VALUE CHAIN ANALYSIS OF DRY WHIT HARICOT BEAN IN THE CASE OF BEREHET WOREDA, AMHARA REGION, ETHIOPIA

MSc Thesis

By

Abebaw Zenebe

January, 2016

Jimma, Ethopia

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JIMMA UNIVERSITY

COLLEGE OF AGRICULTURE AND VETERINARY MEDICINE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

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DEDICATION

I dedicate this thesis manuscript to my family especially my mother Shewamberat Belay and my heart friend Selamawit Atiso for their continuous contribution throughout my life.

STATEMENT OF AUTHOR

First, I declare that this thesis manuscript is prepared by my effort with the guidance and close supervision of my advisor. The thesis has been submitted in partial fulfillment of the requirements for MSc. degree at Jimma University. It is deposited at the University library to be made available to borrowers under the rules of the library. I declare that this thesis is not submitted to any other institution anywhere for the award of an academic degree, diploma or certificate.

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BIOGRAPHICAL SKETCH

The author was born on May, 1987 in Metehbila town of North Shewa Zone, Amahara Region. He attended his class elementary and junior education at Metehbila primary schools and preparatory school in Menjarshenkora in Arerti town. After successful passing ESLCE, He was joined Debrebrhan University in 2008 and graduated with B.Sc. in plant science and protection 13 July, 2010. After graduation he was served in Berehet Woreda Office of Agriculture for 3 year. He joined Jimma University in October 2013 to pursue MSc. degree in agribusiness and value chain management program.

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ABBREVIATIONS AND ACRONYMS

BLUE   Best Linear Unbiased Estimator

BWoA   Berehet Woreda Office Agriculture

CIMMYT   International Maize and Wheat Improvement Center

CL RM   Classical Linear Regression Model

CSA   Central Statistical Agency

ECX   Ethiopian Commodity Exchange

EEPA   Ethiopian Export Promotion Agency

EIAR   Ethiopian Institute of Agricultural Research

EPPA   Ethiopian Pulses Profile Agency

FAO   Food and Agriculture Organizations

IFPRI   International Food Policy Research Institute

MoA   Ministry of Agriculture

NMM   Net Market margin

PPS   Probability Proportional to Size

SPSS   Statistical Package for Social Science

TGMM   Total Gross Market margin

USAID   United States Agency for International Development

VIF   Variance Inflation Factor

ABSTRACT

Haricot bean is one of the major types of pulses grown in Ethiopia especially in the lowland regions of rift valley. White haricot bean is as a source of income, nutrition and also used as source of foreign currency. This study was undertaken to identifying white haricot bean value chain actors; examining the marketing performance of dry white haricot bean; analyzing the determinants of haricot beans supply to the market and identifying major constraints and opportunities some actors along haricot bean value chain in the study area. This study result showed that distance from production area to the near market center, access to market information, education level of household heads and total land owned household were found significantly affect the quantity of white bean supply to market. Sever insects attack, disease, weeds, lack of improved seed variety, wild animals, shortage of rain fall, shattering of seed and delayed supply of inputs specifically pesticides and fertilizer are also main challenges faced in the study area. The value chain analysis revealed that the major actors in the Woreda are input wholesalers agent rural retailers', local collectors, primary cooperatives, urban retailers and wholesale agents. Accordingly, the value chain activities in the survey period input supply, production, marketing, export and consumption. The white haricot bean marketing performance was also measured using marketing margins complemented with analysis of costs and gross profits generated by different marketing channel actors. The research also finds that white haricot bean passes through several intermediaries with little value being added before reaching the end users. The lowest net margin is observed at farm level where haricot bean sold directly from producer to consumers only through local collector and urban retailer. While highest profit is realized in wholesale agent and exporter. So, the chain is governed by wholesale agent and exporters who have capital advantage over the other chain actors. Therefore, strategy aiming at increasing farmers' existing extension service, developing and improving infrastructure and should also be strengthened in a way that enables working in harmony with relevant actors to bring the value chain' development.

Key Words: Actors, Multiple linear regression model, Value chain analysis, White Haricot bean.

1. INTRODUCTION

1.1. Background of the Study

Agriculture is the main stay of Ethiopian economy contributing about 43% of the GDP, 80% of employment and 90% of the export (MoFED, 2011). Having all these importance, agriculture continues to face a number of problems and challenges. The major ones are adverse climatic conditions, lack of appropriate land use system resulting in soil and other natural resources degradation, limited use of improved agricultural technologies, the predominance of subsistence agriculture and lack and/or absence of business oriented agricultural production system, limited or no access to market facilities resulting in low participation of the smallholder farmers in value chain or value addition of their produces (Bezabih, 2010).

The world dry white haricot bean production is estimated to be about 19.7 million metric tons harvested on 25.5 million hectares land, which make the crop the most important source of protein and energy in human diets in the tropical and subtropical developing countries particularly in the Americans, Eastern and Southern Africa (FAO, 2012).

According to IPMS (2008) project used value chain approach to develop haricot bean product make farmers more competitive, increase their economic benefit and productivity in one of the project sites in Southern Ethiopia, Halaba Special district. Haricot bean is one of the major types of pulse widely grown in lowlands and rift valley of Ethiopia. Haricot bean ranks the third major marketable commodity in the country playing role as source of income and nutrition in food security (IPMS, 2008). Currently, haricot beans cover the dominant part of the Ethiopia's pulses export. However, the share of pulses in general in the export market has been limited by external demand for quality (Gezahegn *etal,* 2006). Within Ethiopia, pulses are the third largest crop export behind coffee and oil seed, and represent a USD 90 million export industry (Shahidurb *etal.,* 2010).Among the different pulse crops grown in the country, haricot bean accounts for the second largest production share of 17 percent, while the other pulses, such as

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horse beans, chickpea, lentils, green pea, lupines and green beans account for the remaining percent (Negash, 2007).

The crop is grown either as a sole crop and/or intercropped with either cereal or perennial crops (Negash, 2007). There is a wide range of haricot bean types grown in Ethiopia, including the mottled, red, white and black varieties. The leading white bean varieties are the Awash 1, Awash Melaka and Mexican 142 varieties. The pure red and pure white colored beans are the most common commercial varieties (Ferris, 2008 and Negash, 2007).

With regard to economic importance of haricot bean, it is used as source of foreign currency, food crop, means of employment, source of cash, and plays great role in the farming system (CSA, 2009).Despite growth in the bean markets there is little evidence of large-scale bean farming in Ethiopia and virtually all beans are produced on smallholder plots, with minimal inputs. The average plot size of farmers in Ethiopia is 1.5 ha and up to 83% of the farming households in Ethiopia have an area of less than 2 ha, with 56 % of farming households having less than 1 ha (World bank, 2006).On marketing side; limited access to market, unsteady price of product, lack of storage facilities (ECX), poor coordination amongst traders & market promotion are the major constraints of marketing (Frehiwot, 2010).

Opportunities of haricot beans value chain in Ethiopia, with a total of about 322,670 hectares of haricot bean area; Ethiopia produces some 248,000 metric tons annually, exports about 54,122 metric tons, and obtains US$ 24.87 million/year. Haricot bean is an important crop for domestic consumption and the export market (ECX, 2009). Another existing opportunity for improving the bean sector is that production is concentrated in and around the Rift valley area, which is well connected by good road conditions to the Addis-Djibouti railway network (USIAD, 2010).The increasing demand for quality haricot bean on the world export market, suitable climate of the country, low production costs, availability of arable land and access to the port of Djibouti is a great opportunity for Ethiopia to export large quantities all over the world and boost its export earnings. In order to identify the problems hindering the country from increasing export earning, along the value chains (Bishop and Sambrook, 2008). However, at the moment, the country is not benefiting from this existing potential.

Haricot bean is considered as the main cash crop and protein source for farmers in many of the low land and mid altitude zones of Ethiopia (Rahmeto, 2007). In addition to the domestic markets, Ethiopia is supplying white beans into the export canning industry in European Union (EU) and other eastern European markets (Ferris and Kaganzi, 2008). Since the larger proportion of the white haricot bean produced is for market, it takes a significant share of the national income from commodity export. Despite the significance of white beans in Ethiopian economy and current income generating capacity of white beans as compared to its magnificent potential in the country, it has not been given due attention.

1.2. Statement of the Problem

Rahmeto (2007) examined that number of factors related to technological, institutional, and organizational influence competitiveness of value chain. According to Shiferaw *etal*, (2010) improving productivity and market Success of Ethiopian farmer's project adopted a participatory market oriented commodity value chain development approach, to address problems and potentials for haricot bean production in Alba Special district, in Southern Ethiopia. A review of literature in agro-industry value chain in Ethiopia indicates that the sector faces many challenges due to limited efforts in market linkage activities and poor market information among actors (Dereje, 2007; Kaleb, 2008; Dendena *etal,* 2009). In Ethiopia, value chain indicates that the sector faces many challenges due to; poor market performance, limited efforts in market linkage activities and poor market information among actors (Dereje, 2007; Kaleb, 2008 and Abebe *etal.,* 2010).The authors studies on white bean production and marketing in Ethiopia were undertaken by different authors (Chilot,2010; Frehiwot,2010; Rahamato,2007;Zeleke,2010; Ferris ,2008;Kaganzi ,2008 ,USDA,2008;and ECX 2008).However, the majority of these studies were mainly focused on: marketing aspect of the crop and white bean production related problems. But they, ignoring white haricot bean marketing channels along the actors. Because of, market channels were used to considering specific white haricot bean marketing channels; connecting all the actors in a particular chain of production to final consumer; identify which producers would sell his products to either of the market.

According to Zeleke, (2010), the efforts of increasing agricultural production and productivity have to be accompanied by a well performing marketing system which satisfies consumer

demands with the minimum margin between producers and consumer prices. Higher prices for producer can encourage farmers to adopt new technologies, increase production. However, there are external and internal problems that influence the marketing performance in district. According to him also the high potential areas of Ethiopia can produce enough haricot beans to meet the needs of the people in the deficit areas. However, the poor agricultural marketing system of haricot bean discourages farmers to produce more and supply to the market.

The productions of haricot bean still have problem (Frehiwot, 2010). Red pepper, teff, sesame and haricot bean are the major cash crops grown in the study area mainly for market. However, marketing aspects of only red pepper and haricot bean were undertaken by Rehima (2007) and Zeleke (2010). While exit marketing of dry white haricot bean which, have potential production and volume of market supply in the district have not yet answered. Abebe *et al* (2010) studied the intervention on haricot bean output marketing shows that farmers are working with inferior quality standards for export and small volume of haricot bean. According to his partnership between actors in haricot bean value chain development is informal with poor linkage. As an analytical framework, the value chain is divided here into three broad stages, namely production, aggregation and marketing, and commercialization towards exports (IFPRI, 2010).However, a set of constraints span the haricot bean value chain in production, and aggregation and trading still have a lot of problem.

The major value chain actors that involve in the country haricot bean trading activities are farmers, collecting agents, rural assemblers, village traders, brokers, transporters/travelling traders/, urban wholesalers and exporters. In the absence of well developed marketing performance, marketing facilities, and marketing efficiency, farmers are at disadvantage by selling their increased market supply to traders in the market as they get low prices (Thakur *et al*., 1997, Frehiwot, 2010). However, a very strong relationship between village traders, their collecting agents and farmers through small loans and credit systems to provide inputs and local expenditures that are required by farmers, price was determined mostly by traders. Although, farmers were cheated in kilograms of white haricot bean their supply by local collectors. But, still have not solved this type of problem in the study area.

Therefore, the research is a need to employ a value chain approach fully understand and resolve the problem of dry white haricot bean value chain at all levels. Yet there is no research study which tries to look into the whole spectrum of value chain of this crops and determinants of white haricot bean supply in district. This made the undertaking of value chain analysis of dry white haricot bean in the Berehet Woreda is very important. This work was designed to address the current information gap on the subject and contribute to proper understanding of the challenges and assist in developing improved value chain development strategies to benefit of farmers, traders and other market participants.

1.3. Research Questions

The study to answer the following questions:
1. What are the determinants of the farmer's supply white haricot bean to the market?
2. What are white haricot beans market performances in the study areas?
3. Who is more benefiting from haricot beans value chain?
4. What are the opportunities and constraints of dry white haricot beans value chains in the study areas?

1.4. Objective of the Study

1.4.1. General Objective

The general objective of the study to analyze the value chains of white haricot bean in the study area.

1.4.2. Specific Objective of the Study

The specific objectives of the study are:
1. To identify white haricot bean value chain actors in the study area.
2. To examine the marketing performance of white haricot bean in study area.
3. To analyze the determinants of white haricot bean supply to the market in the study areas.
4. To identify constraints and opportunities some actors along haricot bean value chain in Berehet Woreda.

1.5. Significance of the Study

The critical analysis of haricot bean value chains is very important before launching and implementing value chain development issues. Hence, the study gives detail information on how haricot bean value chain is functioning particularly in the local market focusing on Berehet woreda, which is one of the major haricot beans producing area. The same information could also be of value to extension agents, farmers, value chain actors and consumers who can use the resulting information for value adding for their respective decisions. This thesis research was helped to assess the possibility of haricot bean value chain. The thesis was conducted to answer research questions of value chain posed in the previous section. The research was also serving as a facilitator for further studies in the future on related issues, which are not cover.

1.6. The scope and Limitation of the Study

This study aimed at identifying challenges and opportunities white haricot bean value chain in Berehet District, North shewa zone and Ethiopia. Due to time and financial resource unavailability, the study is limited in its depth and coverage to fully address the aforementioned objectives of the study. And also in some areas, interviewees and discussants are not easily accessible. Furthermore, Since Ethiopia has wide range of diverse agro-ecologies, institutional capacities, organizations and environmental conditions, the result of the study may have limitations to make generalizations and make them applicable to overall country. However, it may be useful for areas with similar context with the study area.

2. LITERATURE REVIEW

2.1. Definitions and Concepts Haricot bean Value Chain Analysis

Industry chains are classified as either 'supply' or 'value' chains. The following definitions within the general term 'industry chain' are used.

Supply chain: It is taken to mean the physical flow of goods that are required for raw materials to be transformed into finished products. Supply chain management is about making the chain as efficient as possible through better flow scheduling and resource use, improving quality control throughout the chain, reducing the risk associated with food safety and contamination, and decreasing the agricultural industry's response to changes in consumer demand for food attributes (Dunne, 2001).

The total annual supply of haricot beans in the country is estimated by considering annual production, import and stock balance. Haricot bean was not imported in to the country so far unless some donors imported for food security purposes, remarkably in small amount. It is also difficult to get data on stock balance. Therefore, the annual total supply of haricot beans is the reflection of its production (Chilot *et al.,* 2010).

Value chain: A value chain may be defined as a set of interconnected, value-creating activities undertaken by an enterprise or group of enterprises to develop, produce, deliver and service a product or service (Janssen *et al.,* 2010). Value chains include all of the vertically linked, interdependent processes that generate value for the consumer, as well as horizontal linkages to other value chains that provide intermediate goods and services (Webber &Labaste, 2010). (Feller *et al.,* 2006) categories the supply chain to be between the product's requirements and the customer, but categories the value chain as starting from the customer's requirements to the product. It is taken to mean a group of companies working together to satisfy market demands. It involves a chain of activities that are associated with adding value to a product through the production and distribution processes of each activity (Schmitz, 2005). An organization's competitive advantage is based on their product's value chain. The goal of the company is to

deliver maximum value to the end user for the least possible total cost to the company, thereby maximizing profit (Porter, 1985).

The value chain concept entails the additions of value as the product progresses from input supply to the producer and the consumers. The value chain incorporates productive transformation and value addition at each stage of the value chains. At each stages of the value chain, the product changes hand through the chain actors, transaction costs are incurred and generally, some form of value added, value addition results from diverse activities including bulking, cleaning, grading, transporting, storing and processing (Anandajayasekeram and Birhanu, 2009) for the case of a typical agricultural value chain.

A value chain is the full range of activities required to bring a product from conception, through the different phases of production and transformation. A value chain is made up of a series of actors (or stakeholders) from input suppliers, producers and processors, to exporters and buyers engaged in the activities required to bring agricultural product from its conception to its end use (Kaplinsky and Morris, 2001). Bamman(2007) has identified three important levels of value chain.

1. Value chain actors**:** The chain of actors who directly deal with the products, i.e. produce, process, trade and own them.
2. Value chain supporters: The services provided by various actors who never directly deal with the product, but whose services add value to the product.
3. Value chain influencers*:* The regulatory framework, policies, infrastructures, etc.

It can easily result in high discards. A value chain projects tends to imply more an introduce of a crop or other farm enterprise not being produced in a community rather than facilitating already well established crop and responding to the normal fluctuation in agriculture production caused by variability in rainfall or other climatic variables and acreage planted as farmers try to guess what crop was bring them the best return each year.

When a value chain project does become involved in a well established value chain enterprise it can be difficult to separate the project's contribution from any spontaneous response by the s mallholder farmers to normal variation in rainfall or other climatic variable or estimations of what crop will give the best return for a given year and an acreage adjustment accordingly

(Tinsley, 2009).Understanding of the value chain is essential to creating development strategies effectively.

