variable measured in quintals per household and assumed to affect the marketable supply of chickpea positively. According to Butler and DNIVA (2005), yield can have serious and unpredictable consequences on the supply.

2. **Land size (LAND):** The total land used for chickpea production was measured in terms of number of hectares the household owns and it was expected to affect the household level of chickpea marketable supply positively because, a producer who owns a large area of land for chickpea production than a producer who own less area of land and under the same input utilization condition can produce more.

3. **Access to credit (CREDIT):** Access to credit is measured as a dummy variable taking value of 0 if the farmer had access to credit and 1 otherwise. This variable was expected to influence the marketable chickpea positively on the assumption that producers use the credit for production purpose.

4. **Market information (MKT INFO):** This variable was measured as a dummy variable taking a value of 0 if the farmer had access to market information and 1 otherwise. It has been hypothesized to affect marketable supply of chickpea positively. Producers that have access to market information are likely to supply more chickpea to the market than informed producers.

5. **Extension service (EXTN):** This variable was measured as a dummy taking a value of 0 if the household head has contact with a development agent and 1 otherwise. Extension service was expected to have positive effect for market participation through its stimulation of production and productivity. Farmers that have frequent contact with DAs will have better knowledge to produce and market their product.

6. **Variety of chickpea (VAR):** This variable was measured as a dummy taking a value of 0 if the household head has grown Desi type 1 if the household produces Kabuli type and 2 if the household used to produce both Desi and Kabuli varieties of chickpea is expected to be different.

The market oriented Kabuli is expected to have higher demand than domestic Desi type hence, it is expected supply of Kabuli type of chickpea to be higher than that of Desi type.

7. Crop quality: When markets are free relatively from the problem of asymmetric information and when buyers are able to differentiate products according to observable quality parameters; the market is likely to offer a price premium for superior quality (Akerlof 1970; Fafchamps, 2004). Therefore, other things being equal, it can be hypothesized that 1st quality grade Kabuli and Desi chickpeas sold for significantly higher price than 2nd quality grades. To see the effects of these variables in the farm-gate price determination model, a variable grade1 takes on the Value of one while a variable grade 2 takes on the value of zero. Hence, the expected Coefficients for this variable would be positive.

These variables could be positive.

CHAPTER FOUR:

RESULT AND DISCUSSION

4.1 DESCRIPTIVE RESULTS

This chapter analyses determinants of chickpea marketable surplus and key marketing outlets chosen by farmers by using descriptive statistics and econometrics model (multiple linear regression). The former were used to analyze market outlets while the latter was used to analyze determinants of marketable surplus.

4.1.1 Description of Dummy Variables

Table 4. 1 summary of dummy variables

		Frequency	Percent	Valid Percent	Cumulative Percent	Sign
Variety of chickpea	Desi	51	54.3	54.3	54.3	0.000
	Kabuli	21	22.3	22.3	100.0	
	Both	22	23.4	23.4		
	Total	94	100.0			
Crop quality of production	No	51	54.3	54.3	54.3	0.464
	yes	43	45.7	45.7	100.0	
	Total	94	100.0	100.0		
Extension service	Yes	71	75.5	75.5	75.5	0.058
	No	23	24.5	24.5	100.0	
	Total	94	100.0	100.0		
Access credit	Yes	64	68.1	68.1	68.1	0.204
	No	30	31.9	31.9	100.0	
	Total	94	100.0	100.0		
Market information	Yes	61	64.9	64.9	64.9	0.451
	No	33	35.1	35.1	100.0	
	Total	94	100.0	100.0		

Source; own survey, 2019

The table above showed summary of respondent's response on dummy variables. During the two month household survey conducted in 2018 at Anchar districts at the selected kebeles, crop, livestock and off-farm incomes are found to be important sources of income for the households. Most house hold generate there income from crop and livestock. As indicated in the above table (1) 54.3 percent of the respondents who engaged in production and supply of chickpea in the targeted kebeles were men. The rest of respondents were women which accounts 45.7 percent of

the total respondents who involved in production and supply of chickpea. From the table one can understand that men population was involved well than women in production of chickpea.

The summary table showed that 54.3percent of respondents supplies Desi type of chickpea. While 22.3 percent of the respondents supplies Kabuli type of chickpea the rest of the respondents which accounts to 15.7percent supplies both Desi and Kabuli type.

