

**ANALYSIS OF WHEAT VALUE CHAIN: THE CASE OF SINANA  
DISTRICT, BALE ZONE, OROMIA REGION, ETHIOPIA**

**MSc THESIS**

**SULTAN USMAN MAHAMUD**

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**Sultan Usman Mahamud**

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**Haramaya University**

**POSTGRADUATE PROGRAM DIRECTORATE**  
**HARAMAYA UNIVERSITY**

As Thesis Research advisors, we hereby certify that we have read and evaluated this thesis prepared, under our guidance, by Sultan Usman entitled “**Analysis of Wheat Value Chain: The Case of Sinana District, Bale Zone, in Oromia Region, Ethiopia**”. We recommend that it be submitted as fulfilling the thesis requirement.

Dr. Jema Haji

Major Advisor

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Dr. Eliud Birachi

Co-Advisor

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

As member of the Board of Examiners of the M.Sc. Thesis Open Defense Examination, we certify that we have read, evaluated the Thesis prepared by Sultan Usman and examined the candidate. We recommended that the Thesis be accepted as fulfilling the Thesis requirement for the Degree of Master of Science in Agriculture (Agricultural Economics).

\_\_\_\_\_  
Chairperson

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Internal Examiner

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
External Examiner

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## **DEDICATION**

I dedicate this thesis manuscript to my father **USMAN MAHAMUD JILO** and my mother **JATO GADA GANDO** as well as to all my family for nursing me with affection and love and for their dedicated partnership in the success of my life.

## STATEMENT OF THE AUTHOR

First, I hereby declare that this thesis is my own work and that all sources of materials used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfilment of the requirements for an advanced M.Sc. degree at Haramaya University and to be made available for end users and borrowers at the University's Library under rules and regulation of the Library. I solemnly declare that this thesis should not be submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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Name: **Sultan Usman**

Signature: \_\_\_\_\_

Place: **Haramaya University, Haramaya**

Date of Submission: **November, 2015**

## **BIOGRAPHICAL SKETCH**

Sultan Usman was born in Aseko Woreda, Arsi zone of Oromiya Regional State in October 1988. He attended his primary education at Boydo elementary school and his junior at Aseko elementary and junior school. He attended his secondary and preparatory school education at Mechara senior secondary high school in West Hararghe zone.

After completion of his high school education, he joined Haramaya University college of Agriculture in October 2008 and graduated with BSc. Degree in Agricultural Economics. Soon after his graduation, he was employed by Oromia Agricultural Research Institute, Sinana Agricultural Research Centre and served as socioeconomics junior researcher for four years. The author joined the School of Graduate Studies of Haramaya University in October 2014 to pursue of his MSc degree in Agricultural Economics in regular program.

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## LIST OF ACRONYMS AND ABBREVIATIONS

ADLI	Agricultural Development Led Industrialization
ATA	Agricultural Transformation Agency
BLUE	Best Linear Unbiased Estimator
BZADO	Bale Zone Agricultural Development Organization
BZFEDO	Bale Zone Finance and Development Office
CSA	Central Statistical Agency
EAAPP	Eastern Africa Agricultural Productivity Project
FAO	Food and Agriculture Organization of United Nations
GDP	Gross Domestic Product
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
KM	Kilometre
masl	meter above sea level
MNL	Multinomial Logit
MoFED	Ministry of Finance and Economic Development
OECD	Organization of Economic Cooperative and Development
OLS	Ordinary Least Squares
SARC	Sinana Agricultural Research Centre
SNNPR	Southern Nations Nationalities and Peoples Region
SSA	Sub-Saharan Africa
UNIDO	United Nations Industrial Development Organization
VIF	Variance Inflection Factor

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## **Analysis of Wheat Value Chain: The Case of Sinana District, Bale Zone, Oromia Region, Ethiopia**