Value chain is a useful concept to upgrade competitiveness in commodity development. It helps to identify value chain aspects that are critical to improve chain performance and returns to chain actors. The framework allows governments aspiring to enhance their countries competitiveness or to pinpoint where their actions can have the most positive impact. Value chains encompass the full range of activities and services required to bring a product or service from its conception to sale in its final markets. Value chains include input suppliers, producers, processors and buyers (Campbell, 2008).

The different actors operating in the haricot bean value chain and their respective roles input suppliers, haricot bean producer, rural assembler, cooperative unions, wholesalers, exporter and processors/cleaners/, and retailers(USAID, 2010). However, the words "smallholder" and "farmer" are used as synonyms in this work.

2.2. Major Concepts Guiding Agricultural Value Chain Analysis

There are four major key concepts guiding agricultural value chain analysis (Anandajayasekeram and Berhanu, 2009; Kaplinsky and Morris, 2000). These are effective demand, production, value chain governance, and upgrading.

2.2.1. Effective Demand

Agricultural value chain analysis views effective demand as the force that pulls goods and services through the vertical system. Hence, value chain analysis need to understand the dynamics of how demand is changing at both domestic and international markets, and the implications for value chain organization and performance. Value chain analysis also needs to examine barriers to the transmission of information in the changing nature of demand and incentives back to producers at various levels of the value chain (MSPA, 2010).

2.2.2. Production

In agricultural value chain analysis, a stage of production can be referred to as any operating stage capable of producing a saleable product serving as an input to the next stage in the chain

or for final consumption or use. Typical value chain linkages include input supply, production, assembly, transport, storage, processing, wholesaling, retailing, and utilization, with exportation included as a major stage for products destined for international markets. A stage of production in a value chain performs a function that makes significant contribution to the effective operation of the value chain and in the process adds value (Anandajayasekeram and Berhanu, 2009).

Producing the required amount effectively is a necessary condition for responsible and sustainable relationships among chain actors. Thus, one of the aims of agricultural value chain analysis is to increase the quantity of agricultural production. In particular, sector analysis tends to be static and suffers from the weakness of its own bounded parameters. Such analysis struggles to deal with dynamic linkages between productive activities that go beyond that particular sector (Kaplinsky and Morris, 2000). By going beyond the traditional narrow focus on production, value chain analysis scrutinize interactions and synergies among actors. Thus, it overcomes several important limitations of traditional sector assessments.

2.2.3. Value Chain Governance

Governance refers to the role of coordination and associated roles of identifying dynamic profitable opportunities and apportioning roles to key players (Kaplinsky and Morris, 2000). Value chains imply repetitiveness of linkage interactions. Governance ensures that interactions between actors along a value chain reflect organization, rather than randomness. The governance of value chains emanate from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in activities, roles and functions. It is important to note that governance and coordination sometimes appear as synonymous or interchangeable terms in the literature. Already in the 1980s, Williamson (1979, 1985) used the term governance to define the set of institutional arrangements in which a transaction is organized. As Gereffi's work on Global Commodity Chains and the role of governance appeared, the term coordination took on a new meaning, basically, the vertical organization of activities.   The application of contract   /private ordering/ governance leads naturally into the reconceptualization of the firm not as a production function (in the science of choice tradition) but as a governance structure (Williamson, 2002).

According to Raikes *et al.* (2000) trust-based coordination is central for goods and services, whose characteristics change frequently, making a standardized quality determination for the purposes of industrial coordination difficult. This applies to the manufacturing industry as well as Agri-food chains. It is possible to identify in one industry several coordination forms used by different firms where the choices rely on the trust existent between the firms.

Value chains can be classified into two based on the governance structures: buyer-driven value chains, and producer-driven value chains (Kaplinsky and Morris, 2000). Buyer-driven chains are usually labor intensive industries, and so more important in international development and agriculture. In such industries, buyers undertake the lead coordination activities and influence product specifications. In producer-driven value chains which are more capital intensive, key producers in the chain, usually controlling key technologies, influence product specifications and play the lead role in coordinating the various links. Some chains may involve both producer and buyer driven governance. Yet in further work (Humphrey and Schmitz, 2002; Gibbon and Ponte, 2005) it is argued that governance, in the sense of a clear dominance structure, is not necessary a constitutive element of value chains. Some value chains may exhibit no governance at all, or very thin governance. In most value chains, there may be multiple points of governance, involved in setting rules, monitoring performance and/or assisting producers.

Chain governance should also be viewed in terms of 'richness' and 'reach', *i.e.,* in terms of its depth and pervasiveness (Evans and Wurster, 2000). Richness or depth of value chain governance refers to the extent to which governance affects the core activities of individual actors in the chain. Reach or pervasiveness refers to how widely the governance is applied and whether or not rival bases of power exist. In the real world, value chains may be subject to multiplicity of governance structure, often laying down conflicting rules to the poor producers (MSPA, 2010).

2.2.4. Value Chain Upgrading

Upgrading refers to the acquisition of technological capabilities and market linkages that enable firms to improve their competitiveness and move into higher-value activities (Kaplinsky and Morris, 2000). Upgrading in firms can take place in the form of process upgrading, product upgrading, functional upgrading and chain upgrading. Upgrading entails not only improvements

in products, but also investments in people, knowhow, processes, equipment and favorable work conditions. Empirical research in a number of countries and sectors (Humphrey and Schmitz, 2000; Humphrey, 2003; Humphrey and Memedovic, 2006) provide evidence of the importance of upgrading in the agricultural sector.

Market and Marketing

Market: refers to a place where goods and services are exchanged in return for something of value. A market is a point, or a place or sphere within which price making force operates and in which exchanges of title tend to be accompanied by the actual movement of the goods affected (Beckman and Davidson, 1962).

Marketing: the process of exchange and relationships lead to the concept of market. It is the set of the actual and potential buyers of a product (Kotler and Armstrong, 2003). Conceptually, a market can be visualized as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries.

Marketing Efficiency

Efficiency in marketing is the most used measure of market performance. Improved marketing efficiency is a common goal of farmers, marketing organizations, consumers and society. It is a commonplace notation that higher efficiency means better performance whereas declining efficiency denotes poor performance. Most of the changes proposed in marketing are justified on the grounds of improved efficiency (Kohls and Uhl, 1985)

Marketing Performance

Market performance can be evaluated by analyzing costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if it used to show how the consumer's price is divided among participants at different levels of marketing system (Mendoza, 1995).

Marketing Margin: refers to the difference between what consumers pay for a product and the prices received by producers for the same product, or the difference between the price received

by the first seller and that, which is paid by the final consumer of the product (Cramers and Jensen, 1982; William and Robinson, 1990; Holt, 1993).

Marketing Costs: are the embodiments of barriers to access to market participation by resource poor smallholders. It refers to those costs, which are incurred to perform various marketing activities in the transportation of goods from producer to consumers. Marketing costs includes handling cost (labor, loading and unloading, costs of damage, transportation and etc) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway *et al.*, 2002).

Marketing Channel: Formally, a marketing channel is a business structure of interdependent organizations that reach from the point of product or origin to the consumer with the purpose of moving products to their final consumption or destination (Kotler and Armstong, 2003). This channel may be short or long depending on kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam *et al*., 2001)

2.2.5. Measuring value chain

A fundamental aspect of global value chain research is how 'value' itself, is conceptualized and measured. According to Gereffi (1999) profit, value addition and price markups are indications of income shares across value chain actors. Value added shares can be calculated for different links in the chain. A second way to calculate value added is to look its distribution by each value chain actors of vegetable market and decomposing for each actor to get approximations of each value-added share. Marketing margin is the difference between the value of a product or a group of products at one stage in the marketing process and the value of an equivalent product or group of products at another stage. Measuring this margin indicates how much has been paid for the processing and marketing services applied to the product(s) at that particular stage in the marketing process (Smith, 1992).

2.2.6. Benefit of Value Chain in Agricultural Sector

It is an innovation that enhances or improves an existing product, or introduces new Products or new product uses. This allows the farmer to create new markets, or

differentiate a product from others and thus gain an advantage over competitors. In so doing, the farmer can ask a higher premium (price) or gain increased market share or access. Adding value does not necessarily involve altering a product; it can be the adoption of new production or handling methods that increase a farmer's capacity and reliability in meeting market demand. Value-added can be almost anything that enhances the dimensions of a business. The key is that the value adding activity must increase or stabilize profit margins, and the output must appeal to the consumer (AAFC, 2004). Value chain is useful as a poverty-reduction tool if it leads to increase on and off farm rural employment and income. Increased agricultural productivity alone is not a sufficient route out of poverty within a context of globalization and increasing natural resource degradation. A focus on post harvest activities, differentiated value added products and increasing links with access to markets for goods produced by low-income producers would appear to be the strategy open to smallholders (Lundy et al., 2002). Traditionally, little attention has been paid to the value chains by which agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities. While high-income countries add nearly US$185 of value by processing one tone of agricultural products, developing countries add approximately US$40. Furthermore, while 98 percent of agricultural production in high-income countries undergoes industrial processing, barely 38 percent is processed in developing countries. These indicate that well developed agro-value chains can utilize the full potential of the agricultural sector (UNIDO, 2009).

In the process of preparing an agro-industrial master plan for Ethiopia, a prioritization process was conducted for several commodities to identify those offering the highest prospects for growth (UNIDO and FAO, 2009). Group 1: Commodities that are highly important to the economy due to the large population involved in their production and to their contribution to national food security. This group includes: (i) cereals (wheat, maize, teff and barley); (ii) oilseeds (sesame, Niger seed, linseed and rapeseed); (iii) coffee; and (iv) sugar. Group 2: Commodities that are of importance to the economy, due to the number of people involved in production, processing and marketing as well as to their contribution to food security. This group includes: (i) dairy products; (ii) meat; (iii) tea; and (iv) fruit and vegetables. Group 3: Commodities that entail a competitive advantage for Ethiopia. This group includes: (i) honey; (ii) pulses; (iii) spices; and (iv) grapes/wine.

2.2.7. Developing Value Chain Systems towards the Benefits of the Poor

In recent years, the pro-poor growth approach has become one of the key concerns of developmental organizations. The focus of the approach lies in the promotion of economic potentials of the poor and disadvantaged groups of people (OECD, 2006). The main aim is to enable them to react and take advantage of new opportunities arising as a result of economic growth, and thereby overcome poverty (Berg et al., 2006). The promotion of value chains in agribusiness aims to improve the competitiveness of agriculture in national and international markets and to generate greater value added within the country or region. The key criterion in this context is broad impact, i.e. growth that benefits the rural poor to the greatest possible extent or, at least, does not worsen their position relative to other demographic groups. Pro-poor growth is one of the most commonly quoted objectives of value chain promotion. In recent years, the need to connect producers to markets has led to an understanding that it is necessary to verify and analyze markets before engaging in upgrading activities with value chain operators. Thus, the value chain approach starts from an understanding of the consumer demand and works its way back through distribution channels to the different stages of production, processing and marketing (GTZ, 2006).

The value chain approach seeks to identify long-term solutions to reduce the vulnerability of developing countries to fluctuating world market prices or trade shocks. It does not just focus on adding value to existing traditional commodity exports (in other words, diversifying the same product), but also on promoting alternative products. Another characteristic of the approach is that it does not solely concentrate on functional dimensions such as supplying appropriate inputs, or applying good agricultural processing, handling and distribution practices. It emphasizes the importance of institutional arrangements, or rather governance issues, along the value chains that link and coordinate producers, processors and distributors of a certain product. Moreover, this aspect covers authority and power relationships that determine how financial, material and human resources are allocated and flow within the chain (Gereffi et al., 1994). Dynamic value chain systems respond to market shifts by developing and transferring knowledge to intermediaries and producers, so that they can adapt and maintain a competitive market position over time. Vibrant value chain systems grow and continuously incorporate new businesses, generating ever

increasing jobs, income, and assets. In this manner, value chain systems can have the potential to significantly reduce poverty for large numbers of poor people (Alexandra and Mary, 2006).

2.2.8. Statues Haricot bean Production in Ethiopia

Haricot beans (*Phaseolus Vulgaris legume)* are one of the major types of pulses grown in Ethiopia (EEPA, 2004) especially in the lowlands and in the rift valley. There is a wide range of haricot bean types grown in Ethiopia including mottled, red, white and black varieties. The focus of this genetic improvement program has been on the pure red and white beans to support the commercial sector. To support both the growth in domestic and export bean markets, the Ethiopian Institute of Agricultural Research (EIAR) has developed a range of high yielding, multi-disease resistant bean varieties (Ali *et al.,* 2003).The most commercial varieties are pure red and pure white colored beans and these are becoming the most commonly grown types with increasing market demand. Within the red bean types, the most favored and most commercially accepted varieties include Red Melaka, a mottled medium sized red; Red Wolaita, a medium sized pure light red; and Nasser, a small pure dark red variety (Ferris, 2008).

Haricot beans tolerate most environmental conditions in tropical and temperate zones, but do poorly in very wet tropics where rain causes disease and flower drop. Rain is undesirable when dry seeds are harvested. Frost kills plant. Excessive water will injure plants in a few hours, but some black-seeded beans will grow well in standing water. Beans grow best in well-drained, sandy loam, silt loam or clay loam soils, rich in organic content , Haricot beans are adapted to the low and mid altitude areas at an altitude 900-2100 meter above sea level and optimum temperature of 24°c and average rainfall 200-600 mm per annum (Frehiwot, 2010).

The crop is grown by subsistence farmers either as a sole crop and/or intercropped with either cereal or tree crops. Shade tolerance and early maturity contributes to haricot bean's prominent position as under storey intercrop for sorghum, maize, and coffee in the eastern zones of the country in which 85 % of all sorghum is intercropped with beans (Shimelis *et al*., 1990).

With regard to economic importance of haricot bean; the importance of haricot bean as a source of income, nutrition and its role in food security at a household level is very high (Simane *et al.,* 1998). It is also used as source of foreign currency, food crop, means of employment, source of

cash, and plays great role in the farming system (CSA, 2005). According to EPPA,(2004) in the year 2000, 2001 and 2002 Ethiopia exported 23994.4, 32932.7 and 42127.0 tones and earning 8.2, 9.98 and 13.2 million USD respectively.

The main destination markets were Pakistan, Germany, Yemen, UK, South Africa, India and Mexico having 12.5, 7.8, 6.9, 5.79, 4, 4, 4 % share respectively (EPPA, 2004).The country's exports of haricot beans have increased over the last few years, from 58,126 MTs in 2005 to78, 271 MTs in 2007 and Ethiopia gets 63 million dollar from haricot bean market in 2005 (Legesse *et al.*, 2006).

Haricot bean play a crucial economic role in food and nutrition security, in Ethiopia. Recently, the production and supply of pulses, has increased due to increased demand in both local and international markets, thus enhancing smallholders' income (Shahidur *et al.,* 2010). Ethiopia is among the top ten producers of pulses in the world with pulses being the third largest export commodity of the country (MoARD, 2008).

Haricot bean stands out among the pulses and is also known as "the poor man's meat" due to its high protein content, which compensates for the deficiency that could have occurred in a population with low income. Different types of haricot beans are grown in Ethiopia. These include white pea beans, grown in the central Ethiopia (Shoa) as cash crop, colored beans grown in the southern part of Ethiopia for local consumption and climbing beans grown in the North West (Metekel) and western Ethiopia (Wollega). Climbers are planted along fences and on the borders of maize fields (Zelalem, 2002).

White beans from the northern Rift Valley were sold into export markets to supply European canning factories and red beans were exported from the southern Rift valley areas to supply drought affected areas in northern Kenya (Ferris and Robbins, 2004). The major storage and trading sites in the southern Rift Valley area are concentrated in the towns of Sodo, Awassa and shashemene while the major collection centers for white beans being in Nazareth, prior to exportation through Djibouti (Ferris, 2008).There are good prospects that this market will grow as consumers in industrialized countries seek ever more competitive suppliers (Ferris and Kaganzi, 2008). For the major processing companies, Ethiopia is a relatively new source of

supply and recent investments by a number of international companies from Italy, UK and Turkey indicate that market prospects are good (CIAT, 2004).

2.3. Review of Empirical Studies

2.3.1. Value Chain Approach

Value chain approach is used by many organizations across the globe. Following the pioneering contributions, of Porter (1985) who focused on how individual firms can create value and build up their competitive advantage and Giraffe (1994) who focused primarily on the economic governance patterns in "global" value chains, different institutions and individuals applied value chain approach. The World Bank Group is already engaged in value chain studies in various countries and regions of the world, including Africa, Latin America, Central Asia, South Asia, East Asia, and the Middle East and North Africa. In addition, many other international development agencies such as, USAID, the Commack Trust and International Labor Organization use the approach. FAO is currently utilizing value chain approach for livestock development in IGAD countries. Value chain and innovations are also interlinked. Improvement in productivity and competitiveness of the value chain is the litmus test for value chain innovation (Anandajayasekeram and Gebremedhin, 2009).

The concept of value chains has been extended to the analysis of globalization (Gereffi and Korzeniewicz, 1994; Kaplinsky, 1999). The potato value chain conducted in Bhutan (Joshi and Gurung, 2009) analyzed the context of potato production, mapped chain actors, factors affecting value chain and chain relationships. A case study of the potato value chain conducted in Kenya has shown that contract farming can be used to reduce transaction costs and risks, and to improve the organization and governance of value chains by creating stable business relationships (Kirumba *et al.,* 2004).