Regarding extension and training service, 75.5 percent of the respondents get extension training service, while, rest of the respondents accounting to 37.1percent did not get extension training service. This showed that most of the respondents had an access to extension and training service which is very important to make farmers aware about different varieties and new technologies.

4.1.2Description of continuous variables

Among the selected households, the smallest land holding was 1 hectare while the largest was 5 hectare. On average; landholding was about 2.83 hectare. Yield of the respondents range from 1 up to 8 having meant of 4.7.Accordingly respondents produce different quintal of chickpea ranging from 10 up to 60 quintal with mean value of 35.94 quintal. .

Table 4. 2 *summary of continuous variables*

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
land size of household	94	1.00	5.00	2.82	1.509559

yield in quintal of household	94	1.00	8.00	3.38	1.57053
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Source survey result, 2019

4.1.3. Market outlets

From the total respondents, 20 farmers sold their marketable surplus to district wholesalers which account to about 60 quintals; about 34 producers (farmers) sold to grain trader (Retailer) which accounts to 47.5 quintal of chickpea., 11 farmers sold to farmer union or assembler which accounts about 17 quintal of chickpea and the rest 25 farmers deliver their products directly to the consumer and they supply about 46 quintal of chickpea. The key marketing channels chosen by farmers are as follows:

Producer \Rightarrow retailer,

Producer \Rightarrow wholesalers,

Producer \Rightarrow assembler

Producer \Rightarrow consumer

Table 4.3 *Key Marketing Outlets*

market outlet of household					
		Quintal	Number of hhs who used the outlet	Percent	Cumulative percent
Valid	whole seller	60	20	21.3	22.2
	Assembler	17	11	11.7	34.4

Retailer	47.5	34	36.2	72.2
Consumer	46	25	26.6	100.0
Total	170.5	90	95.7	
Missing System		4	4.3	
Total		94	100.0	

Source survey result, 2019

The above channel is not the only channel that existed in marketing .there is a number of other possible channels for example a retailer can deliver to wholesaler, and a wholesaler can deliver to assembler or vice versa. But, because of time and budget constraints, these have not been covered in this study.

4.2. Econometric Results

Econometric analysis is one of the important methods of analyzing the significance relation of the independent and dependent variable. It uses different testes of significance, like t-test-value and standard error. In this study, the researcher uses the p-value to test the significant effect of the independent variable on the dependent variable, and the researcher uses multiple linear regression models. Multiple linear regression models are a method of estimating or predicting a value on some dependent variable given the values of one or more independent variables.

4.2.1 Determinants of Marketable Surplus

Mainly in the study area is chickpea produced for market. According to the survey all farmers were supplied chickpea to market. Due to this several variables were hypothesized to determine the factors that affect the marketable surplus of chickpea. For this study eleven explanatory variables are hypothesized to analyze factors affect household level marketable supply of chickpea to market. The hypothesized variables were; yield, land size, crop quality, extension service, access to credit, market information and variety of chickpea. Based on multiple linear regression analysis four variables are found that significantly affect the marketable supply of chickpea at household level. Yield of household produce, current market price, number of oxen, variety of chickpea, and family size are variable that significantly influence the marketable supply of chickpea by household. In order to identify the most determinant variables in this

study, an attempt has been made by using multiple linear regression methods. Based on above explanation, the can develop marketable surplus of chickpea model as follows;

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + U_i$$

Where: y is response or dependent variable

X1= yield

X2=respondents land of size

X3=respondents variety of chickpea

X4=respondents crop quality

X5=respondents extension service

X6=respondents access to credit

X7=respondents market information

U_i = disturbance term

Table 4.4 Determinants of marketable surplus chickpea

Source	SS	df	MS	Number of obs = 94
-----+-----				F (7, 86) = 264.14
Model	25243.4902	7	3606.21289	Prob > F = 0.0000
Residual	1174.12679	86	13.652637	R-squared = 0.9556
-----+-----				Adj R-squared = 0.9519
Total	26417.617	93	284.060398	Root MSE = 3.6949