### **ABSTRACT**

*This study focused on the analysis of wheat value chain in Sinana district of Bale zone with specific objectives of analysing the market structure-conduct-performance of wheat markets; identifying the determinants of wheat supply to the market and market outlet choice of wheat producers, and wheat value addition at different stages of the marketing chain. Primary data were collected from 120 farmers and 37 wheat traders using structured questionnaires. Descriptive statistics and Econometrics models were used to analyze the collected data. Results show that the main wheat value chain actors in the study area are input suppliers, farmers/producers, assemblers, wholesalers, processors, retailers, commission agents and cooperatives. Market concentration ratio at district level was 88.7% which indicated oligopolistic market structure. The result of 2SLS indicated that size of landholding, livestock ownership, family size and quantity of wheat produced influences amount of wheat supplied to market significantly. The multinomial logit model result indicated that the likelihood to choose wholesalers market outlet was significantly influenced by frequency of extension contact, distance from market place, own price of the commodity and membership to cooperative compared to accessing assemblers wheat market outlet. The likelihood of accessing cooperative wheat market outlet was significantly influenced by price given to the commodity and distance from market place compared to accessing assembler market outlet. The likelihood of accessing processors market outlet was significantly influenced by price of commodity, ownership of transportation facilities and distance of processors from production place. Result of probit model indicated that access to market information, quantity of wheat produced, distance from market place access to market information, access to extension and credit services significantly affected farmer's decision to be engaged in value addition. Therefore, policies aiming at increasing farmer's awareness of producing value added wheat produce to enhance value creations are recommended to strengthen chain development.*

**Key words:** Value chain, structure-conduct-performance, value addition, 2SLS, multinomial logit, market outlet.

# 1. INTRODUCTION

## 1.1. Background of the Study

Agriculture is a core driver of the Ethiopian economy. It accounts for about 45 percent of the Gross Domestic Product (GDP), employs more than 85 percent of the total population that is directly or indirectly engaged in agriculture, generates about 80 percent of the foreign exchange earnings of the country, and provides raw materials for 70% of the industries in the country. About 15-17 percent of the Government of Ethiopia's (GoE) expenditures are committed to the sector (Dawit *et al.*, 2010). The role of agriculture in securing the food needs for the fast growing population is considerable.

Despite having all this 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 of 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).

Wheat is increasingly becoming a key staple in Africa and sub-Saharan as a result of income growth and rapid urbanization. But sub-Saharan countries and Africa as a whole produce only about 30% and 40% of their domestic requirements respectively, causing a heavy dependence on imports and making the region highly vulnerable to global market and supply shocks (Negassa *et al.*, 2012). Ethiopia is the second largest wheat producer in sub-Saharan Africa, after South Africa. Area under wheat cultivation had expanded from 1.40 million ha in 2004/05 to 1.55 million in 2010/11. Although most of the wheat grown in Ethiopia is bread wheat, there is some durum wheat which is often grown mixed with bread wheat (Demeke and Di Marcantonio, 2013).

In Ethiopia, cereal production and marketing are the means of livelihood for millions of small holder households and it constitutes the single largest sub-sector in economy. Cereal accounts for roughly 60% of rural employment, 80% of total cultivated land, more than 40%

of a typical household's food expenditure, and more than 60% of total caloric intake. The contribution of cereals to national income is also large. According to available estimate, cereal production represents about 30% of gross domestic product (GDP). This calculation follows from the fact that agriculture is 48% of the nation's GDP (World Bank, 2007). According to CSA (2013) report, cereals contributed 84.96% (about 0.197 million tons) of the grain production. Maize, teff, wheat and sorghum made up 26.63% (0.062 million tons), 16.28% (0.038 million tons), 14.85% (0.34 million quintals) and 15.58% (0.036 million tons) of the grain production, respectively.

Wheat is among the most important crops in Ethiopia, ranking fourth in total cereals production 13.25% (1.63 million hectares) next to maize, sorghum and teff (CSA, 2013). It is grown as a staple food in the highlands at altitudes ranging from 1500 to 3000 masl. Nearly all wheat in the country is produced under rain-fed conditions predominantly by small scale farmers. A few governments owned large-scale (state) farms and commercial farms also produce wheat (Demeke and Di Marcantonio, 2013).