Horticulture value chain study conducted in Eastern parts of Ethiopia indicated that potato is one of the major horticulture crops exported to Djibouti and Somali land (Emana, 2008). According to Bezabeh (2011) the major constraints of marketing identified by the same study include lack of markets to absorb the production, low price for the products, large number of middlemen in the marketing system, lack of marketing institutions safeguarding farmers' interest and rights over their marketable product, lack of coordination among producers to

increase their bargaining power, poor product handling and packaging, imperfect pricing system and lack of transparency in market information communications.

Dereje (2007) used value chain approach to study the competitiveness of Ethiopian coffee in the international market. The study indicates that Ethiopian farmers have low level of education, large family size with small farmland and get only 3% of the retail price in the German market.

2.3.2. Determinants of Market performance

Muhammad (2011) marketing performance of teff and wheat markets were analyzed by estimating the marketing margin, by taking into consideration associated marketing costs for key marketing channels. Based on production costs and purchasing prices of the major market participants along the chain, margins at farmer, urban assemblers, wholesalers and urban retailer's levels were estimated and analyzed.

Marketing margins are the difference between prices at two market levels. The term market margin is most commonly used to refer to the difference between producer prices of an equivalent quantity and quality of a commodity. 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 (Spencer, 1971). Marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The margin covers costs involved in transferring produce from one stage to the next and provides a reasonable return to those doing the marketing. It can be interpreted as a cost of providing a mix of marketing services.

Bezabeh (2011) in potato marketing, low prices offered for ware potato used to be reported by producers. This is attributed to non-diversified potato consumption culture in the country. However, recently, processing and consumption of value added potato products, such as chips is showing an increasing trend especially in urban areas. A study by Agajie *et al.* (2007) indicated that demand for potato chips by both high and low income households has increased in recent years especially in Addis Ababa. Therefore, the sector has great potential for growth. This future growth should be geared towards improving the performance of the whole potato value chain. It is also important to link value chain with innovation system perspective in agricultural research for development so that one reinforce the other (Bezabeh, 2011).

2.3.3. Determinants of Market Supply

There are a number of empirical studies on factors affecting the market supply of agricultural commodities. Ayelech (2011) identified factors affecting the marketable supply of fruits by using OLS regressions. She found that fruit marketable supply was affected by; education level of household head, quantity of fruit produced, fruit production experience, extension contact, lagged price and distance to market.

According to Wolday (1994) marketable supply of agricultural product could be affected by different factors including the size of land holding, the output level, family size, market access, price, inputs, formal education, oxen number, accesses to extension and credit services, distance to market, time of selling, access to labor and age. In sum, empirical evidences indicate that marketable supply approach has become an important framework to analyze economic agents in agricultural sector. In this study an attempt was made to identify factors affecting the marketable supply of vegetables.

According to Muhammad (2011) by using multiple liner regressions model the relationship with market supply of teff and wheat are described as sex of the household head, age of the household head, family size, quantity produced, farm size, lagged price, access to credit, access to market information, price of other crops (pepper), and access to extension service.

3. RESEARCH METHODOLOGY

3.1. Description of the Study Area

Berehet district is located 226 km north eastern of Addis Ababa in the Amhara Regional State. The topography ranges between dry lowlands at altitudes of around 1000 m to 3200 m to above sea level. The area is classified into Dega (3 %), Weyna-Dega (17 %) and Kola (80 %) agro climatic zones. Average annual temperature of the district is 25-30℃. The average annual rainfall in the district is 800 mm (DoARD). The district is composed of 9 Kebeles Administrations. Sorghum, maize, teff, haricot bean, barley, wheat and vegetables (potato, tomato, onion, and paper) are the dominant crops in the Woreda (DoARD, 2014).Berehet is one of the Woreda's in the Amahara Region of Ethiopia, Part of the Semen Shewa Zone. The district is bordered on the south by the Germama river which separates it from Menjarna Shenkora, on the west by Hagere Mariamna Kesem, on the north by Asagirt and on the east by the Afar Region. The major town in Berehet is Metehbila.

Based on the 2008 national census conducted by the Central Statistical Agency of Ethiopia (CSA), the Woreda has a total population of 40,371 an increase of 80.2% over the 1994 census, of whom 21,212 are men and 19,160 women; or 6740 are urban inhabitants. With an area of 884.50 square kilometers, Berehet has a population density of 43.98 persons per square kilometer, which is less than the Zone average of 115.3 persons per square kilometer. The majority of the inhabitants practiced Ethiopian Orthodox Tewahido Christianity, with 82.5% reporting that as their religion, while 17.8 of the population said they were Muslim and 0.2 % is others.

3.2. Research Design

In this study cross sectional research design was used and both quantitative and qualitative methods were employed. Semi-structured questionnaire prepared focus group discussion and personal observation methods were used to gather the required data.

3.3. Sampling Procedure

A multi-stage technique was implemented to select white haricot bean producer kebeles and sample farm households.

3.3.1 Producers Survey

The Woreda was selected purposively based on production potential. The first stage of selection were performed according to the information taken from the Woreda agricultural office annual data of the white haricot bean productions of the consecutive years before the survey (2010-2014). Due to this out of 9 kebeles 3 were chosen (high producer, medium producer and low producer) by stratifying sampling. Then the second stage was also selected based on the proportion of population by taking the list of households from development agent office. Through this a total of 138 respondents were selected from these three Kebeles. Finally, simple random sampling method was used to identify the producers.

Accordingly, the number of respondents in each rural kebeles is shown in table (1).To determine the dry white haricot producer of the survey sample size Yamane (1967) formula was used to calculate sample size. $n = \frac{N}{1 + N(e)^2}$ *Where;* n is the sample size which is 138, 'N 'is the population number of white haricot bean producer and 'e' is the level of precision which is ±5% in the 95% confidence interval.

Table 1.Name of the peasant associations and samples that were selected

No	Name of kebele.	No. of household white haricot bean producer	Size of the proportions	Sample size considered Kebele household.
1	Kostya(08)	110	0.52	71
2	Demeko(09)	40	0.19	26
3	G/solmon(02)	61	0.29	41
	Total	**211**	**1.00**	**138**

3.3.2. Traders' survey

For this study three markets (Metehbila, Akeremt and Mentamer) were selected purposely, which are the main white haricot bean market sites in the study area. The lists of cooperatives,

rural collectors and suppliers were obtained from the Woreda office of trade and industry (OoTI), 30 white haricot bean traders were selected for this study. Furthermore, data were collected from Nazareth ECX market about relevant information along the value chain study.

Table 2.Sample distributions traders of white haricot bean.

Name of Selected market	Input suppliers	Collectors	Retailers	Wholesaler	Cooperatives	Exporter	Total
Akeremt	1	3	2	2	1	0	9
Mentamer	1	4	3	3	1	0	12
Metehibla	2	3	1	1	1	0	8
Nazareth	0	0	0	0	0	1	1
Total	**4**	**10**	**6**	**6**	**3**	**1**	**30**

3.4. Method of Data Collection

Both primary and secondary data were collected for the study. The secondary data were gathered from various sources including Berehet DoAR, ECX and CSA, primary cooperatives in the selected sample kebeles and other NGOs who were involved in white haricot bean production and development activities in the study area. Besides, relevant literature, Melkasa research official reports was also consulted as secondary data source.

Primary data were collected from sampled stakeholders, who are involved in input supply, production, marketing and supportive services (extension and facilitation) along the white haricot bean value chain. Household survey, focus group discussion and personal observation methods were employed to gather the information required. Semi-structured questionnaire were used to collect data from farmers. In this survey, three FGDs were conducted in the selected farmers (one FGD in each) with 8 to10 participants in each session for understanding on selected key issues are; input supply, production, marketing and consumption as well as constraints and opportunities, potential interventions to remove the constraints and take advantage of the opportunities.

3.5. Methods of Data Analysis

Both qualitative and quantitative methods of data analysis were used. Functional analysis was used to identify the various actors and their roles in the value chain. During analysis a number of tools were employed. For instance; chain mapping and actor linkage were used to identify the various actors and their function and mapping patterns of interaction between actors. Besides, SWOT (strength, weakness, opportunity and threat) analysis was used to analyze the constraints and opportunities of some actors across the value chain.

3.5.1. Descriptive Statistics

Regarding the quantitative analysis, simple descriptive statistics such as simple measures; mean, standard deviation, frequency and percentages were used for the survey data gathered from sample farm households. Statistical package for social science (SPSS) version 16 were employed to analyze the data. The analyzed data are presented using map and tables.

3.5.2. Value Chain Analysis

To identifying dry white haricot bean value chain. As products move successively through the various stages, transactions take place between multiple chain actors, money and information was exchanged and value has been progressively added. Moreover, individual enterprises may feed into numerous chains; hence, which chain (or chains) was targeted depends largely on the point of entry for the research inquiries (Kaplinsky and Morris, 2001).

Accordingly, four aspects of value-chain analysis have been applied in agriculture

1. **Value chain mapping:** value-chain analysis systematically maps the actors participating in the production, distribution, marketing and consumption of haricot bean. This mapping assesses the characteristics of actors, profit and cost structures, and flows of haricot bean throughout the chain, employment characteristics, and the destination and volumes of domestic and foreign sales**.**

2. **Identifying the distribution of benefits of actors in the chain:** Through the analysis of margins and profits within the chain, one can determine who benefits from participation in the chain and which actors could benefit from increased support or organization.

3. **Examining the role of upgrading within the chain:** Upgrading can involve improvements in quality and product design that enable producers to gain higher value or through diversification in the haricot bean served. An analysis of the upgrading process includes an assessment of the profitability of actors within the chain as well as information on constraints that are currently present. In addition, the structure of regulations, entry barriers, trade restrictions, and standards can further shape and influences then environment in which upgrading can take place.

4. **Role of governance in the value chain:** Governance in a value-chain refers to the structure of relationships and coordination mechanisms that exist between actors in the value-chain. Governance is important from a policy perspective by identifying the institutional arrangements that may need to be targeted to improve capabilities in the value-chain, remedy distributional distortions, and increase value-added in the sector. By systematically understanding these linkages within a network, one can better prescribe policy recommendations and, moreover, further understand their impact throughout the chain (Berg *et al.*, 2005).

3.5.3. To analysis the performance of dry white haricot bean**.**

Market performance refers to the impact of structure and conduct on prices, costs, and volume of output (Pomeroy and Trinidad, 1995).

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 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 (e.g., Wohlengenant and Mullen, 1987; Schroeter and Azlam, 1995; Holt, 1993) and (Sexton, Zharg and Chalfant, 2005 as cited on Jema, 2008) argued that even though variations in the margin over time might be attributable to marginal marketing costs under perfect

computation, additional factors such as seasonality, technological changes, and sales volume may also explain the variations in the margin.

Marketing Margin- In a commodity subsystem approach, the institutional analysis is based on the identification of the marketing channels. When there are several participants in the marketing chain, the margin is calculated by finding the price variations at different segments and by comparing them with the final price to the consumer. The consumer price is the base or the common denominator for all marketing margins. Comparing the total gross marketing margin is always related to the final price or the price paid by the end consumer and then expressed as a percentage (Mendoza, 1995).

Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain, for example between producer and wholesale, wholesale and retail prices (Scarborough and Kydd, 1992). Large gross margins may not express high profit; this is because size of marketing margins largely depends upon a combination of the quality and quantity of marketing services, and the efficiency with which they are undertaken and priced. The quality and quantity of marketing services depends on supply and demand of marketing services and/or the degree of competition in the market place. Therefore, in using market margin analyses to assess the economic performance of markets, it is always preferable to deconstruct them in to their cost and return elements (Scarborough and Kydd, 1992).

Mendoza (1995) warns that precise marketing costs are frequently difficult to determine in many agricultural marketing chains. The reasons are that these costs are often both cash costs and imputed costs, the gross and not the net marketing margin is advised to be calculated. According to Mendoza (1995), "marketing margins" should be understood as the gross marketing margins. He advises marketing researchers to emphasize on gross marketing margins in reporting their findings. In similar manner, in this proposal, gross marketing margin was considered instead of net marketing margin, as it was difficult to estimate the implicit costs incurred during transaction of haricot bean.

The total marketing margin is given by the following formula.

$$\text{TGMM} \quad = \frac{\text{End buyer price –First seller price}}{\text{End buyer price}} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

Where, TGMM is total gross marketing margin. It is useful to introduce the idea of producers' gross margin (GMMp) which is the portion of the price paid by the consumer that goes to the producer. The producers' margin is calculated as:

$$\text{GMMp} \quad = \frac{\text{End buyer price –Marketing gross margin}}{\text{End buyer price}} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

Where, GMMp= the producer's share in consumer price.

Net marketing margin (NMM) is the percentage over the final price earned by the intermediary as this net income once his marketing costs are deducted. The equation tells us that a higher marketing margin diminishes the producer's share and vice-versa. It also provides an indication of welfare distribution among production and marketing agents.

$$\text{NMM} = \frac{Grossmarketingmargin \ -Marketingcost}{Endbuyerprice} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots \textbf{..(3)}$$

From higher NMM or profit of the marketing intermediaries reflects reduced downward and unfair income distribution, which depresses market participation of smallholders. An efficient marketing system is where the net margin is near to reasonable profit. To find the benefit share of each actor the same concept was applied with some adjustments. In analyzing margins, first the Total Gross Marketing Margin (TGMM) was calculated.

This is the difference between producer's (farmer's) price and consumer's price (price paid by final consumer) such that

TGMM = End buyer price's – farmer's price ……………………………………… (4)

Then, marketing margin at given stage "t" (GMM) was computed as

$$\text{GMMt} = \frac{SPt-PPt}{TGMM} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(5)}$$

Where, Sp_t is selling price at t^{th} and pp_t is purchasing price at t^{th} link

Total gross profit margin also computed as:

$$\text{TGPM} \quad = \text{TGPM} - \text{TOE} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(6)}$$

Where, TGPM is total gross profit margin, TGMM is total gross marketing margin and TOE is total operating expense.

Dawit (2010) and Marshal (2011) was similar concept of profit margin that deducts operating expense from marketing margin.

Then profit margin at stage "t" is given as:

$$\text{GPMi} = \frac{GMMt - OEt}{TGPM} \times 100 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \textbf{(7)}$$

Where, GPMi =Gross profit margin at i[th] link

GMMt =Gross marketing margin at t[th] link

OEt =Operating expense at t[th] link

TGPM=Total gross profit margin.

3.5.4. Econometric Analysis

Determinants of Haricot beans Supply to the Market in the Study Area.

To make commercialization effective, producers need to produce and supply substantial volume to market. Market supply could be increased through provision and use of superior production technologies and through improving other relevant factors too. Therefore, it was essential to recognize and realize patterns of these influencing factors.

However, special attention must be taken in considering the most important explanatory variables in explaining market supply level which could be different for different area of production and level of commercialization. Therefore, considering specific situation was decided determinants of market supply to include; haricot bean farming experience, credit access, distance from productions area to nearest market, age of house hold per heads, family size, sex of house hold, educations level of house hold, access to market information, extension contact, value addition, income from nonfarm activity, total land owned by the household and the number oxen owned in house hold level.

According to Mohammed (2011) multiple linear regression models was fitted to survey data to generate information about determinants of marketed supply of teff and wheat. Also Rehima (2010) multiple linear regression models is used to analyze determinants of red pepper market supply. Due to this multiple linear regression models were fitted to survey data to generate information about determinants of the quantity of dry white haricot bean supply. A regression with two or more explanatory variables is called a multiple regression. This method of data

analysis refers to the use of different economic and statistical tools or models for testing hypothesis related to the objective of the study.

Econometric Model Specification

Multiple linear regression models were fitted to survey data to generate information about determinants of dry white haricot bean supply. A regression with two or more explanatory variables is called a multiple regression. Rather than modeling the mean response as a straight line, as in simple regression, it is now modeled as a function of several explanatory variables. To perform multiple linear regressions with 13 explanatory variables use the command. Based on literatures, dry white haricot bean supply model to be estimated the Following Greene (2003), the multiple linear regression models is specified as;

$$Y_t = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13})$$

Where Y_t = How much quantityof haricot beans supplied to the market

X1= Haricot bean Farming Experience

X2 = Credit access

X3 = Distance from productions area to nearest market

X4 = Age of the Household

X5 = Family labor

X6 = Sex of the Household

X7 = Educations level of the Household

X8 = Access to market information

X9 = Access to Extension service.

X10= Post harvest and Pre harvest Value addition

X11 = Income from Nonfarm Activity

X12 = Number of oxen owned in the Household level

X 13=Total land owned

3.6. Specification of Errors

Test for multicollinearity: detect multicollinearity problem for continuous variables, Variance inflation factor (VIF) $=\frac{1}{1-Rj^2}$, for each coefficient in a regression as a diagnostic statistic was us ed. Here, R^2 represents a coefficient of determination the subsidiary or auxiliary regression of

each independent continuous variable X. As a rule of thumb, Gujarati (2003) stated that if the VIF value of a variable exceeds 10(which was happened if Rj^2 exceeds 0.90), the variable is said to be highly collinear.

A measure of multicolliniarity associated with the variance inflation factors is computed as;VIF (Xi) $=\frac{1}{1-Rj^2}$ Where, Rj^2 are the multiple correlations coefficients between explanatory variables, the larger the value of, Rj^2 the higher the value of VIF (Xj) causing higher co linearity in the variable (Xi).