quasupp	Coef	Std. Err	t	P> t	95% Conf	Interval
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Yield	2.719016	.4007102	6.79	0.000	1.92243	3.515601	
Land size in hectare	2.94952	.5255193	5.61	0.000	1.904823	3.994218	
Access to credit	-.3761461	1.016874	-0.37	0.712	-2.397624	1.645332	
Market information	6.771769	1.688296	4.01	0.000	3.415546	10.12799	
Extension service	2.257221	.8423937	2.68	0.009	.5825979	3.931844	
Variety of chickpea	3.52279	1.50064	2.35	0.021	.5396162	6.505963	
Crop quality	3.450219	1.314859	2.62	0.010	.8363654	6.064072	
_cons	5.854425	1.029563	5.69	0.000	3.807722	7.901129	

Note: dependent variable is marketable surplus chickpea

*, **, *** indicate statistically significant at 10% 5% and 1% probability level, respectively

number of obs =94, prob > f = 0.0000

r-squared = 0.9556, adj r-squared = 0.9519

note; expect for the variable named distance to market (n=number of transaction), n represent number of observation

the estimated regression result for market surplus model are presented in table 4.5. the coefficient of multiple determination (r-square) shows that about 95.2 percent of variation in chickpea by the model variable.

Table 4.5 The p-value interpretation

Coef.	P-value	Decision
Yield	0.000<0.5	significant at 1% level of significance
Land	0.000<0.5	Significant at 1% level of significance
Credit	0.712>0.5	insignificant at 1%, 5%, 10% level of significance
Mrkt	0.000>0.5	significant at 1% level of significance
Extin	0.009>0.5	significant at 1% level of significance
Var	0.021<0.5	Significant at 5% level of significance
Crp	0.010<0.5	Significant at 1% level of significance
Cons	0.000<0.5	Significant at 1% level of significance

This interpretation is based on multiple linear regression, of all variable coefficients has attained their expected sign. Thus, the estimated model is specified as follows.

Yield; the coefficient of yield is found to be significantly determining of marketable surplus chickpea because and its coefficient showed the expected positive sign yield of respondents was found to be significant. The continuous variable, yield of the respondent, has a positive sign as expected and it is also statistically significant. The coefficient of yield was positive number. This implies, keeping other things remain constant, when the yield of respondents increases by one year, marketable surplus of chickpea increases by 2.719016 unit

Extension to service; the extension to services is found to be significantly determining market able surplus of chickpea and its coefficient showed the expected positive sign. The dummy variable, extension to service of the respondent, has a positive sign as expected and it is also statistically significant at 1%. The coefficients of extension to service were positive which explains, keeping other things remain constant, when the crop quality increase by one percent, marketable surplus of chickpea increases by 2.257221 units.

land size; land size was found to be significantly determined marketable surplus of chickpea and its coefficient shows the expected positive sign to our independent variable. The continuous variable, land size of the respondent, has a positive sign as expected and it is also statistically significant at 1%. The coefficients of land size respondents were positive number which explains, keeping other things remain constant, when land size increase by one, marketable surplus of chickpea increases by 2.94952 units.

Access to credit; access to credit was found to be insignificantly determine marketable surplus of chickpea in labor market because their probability value is greater than 5%, and its coefficient showed the expected negative value. The coefficients of high access to credit were negative number which indicates, keeping other things remain constant, when access to credit increase by one percent, marketable surplus of chickpea decreases by -.3761461 units.

Crop quality; crop quality was found to be significantly determined marketable surplus of chickpea and its coefficient showed the expected positive value. This implies keeping other things remain constant, when crop quality increase by one percent marketable surplus of chickpea increases by 3.450219 units.

Market information; market information is found to be significantly determining marketable surplus of chickpea and its coefficient showed the expected positive sign. The dummy variable, market information of the respondent, has a positive sign as expected and it is also statistically significant at 1% level of significance. From our estimation result, keeping other things remain constant, as information market increase by one percent, marketable surplus of chickpea increases by 6.771769 units.

Variety of chickpea; variety of chickpea was found to be significantly determined marketable surplus of chickpea and its coefficient showed the expected positive value. This implies keeping other things remain constant, when variety of chickpea increase by one percent marketable surplus of chickpea increases by 3.52279 units.