In order to improve the production and productivity of agriculture, Ethiopia has developed different development policies that enhance agricultural production. In 1994/95, the country adopted Agricultural Development Led Industrialization (ADLI) development strategy. The strategy argues that growth starts from agriculture and initiates the growth of other sectors especially the industry sector through backward and forward linkages (MoFED, 2006). Furthermore, Ethiopia launched and commenced implementing earnestly its Growth and Transformation Plan (GTP) in 2009/10. The Agricultural Transformation Agency (ATA) has been established in 2010 to enhance productivity and production of smallholder farmers and pastoralists as part of the current five year (2011-15) Growth and Transformation Plan (GTP). The primary aim is to promote agricultural sector transformation by supporting existing structures of government. The Agency has identified its priority crops and wheat is one of the eight commodities identified (the others are teff, maize, barley, pulses, oilseeds, rice and livestock) for special support.

Oromia is one of the largest regions in Ethiopia that shares largest area coverage of the country and where problems reflected above are prevalent. It is also known for high production of cereal crops in the country. Among zones in Oromia, Bale zone is particularly known for its extensive wheat production and sometimes called "wheat belt" of Ethiopia.

However, several problems hinder the performance of wheat production and productivity in Bale highlands. Shortage of improved seed variety, low price of wheat products, high price of fertilizer, pesticides and seed, price instability problems for agricultural products, high costs of combine harvesting, reduced soil fertility, lack of sustainable market outlet, poor infrastructure, grass weed and disease are the major constraints of wheat production (EAAPP, 2012).

To reverse this situation and improve wheat production and productivity in the area among calls for development of well-performing marketing system which satisfies consumer demands with the minimum margin between producers and consumer prices. Well-functioning marketing system is not limited to stimulation but it also increases production by seeking additional output. However, wheat value chain and their characteristics have not yet been studied and analysed for different parts of the country, especially in Bale highlands which are known in the production of wheat. This study focused on investigating the wheat value chain and important constraints using value chain analysis approach in Sinana district of Bale highlands. The finding of the study can assist in developing improved market development strategies to benefit all stakeholders that are participating in wheat value chain in the study area.

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

Development policy of Ethiopia has placed emphasis on increasing agricultural production to serve as a base for rural development. Even though there has been an increase in agricultural production, there were drawbacks with regards to many households limited participation in the markets. The limited market participation of many agricultural households face is considered to be a major constraint to combating poverty (Best *et al.*, 2005). This shows that an efficient, integrated and responsive market that is marked with good performance is of crucial importance for optimal allocation of resources and stimulating households to increase output (FAO, 2003).

Negassa and Robert (2007), Mulat *et al.*, (2007), Dorosh and Ludovic (2007) assessed the marketing system and the reasons for high price increase by taking three major staple food grains in Ethiopia: maize, wheat and teff. Their major finding was that the spatial efficiency

of the grain market has improved in some markets following grain marketing reforms at different points in time since 1990s; it remained unchanged in some markets; and it even worsened in others. Regarding the growing grain price the researchers found out that the increasing demand, hoarding by farmers' cooperatives, collusion among big grain traders and increasing marketing costs were the major reasons.

According to Bezabih (2010), agriculture continues to face a number of problems and challenges in Ethiopia. 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.

Negassa *et al.* (2004) argue that spatial inefficiency within Ethiopian wheat markets prevents wheat from being transferred from the regions in which surpluses are generated to those in which demand outpaces production. One possible explanation for this failure is that the marketing system lacks the capacity to provide timely and accurate price signals, which present special challenges given the price instability described above. The riskiness of the wheat market may also reduce private sector participation, particularly in rural areas where distribution costs may be higher.