Contingency coefficient is used to check multicolliniarity or association between discrete variables. The value ranges between 0 and 1, with 0 indicating no association between the variables and value close to 1 indicating a high degree of association between variables. Therefore, for this study, variance inflation factor (*VIF)* was detecting multicolliniarity problem for continuous variables. On the other hand, for dummy variables contingency coefficient was used.

A popular measure of multicolliniarity associated with the CC is defined as:

$$Cc = \sqrt{\frac{x^2}{N+x^2}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{(8)}$$

Where, Cc is contingency coefficient, χ_2 is chi-square test and N is total sample size. If the value of CC is greater than 0.75, the variables are said to be collinear.

Conversely, test for heteroscedasticity was undertaken for the study. There are a number of test statistics for the detecting heteroscedasticity; According to Guajarati (2003) there is no ground to say that one test statistics of heteroscedasticity is better than the others.

Therefore, due to its simplicity, Kroenker-Bessett (KB) test of heteroscedasticity was used for the study. Similar to other test statistics of heteroscedasticity, KB test is based on the squared residuals $Û i^2$

However, instead of being regressed on one or more regresses, the squared residuals are regressed on the squared estimate values of the regress. Particularly, if the original model

$$Yi = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots \beta_k X_{ki} + ui \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \textbf{(9)}$$

ui is obtained from this model and then $Û i^2$ is estimated as $Û i^2 = a_0 + a_1 Ý i^2 + $ ui, Where, $Ý i^2$ are the estimated values from the original model.

3.7. Hypothesis and Definitions of Variables

In order to identify factors influencing quantity of white haricot bean supplied to the market both continuous and dummy variables were hypothesized based on economic theories and the findings of empirical studies. Accordingly, in order to investigate the determinants of quantity of white haricot bean supplied to the market, the following variables were constructed.

3.7.1. Dependant Variable

Quantity supplied: It is continuous dependent variable which is used in the multiple linear regression model equation. Quantity of white haricot bean supplied to the market in (2014/15) was measured in quintal (100 kg) and represents the actual supply of white haricot bean farm household to the market in the survey year.

3.7.2. Independent Variables

Sex of the household head (SEXh): This is dummy variable that takes a value of one if the household head is male and zero otherwise. Both men and women participate in production of haricot bean. Male households have been observed to have a superior tendency than female household in haricot bean production and haricot bean supplied in the market. But female farmers have encounter of problem such as lack of capital, access to credit and extension services. Tshiunza *et al., (*2000), discussed the determinants of market production of cooking banana in Nigeria. In their study the male farmers tended to produce more cooking banana for market than female farmers.

Age of the household head (AOFHH): Age is demographic variable and is measured in years. The expected influence of age is assumed positive; it is a proxy measure of farming experience of household. Aged households are believed to wise and acquire skills in farming hence produce much and supply more. On the other hand; older households may also be tradition bound and reluctant to take up new technologies, hence negatively affecting haricot bean production.

Number of oxen owned (NOFWND): It is a continuous variable and is expected to affect the market supply of haricot bean positively. This is because those farmers who have their own oxen can reduce their cost of production (oxen rent) and can plough their land on time and as a

result be able to produce more haricot bean and supply for the market. Kin die (2007) found that the number of oxen owned by the households affected positively the market supply of the District.

Credit Access (CACC): Access to credit is measured as a dummy variable taking a value of one if the household has access to credit and zero otherwise. Among other things, credit access is assumed to have a positive significant to the market supplied of white haricot bean, because a farmer who has access to credit service can purchase improved seed and hence increase the production and market supply of white haricot bean at the district level. Therefore, it is hypothesized that access to credit would have positive influence on level of production and sales. Alemnewu (2010) and Mohammed (2011) who found that teff producer gets credit, the amount of teff supplied to the market increased.

 Distance from production area to main road (DPAMR): This is a continuous variable included in the model to indicate the distance of household from the main road. As the crops are bulky the proximity to the road had bean matter the farmers need to produce and supply to the market. There is no doubt that transport is great importance for marketing agricultural product. In particular, rural communities in remote areas suffer from lack of transportation facilities. This happens due mainly to absence of adequate means of transformation and due to poor infrastructural conditions like roads (Robbins *et al.,* 1990). It is measured in kilometers of single trip and is expected to take a negative signs.

Access to Extension Service (AEXES): A dummy variable taking a value of one if white haricot bean producer household has access to extension service and zero otherwise and representing extension services as a source of information on technology. It is expected that extension service widens the household's knowledge with regard to the use of improved technologies and has positive impact on white haricot bean sale volume. Therefore, this variable is hypothesized to influence volume of white haricot bean sales positively. Ayelech (2011) found that if fruit producer gets extension, the amount of fruits supplied to the market increases. The aim of the extension service is introducing farmers with new and improved agricultural inputs for better methods of increasing production and productivity in turn increase market supply.

Access to market information (ACMIN): This is measured as a dummy variable taking value of one if the producer had access to market information and zero otherwise. It has been hypothesized that to affect positively market supplied of white haricot bean. The better information farmers had out is likely to supplied white haricot bean to the market. The general idea is that maintaining a competitive advantage requires a sound business plan. Again, business decisions are based on dynamic information such as customer needs and market trends. This requires that an enterprise is managed with due attention to new market opportunities, changing needs of the costumer and how market trends influence buying (CIAT, 2004).

Education level of the household (EDLHH): It is a continuous variable and refers to the formal schooling of a respondent during the survey period. Those household heads who had formal education determines the readiness to accept new ideas and innovations, and easy to get supply, demand and price information and this enhances farmers' willingness to produce more and increase volume of sales. Holloway *et al.* (2002) observed that education and visits by an extension agent had significant and positive effect on quantity of milk marketed in Ethiopian highlands.

Active family labor (AFL): This is a continuous variable representing the availability of economically active labor force in the household (male and female). It is expected to take positive coefficients explaining an increase in economically active labor force to increase the farmer's participation in the crop farming. As haricot bean production is labor intensive activity during harvesting and weeding, haricot bean production in general and market supply of white haricot bean products in particular is a function of labor. Accordingly, families with more household members tend to have more labor which in turn increase haricot bean production and then increase white bean market supply. On the other hand, family labor decrease also decreases market supply because may be half proportion of the labor have a student staying to school. But for this study active family labor was expected to influence positively the volume of white bean supply to the market. Gezahagn, (2010), who found that family labor have positive effect on the households' gross income from groundnut production.

Haricot bean farming experience (HFEP): It is the total number of years a farmer stays in production of haricot bean. A household with better experience in haricot bean farming is expected to produce more amounts of haricot bean and, as a result, he is expected to supply

more amounts of haricot bean to market. Farmers with longer farming experience are expected to be more knowledgeable and skillful (Ayelech, 2011).Therefore, this variable is hypothesized to positively influence quantity supplied to the market.

Pre-harvest and post-harvest value addition (PAPAV): It is a dummy variable measured in terms of whether the household practices value adding activities on his white haricot bean products or not. It takes a value one if a household practice value adding activities and zero otherwise. Farmers who practice better to use improved haricot bean seed, apply modern agronomic practice in order to produce surplus and more supply to the market beside this better pre- harvest management practice (weeding, threshing generally the overall agronomic practice and post-harvest handling like (storing, separating quality product by shape, color, sorting etc.) have better relationship with customers have high probability to sell.

Income Nonfarm farming activities (INFA): It is a continues variable measured in terms of whether the household obtained income from non-farming activities. This income may strengthen farming activity by getting other income such as trade in shop and other Arts have better alternative for house hold consumption, these helps to raise the volume of market supply directly sell over all produced.

Total land owned (TLOWN) - This is a continuous variable in hectare indicating the total land owned by a farmer. It is expected to take positive sign implying that the larger land size a farmer owns the more land size would be allocated for the crop at interest. Increase in size of land assumes direct influence on market supply. DNIVA (2005) found expanding the area under crop increased the market supply of the crop

Table 3 . Description of the dependent and independent variables used in the model

Variables used in the model	Explanation	Category	Value
QUASP	Quantity supplied	Continuous	Kilograms
SEXh	Sex of the household head	Dummy	1=female and 0= male
AOFHH	Age of the household head	Continuous	Years
NOFWND	Number of oxen owned	Continuous	Numbers
CACC	Credit Access	Dummy	1= yes, 0= no
DPAMR	Distance from production area to main road	Continuous	Kilometers
AEXES	Access to Extension Service	Dummy	1=yes or 0= no
ACMIN	Access to market information	Dummy	1=yes or 0=no
EDLHH	Education level of the household	Continuous	Years of School
AFL	Active family labor	Continuous	Number of labor
HFEP	Haricot bean farming experience	Continuous	Numbers of years
PAPAV	Pre-harvest and post-harvest value addition	Dummy	1=yes,0= no
INFA	Income Nonfarm farming activities	Continues	Number of birr
TLOWN	Total land owned	Continuous	Hectares

4. RESULT AND DISCUSSION

The main findings of the study presented in four parts. The first parts the role of actors along the value chain. The second parts give an overview of white bean marketing channels and performance analysis. The 3rd parts illustrate current determinants' of quantity supply white haricot bean market. The final parts analyze constraints and opportunities of the value chain.

4. 1. Value Chain Analysis

4.1.1. White haricot bean Value Chain Map

According to McCormick and Schmitz (2001), value chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. It also helps to identify the different actors involved in the haricot bean value chain and to understand their roles and linkages. Consequently, the current value chain map of dry white haricot bean in Berehet is depicted in Figure 1.

Figure 1. Value chain map of dry white haricot bean
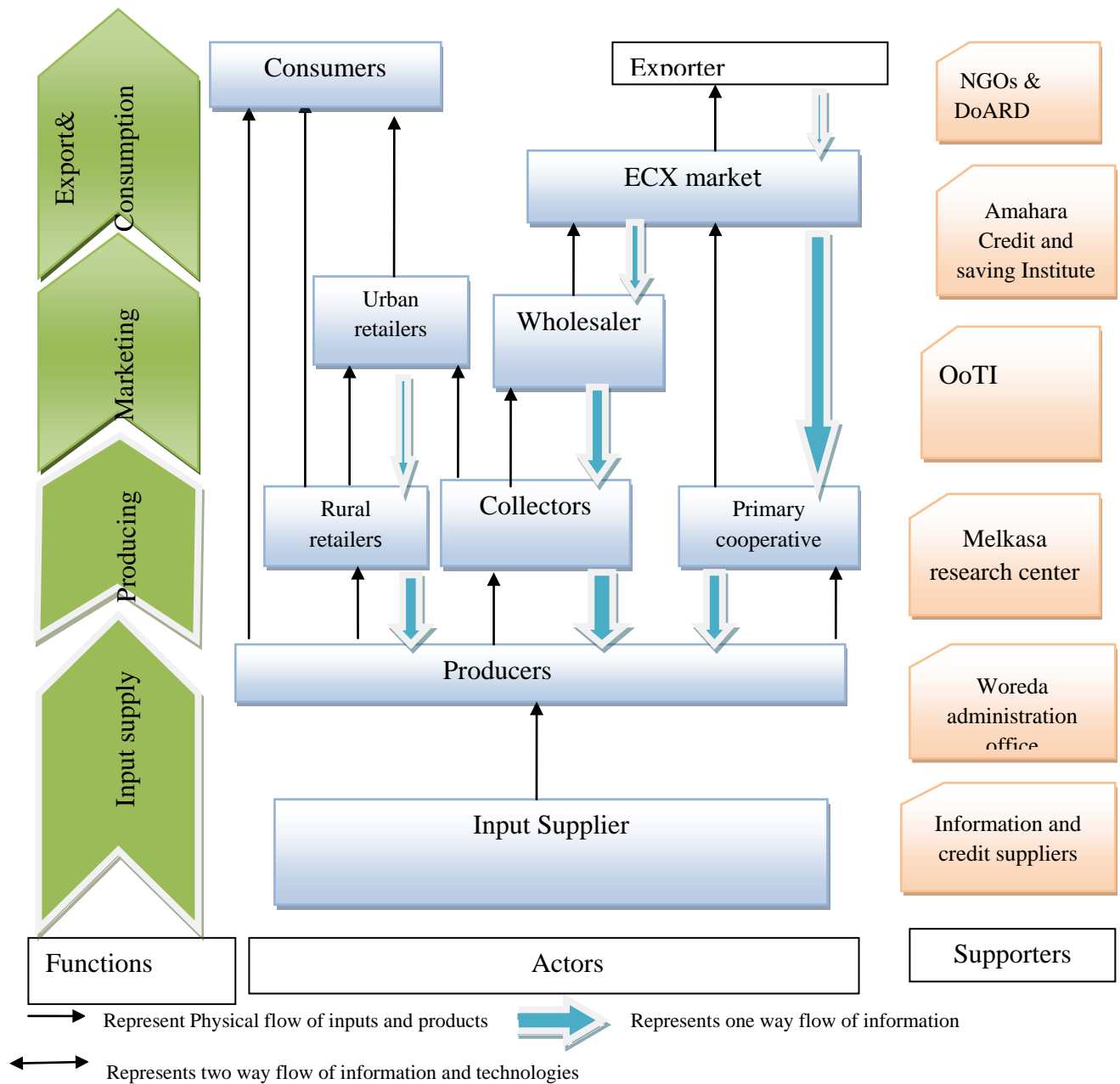
Source: Own sketch from survey result, 2014

4.1. 2. Actors and their Role

This part presents the actors and the role they play in the white haricot bean value chain in the study area. In the same way as to Ghimiray *etal* (2007), actors and their role are assessed the different stages of the value chain as; input supply, production, marketing, exporting and consumption.

The functional analysis result, as clearly presented in appendix 6, highlighted the involvement of diversity of actors who are participated directly or indirectly in the value chain. According to KIT *et al*. (2006), the direct actors are those involved in commercial activities in the chain (input suppliers, producers, traders, retailers and consumers) and indirect actors are those that provide financial or non-financial support services, such as credit agencies, business service providers, government, NGOs, cooperatives, researchers and extension workers.

In the study area, there are multiple public and non public actors involved along the dry haricot bean value chain, upstream from input supply to downstream consumers, playing different role. They were; input suppliers, producers, traders (suppliers, collectors, retailers, and cooperatives), consumers and supporting (indirect) actors. Some functions or roles are performed by more than one actor and some actors perform more than one role. A brief description about actors involved and their role is mentioned in appendix 6.

4.1.3. Primary Actors

Producers

Dry white haricot bean growers are the major actors who perform most of the value chain functions right from farm land preparation on their farms or procurement of the inputs from other sources to handling and marketing. The major value chain functions that haricot bean growers perform include ploughing, planting, fertilization, weeding, pest/disease controlling, harvesting and post handling of dry white haricot bean.

Sole cropping is the most popularly practiced production system in Berehet Woreda's. In this Woreda's 42 % of producers intercrop haricot bean with in cereal crops (inter crop maize with white haricot bean and sorghum with white haricot bean) and almost all producers reported that they practice sole cropping in the district around 58% of the districts are well known to practiced sole cropping production systems (Table 3).

Table 4. Cropping systems and value addition of haricot bean

Berehet		Total(N=138)	
Variables	Items	N	%
Cropping	Sole cropping	80	58.0
system	Inter crops with cereal	58	42.0
Value adding	Yes	51	37.0
Activities	No	87	63.0

Source: Own computation from survey result, 2014

Local Collectors

These are traders in assembly markets who collect dry white haricot bean from farmers in village markets and from farms for the purpose of reselling it to wholesalers and urban retailers. The trading activities of collectors include buying and assembling, packing, sorting, transporting and selling to suppliers.

Wholesale agent

Wholesalers are market actors who can buy from the primary market and can only supply to the ECX market. According to office of trade and industry (OoTI) information in the district have 6 wholesaler agents, that have been registered and receive certificate to trade at the primary market and they have started the operation. Wholesalers are mainly involved in buying haricot bean from collectors and producers in larger volume than any other actors and supplying them to exporters through ECX market. They also store product, usually for a maximum of 20-30 days. They have the main assembly market centers for haricot bean in their respective surrounding areas. They also have better storage, transport and communication access than other traders.

Cooperatives

In the district they have 6 Primary Cooperatives and one cooperative union. The maximum number of primary cooperatives in each peasant associations is only one. Primary Cooperatives are market actors who can buy from the producer market from member and non-member

farmers and can supply directly to their cooperative unions furthermore, they can a potential to supply the ECX market. Primary cooperatives are playing an important role in the supply of input required for white haricot bean production. Fertilizer, pesticide and improved seeds are the main inputs delivered. These inputs are supplied either in cash or in loan base.

Kessem cooperative union is the only cooperative union in the study area based in the district. It played a major role in the supply of input for primary cooperatives and district of agriculture. Based on input demand from primary cooperatives and district of agriculture, it undertakes input purchase following an public sale process. Ultimately, it distributes the purchased input to the respective primary cooperatives and district of agriculture again to distribute to farmers. One expert from Kessem cooperative union explained that the union supplied fertilizer, chemicals and improved seeds.

Retailers

Retailer involvement in the chain includes buying of white haricot bean transport to retail place and displaying and selling to consumers. Retailers are actors in haricot bean value chain in Berehet Woreda. They are the last link between producers, urban retailer and consumers. They mostly buy from producers and sell to urban retailers, local and urban consumers. Consumers usually buy the product from retailers as they offer according to requirement and purchasing power of the buyers. Retailers can be divided in to urban and rural in white haricot bean in Berehet Woreda because of the reason that white haricot bean is not sold in large amount as consumer level. Rural retailers are based in village market and mainly purchase haricot bean from farmers, and sell to consumers and urban retailers. Urban retailers purchase from framers and rural retailers in village market and sale to urban consumers.