Constant; Regardless of yield, access to credit, land size, market information, extension to service, and crop quality, Variety of chickpea (all explanatory variables marketable surplus of chickpea estimated to be equal to 5.854425.

As illustrated in the above table, the most significant factors that determine the supply of chickpea by the farming house hold were yield and crop quality. Both independent variables (yield and crop quality) have a positive relationship with marketable surplus, (dependent

variable). This means when yield of house hold increase, their marketable surplus increases significantly. Accordingly a unit increase in yield will increase the marketable surplus by 2.72 quintal holding all other variables constant (variety, extension and other variable).similarly, when crop quality increases, their marketable surplus also increases. This could be due to the fact that farmers will allocate more land for cultivation of chickpea if the crop quality is high. The crop quality of chickpea increase by the increased marketable surplus by 3.450219 quintal holding all other variable constant (yield, extension, variety and other).

The relationship between Variety and marketable surplus was also significant. The relationship between marketable surplus and variety of chickpea was indicated by positive coefficient consequently, A unit increase of Desi type of chickpea (a unit shift from Kabuli observation to Desi observation) increases marketable surplus by positive amount of 3.52279 quintal holding Desi type of chickpea is market oriented and it also have the ability to fulfill export standard, hence it has better demand and better price. Similarly, extension training service had positive relationship with marketable surplus. A unit increases in frequency of extension and training service pushes the marketable surplus positively by the amount of 2.257221 quintal holding other variables constant (land size, yield, variety). This increment in marketable surplus could be due to those who has access to the extension service have better chance to adopt the market oriented Desi type of chickpea and they have possibility to adopt new method of production which increase their yield

4. 3 DIAGONESTIC TESTS

4.3.1. Test for Multicollinearity

To detect Multicollinearity, the paper used variables inflation factory (VIF). In this test if we have a choice, we would have VIFs to be smaller (other thing equal). But we have rarely choice, if we think a certain explanatory variables need to be included in regression to infer causality of explanatory variables, then we are hesitant drop them whether we think VIFs is “too high” cannot really affect that decision.

If say, our main interest is in the causal effects of one explanatory variable on dependent variable, then we should ignore entirely the VIFs of other independent variables coefficients.

Finally setting the cut off value of VIF which have concluded Multicollinearity is a “problem” is arbitrary and not especially helpful. Sometimes the value of 10 is chosen: if VIF is the above 10 (equivalently, R² above 0.9), then we concluded that 10 doesn’t mean that standard deviation of the coefficients is too large to be use full because standard deviation depends on and SST and the later can be increased by increasing sample size. Therefore, just we look at the size of VIFs is of limited use although one might what to do so out of curiosity (Gujarati, 2004). Let we see VIF from the estimation result.

Table 4.6 The Result of VIF

Variable	VIF	1/VIF
yield	6.15	0.162499
Mktinfo	4.87	0.205309
Land	4.29	0.233268
var	3.66	0.272936
crpqly	2.63	0.380088
credit	1.74	0.574588
extin	1.21	0.828060
Mean VIF	3.5	

Computed by stata 12, own source (2019)

The above table means of VIF and 1/VIF shows that there is no Multicollinearity problem among variables. If mean VIF value greater than 10 and 1/VIF value greater than 1, say we can say there is Multicollinearity. However, from the study the estimation result is the VIF value less than 10 and 1/VIF than 1, implying this study is there is no problem of Multicollinearity

4.3.2 Tests of Heteroskedasticity

Breusch- pagan test Look straight to the P-value is (preferable) 0.05 or smaller, then the null hypothesis is rejected and here is significant evidence there is heteroskedasticity, but if prob- χ^2 is 0.05 or greater than, or then null hypothesis is rejected, here significant, evidence there is no heteroskedasticity problem (Gujarati, 2004). Look the following estimation result;

Table 4.7 test of heteroskedasticity

<p>Breusch- pagan/cook- Weisberg test for heteroskedasticity Ho: constant variance Variables: fitted values of 1h Chi1 (1) =6.81 Prob >chi2 = 0.091</p>
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Computed by stata 12, own source 2019

From the above table estimation result, we can compare critical p-value of prob > χ^2 greater than 0.05. This means there is no problem of heteroskedasticity, because $0.05 < 0.091$

4.3.3 Normality test

This normality test is determined by critical p-value at 5% of level of significance and χ^2 prob > χ^2 . Let we see this test from estimation result by using of kurtosis

Table 4. Test for normality data.