According to Mohammed Hassena (2009) upgrading the wheat market value chains sector takes into account the systematic review of the problems and opportunities that exist across the value chain from input supply to marketing of the final product. The major challenge in the wheat value chain and the reason behind supporting this value chain in general is because of the incoming globalization. Under current productivity and service provision, it will become more difficult for Ethiopian wheat sector to withstand the competition from more productive and efficient system of most other countries. More productive and efficient countries can provide wheat products at lower cost to the consumer which has repercussion on the economy in general. Some of the specific challenges that affected wheat value chain were less quality control systems, weak quality based pricing system, low wheat production and less technical capacity of production.

Supply of agricultural crop in the study area is subjected to seasonal variations where surplus supply at harvest is the main feature. The nature of the product on the one hand and lack of properly functioning marketing system on the other, often resulted in lower producers' price. Several studies that have in the past examined the marketing system of various agricultural commodities and its implications for agricultural and economic development in Ethiopia in general have employed the market value chain approach on different enterprises. However the analysis of wheat market value chain in Bale highlands, which is the main source of wheat for Ethiopia was not conducted yet. In the absence of adequate information on wheat marketing in Bale highland designing appropriate wheat marketing policy in Ethiopia will take place in an information vacuum. So this study is proposed to investigate the value chain analysis of wheat in Sinana district of Bale zone.

Therefore, this study focuses on identifying the weakest link of the wheat value chain, in order to narrow the information gap and contribute to an understanding of the challenges and assist in developing improved market development strategies to the benefit of smallholder farmers, traders, and other market participants. Specifically, this research investigated the value chain analysis of wheat in Sinana district of Bale highland.

### **1.3. Research Questions**

The study tries to answer the following research questions:

1. Does structure-conduct-performance of wheat market look like in the study area?
2. What factors determine the marketed surplus of wheat in the study area?
4. What are the factors affecting farmers wheat market outlet choice decision?
5. What are factors affecting wheat value addition in wheat marketing value chains?

### **1.4. Objectives of the Study**

The general objective of the study was to analyze the wheat value chain in Sinana district of Bale zone.

The specific objectives of the study are:

1. To analyse the market structure-conduct-performance of wheat markets in the study area;

2. To analyze the determinants of wheat supply to the market in the study area;
3. To identify marketing channels of wheat and factors affecting outlet choice decisions of wheat producers; and
4. To determine factors affecting wheat value addition at different stages of the marketing chain.

### **1.5. Scope and Limitations of the Study**

This study focused on the entire wheat value chain from input supplier to the consumer within Sinana district. The study was conducted in one district and important information were collected from sample households and marketing actors involved in the marketing of wheat in the study area.

However, there are spatial as well as temporal limitations to make the study more representatives in terms of wider range of area coverage and time horizon. 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 the country as a whole. These limitations are mainly due to shortage of time, budget and facilities.

### **1.6. Significance of the Study**

The study provides a holistic picture of existing challenges, opportunities and entry points in the wheat value chain. In addition, the study provides information on the determinants of wheat supply to the market, the determinants of market outlet choice decisions, marketing margin, benefit share of actors, and identifies opportunities and constraints of wheat value chain in the study area. The information is expected to have valuable input that helps market participants to understand supply potential and performance of wheat marketing and come up with important recommendations that helps in delivering required efforts to enhance the production and utilization of wheat at larger scale to bring about economic development in the area. The information generated in this study could help a number of organizations including: national and international research institutions, development organizations, traders, producers, policy makers, extension service providers, government and non-

governmental organizations to assess their activities and redesign their mode of operations in study area.

### **1.7. Organization of the Thesis**

This thesis constitutes five major sections. The first and introductory sections subtopics that are already discussed above includes, background, statement of the problem, research questions objectives of the study, scope and limitations of the study and significance of the study. The second section elaborates a review of some theoretical and practical conceptualizations with respect to the agricultural marketing and value chain analysis. A brief description of the study area and a thorough explanation of the methodologies used for the study are presented in section three. The findings of the study are presented in the result and discussions part in section four. Finally section five deals with conclusions and recommendations that are drawn from the study.