Exporters

It was the final destination in both white haricot bean value chain map and white haricot bean marketing channel. Exporters were the major operator in the white haricot bean marketing.

Input Suppliers

At this stage of the value chain, there are many actors who are involved directly or indirectly in agricultural input supply in the study area (Appendix 6). Currently, district of agriculture and

primary cooperatives are the main source of input supply. To some extent private input suppliers, dry haricot bean growing farmers, and Awash Melkasa research center have also participated in such activity. All such actors are responsible to supply agricultural inputs; improved seed varieties, fertilizer and pesticides which are essential inputs at the production stage.

District Office of Agriculture (DoAR)

District of agriculture and rural development delivered inputs like chemical fertilizer, pesticide and farm implements. District of agriculture is the only actor responsible for the supply of such inputs in areas where there is no primary cooperatives. According to district cooperative promotion main process experts, out of the total 9 Kebeles of the district, only 6 kebeles have primary cooperatives. Besides, it also plays a role in provision of improved varieties through purchasing either form research centers (MARC), farmers' cooperatives who are working in dry white haricot bean growing areas of the study area and individual dry white haricot bean producer farmers. It distributed the purchased seed directly to farmers or primary cooperatives on a cash base by adding a transport cost.

Development agents are the main players in input supply activities at grass root level. Their role is different depending up on the presence or absence of primary cooperatives. In areas where there are primary cooperatives, they are playing facilitation role in collecting farmers input requirement, demand and submitting it to the primary cooperative in their respective kebeles and DoAR. They also play the same role during input distribution. Whereas, in areas where there are primary cooperatives, besides collection of input demand, they are also fully responsible to distribute the input supplied and collect the money with the support of kebeles administration.

Private Input Suppliers

Private input suppliers are also playing a limited role in the supply of agricultural inputs particularly of pesticides, fertilizer and improved seed. These suppliers are situated both at local and urban centers. Hence, those suppliers provide them timely supply of inputs on a cash base without moving longer distance at the required quantity.

Melkasa Agricultural Research Center (MARC)

Even though MARC has mandate to supply input, it was involved in such activity particularly of supply of improved seeds either directly to farmers (for demonstration) or to district of agriculture to distribute among farmers in potential dry haricot bean growing areas of the District. District of agriculture also scale up the production of dry white haricot bean in appropriate area. Accordingly, during 2014/15 cropping season more than 60 quintal of improved dry haricot bean namely; Awash-1 and Mexican-142 are used.

Supporting Actors

Such actors are those who provide supportive services including training and advisory service, Information service, financial and research services. According to Martin *et al.* (2007), access to information or knowledge, technology and finance determines the state of success of value chain actors. District of agriculture, primary cooperatives, Melkasa agricultural research center and Amahara credit and saving institute are the main actors who play a central role in the provision of such services.

Advisory Service

DAs, DoAR and NGOs were the main source of dry haricot bean information decimators'. The survey result revealed that 96% of sample respondents was get in white haricot bean advisory services that was organized in production seasons. As shown in (Table 4) 0.7, 3.8, 1.5, 89.4 and 4.5% got advising from by (DAs), Neighbors and friends, DAS and NGOS, DAS and Woreda experts and All DAS, NGOS and friends. Here, key informant DAs and SMSs from DoAR were also played great role in facilitation of the advising to support haricot bean producers.

Table 5. Advisory service and source of advisory service

Variables	N(=138)	Percent
Advisory Service		
Yes	132	95.7
No	6	4.3
Source of Advisory Service		
Development agents	1	0.7
Neighbors and friends	5	3.8
DAS and NGOS	2	1.5
DAS and werda experts(SMSs)	118	89.4
All DAS, NGOS and werda experts	6	4.55

Source: computed from own survey, 2014

Sample of respondents also identifies the way how they have got the service. Minority of respondents mentioned farm-to- farm visit by DAs, experience sharing, training Woreda experts and NGOS and majority of respondents mentioned from the total sample 132 respondents that get 87.12% from all (farm to farm visit, experience sharing and training) mechanism of advisory service provision. See detail description in the (table 5)**.**

Table 6. Advisory and technical information dissemination method

Mechanism of advisory service provision	N= (132)	Percent
Farm to farm visit by the development agent	3	2.27
Experience sharing	7	5.3
Training	7	5.3
All(Farm to farm visit and training)	115	87.12

Source: computed from own survey, 2014

Financial Services

In the study area, primary cooperatives, Relatives (friends and families) and Amahara credit and saving institute (ACSI) have been identified a source of credit both in kind or on a cash base. The survey result showed that only 75.4 % took credit but the rest did not take credit. Some of the respondents' reasons for not participating in credit market were religious which is related to taking or giving interest. Sources of credit for traders are also the same as producers except some big traders get credit from banks.

Table 7. Credit availability, source and purpose of credit used by sample of respondents

Variables	Total	
	N=(138)	Percent
Did you get Credit before?		
Yes	106	75.4
No	34	24.6
Credit Source?		
Cooperative	18	16.98
Amahara credit and saving institute	23	21.7
Relatives(friends, families)	65	61.3
Credit Purpose		
purchase of fertilizer and seed	10	9.4
payment of hired labor	8	7.5
purchase of transport animals and oxen	88	83

From own survey, 2014

With regard to credit source out of 106 sampled farmers who took credit, 21.7% of the farmer gets credit from Amahara credit and saving institute (ACSI), 16.98% get credit from service cooperatives, 61.3% relatives (families) and friends. From a sample of 106 credit users, about 83 % used the obtained credit to pay for purchase of transport animals and oxen 7.5% payment of hired labor and 9.4% purchase of fertilizer and seed respectively.

4.2. Marketing Performance and Channel of White haricot bean.

4.2.1. White haricot bean Marketing Channel

A marketing channel is a business structure of interdependent organizations that reach from the point of product origin to the consumer with the purpose of moving products to their final consumption destination (Kotler and Armstrong, 2003). The analysis of marketing channels is intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to the final end market. Since the channels to dry white round haricot bean was the analysis was done majorly produced haricot bean in the study area.

Eight main alternative channels were identified for dry white haricot bean marketing. It was estimated that 8650 qt. of dry white haricot bean were produced production season of 2014/15 in Berehet Woreda. From the total quantity 5880 qt. of dry white haricot bean are supplied by sample respondents marketed in Metehbila, Nazareth, Akeremt and Mentamer in 2014/15. The main marketing channels identified from the point of production until the product reaches the final consumer and exporter through different intermediaries were depicted in Figure (2).

As can be understood from figure (2) the main receivers from producers were suppliers, rural retailers and primary cooperatives with an estimated percentage share of 52%, 20% and 11.2%, respectively. On top of this, channel comparison was made based on volume that passed through each channel. Accordingly, the channel of producer – suppliers– ECX market–exporter carry on the largest followed by producer– cooperatives–ECX market–exporter and producer – rural retailers – urban retailer – consumer that carry a volume of 3562Qt, 1176Qt and 663Qt in that order.

1. Input supplier ⟶ Producer ⟶ Consumer
2. Producer ⟶ Local Collectors ⟶ urban retailer ⟶ consumer
3. Producer ⟶ Rural retailer ⟶ urban retailer ⟶ Consumer
4. Producer ⟶ Rural retailer ⟶ Consumer
5. Producer ⟶ Urban retailer ⟶ Consumer
6. Producer ⟶ Primary cooperative ⟶ Union ⟶ ECX ⟶ Exporter
7. producer ⟶ Local Collectors ⟶ wholesaler ⟶ ECX market ⟶ Exporter
8. Producer ⟶ wholesaler agent ⟶ ECX ⟶ Exporter

Figure 2. Dry white haricot bean marketing channel
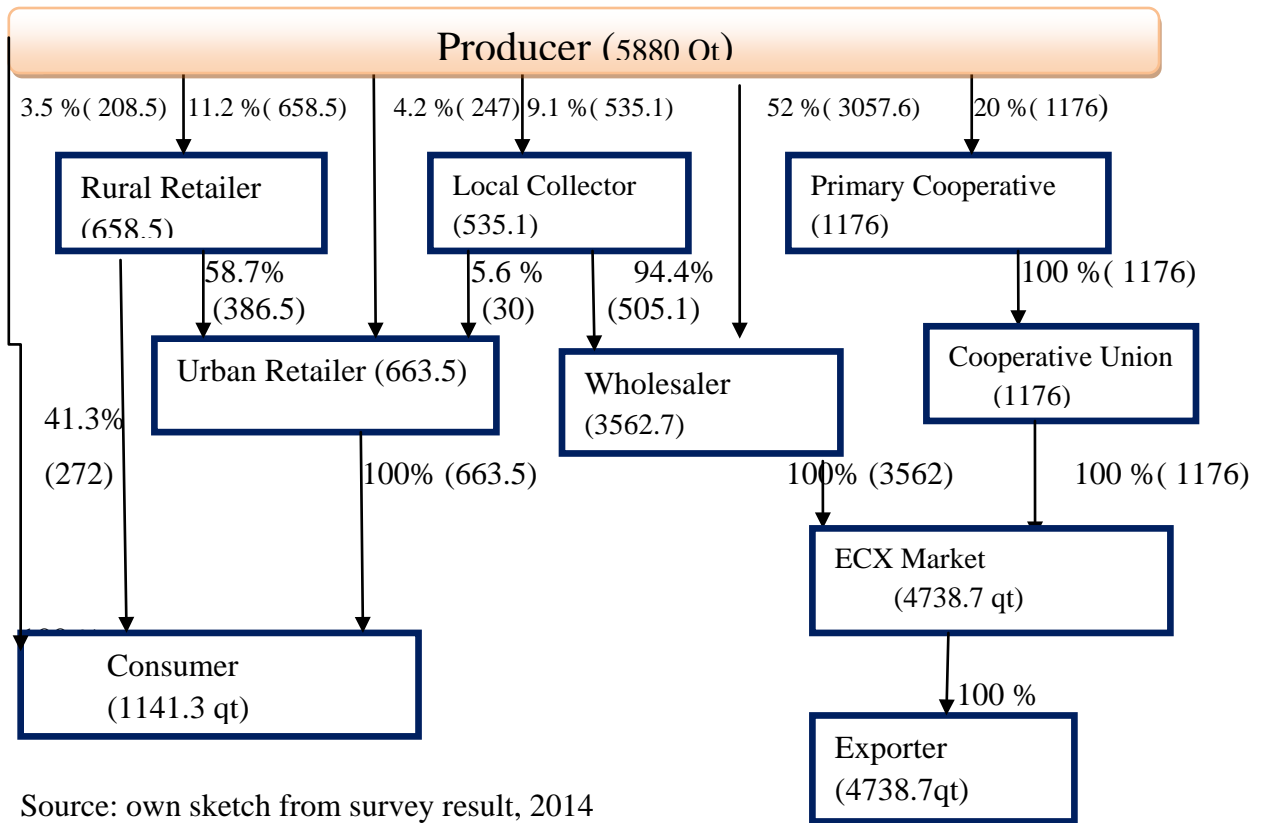
Source: own sketch from survey result, 2014

4.2.2. White Haricot Bean Market Performance

Table (9) indicates different types of marketing cost related to the transaction of white haricot bean by collectors, wholesale agent, rural retailers, urban retailers, cooperative and ECX market and the benefit share of each marketing actors. As Mendoza (1995) argued, when there are several participants in the marketing channel, the margin is calculated by finding the price variations at different segments and then comparing them with the final price to the consumers and exporters. The consumer price and exporter price are the base or the denominator for all marketing margins. The marketing margins of different channels were computed based on the formulas.

Table 8. Marketing profits of agents in white haricot bean marketing channels

Marketing Actor		Marketing channels(ETB/QT)							
		1	2	3	4	5	6	7	8
Input supplier	Purchasing price	900							
	Marketing cost	70							
	Selling price	1000							
	Marketing profit	30							
Producer	Purchasing price	1000							
	Production cost	89							
	Selling price	1300							
	Marketing profit	211							
Local collector	Purchase price		1300					1300	
	Marketing cost		69					69	
	Selling price		1400					1450	
	Marketing profit		31					81	
Rural retailer	Purchase price			1300	1300				
	Marketing cost			73	73				
	Selling price			1400	1420				
	Marketing profit			27	47				
Urban retailer	Purchase price		1400	1400		1305			
	Marketing cost		98	85		120			
	Selling price		1530	1530		1530			
	Marketing profit		32	45		105			
Wholesaler	Purchase price							1450	1450
	Marketing cost							110	120
	Selling price							1680	1680
	Marketing profit							120	110
Cooperative	Purchase price						1450		
	Marketing cost						80		

		1	2	3	4	5	6	7	8
	Selling price						1680		
	Marketing profit						150		
Exporter	Purchase price						1680	1680	1680
	Marketing cost						126	126	126
	Selling price						1970	1970	1970
	Marketing profit						164	164	164
Total marketing cost of the channel		159	167	158	73	120	206	305	246
Total marketing profit of the channel		400	230	230	120	225	520	670	520
Net marketing profit of the channel		241	63	72	47	105	314	365	274

Source: own computation from survey result, 2014

Table 9. Marketing margins for white haricot bean traders in marketing channels

Marketing Actors	Marketing channels (%)							
	1	2	3	4	5	6	7	8
TGMM	33.07	15.64	17.19	8.45	14.7	28.41	38.75	28.41
GMMSr	0.1							
GMMP	23.07							
GMMCl		7.14					10.34	
GMMRr			8.57	8.45				
GMMUr		8.5	8.49		14.7			
GMMWs							13.69	13.69
GMMCo						13.69		
GMMEx						14.72	14.72	14.72
GMMBK	66.07	84.36	82.94	91.55	85.3	71.59	61.25	71.59
NMMP	16.23							
NMMCl		2.21					5.58	
NMMRr			1.92	3.31				
NMMUr		2.09	2.94		6.86			
NMMSp							7.14	6.55
NMMCo						8.93		
NMMEx						8.32	8.32	8.32

Source: own computation from survey result, 2014

As indicated in table (8), the total gross marketing margin (TGMM) is highest in channel 7 (38.75%) followed by channel 6 and 8 that each accounts 28.41% of consumer and exporter price. From the identified marketing actors producers get high gross marketing margin that account 23.07% of consumer price. Net marketing margin (NMM) is highest for producer in channel 1 in consumer price followed by ECX marketing channel 6, 7, 8 which accounts 16.23 consumers price and 8.32 exporter price respectively.

As indicated in table (7), ECX market incur highest marketing cost (126 ETB/QT) in channel 6, 7 and 8 linking cooperative with ECX followed by wholesaler (120 ETB/QT) because ECX warehouses are insured at maximum coverage to protect against loss and damage of haricot bean deposits. While the lowest marketing cost that ends in local collector in channel (2), where transport, loading, unloading, telephone cost, sorting and other expenses are low. Local collectors and rural retailers incur low marketing cost for the reason that they purchased and sold.

Table (7) revealed that, marketing gross margin is directly related to the amount of the marketing cost in each channel. The channels with high marketing costs also have high gross marketing margins. Those with lowest costs have low margins, indicating that prices are directly related to costs incurred in the marketing channel. The lowest net marketing profit (ETB 47/QT) is observed at farm level where haricot bean was sold directly from producer to consumers only through rural retailer. While the highest profit of (ETB 365 birr/qt) is realized in channel (7) where haricot bean was sold from producer to exporter passes through ECX market. The price received by producers varies depending on the out let used and the type of the buyer. A cooperative and wholesaler pay high price to producers followed by urban retailer and rural retailer.

Table (8) shows the producer's share of the final consumers' and export price in each marketing channel. As one can see from the table, farmers capture the largest share of the consumers' price for channels ending in the rural markets, followed by urban retailer and local collector markets. For case in point, the farmers capture about 91.55% of the consumer price in channel 4 and 85.3 % in channel 5. This compares with 82.9 consumer price in channel 3 and 61.25% in channel 7 and 71.59% in channels 6 and 8 in export price.

The pattern of changes in prices within each of the identified marketing channels and the distribution of costs and margin across different market participants is also shown in table 8. High transaction cost and marketing margin are found in channels starting from rural markets and ending in Addis Ababa market where multiple actors were involved between the producers, the consumers and the exporters.

The high export price in channels (6, 7) and (8) were an attribute of the high willingness and ability to pay for the selected exporters using this channel do seem to allow these actors to capture a higher share of the channel's profit.

4.3. Econometric Model Outputs

4.3.1. Determinants of Quantity White haricot bean Supplied to the Market

Table conveys the factors that affect the amount of white haricot bean supplied to market by producers. White haricot bean are produced for market and consumption beside this most important cash crops in export market.

Before running the multiple linear regression models, all the hypothesized explanatory variables were checked for the existence of multi-co linearity and heteroscedasticity problem. The study used Variance inflation factor to investigate the degree of multi-co linearity among continuous explanatory variables and contingency coefficient among dummy variables. A statistical package known as SPSS 16 was employed to compute the VIF and CC values. The results for all VIF values were ranging between 1.01 and 2.25. Likewise, the values of CC were ranging between 0.19 and 0.45. Hence, multi-co linearity was not a serious problem both the continuous and discrete variables. For details (Appendix 1). And hence all the explanatory variables were included for the model analysis of determinants of market supply of white haricot bean. Among the overall four variables were found to be the factors which determine the volume of white haricot bean market supply by producers.