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
resid	94	0.97940	1.616	1.061	0.14444

Computed by stata 12, own source 2019

From the above normality test, our estimation results greater than critical p-value 5% of level of significance. That means our estimated result occurred is 0.14444. Therefore, $0.14444 > 0.05$, so reject null hypothesis that the residuals are normally distributed.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. CONCLUSIONS

This research was conducted in selected kebele Anchar district on factors affecting marketable surplus of small farmers and on selection of key market outlets and reasons for selection of key marketing outlets by farmers. The descriptive statistics result showed that the chickpea grains are sold mostly to wholesalers, retailer, consumers, and assembler. This indicates that farmers are now with the problems of trying to supply markets of (especially rural wholesaler) ineffective demand for chickpea product, with little attention to make profitable production and marketing

planning in the sector, as these only lead to production for lower prices. The reasons for preferring these buyers are in the nature of availability and easy accessibility, and timely pay which clearly show that it is not sufficient rational activity to have competitive markets. On the other hand, farmers are now with the problem of lacking alternative ample profitable market opportunities; as all these prove that the sellers and buyers and government bodies in chickpea markets still do not carry out their functions efficiently in a manner as to create time, place and form utility in the product by way of its marketing.

Econometric tests for variables that affect marketable surplus were conducted to supplement model predictions and survey results. Results show yield factor considerably influence marketable surplus. Farmers who have larger land holding have the capability of producing and supplying more. Farmers particularly in the Anchar areas and Ethiopia in general do not produce more of chickpea due to they have small plots of land and they generally do not follow given recommendation for production of particular crop. Similarly, price pushes marketable surplus considerably. Farmers are incentivized to supply more of chickpea since its price was higher than previous years. In general, in Ethiopia and in Anchar areas in particular price of chickpea is not constant. It shows great variation between early harvesting season and early start of summer. Small farmers are forced to sell at lower price in order to pay their loan of fertilizer and chemicals. The grains marketing system is generally characterized by low volume, lack of effective demand for the product, and low awareness about market preferred chickpea varieties replacement there by hindering the uptake of these profitable Varieties.

Thus, the supply in the market of these high values Desi chickpea types are in very limited quantities and from several highly dispersed small producers. Given the low adoption of improved varieties at present, the marketed surplus by individual farmers and the overall traded volume are low, and hence a disincentive to grain producers to increase production and be competitive in price and quality.

Land size also affects supply of chickpea positively. Farmers who have larger number land size more produce than those who hold smaller land. In general, the most farmers have small hold

land affect reduces the production and supply of chickpea. On other hand farmers with large land size holding more produces and supply due to the farming practice and some farmer hold large land size to produce small amount of chickpea due to the poor farming practice

Extension service also affects marketable surplus positively. Farmers who have access to extension service supplies more than those who do not have access to extension training service due they have access to new varieties and they have possibilities of adopting new way of production. Variety of chickpea also has positive effect on marketable surplus. Farmers who produce Desi type of Chickpea supplies more than those who produce Kabuli type of chickpea. The reason is that Desi type has the ability to fulfill export standard as a result it has better effective demand and better price than Kabuli type.

Finally, the marketable surplus chickpeas regression run indicates that smallholder farmers in Ethiopia need to consider primarily the yield enhancing inputs to enhance the market participation. Continuous result oriented supervision by agricultural development agents to introduce the uptake of improved varieties and use of good agronomic practices will help to push up the marketable surplus of chickpea offer to markets. On the other hand, creation of new markets those are nearest to the farmers' residential areas to decrease cost of marketing will increase the surplus offer when there are effective demands for products at these markets.

5.2 Recommendation

The descriptive statistics result confirmed that a fairly weak preference of chickpea buyers by smallholder farmers or the margins display a high expectation from the supplier farmer and government bodies in terms of creating effective demand for the product. Therefore, farmers need to learn not only how to produce but first how to expand the size of market to improve profitability of farmer's production. Identifying potential buyers enables farmers to have production and marketing plans guided by demand led markets. In another word there is also a need for policy interventions in the product quality control as the development of market is possible only when quality based marketing systems that offer better differentiated prices for products that differ in observable quality parameters. Marketable surplus chickpeas model determined that production of yield enhancing Desi varieties provides the means for higher profit.