## 2. LITERATURE REVIEW

This chapter presents the definition of concepts related to marketing, value chain, approaches to study agricultural marketing, benefit of value chain, agricultural market value chain analysis, relevance of value chain for the poor, efficiency of marketing system, empirical reviews and conceptual framework of the study.

### 2.1. Definition and Basic Concepts

#### 2.1.1. Concepts related to marketing

This sub-section provides basic definition of a market, marketing, market channel, marketing system agricultural marketing and market outlets.

**Market:** The term market has got a variety of meanings. FAO (2008) defined markets are places where buyers and sellers come together to trade. They are social arrangements that allow buyers and sellers to obtain information and exchange commodities. In some cases the market may mean the place where buying and selling takes place, an arena in which a good is sold, a group of people carrying on buying or selling, or the commodity traded, such as the corn market, or time market (Larson, 1957). Still another scholar (Saccomandi, 1998) defined market as “the exchange, circulation and distribution of commodities between people and places.”

**Marketing:** The term marketing has a variety of meanings by various stake holders. All the concepts reflect the different aspects of the marketing process. Backman and Davidson (1962) defined market as 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.

Kotler’s (2003) definition of marketing is widely known as “the 21 century definition of marketing” which runs as follows a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and values with others.

**Market channel:** The marketing channel is a trade or distribution network and it is defined by Stern *et al.* (1996) as sets of interdependent organizations involved in the process of making the product or service available for consumption. The channel follows a vertical structure where products flow from producer to the ultimate consumer and in which actors meet at each market. Different marketers exist in channel arrangements to perform marketing functions that contribute to the product flow. Actors acting between producers and final users are known as intermediaries.

**Marketing chain:** Defines follow of commodity from producer to consumers that brings into place economic agents who perform complementary functions with the aim of satisfying both producers and consumers (Islam *et al.*, 2001).

**Marketable and market surplus:** Marketable surplus is the quantity of the produce left out after meeting farmer's consumption and utilization requirements for kind payments and other obligations such as gifts, donation, charity, etc. So, marketable surplus shows the quantity left out for sale in the market. The marketed surplus shows the quantity actually sold after accounting for losses and retention by farmers, if any and adding the previous stock left out for sale. Thus, marketed surplus may be equal to marketable surplus, it may be less if the entire marketable surplus is not sold out and the farmers retain some stock and if losses are incurred at the farm or during transit (Thakur *et al.*, 1997).

**Marketing system:** It is defined as the sequential set of kinds or types of business firms through which a product passes during the marketing process. It is the interrelationship of firms (Branson and Norvell, 1983). It is usually seen as a "system" because it comprises several, usually stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process (Mendoza, 1995).

**Agricultural marketing:** is defined as agriculturally oriented marketing. It embraces all operations and institutions involved in moving farm products from farm to consumers (Pritchard, 1969). It covers all the activities associated with the agricultural production and food, feed, and fiber assembly, processing, and distribution to final consumers, including analysis of consumers' needs, motivations, and purchasing and consumption behavior (Branson and Norvell, 1983).

Agricultural marketing was viewed by Olukosi and Isitor (1990) and Idem (1999) as the process by which agricultural products flow physically and economically from the producers to the consumers in order to effect exchange of goods and services that satisfy the needs of individuals, groups or the entire society. In the process of marketing, buyers and sellers are linked together and can react to current situations of supply and demand. Participants thereby generate income which enhance their welfare. Generally, an effective and efficient marketing system enhances consumption, output and economic development.

### **2.1.2. Concept of market value chain**

Many organizations use the terms “value chain” and “supply chain” interchangeably; however, these are basically different.

**Supply chain:** It is taken to mean the physical flow of goods and process 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).