Table 10. Classical linear regression results of determinants of white haricot bean supplied to the market

Variable	Coef.	Std.Err.	T
TLOWN	0.201**	0.645	0.311
SEXH	-0.309	0.908	-0.340
AOFHH	0.002	0.044	0.045
NOFWND	0.006	1.035	0.005
CACC	-0.94	0.869	-1.081
DPAMR	-0.398**	0.701	-0.567
EXEC	-0.044	1.872	-0.023
ACMIN	0.184**	1.051	0.175
EDLHH	0.208**	0.845	0.246
AFL	-0.152	0.089	-1.707
HFEP	0.012	0.042	0.285
PAVAD	0.051	0.825	0.061
INFA	0.225	0.750	0.30

R^2=0.57, F=4.97***, N=138,   ** is statistically significant at 5% level.

Source: Own computation from survey result, 2014

Distance from the Nearest Market (DPAMR): It affects haricot bean supply to the market negatively at 5% significance level. The result shows that as the distance from the nearest market increased by one kilometer hour the quantity of white haricot been supplied to the market decreased by 0.398qts. In particular, the producers in the research areas suffer from lack of transportation facilities. Since; the distance to the market center increases transportation cost increases. This is in line with Ayelech (2011) who indicated that distance to market caused market surplus of avocado to decline in Gomma Woreda.

Education Level of the Household (EDLHH): As Abay (2008), producers who have higher education level have better attitudes towards the new production technologies, input utilization, to actively being beneficiaries of services provided to them. The education level of farmers exhibited a significant and positive effect on the market supply of haricot bean. As the education level of farmers was increased by one level the amount of white haricot bean sold

increased by 0.208 qts. It was assumed that producers with better education levels would have better understanding and information about the current market situations relative to others (unlearned). As the education level of households is improved, their attitude to adopt new technologies and to acquire market information becomes better. Hence, the education level of farmers is one of the factors which determine the market supply of white haricot bean in the district. This would help them produce more and increases their willingness to sell.

Access to Market Information (ACMIN): It affected marketed supply of haricot bean positively significantly at 5% significance level. On average white haricot bean producer gets market information, the amount of haricot been supplied to the market increase by 0.184 quintals. This suggests that access to market information reduces farmers risk aversion behavior of getting a market and decreases marketing costs of farmers that affects the volume of white bean market supply. The implication is that obtaining and verifying information helps to supply more quantity of white haricot bean in the market. This is in line with Mohammed (2011) who illustrated access to market information by farming households increase market supply of teff significantly in Halaba especial Woreda.

Total land owned (TLOWN): It affected market supply of haricot bean positively and implied that the larger land size a farmer owns the more land size was allocated for the crop at interest. Increase in size of land direct influence on market supply of white haricot bean. DNIVA (2005) found expanding the area under crop increased the market supply of the crop.

4.4. Constraints and opportunities along Haricot bean Value Chain in Berehet Woreda.

4.4.1. Constraints

This section looks at a comprehensive list of value chain constraints that were identified by various chain actors.

Production Problem

Limited access to and supply of input particularly of improved seed, fertilizer and pesticides', severe root rot attack, aschochitya blight disease, weed(grass and leaf) wild animals(tortoise and rabbit)and shortage of rain fall were identified as the main constraints of the farmers who could limit white haricot bean productions .

Limited Access to and Supply of Agricultural Inputs

The most important physical inputs for white bean production are improved seeds, fertilizers, and pesticides. Research and extension services, information and appropriate technological support are non-physical inputs are very important for higher yields.

Farmers who participated both in questionnaire respondents and focus group discussion identified limited supply of improved seeds as a major input related problem in their area. Among the total sample of respondents, 13.8 % replied limited access and supply of improved varieties seed as their production problem (table10). This caused mainly due to absence of responsible haricot bean seed multiplying and distributing agency. According to focus group discussion participant farmers an effort was made to distribute the seed via farmer-to-farmer exchange mechanism and involvement of cooperatives has revealed an encouraging result, it could not satisfy the increasing demand of farmers.

Regarding the supply of fertilizer and pesticide among the total respondents 18.1% delayed supply were also reported. For the delayed supply of input particularly of chemical fertilizer and pesticide farmers criticized DAs for their delayed input demand collection from them. On the other side, DAs explained in ability of farmers to reflect their input demand on time and prolonged input supply process chain as the main reason for the delayed delivery of inputs.

As to DAs, delayed farmers input demand request emanate from lack of farmers skill to plan what to produce and how much to produce.

According to farmers explanation during focus group discussion unable to know the rain fall pattern since the existing rain fall condition affect farmers production and input utilization, unable to know exact input delivery price during the time of input utilization. The development agent, private lenders and cooperatives were having problematic to supply input regarding delayed reflection of their input demand. In such a case, they decide to produce crop with low production cost especially they produce chick pea. Inputs have been delivered to farmers in the form of hand to hand sale (on a cash base), half pay (mostly of 20%) of credit.

Similarly, even if farmers demand were collected early the supply might also delay. This is because of prolonged chain of input supply. Key informants from Kessem cooperative union

district of agriculture experts identified many reasons as; delayed input request from DAs and primary cooperatives, need of time to compile the request from all the kebeles and to call for potential input suppliers for auction. The auction process by itself has also its own contribution for the delay of input supply. Mostly the winner does not supply the input required both in quality quantity and time.

Shortage of Rainfall

Since white haricot bean need sufficient amount of rain for flowering stage. As indicated in table (10), shortage of rain fall was mentioned by 21% of respondents. During focus group discussion farmers expressed that during the last cropping season (2014/15) the rain had stopped early and most of them did not get expected yield. However, some farmers who plant early (june15-23) with soil high water holding capacity and those who used fertilizer obtain good yield. At the same time, participants argue on the need of early maturing type of varieties to relive form the problem. Some group required to have varieties with less maturity date. On the contrary, others did not support the first group since varieties with less maturity date than the existing one will face shattering problem at normal cropping season. They presence of high sufficient rain fall during flowering stage is very crucial is as compared to shortage of rainfall.

Table 11. For farmer production problem

Production problem	Total house hold(138)	
	Number	Percent
Pest(disease, weed, insect)	57	41.3
Lack of improved seed Varity	19	13.8
Shortage of fertilizer and pesticide	25	18.1
Wild animals	4	2.9
Shortage of rain fall	29	21
Shattering of seed	4	2.9

Source: survey result, 2014

Market Problem

Almost all white haricot bean producer farmers respond that there were market problems in their area. The major white bean marketing constraints are related with non-availability of market/limited access to market, small number of market actors, low quality product (mixed of white bean to red bean verities during trashing time) that can meet consumers demand and lack of market information less awareness of possible market actors (consumers, retailers and village collectors) during the time of exchanging (table 11). Price volatility means the price was variable during the first supply month November – January (13-13.5 birr/kg) and June to July (15-17 birr/kg).

Table 12. The major marketing problem of producer

Problem of marketing?	Total Household(138)	
	Number	Percent
Lack of market	14	10.1
Price volatility	29	21.0
Lack of appropriate Storage	29	21.0
Lack of transport	23	16.7
Lack of market information	13	9.4
Lack of quality	30	21.7

Source: survey result, 2014

Complex Credit Supply and Repayment Condition

Regarding credit utilization, farmers indicated that the credit obtained is not only used for white bean production but also other crop production activities. White haricot bean production requires high cost of production. As shown in table (6), farmers used credit obtained for payment of hired labor, purchase of plough oxen, seed and fertilizer. They indicated that, their sources of credit are ACSI, friends/relatives and primary cooperatives. In order to see problems and importance of these credit institutions to farmers' situation some analysis was done by taking into consideration criteria like interest rate, collateral requirement and the availability of the required amount of credit.

ACSI is one of credit institutions found in the district. Focus group discussion participant farmers reported that ACSI's interest rate is so high and unaffordable to them. Besides, all farmers also complained on group collateral system. They explained group collateral problem as when some group members left away or failed to pay the loan, the group is forced to pay the loan made available for those group members. From table (6) out of the total 106 sample respondents who get credit, 16.98% (18) and 21.7% (23) respondents mentioned high interest rate and need of group collateral as a challenge in accessing credit from this institution. All the primary cooperatives in the sample kebeles provide credit to member farmers. However, according to district of agriculture cooperative promotion expert, the credit provision of cooperatives largely depends on their capital accumulation. They provide credit in kind as well as in cash. Limited supply of credit was the main problem in all the cooperatives.

In addition to all the above problems, farmers during focus group discussion identified other problems like; lack of awareness, piece of land allocation for white haricot bean production. Regarding seed mixture, as farmers explained that the improved seeds they obtained from farmers, farmer cooperatives as well as district of agriculture were mixture of red and white type of seed. Such a mixture reduces the quality of their production and created challenge during harvesting since, its do not have equal time of maturity. Awash 1 and awash 2 varieties of highly productive and disease resistant pure basic seed could be potential solution for such a problem.

Consumers

Haricot bean is high in starch, protein and dietary fiber and is an excellent source of minerals. Some health benefits of haricot bean are; lowers heart attack risk by the soluble fiber provided from this legume (ILRI, 2008). Though, lack of modern food processing technology and traditional feeding habit here also mentioned as the main challenge for white haricot bean consumption. During focus group discussion with farmers believed that they had developed the traditional (locally known as "Nefero") food habit for white haricot bean. In addition, the productivity very high and the market value were good enough to encourage production. However, the absence of modern processing technology hinders the production and utilization of white haricot bean by farmers as well as urban consumers.

4.4.2. Opportunities

On the other hand, availability of favorable soil type and climatic conditions, presence of high market demand and technical support from GOs and NGOs, high productivity of the crop, high profitability of the crop and need of crop diversification were some of the opportunities of the crop by most of the producers. For more detail, see table (12).

Favorable land and Climatic condition

Dry white haricot beans tolerate most environmental conditions in tropical and temperate zones; haricot beans are adapted to the low and mid altitude areas at an altitude 900-2100 masl, and optimum temperature of 24ºc and average rainfall 200-600 mm per annum (Frehiwot, 2010). Berehet is one of the potential areas that found the low land areas of Amahara region to grow white haricot beans. The survey result highlight 15.2% of respondents mentioned the availability of favorable land beans grow best in well-drained, silt loam or clay loam soils, rich in organic content.

High Productivity Potential of White Haricot bean

As indicated in table (12), high productivity potential of haricot bean was mentioned as an opportunity for 22.5% of sample respondents. During focus group discussion, farmer's compare white haricot bean productivity and high yield with inter cropping with sorghum and maize, they prefer to grow haricot bean. Farmers reported that white haricot bean has high productivity on average 18 qt/ha to sole cropping and 10 qt/ha average productivity with inter cropping of maize and sorghum. Ghimiray *et al. (*2007) confirms that higher yield potential is considered as an important factor particularly for farmers' because it provides food security at household level and also surplus production can be sold to generate cash for other expenditure.

Table 13. Opportunities to produce white haricot bean in district

Opportunities	Total Household (138)	
	Number	Percent
Favorable environmental condition	21	15.2
Presence of good market demand	34	24.6
Need of crop diversification	32	23.2
High productivity of the crop	31	22.5
High profitability of the crop	20	14.5

Source: survey result, 2014

Increased Institutional Support

The existence of various governmental, nongovernmental and community based organizations, who are involved in the white haricot bean sector development in the area, is an opportunity for improvement. The availability of DAs at each Peasant Association (PA) and possibility of promoting white haricot bean technologies through FTCs' is a good opportunity. Furthermore, existence of primary cooperatives at the grass-root level is another opportunity in provision of input, credit and market information.

Table 14. Strengths, weaknesses, opportunities and threats (SWOT) white haricot bean value chain in the district.

Strengths	**Weaknesses**
• Large number of farmers involved in Cultivation • some initiations use of improved white bean seed, knowledge and information among farmers • Technical training to farmers	• Lack of knowledge of cultivation and handling • Poor market access • Small number of market actors • Low quality product(mixed verities undesired shapes) • Poor quality of input supply • Poor and inefficient supply chain(logistic) • Lack of skilled people for the subsector

	• Limited access to and supply of input particularly of improved seed and pesticides
	• High labor demand for crop management(weeding, harvesting and threshing)
	• Absence of adequate amount of capital for run to supply input required
	• Extended or prolonged input supply process
	• Lack of agronomic practice(weeding is not equally operated as compared to other crops)
Opportunities • Favorable land and climatic condition • High productivity potential of white haricot bean • Increased institutional support from governmental, nongovernmental and community based org-anization • Placement of DAs at the Kebeles level to provide • Have early maturity period • Have maintaining of soil fertility • The presence of primary cooperatives among farmers member helps farmer easily sell haricot bean product for their union.	**Threats** • Shortage of rain fall • Severe root rot attack and disease problem

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

This study was initiated to understand value chain of white haricot bean in Berehet Woreda's of Amahara regional state. With the objectives of analyzing dry white haricot bean value chain, to analyze the marketing performance, analyzing the determinants of haricot beans supply to the market and identify major constraints and opportunities along haricot bean value chain. The totals of 9 white haricot bean producing kebeles in the district, out of which 3 of them were selected. Primary data were collected from sampled stakeholders and semi-structured questionnaire were used to collect data from farmers. Household survey, focus group discussion and personal observation methods were employed to gather the information required. The primary data for this study were collected from 138 households from study area and 30 traders from Metehibla, Akeremt, Mentamer and Nazareth markets.

The collected data were analyzed by descriptive statistics and with the aid of an econometric model using SPSS software. The econometric model employed to analyze the collected data was the multiple linear regression model. The findings of this study are summarized as follows. Multiple linear regression model result indicated that distance from the near market center, access to market information, education level of household and haricot bean land were found to significantly affect the quantity of white bean supply to market.

White haricot bean value chain analysis of the study areas discovered that the main value chain actors are input suppliers, haricot bean producing farmers, seed suppliers, rural retailers, local collectors, wholesale agent, exporters and consumers. Wholesale agent purchase white haricot bean from farmers and local collectors and sell to exporters. Urban retailers purchase white haricot bean from producers, local collectors and rural retailers and sell to consumers. Value chain supporters or enablers provide facilitation tasks like creating awareness, facilitating joint strategy building and action and the coordination of support. The main supporters of the white haricot bean value chain in the study areas are office of agricultural and rural development

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(OoAR), Office of trade and industry (OoTI), Amahara saving and credit institution and Melkasa research center have been delivered to information and credit suppliers.

As one can see from identified marketing channels, different actors were participating in white haricot bean marketing. From the indentified marketing channels the main receivers from producers were consumers' rural retailers', local collectors, primary cooperatives, urban retailers and wholesale agents with an estimated percentage share of 3.5 %, 11.2%, 9.1%, 20%, 4.2% and 52 %, respectively. The lowest net margin (ETB 47 birr/qt) is observed at farm level where haricot bean was sold directly from producer to consumers' only rural retailer. While the highest profit of ETB 365 birr/qt is realized in channel 7 that are exporters.

The major constraint in white haricot bean value chain are lack of modern food processing technology and traditional feeding habit here also mentioned as the main challenge of white haricot bean consumption. This in turn leads to low consumer demand, decreased farmers' income and ultimately discourages farmers to produce more. Sever insects attack, disease, weeds, lack of improved seed variety, wild animals, shortage of rain fall, shattering of seed and delayed supply of inputs specifically pesticides and fertilizer were also main challenges faced in the study area. On the other hand, availability of favorable soil type and climatic conditions, presence of high market demand and technical support from GOs and NGOs, high productivity of the crop, high profitability of the crop and need of crop diversification were some of the opportunities of the producers.

5.2. Conclusion and Recommendations

The result of multiple linear regression model analysis pointed out that dry white haricot bean marketing supply was positively influenced by formal education level of the household. This result verifies that education develops the willingness of the producer household to allow new technology and information which in turn widens their readiness to produce more and raises the volume of white haricot bean market supply. Besides, there is no comfortable road transport that is great importance for marketing white haricot bean in the nearest market. In particular, the producers in the research areas suffer from lack of transportation facilities. Since; the distance from production area to the market center is very far.

The value chain analysis revealed that the major actors in the Woreda were consumers' rural retailers', local collectors, primary cooperatives, urban retailers and wholesale agents. Accordingly, the value chain activities in the survey period were input supply, production, marketing, export and consumption. It is also found out that white haricot bean passes through several intermediaries with little value being added before reaching the end users. The lowest net margin is observed at farm level where haricot bean was sold directly from producer to consumers only through local collector and urban retailer. While, the highest profit is realized in wholesale agent and exporter. So, the chain is governed by wholesale agent and exporters who have capital advantage over the other chain actors

Based on the above conclusion and the study results the following recommendations could be forwarded:

✓ The District agricultural Office and other institutions should give practical supported adult training and educating on white haricot bean production and marketing.
✓ Multiple linear regression model result white bean supply to the market is positively and significantly affected by access to market information. Therefore, strengthening the supportive activities such as information centers and extension contact would also boost white haricot bean supply to the market.
✓ The multiple linear regression model result market supply is significantly and negatively affected by distance to nearest market. Therefore, improving road infrastructure help to increases white haricot bean supply to the market.