As yield is one of the major determinants of marketable surplus, farmers should try to increase their yield by adopting new methods of production and by sowing their chickpea timely in a recommended way. Marketable surplus is affected positively and significantly by land size. The problem is most farmers have small land size in hectares. Farmers should be well to adopt new methods to increase their production and decrease their consumption which help them to supply more of chickpea to the market. Training of farmers becomes possible through extension services hence government should intensify the frequency of extension service provision to farmers in order to help them to adopt new methods of production and new varieties of chickpea.

Farmers should be motivated to adopt new variety of chickpea which help them to increase their marketable surplus and their income. Since Desi type of chickpea have the ability to fulfill export standard it have better demand than the type of Kabuli because desi type of chickpea have to adopt any climate. Hence, farmers should be given awareness about benefits of new variety and its marketing opportunities.

Most small farmers sell their products as soon as they produce in low price which make them to loss their profit. Farmers should be trained on how to assemble their product in order to help them to sell their products when market price gets high. Price of chickpea is not same throughout the year hence farmers should be informed times of high price and times of low price for to help them to increase their return

Future research need to be conducted on the marketing of chickpea to identify existing limits in the cultivation of quality seeds of market preferred varieties to avoid the problem of supplying the same limited markets with little quantity and little attention to quality.

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APPENDIX

WOLKITE UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ECONOMICS

RESEARCH QUESTIONNAIRES

Date: _____

Dear Respondent,

I am a 3rd year economics student at university of Wolkite and I am conducting a research for the fulfilment of BA degree in Economics. The purpose of this questionnaire is to collect data, so as to obtain data to examine the determinants of surplus marketable chickpea in case of Anchar district, Ethiopia.

Interview Schedule Developed For the Study of Determinant of Surplus Marketable Chickpea

Name of kebeles :a) midhagdu b) Biyyo c) kus

Education year of schooling? 1) Illiteracy 2) 1-8 3) 9-12 4) above 12

3) Land size ? a)1-3hectar b) 3-5 hectar

4) Do you produce chickpea? 1). yes 0). no

5) If question number 4 is yes, which kind of chickpea do you produce? A. desi type b) kabuli type

6) How many quintal do you produce per year?

2016/2017.....quintal of Desi and.....quintal of Kabuli

2017/2018..... Quintal of Desi and.....quintal of Kabuli.

7) Do you get extension service on production of chickpea? 1). Yes 0). no

8) Do you have access to credit? 1). yes 0). no

9) Do you supply your chickpea to market? 1). yes 0). no

10) If question number 17 is yes then how money quintals did you supply over the last agricultural year?

11) To whom do supply a. whole seller b. Assembler c. Retailer d. Consumer

12) Reason for choosing particular buyer? A) Better price b) shorter distance c) timely pay
d) Reliable e) weight f) Other specific

13) Where do you supply your chickpea?.....

14) How far is your home from market in km?.....

15) Do you get market information?.....

```
. reg quasupp yield land credit mktinfo extin var crpqlyt
```

```
Source |   SS   df    MS       Number of obs =   94
-----+-----
Model | 25243.4902   7 3606.21289       Prob > F   = 0.0000
Residual | 1174.12679  86 13.652637       R-squared   = 0.9556
-----+-----
Total | 26417.617  93 284.060398       Adj R-squared = 0.9519
Root MSE   = 3.6949
```

```
-----
quasupp |   Coef.  Std. Err.   t  P>|t|   [95% Conf. Interval]
-----+-----
yield | 2.719016  .4007102   6.79  0.000   1.92243  3.515601
land | 2.94952   .5255193   5.61  0.000   1.904823  3.994218
credit | -.3761461  1.016874  -0.37  0.712  -2.397624  1.645332
mktinfo | 6.771769  1.688296   4.01  0.000   3.415546  10.12799
extin | 2.257221  .8423937   2.68  0.009   .5825979  3.931844
var | 3.52279   1.50064   2.35  0.021   .5396162  6.505963
```

```

crpqly | 3.450219 1.314859 2.62 0.010 .8363654 6.064072
_cons | 5.854425 1.029563 5.69 0.000 3.807722 7.901129