Kotler (2003) also defined supply chain as a longer channel stretching from raw materials to final products that are carried to final buyers. He shortly put as value-delivery network. He also separated supply chain from demand chain in that the later starts from thinking first the target market and move backwards from that point, as a backward orientation.

According to Andrew *et al.* (2006), the term supply chain is used internationally to encompass every activity involved in producing and delivering a final product or service, from the supplier’s supplier to the customer’s customer. The primary focus of supply chains is thus on cost and efficiencies in supply.

**Value chain:** describes the full range of activities required to bring a product or service through the different phases of production, including physical transformation, the input of various producer services, and response to consumer demand (Kiplanisky *et al*, 2000). As such, value chains include the vertically linked interdependent processes that generate value

for the consumer. Value chains focus more on value creation, innovation, product development, and marketing.

The value chain concept entails the addition of value as the product progresses from input suppliers to producers and consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekaram and Berhanu, 2009) as shown in Figure 1 for the case of a typical agricultural value chain.

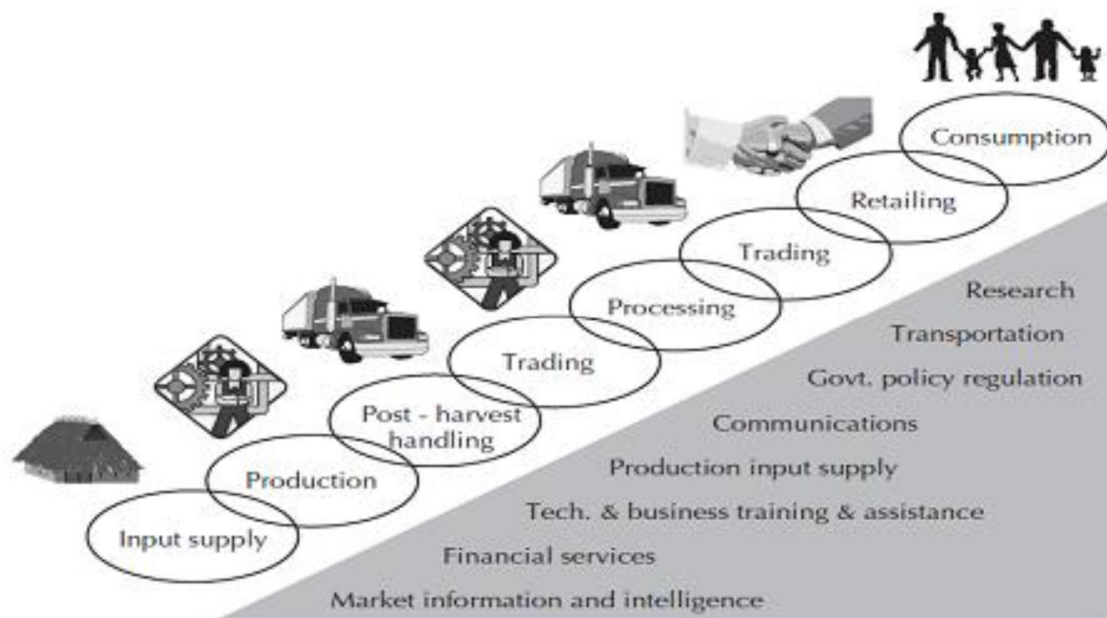


Figure 1: Typical agricultural value chain and associated business development services.  
Source: Adapted from Anandajayasekaram and Berhanu (2009).

A defining feature of global economic systems is the shift from traditional units of production defined within national boundaries to the rise of global value chains, embodying networks of actors, tied together by contractual relationships. Value chains are defined as institutional arrangements linking producers, processors, marketers, and distributors—often separated by time and space—that progressively add value to products as they pass along the chain (Nabi and Luthria, 2002).

### **2.1.3. Approaches to study agricultural marketing**

Marketing studies adopt different viewpoints and approaches to study agricultural marketing problems. The functional, institutional (organizational) and commodity approaches, and the mixed system approaches are a few systems of understanding or analyzing marketing (Mendoza, 1995).