Marketing

1. Standardization of weighing scale in a participatory manner is needed through legal framework that defines standard measurements and mechanisms of protecting the uneducated farmers from being exploited. Build the capacity of the producers to claim their right. Moreover, providing weighing facility for the cooperatives contributes to realization of claiming the right. Awareness rising for traders and brokers on this is necessary.
2. Middleman operates without license. As they do well in linking buyers and sellers, they also distort prices to make hidden margin from the deal. It is suggested to advocate for

licensing the functions of Middleman where they will be accountable for their actions. Building their capacity on how cooperation in value chain development is beneficiary and their role.

3. Organize and capacitate producers to enhance their negotiation power and skill.
4. Create value chain forum at woreda level where the different value chain actors come together and discuss the problems of white haricot bean value chain and solve them.

Consumption

1. The demand for the product in the total consumption bundle of rural and urban consumers is small which means that the product fetches low price. The low consumption attributes to lack of knowledge to prepare different recipe, dishes, and products from white haricot bean by most consumers in Ethiopia. Therefore, promotion of white haricot bean utilization through demonstration different ways of utilizing white haricot for food can induce higher demand their by motivating the producers to produce more.
2. At a household level, it is good to emulate the experience of Nifero in Ethiopia to create awareness on nutrition value of white haricot bean and different ways of processing white haricot bean to make it part of household diet.
3. At an industry level, nearly no one is processing white haricot bean. Protein could be produced from white haricot bean though there is a need for economic feasibility of the business. As the production of white haricot bean booms, it will be necessary to bring on board the potential industries such as protein extractors and food complex industries.
✓ All the problems faced by white haricot bean value chain, but cannot be addressed by a single study, various actors: including research, extension service, input suppliers and credit agencies need to be collaborating in search of appropriate solutions and implement them. Strengthening the linkage along value chain actors; there is a need to change the outlook of actors, i.e. developing a wide set of attitudes and practices. In particular, positive attitudes toward partnership, interaction, networking and learning need to transfer among main actors in the value chain. In line with changed attitude and practices of actors, there should also be partnership that holds all actors together to interact.

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7. APPENDIX'S

Appendix 1.Variance inflation factor for continuous variables

Variables	Tolerance	VIF
AOFHH	0.44	2.25
NOFWNP	0.87	1.01
DPAMR	0.82	1.21
EDLHH	0.78	1.29
AFL	0.47	2.19
HFEP	0.83	1.21

Appendix 2. Strengths, Weaknesses, Opportunities and Threats of some actors (SWOT).

Strengths	Weaknesses
- Large number of farmers involved in Cultivation - some initiations use of improved white bean seed, knowledge and information among farmers - Technical training to farmers	- Lack of knowledge of cultivation and handling - Poor market access - Small number of market actors - Low quality product(mixed verities undesired shapes) - Poor quality of input supply - Poor and inefficient supply chain - Lack of skilled people for the subsector - Limited access to and supply of input particularly of improved seed and pesticides - High labor demand for crop management (weeding, harvesting and threshing)

	• Absence of adequate amount of capital for run to supply input required
	• Extended or prolonged input supply process
	• Lack of agronomic practice(weeding is not equally operated as compared to other crops)
Opportunities • Favorable land and climatic condition • High productivity potential of white haricot bean • Increased institutional support from governmental, nongovernmental and community based organization • Placement of DAs at the Kebeles level to provide • Have early maturity period • Have maintaining of soil fertility • The presence of primary cooperatives among farmers member helps farmer easily sell haricot bean product for their union.	**Threats** • Shortage of rain fall • Severe root rot attack and disease problem

Appendix 3. Demographic and socioeconomic characteristics of samples (categorical variables)

Variables	Items	N	%	χ^2-test
Sex	Male	103	74.6	33.5***
	Female	35	25.4	
Education level	Able to read and write	84	60.9	6.5*
	Illiterate	54	39.1	
Marital status	Married	126	91.3	
	Unmarried	9	6.5	
	Divorced	3	2.2	
Nonfarm income	Yes	53	38.4	7.4***
	No	85	61.6	

Appendix 4. Demographic and socioeconomic characteristics of samples (continuous variables)

	Mean	Standard deviation	t-test
Age	44.8	8.9	51.39***
Family size	2	0.72	1.7**
Farming experience	1.2	1.01	2.9**

Appendix 5. Nature of variables analyzed by CL linear regression model.

Variables	Label	Variable type	Unit of measurement
SEXH	Sex of the house hold	Dummy	Female=0, Male=1
AOFHH	Age of the house hold	Continuous	Years
NOFWND	Number of oxen owned	Continuous	Number
CACC	Credit access	Dummy	Yes=1, No=0
DPAMR	Distance from production area to market	Continuous	Km
EXEC	Extension contact	Dummy	Yes=1, No=0
ACMIN	Access to market information	Dummy	Yes=1, No=0

EDLHH	Education level of hose hold	Categorical	Level as 0, 1,2, 3…
AFL	Active family labor size	Continuous	Man equivalent
HFEP	Experience	Continuous	Years
VAD	Value additions	Dummy	Yes=1, No=0
IOFA	Income from none farm activity	continues	Numbers in birr

Appendix 6. **Actors and their role in the white haricot bean value chain in Berehet**

Stage of the value chain	Actors	Role/ function played by the actor
Input supply	Private input suppliers	Input supply (pesticides)
	Primary cooperatives	Input supply (fertilizer, chemicals and improved seeds)
	Das	Facilitation of input supply
	DoARD	Input supply
	Farmers	Input supply (farmer-to-farmer)seed exchange
Production	Farmers	Ploughing, planting, fertilization, weeding, pest/disease controlling, harvesting and post handling of dry white haricot bean.
Marketing	Farmers	Selling white bean to consumers (other farmers), rural retailer, wholesale agents and cooperatives nearby DoARD
	Local collectors	Collect dry white haricot bean from farmers in village markets and from farms for the purpose of reselling it to suppliers and urban retailers.
	Primary Cooperatives	purchasing from the primary market from member and non member farmers and can supply directly to their cooperative unions further more they can supply to the ECX market

	wholesaler	Purchasing from the primary market and can only supply to the ECX market.
	Retailers	Buying of white haricot bean transport to retail place and displaying and selling to consumers.
Consumption	Farmers	Consumption of white bean produce
Supportive actors	Cooperatives	Provision of credit for farmers
	DAs	Training of farmers Delivery of advisory service to farmers Preparation of farmers field days
	DoARD	Provision of advisory service Provision of training to DAs and farmers Field supervision Facilitation and provision of technical support to
	Keble Administration	Community mobilization and awareness creation
	Melkasa Agricultural Research Center (MARC)	Supply of improved seeds either directly to farmers (for demonstration and on-farm seed multiplication)

Appendix 7. Questionnaires Survey

I. Producers' Questionnaire

Remark: The personal profile obtained from respondents with regard to the theme will be kept and will not have any consequence on the respondent in any ways. Please give correct answers to the following questions**.**

Instructions to Enumerators

I. Make brief introduction before starting any question, introduce yourself to the farmers, greet them in local ways and make clear the objective of the study.

II. Fill the interview schedule according to the farmers reply (do not put your own feeling).

III. Ask each question clearly and patiently until the farmer gets your points.

IV. Please do not use technical terms and do not forget local units.

V. During the process write answers on the space provided.

Objectives of the study

1. Identify actors along the dry white haricot bean value chain,
2. To analysis the performance of dry white haricot marketing channels,
3. To analysis the determinants of hair coat beans supply to the market in the study areas;
4. To identify major constraints and opportunities of haricot bean production and value chain along the actors.

Demographics

1. General Information

1. Name of Respondent: _____

2. Zone: Woreda: Kebele: _____ Village: _____

3. Age of the respondent: [   ] years

4. Sex of the respondent (√): 1. [   ] Male   2. [   ] Female

5. Education level of the respondent (√): 1. [   ] No formal education   2. [   ] 6th grade or less

    3. [   ] 7th to 12th grade   4. [   ] Certificate 5. [   ] Diploma   6. [   ] Degree

6. Marital status (√): 1. [ ] Married 2. [ ] Unmarried 3. [ ] Divorce 4. [ ] Widowed

7. Distance of your residence from the nearest market center: [_____] hrs walks

8. Distance of your residence to the nearest development center: [_____] hrs walks.

9. Distance to all weather road: [ ] OR [   ] hrs walk

10. What is your major means of income generation? (Rank in order of importance) 1. [ ] Khat 2. [ ] Coffee production 3. [ ] vegetables production 4. [ ] Fruit production 5. [ ] Grain production 6. Pulses production 7. [ ] Grain trading 8. [ ] Vegetables trading 9. [ ] Fruits trading 10. [ ] Pulses trading 11. [ ] Khat trading 12. [ ] Coffee trading 13. [ ] Livestock production 14. [ ] Livestock trading 15. [ ] Other (specify)

11. How long have you practiced production of haricot bean products? _____ Years

12. Are you a member of any cooperative? (√) 1. [ ] Yes   2. [   ] No

13. If your answer for **Q.12** is yes, what is the name of the cooperative _____?

Household and Resource data

1. Family size: [ ] Male   [ ] Female   [ ] Total

2. Number of working persons (14-64 ages): [ ] Male [ ] Female [ ] Total

3. Number of children in school: [ ] Male [ ] Female [] Total

4. Number of dependents (< 14 and >64 ages): [ ] Male [ ] Female [ ] Total

5. Do you own arable land? (√) 1. [ ] Yes 2. [ ] No

6. Total crop land: _____timad _____ ha. (***Note: 1 ha = 4timad or 1 timad = 0.25 ha***)

7. What is the size of land used twice in a year? _____ Timed_____ ha.

8. Do you have livestock? (√) 1. [ ] Yes 2. [ ] No

9. If your answer for **Q.10** is Yes, livestock Number: Oxen/bulls [ ], Cows/heifers [ ],

 Calves [ ], Goats [ ], Sheep [ ], Donkeys [ ], Horses [ ], Camels [ ], Mules [ ], Chickens [ ], Bee hives [ ], others

10. Do you have your own transportation facilities? (√) 1. [ ] Yes 2. [ ] No

11. If your answer for **Q. 12** is yes, what type? (√) 1. [ ] Vehicle 2. [ ] Transport animals

3. [ ] Cart

Production

1. Production of pulse crop (dry white haricot bean) and food grains in 2014.

No	Type of Crop	Area in timad	Quantity produced (qt)	Quantity consumed (qt)	For seed (qt)	Quantity sold (qt)	Average selling price/(qt)	Quantity purchased in 2014/qt
1	Red haricot bean							
2	White haricot bean							

2. What was your input for pulse (haricot bean) production & their sources in 2014?

Inputs used for	DAP		Urea		Compost (amount in local unit)	Bio fertilizer(amount in packet)	Pesticide (Lt/kg) Specify
	Kg	source	kg	source			
Haricot bean							
chick pea							

3. Trend of production and cropping pattern during the past 5 years? (Tick √)

Crop	Trend of production			If increasing, why?	If decreasing, why?
	Increasing	Decreasing	Same		
white Haricot bean					

4. Is supply of labor a problem during production? 1.___ Yes   2.__ No

5. What is the labor source of Dry white haricot bean?

     Family labor   3.Labor exchange

      Hired labor   4.Cooperation

6. What type of haricot bean production system do you adopt? 1. [ ] Sole cropping 2. [ ] Inter crops with perennial crops   3. [ ] inter crops with cereal crops   4. [ ] Others_____

7. The source of oxen power (√): 1. [ ] Own 2. [ ] Rent 3. [ ] Other

(specify):_____

8. Oxen power requirement in hours and cost incurred if rented.

Enterprise	Hours	Rate of payment if rented (Birr/day)
Dry white haricot bean		
Chick pea		
Other specify		

9. What are the constraints of production? Rank horizontally*

Crop	Insects	Disease	Weeds	Lack of Improved seed	Shortage Fertilizer	Wild animals	Shattering of seed
white bean							
Soybean							

Input Supply

1. Have you ever used agricultural inputs (fertilizer, chemicals, improved seeds etc.) for the production of dry white haricot beans? (√) 1. [ ] Yes 2. [ ] No

2. If your answer for **Q.1** is No, what was the main reason behind? _____

3. If your answer for **Q.1** is yes, which type and from which source did you get such agricultural inputs in the Haricot bean production process? (*Multiple responses are expected)

Crop type	*Types of inputs used	1. Improved seed 2. Fertilizers 3. Pesticides/herbicides 4. Farm implements 5. Others (specify)	*Sources	1. OoARD 2. Local market (known sources) 3. Cooperatives 4. NGOs (specify) 5. Research centers
Haricot				
Chickpe				
Lentil				

4. Why did you prefer the chosen sources to get the needed inputs? _____

5. How did you get the input from the mentioned sources? (*Multiple responses is possible)

No.	Types of inputs	*How (write the code)	1. Through purchase
	Improved seed		2. On credit bases
	Fertilizer		3. As gift
	Pesticides/herbi cides		4. Through exchange 5. Others (specify)
	implements		

6. Do you always get inputs at the right time? (√) 1. [ ] Yes 2. [ ] No

7. If your answer for **Q.6** is No, what are the reasons? (√) 1. [ ] Unavailability

     2. [ ] Far distance 3. [ ] Others (specify)

8. Do you always get inputs in the quantities that you need? (√) 1. [ ] Yes 2. [ ] No

9. If your answer for **Q.8** is No, why? (√) (Multiple responses is possible) 1. [ ] Not available

    2. [ ] I am not sure of the benefit 3. [ ] Too expensive 4. [ ] Not available on time

     5. [ ] Cash   shortage 6. [ ] Others (Specify) _____

10. Have you encountered problems in accessing these inputs? (√) 1. [ ] Yes 2. [ ] No

11. If your answer for **Q.10** is yes, what are the problems? (*Multiple responses are possible)

No	Types of inputs used	*Problems (write codes)	
1.	Improved seed		1. Unavailability
2	Fertilizer		2. Shortage of supply
3	Pesticides/herbicides		3. Costly
4	Farm implements		4. Remoteness of input
5	Others (specify)		selling site

12. How did you solve these problems? _____

Access to Credit

1. Did you borrow money for haricot bean production before? (√) 1. [ ] Yes 2. [ ] No

2. If your answer for **Q.1** is Yes, from where and for what purpose did you collect the credit? (*Multiple responses are possible)

No.	Source	*Purpose (write codes)	
1.	Micro finance		1. Payment for hired labor. 2. Purchase of fertilizer and seed.
2.	Cooperatives/unions		3. Purchase of farm implements. 4. Payment for rented oxen.
3.	NGOs (specify		5. Purchase of transport animals.
4.	Bank (specify)		6. To rent in land to extend haricot
5.	Trader		bean production.
6.	Relatives		7. Others (specify)
7.	Iqub/Iddir		
8.	Others (specify)		

3. If your answer for **Q.1** is yes, have you paid the loan? (√) 1. [ ] Yes 2. [ ] No

4. If your answer for **Q.3** is No, what is the reason? _____

5. Did you face any problem in accessing credit? (√)   1. [ ] Yes   2. [ ] No

6. If your answer for **Q.5** is yes, what was the problem? (√) (Multiple responses is possible)

    1. [ ] Limited supply of credit   2. [ ] Limited access to transport

    3. [ ] Huge bureaucracy   4. [ ] Others (specify) _____

7. How did you solve these problems? _____

Advisory service

1. Did you get advisory service on haricot bean production practices before? (√) 1. [ ] Yes 2. [ ] No

2. If your answer for Q.1 is No, why? (√) (Multiple responses is possible) 1. [ ] No service provider nearby 2. [ ] Possessed the required information   3. [ ] Availability of contact farmers 4. [ ] Do not have time to get the service   5. [ ] Others   (specify)

3. If your answer for **Q.1** is yes, for how long do you get the service? _____years

4. Who provides the advisory service? (√) (Multiple responses is possible)

  1. [ ] Development agents   2. [ ] NGOs (specify) _____

  3. [ ] Research centers (specify)   4. [ ] Woreda OoARD experts

  5. [ ] Neighbors and friends   6. [ ] Others (specify)

5. How do you get the advisory service? (√) (Multiple responses is possible)

1. [ ] Farm to farm visit by the development agent.2. [ ] experience sharing tour

3. [ ] Visit to demonstration/ model farmers' site   4. [ ] Training

5. [ ] Others (specify) _____

6. How frequent were you visited by development agents last year? (√)

        1. [ ] Once per month   2. [ ] Twice per month

        3. [ ] Three times per month   4. [ ] Four times per month

        5. [ ] Others, specify _____

Marketing Aspect

1. Amount of dry white haricot bean supplied to the market and market agents in 2014?

Crop	Place to sell 1=Farm gate 2=Local Market 3=Town	Distance to market (km)	Means of Transport 1= On donkey 2= Vehicle 3=On foot (Being carried)	To whom do you Sell? 1.Wholesaler 2.Consumer 3.Exporter 4.Brokers 5.Local collector	Terms of sell 1=cash 2=credit 3=advance Payment
Haricot bean					

2. How do you get market price information of dry white haricot bean? _____

3. Did you know the market prices before you sold your haricot bean in 2014? 1=Yes 0=No

4. Did you know the nearby market price before you sold your haricot bean? 1=Yes 0=No

 5. Did you know Nazareth market price before you sold your haricot bean? 1=Yes 0=No 1

6. What is the trend of price for the last 3 years?

Crop	Trend of price (Tick √)			If increasing, why?	If decreasing, why?
	Increasing	Decreasing	The Same		
Haricot bean					
Chick pea					

7. Does your produce have preferred quality by buyers in 2014? 1= Yes 0=No

8. If no, what interventions are needed to attract better price 2014? _____

9. What are the problems of marketing in 2014? Rank horizontally*

Crop	Lack of market	Low price	Storage	Lack of transport	Lack of market information	Agent hinder fair sales	Tax	Others (specify)
Haricot bean								

10. What determines to sell the products to your customers?

   1. Price   3. Fair Scaling

    2. Proximity   4. Others _____

11. Do you negotiate on price in 2014?   1= Yes   0= No

12. How did you sale your produce in 2014? _____

   1. Direct to the purchaser   3. Through commission man to the purchaser

   2. Through broker   4. Others (specify) _____

13. What was /were problem/s created by brokers in 2014 on haricot bean? _____

    1. Took to limited client   3. Charged high brokerage fee

    2. Cheating on scaling (weighing)   4. Wrong price (market) information

14. On average how long did it take you to sale your haricot bean? _____

    1. on the farm -------------------hrs/_____ days.