```

```
. vif
```

```

Variable |   VIF   1/VIF
-----+-----
yield |   6.15  0.162499
mktinfo |   4.87  0.205309
land |   4.29  0.233268
var |   3.66  0.272936
crpqly |   2.63  0.380088
credit |   1.74  0.574588
extin |   1.21  0.828060
-----+-----
Mean VIF |   3.51

```

```
. corr
```

```
(obs=94)
```

```

| quasupp yield land credit mktinfo extin var crpqly resid
-----+-----
quasupp | 1.0000
yield | 0.9417 1.0000
land | 0.9014 0.8592 1.0000
credit | 0.5897 0.5701 0.5698 1.0000
mktinfo | 0.8882 0.8476 0.7712 0.6350 1.0000
extin | 0.3710 0.2817 0.2508 0.2541 0.3957 1.0000

```

```

var | 0.8403 0.7853 0.7359 0.4728 0.7701 0.3119 1.0000
crpqly | 0.7667 0.7106 0.6992 0.4031 0.6277 0.2208 0.7507 1.0000
resid | 0.1174 -0.0097 0.0000 -0.0968 0.0000 -0.0000 0.0000 0.0000 1.0000

```

```
. hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of quasupp

chi2(1) = 6.81

Prob > chi2 = 0.0091

```
. reg quasupp yield land credit mktinfo extin var crpqly, robust
```

Linear regression Number of obs = 94

F(7, 86) = 337.01

Prob > F = 0.0000

R-squared = 0.9556

Root MSE = 3.6949

```

-----
|           Robust
quasupp |   Coef.  Std. Err.   t  P>|t|  [95% Conf. Interval]
-----+-----
yield | 2.719016  .7165335   3.79  0.000   1.294594  4.143437
land | 2.94952  .6211113   4.75  0.000   1.714792  4.184249

```

```

credit | -0.3761461  1.26805  -0.30  0.767  -2.896945  2.144653
mktinfo | 6.771769  3.138856  2.16  0.034  .5319293  13.01161
extin | 2.257221  .8528378  2.65  0.010  .5618356  3.952607
var | 3.52279  1.513199  2.33  0.022  .5146504  6.530929
crpqly | 3.450219  1.068594  3.23  0.002  1.325923  5.574514
_cons | 5.854425  1.255979  4.66  0.000  3.357622  8.351229

```

. linktest

```

Source |   SS   df   MS       Number of obs =   94
-----+-----
Model | 25244.8633   2 12622.4317       Prob > F   = 0.0000
Residual | 1172.7537  91 12.8874033       R-squared   = 0.9556
-----+-----
Total | 26417.617  93 284.060398       Adj R-squared = 0.9546
Root MSE   = 3.5899

```

```

quasupp |   Coef.  Std. Err.   t  P>|t|  [95% Conf. Interval]
-----+-----
_hat | 1.047291  .146623   7.14  0.000  .7560423  1.338539
_hatsq | -.000682  .0020891  -0.33  0.745  -.0048318  .0034678
_cons | -.6356223  2.141937  -0.30  0.767  -4.890317  3.619072

```

. imtest

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	67.90	29	0.0001
Skewness	37.08	7	0.0000
Kurtosis	1.05	1	0.3060
Total	106.03	37	0.0000

. ovtest

Ramsey RESET test using powers of the fitted values of quasupp

Ho: model has no omitted variables

F(3, 83) = 6.66

Prob > F = 0.0004

. testparm quasupp

no such variables

r(111);

. swilk resid

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
resid	94	0.97940	1.616	1.061	0.14444

. sum

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
quasupp	94	35.93617	16.85409	10	60
yield	94	4.712766	2.37198	1	8
land	94	2.819149	1.509559	1	5
credit	94	.5744681	.4970745	0	1
mktinfo	94	.5425532	.5008572	0	1
-----+-----					
extin	94	.4468085	.4998284	0	1
var	94	.6170213	.4887197	0	1
crpqly	94	.6702128	.4726566	0	1
resid	94	-1.11e-09	1.977975	-5.20916	5.429673