#### **2.1.3.1. The functional approach**

This approach involves all the basic marketing activities (functions) that have to be performed in the agricultural commodities and at the marketing of inputs in to agricultural production.

Physical distribution (i.e. functions) and economic activity (i.e. buying, selling) are two dimensions of marketing carried out by institutions or people. An analysis of these two dimensions of agricultural marketing is intimately linked to the institutions created by law or by corporate standards or simply by established procedure, that have emerged as a result of the social and economic relation between the participants in the marketing process (middlemen, consumers and producers).

#### **2.1.3.2. The system (institutional) approach**

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

#### **2.1.3.3. The commodity (individual) approach**

This entails an analysis of marketing functions, system, and structure from the view point of an individual product. This approach combines the above two approaches. We can study a list of products. In a commodity subsystem approach, the institutional analysis is based on

the identification of the major marketing channels. This approach includes the analysis of marketing costs and margins.

## 2.2. Why Value Chain Analysis?

Value chain analysis is a useful analytical tool that helps understand overall trends of industrial reorganization and identify change agents and leverage points for policy and technical interventions. Value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. The analysis consists of identifying chain actors at each stage and discerning their functions and relationships; determining the chain governance, or leadership, to facilitate chain formation and strengthening; and identifying value adding activities in the chain and assigning costs and added value to each of those activities. The flows of goods, information and finance through the various stages of the chain are evaluated in order to detect problems or identify opportunities to improve the contribution of specific actors and the overall performance of the chain (UNIDO, 2009). The value chain can help you answer questions regarding:

- 1) How the products you produce reach the final consumer.
- 2) The structure (economic relationships) between players in the chain.
- 3) How this structure is likely to change over time.
- 4) The key threats to the entire value chain.
- 5) The key determinants of your share of the profits created by your chain.

## 2.3. Agricultural Market Value Chain Analysis

According to Anandajayasekeram *et al.* (2009), there are four major key concepts guiding agricultural value chain analysis. These are effective demand, production, value chain governance, and upgrading.

**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. 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 (Anandajayasekera 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.

**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.

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 works (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 competing bases of power exists. 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).

**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. It is thus possible to identify four trajectories which firms can adopt in pursuing the objective of upgrading, namely: process upgrading: increasing the efficiency of internal processes such that these are significantly better than those of rivals, both within individual links in the chain (for example, increased inventory turns, lower scrap), and between the links in the chain; product upgrading: introducing new products or improving old products faster than rivals. This involves changing new product development processes both within individual links in the value chain and in the relationship between different chain links; functional upgrading: increasing value added by changing the mix of activities conducted within the firm (for example, taking responsibility for, or outsourcing accounting, logistics and quality functions) or moving the locus of activities to different links in the value chain; chain upgrading: moving to a new value chain.

## **2.4. The Relevance of Value Chains for the Poor**

In many parts of the world, agriculture continues to play a central role in economic development and to be a key contributor to poverty reduction. However, agriculture alone will not be sufficient to address the poverty and inequality that are so pervasive in today's world. It is becoming increasingly crucial for policy makers to focus immediate attention on agro-industries. Such industries, established along efficient value chains, can increase significantly the rate and scope of industrial growth. Agro-industrial products offer much better prospects of growth than primary commodities. In addition, the marked trend to break down production processes into specific tasks opens up new opportunities for developing countries to specialize and take a more profitable part in global trade provided they meet increasingly stringent market requirements (UNIDO, 2009).

In developing countries, a significant proportion of national funds are used to support agricultural production inputs – primarily seeds, fertilizers and irrigation systems. 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. However, participation in value chains implies both opportunities and pitfalls for developing countries. The prospect that lead firms such as brand owners, innovators and system integrators may appropriate increasing shares of rent and therefore further widen the gap is very real (Altenburg, 2006). Furthermore, value chains may increase the risk of marginalization faced by areas with poor infrastructure and small farms since chain development may favour larger farms and processing plants which can invest in infrastructure and increase their production capacity.