    2. Village market ---------------- hrs/ _____days.

    3. Metehbila market ----------------- hrs/ _____days

    4. Nazareth market ------------------ hrs/_____ days

15. Did you face difficulty in finding buyers when you wanted to sell haricot bean?

    1= yes   0= No

16. If yes, in Q 15.is it due to: _____

    1. Inaccessibility of market?   3. Lack of information?

17. What do you do if you didn't get the expected price for your haricot bean supply?

    1. Took back home   3. Sold at lower price

    2. Took to another market on the same day   4. Sold on other market day

18. Who sets your selling price for haricot beans in 2014? _____

    1. Yourself   3. Set by demand and supply

    2. Buyers   4. Negotiations   5. Others (specify) _____

19. When did you get the money after you sell to local collectors in credit?

    1. As soon as I sold   3. On other- days

    2. After some hours   4. Others (specify)_____

20. When did you get the money after you sell to retailers in credit?

    1. As soon as I sold   3. On other days

    2. After some hours   4. Others (specify) -----------

21. When did you get the money after you sell to wholesalers in credit?

1. As soon as I sold   3. On other- days

    2. After some hours   4. Others (specify) -----------

22. What is the average cost incurred to harvest haricot bean crop? _____ Birr/day/Hectares.

23. What are the average costs incurred for transporting and handling 1 qt of haricot bean to the nearby market _____birr?

24. Indicate if there is any loss while transporting 1 qt of haricot bean from production area to the nearby market _____ k.gs.

25. Specify if there are any other costs incurred _____birr.

 End of the Questionnaire

Thank you very much for responding to the questions.

Name of the Enumerator: _____ Date of Interview: _____

II. **Traders' Questionnaire**

I. Socio-demographics

1. Name of trader_____Sex_____Age_____Years.

2. Educational level _____

2. Marital status of trader? 1. Single 2.Married 3.Divorced 4. Widows

3. Total family size_____

II. Area information

5. Woreda _____Name of Market_____1.Mentamr market   2.Metehbla market

3. Akeremt market 4. Nazareth market

6. Distance from residence to the market _____ Km /walking time in minutes

The possible answers might be more than one

7. Main occupation

   1. Wholesaler   3. Collector   4. Farmer trader (village collector)

2. Retailer   5.Urban assembler 6. Others (specify) _____

8. How do you undertake haricot bean trade activity in 2014? 1. Alone   2.   With partner

9. How long have you been in haricot bean trading? _____Years.

10. Do you participate in haricot bean trading year round?   1= Yes   0= No

11. If no, at what period of the year do you participate?

        1. Year round   2. When purchase price becomes low

        3. during high supply   4. Other (specify) _____

12. Do you practice trading other than haricot bean? 1= Yes 0=No

13. Number of market days in a week? _____

14. What percent of the total produce is sold on local market in 2014? Haricot bean_____
%.

15. What percent of the produce will goes to domestic market (Nazareth) in 2014?

Haricot bean _____ %.

16. What was the amount of your initial working capital when you start this haricot bean trade? _____Birr.

17. What is the amount of your current working capital in 2014? _____ Birr.

18. What is your source of working capital? 1. Own 2. Loan 3. Gift 4. Share 5. Others (specify)

19. If it was loan, from whom did you borrow? 1. Relative/family 2. Private money lenders.

 3. NGO. 4. Friends. 5. Micro finance institution. 6. Bank. 7. Others (specify) ------

20. How much was the rate of interest? _____ Birr for formal, -------------- for informal.

21. What was the reason behind the loan? 1. To extend haricot bean trading.

   2. To purchase   haricot bean transporting vehicles/animals.3. Others (specify) ------------

22. How was the repayment schedule? 1. Monthly 2. Semi-annually 3. Quarterly

   4. When you get money   5. Others (specify)

23. Is there change in accessing finance for haricot bean trade these days?

    1. Improved   2. Deteriorated   3. No change

24. Who will buy haricot bean from you in 2014? 1. Wholesaler 2. Retailers

     3. Household consumers   4. Brokers 5. Others _____

25. From where did you purchase haricot bean in 2014?

  1. From village, name of village (specify) -------------------------------

  2. From market, name of market (specify) -----------------------------

26. For whom do you purchase haricot bean?   1. For own   2. For others

27. How did you sale your produce in 2010? 1. Direct to the purchaser 2.Through broker

3. Other (specify) _____

28. Who sets the price in 2014? 1. Myself 2. Set by demand and supply 3. Buyers 4.Other ----

29. How did you set price? 1. Set at time of advance given 2. Negotiated at delivery

3. At time of delivery   4. Others_____

30. If purchasing price was set at the time of advance given, how did you agree?

 1. Orally 2. Written agreement   3. Other (specify) _____

31. When did you get the money after sale?

   1. as soon as you sold   2. After some hours

   3. On the other day after sale   4. Other (specify) _____

32. Do you carry out any physical treatment to maintain product quality? 1. Yes 0. No

33. What do you do, if the product is not sold on time?

      1. Took back home 2. Took to another market

         3. Sold it at lower price 4. Sold on other market day

34. How do you attract suppliers? 1. Giving better price 2. By visiting them

      3. Fair scaling /weighing 4. Other

35. Who purchase haricot bean for you in 2014?

         1. Myself 2. Broker 3. Commission agent

         4. Family members 5. Friends 6. Others____

36. What are the behaviors that traders use when selling haricot bean to intermediaries?
_____

Purchasing aspect

38. From which market and supplier did you buy haricot bean in 2014?

Purchased from Market (Location	Purchased from	Quantity purchased on market day	Average price per KG(Haricot bean)	% age share Of haricot bean purchased from specific	Term of payment 1= Cash 2= Credit
Where _____ ___ _____ ___	1. Farmers 2. Rural trader 3.Wholesaler 4.Collector				

39. How do you measure your purchase?

    1. by sack 2. By basket 3. By weighing (kg) 4. By Tasa 5. Others (specify) _____

40. Is obtaining sufficient volume is a problem in 2014? 1= Yes 0= No

41. From which market (s) do you prefer to buy most of the time in 2014? From_____Market.

42. Why do you prefer this market? 1. Better quality 3. High supply

    2. Shortest distance 4. Others _____

43. Which are the months of the year when prices are lowest? Dry haricot bean_____

44. Which are the months of the year when prices are highest? Dry haricot bean_____

45. Is your purchasing price higher than your competitors? 1= Yes 0= No

46. If yes, what was the reason? 1. To attract suppliers   2. To buy more quantity 3. To kick competitors 4. To get better quality 5. Others (specify) _____

47. How many regular suppliers do you have 2014?

   1. Producer _____   3. Assembler _____ 5. Commission agent_____

   2. Wholesalers _____ 4. Retailers' _____ 6. Others (specify)

48. The reasons for low prices in 2014 are due to:

Reasons for low prices	Yes	No
Favorable growing conditions/ excess supply/	1=_____	0=_____
- Poor production	1=____	0=_____
-Trade regulations	1=___	0=_____
-Increase in supply of substitutes	1=____	0=_____
Other_____	1=____	0=_____

Selling aspect

49. To which market and to whom did you sell haricot bean in 2014?

38. From which market and supplier did you buy haricot bean in 2014?

Sold from Market (Location name)	Sold from	Quantity Sold on market day (KG)	Average price per KG(Haricot bean)	% age share Of haricot bean sold from specific source	Term of payment 1= Cash 2= Credit 3= Advance Payment
Where _____ ___ _____ ___ _____ ___	1. Farmers 2. Rural trader **3.**Wholesaler 4.Collector 5. You don't Know				

50. How did you attract your buyers?

    1. By giving better price relate to others3. By visiting them

    2. By fair scaling (weighing) 4. Others (specify)

51. How many regular buyers do you have 2014?

      1. Wholesalers_____ 3. Consumers_____ 5. Commission agent _____

      2. Assembler _____ 4. Retailers' _____ 6. Others (specify) _____

52. What is your packaging material? 1. Sisal sack 2. Plastic sack

3. Basket 4. Others_____

53. Do you know the market prices in different markets (Akeremt market, village market, Metehbila Market, Mentamer market, Nathreteh market) before you sold your haricot bean in 2014? 1=Yes 0= No

54. What is your source of information? _____

55. How do you qualify the reliability, timeliness and adequacy of the information you got? Regarding the nearby local and Nathreteh market.

1. It was reliable 3. It was timely

2. It was adequate 4. Others (specify) ----------

56. Are you willing to pay for market information if it is available? 1= Yes 0= No

57. Accessibility to market roads in rainy seasons for vehicles is 1. Difficult 2. Easily accessible

58. If difficult, for how long? _____Months

59. Do you have other branch to sell your haricot bean in 2014? 1= Yes 0= No

60. What are the opportunities to expand dry haricot bean trading? _____

61. Are there problems on haricot bean marketing? If yes what are the problems, and your suggestion to overcome each Problem in 2014?

No.	Problem faced	1=yes,0=No	What do you think are the causes of this Problem?	What is your Suggestion to solve?
1.	Credit			
2.	Price setting			
3.	Scaling/ Weighing			
4.	Shortage of supply			
5.	Storage problem			
6.	Lack of demand			
7.	Information flow			
8.	Others (specify)_____			

62. Are there restrictions imposed on unlicensed haricot bean traders? 1= Yes 0=No

63. Indicate your average cost incurred per quintal in the trading process of dry white haricot bean in 2014.

Cost components	Cost incurred in birr/qt	
	Haricot bean	Chick pea
Purchase price		
Loading/unloading		
Transportation fee		
Sorting		
Storage cost		
Loss in transport and storage		
Telephone cost		
Inspection and warding		
Other personal expenses		
License and taxes		
Other cost (specify)		
Total cost		
Selling price		
Revenue		

Marketing Services

64. Did you pay tax for dry white haricot bean you purchased in 2014? 1=Yes 0=No

65. Did you pay tax for the dry white haricot bean you sold in 2014? 1=Yes 0=No

66. What was the basis of tax for the haricot bean you purchase in 2014?

   1. per sack_____ birr 3. Per basket _____ birr 5. Per kg _____ birr

  2. per quintal _____ birr 4. Fixed payment _____ birr 6. Others (specify) _____

67. What was the basis of tax for the dry haricot bean you sell in 2014?

    1. per sack_____ birr 3. Per basket _____ birr 5. Per kg _____ birr

    2. per quintal _____ birr4. Fixed payment _____ birr 6. Other (specify) _____

68. What is your opinion regarding the marketing fee paid in this market as compared to your transaction? 1. Low 2. High 3. Average 4. You don't know

69. Is haricot bean trading in your locality needs a trading license? 1=Yes 0=No

70. If yes, how do you see the procedure to get the license? 1. Complicated 2. Easy

71. Did you have haricot bean license? 1=Yes 0= No

72. How much did you pay for haricot bean trade license for the beginning? _____Birr

73. How much is the yearly renewal payment? _____Birr

74. Did you store dry haricot bean before you sold in 2014? 1= Yes 0= No

75. If yes in Q 74 for how long did you store haricot bean in the store? Maximum for _____Hrs or/days.

76. Amount of dry haricot bean lost due to storage ------------------ k.gs/qutals.

End of the Questionnaire

Thank you very much for responding to the questions.

Name of the Enumerator: _____ Date of Interview

III. Consumers Questionnaire

I. General Information

1. Name of Respondent: _____

2. Zone: Woreda: Kebele: _____ Village: _____

3. Age of the respondent: [_____] years

4. Sex of the respondent (√):   1. [ ] Male   2. [ ] Female

5. Education level of the respondent (√): 1. [ ] No formal education 2. [ ] 6th grade or less

       3. [ ] 7th to 12th grade   4. [ ] Certificate   5. [ ] Diploma   6. [ ] Degree

6. Marital status (√): 1. [ ] Married 2. [ ] Unmarried 3. [ ] Divorce 4. [ ] Widowed

7. Distance to nearest town: [_____] OR [_____] hrs walk

8. What is your major means of income generation? 1. [ ] Farming   2. [ ] Trade

3. [ ] Employment 4. [ ] Others _____

9. How much do you earn per year (estimate based on weekly, monthly income):_____Birr

10.   Is haricot bean consumed in your family? (√) 1. [ ]   Yes 2. [ ]   No

11. Experience in haricot bean products consumption? _____ Years

12. Do you produce and consume or purchase? 1. [ ] Purchase 2. [ ] Produce

13. If you purchase, what is the proportion of your income used for purchase of haricot bean product?

14. If no consumption of haricot bean product, why? _____

 Demand for the dry white haricot bean

1.   What type of haricot bean products purchased for consumption? Please respond to the following questions. (*Multiple responses is possible)

Crop type	Quantity purchased (per market day)	No. of market day per weak	Low price paid (birr/kg)	No. of months you may buy at lower price	High price paid (birr/kg)	No. of months you may buy at higher price	*From whom do you buy
Haricot bean							
Chick pea							

2. Do you consider any quality requirements to purchase haricot bean? 1. [ ] Yes 2. [ ] No
3. If yes, what quality requirement do you consider for; Haricot bean, _____ others (specify)
4. What are the constraints hindering consumption of haricot bean? Rank horizontally (1= most severe, 2= second severe and etc)

Crop type	Supply Shortage	Income shortage	Lack of storage home	High price of product	Poor product handling	Lack of market information	Others (specify)
Haricot							
Chick pea							

5. Do you know the benefits of consuming haricot bean product? 1. [ ] Yes 2. [ ] No

6. Do you think there is problem with consumption of haricot bean product? 1. [ ] Yes 2.[ ] No

7. What should be done to increase haricot bean product consumption?

Appendix 8. Check List

Interview Check List for Farmers' Focus Group Discussion

Actors involved and the role they played:

− Actors involved (both private and public organizations)

− Role/ function they play

1. Production

− Production trend in the area (increasing, decreasing, etc.)

− Why you decide to produce/ not to produce white haricot bean in your area?

− What are the challenges you faced in implementing production practices; crop husbandry

    Practice (land preparation, sawing, weeding and harvesting), input utilization

          (Fertilizer and chemicals), pre and post harvest handling, etc.

− How do you adapt the recommendation given by the extension or research organization?

2. Input supply

• Have you got the required agricultural inputs in Quality, adequacy, timeline and price?

• From where and how you get improved seeds (formal and informal sources), fertilizer, chemicals and farm implements?

• Which sources do you like to get improved seeds, fertilizer, chemicals and farm Implements? And why?

• Where do you get the seeds from? (If multiple sources: why?) Where do you prefer to get your seeds from? Why?

• What information do you have about the seed? (Variety name, source, production   traits, consumption traits)

• Is there a problem in getting these inputs?

• What do you recommend/suggest to alleviate the problems and get the service required?

3. Credit

• From where you have got credit (formal and informal sources) and which source is good for

    you and why?

- What are the requirements/criteria to get credit from formal institutions? And what is your suggestion on the criteria?
- In what condition you obtained the loan (individual, group, collateral bases), which one is good for you?
- Which credit institutions are implementing group lending system?
- What are the predetermined criteria for group formation?
- What is the interest rate? Is it good for you? If not why? Is there any difference in interest rate levels of these institutions?
- When and how do you repay the loan you get (terms of repayment period)?
- If not repaid on the due date, what actions did the formal lending institution take on you? What is your opinion on the action?
- What limitations/challenges you encountered to get credit? And what alternative solution do you suggest?

4. Information flow

- ✓ Where and how do you get information/ knowledge and advisory service? (Training, demonstration, experience sharing tour, farm visit, etc.)
- ✓ How do you evaluate the knowledge you acquired during such sessions?

5. Consumption

- Do you have enough knowledge about the food preparation and consumption of white haricot bean? If yes from where do you get such information/knowledge?
- What do you think about the feeding quality of white haricot bean in your area?
- If you are using white haricot bean for household food consumption, how do you use it?
- What alternative solutions do you have to improve the development of white haricot bean in your area?

Evaluation matrix for SWOT analysis

Strengths of production and marketing of Dry white haricot bean	Weakness of production and marketing of dry white haricot bean
Opportunities on production & marketing	Threats on production & marketing