## **2.5. Efficiency of Marketing System**

The movement of goods from producers to consumers at the lowest possible cost, consistent with the provision of the services desired by the consumer, may be termed as efficient marketing (Raju and von Oppen, 1982). Marketing efficiency depends mainly on costs and profits of marketing enterprise and can be measured by operational and/or allocative efficiency. Operational efficiency aspect is related to the cost of marketing and the allocative efficiency aspect includes the profit of the marketing enterprises, which depends on the level of competition (Raju and von Oppen, 1982). Marketing margins are affected by a number of factors: distance to be covered, adequacy of transport, effectiveness with which the various activities are carried out and services that are provided (FAO, 1987). When production is

more scattered, supply is confined to one major season, distance are much longer and the whole marketing infrastructure is less developed, the marketing margin is then likely to be high.

In order to evaluate the efficiency of markets, researchers used different approaches, Scarborough and Kydd (1992) used three main approaches:

**1. The internal productive efficiency of marketing enterprises:** In this intra-firm organization, management structures, motivation incentive arrangements, and decision making rules and processes were seen as important on efficiency of operations. Descriptive analysis of accounting data, statistical analysis of same data using econometrics, and analysis which combine both physical product and cost relationships, were used to analyze the internal efficiency of the marketing enterprise. However, today marketing is not a single isolated phenomenon that a certain enterprise can separate itself and only depend on its efficiency, rather, a number of factors influence its performance that demands to take into account consideration when decision is made. Hence, this approach becomes less important.

**2. The food system framework:** This based on the concept of structure, conduct and performance, but attempts to broaden and inject more dynamic aspect into the model. It goes beyond industry boundaries and assumes structure and conduct vertically over the entire commodity flow from input supplier to ultimate consumer. The justification behind this extension is that structure and behaviour at one level in the section, can influence those in others. By analyzing the structure of the whole sub-sector, hypothesis concerning the effects of the nature of vertical coordination between different, but related industries, on market and economic performance, can be developed. The issues of economic, infrastructural and institutional environments in which market are operating are not are not taken as given, but are studied in terms of their impact on market performance, and the constraints and opportunities for the market to contribute to improved economic performance.

**3. The structure-conduct- performance (S-C-P) approach:** It focuses on the behaviour of similar rather than individual firms. This approach provides a broadly descriptive nature of market attributes, and the relationship between them and performance. The emphasis is not on the internal part of firms, but on relationships between functionally similar firms and

their market performance as group. Therefore, the S-C-P was employed as theoretical framework to analyze efficiency of wheat marketing of the study area.

The approach was developed to analyse the market organization of the industrial sector and it was later applied to assess the agricultural marketing system (Scarborough and Kydd, 1992). This approach analyses the relationship between functionally similar firms and their market behavior as a group and is mainly based on the nature of various sets of market attributes, and relations between them (Scarborough and Kydd, 1992). The direction of causation goes from structure through conduct to performance (Claudius and Mueller, 1961). The approach has been used to analyse marketing efficiency in many countries, Lele (1967) in India, Jones (1972) in West Africa and Magrath (1992). The S-C-P model analyses productive efficiency of individual marketing enterprises (Andargachew, 1990; Admasu, 1998).

Market structure refers to the number and relative size of distribution of buyers/sellers in the market. It is generally believed that higher market concentration implies a non-competitive behaviour and thus inefficiency. But, studies also warn against the interpretation of such relationships in isolation (Scott, 1995). Concentration in an industry is a concern when market power hinders the efficient operation of markets. For instance, a dominant firm with market power can raise the prices it charges consumers without fear of being undercut by competitors. A firm with market power might also be able to drive down the prices it pays to suppliers, reducing suppliers' profits and distorting their incentives to produce. But, concentration may also has positive economic benefits, including economies of scale and other effects (Brennan *et al.*, 1999). Therefore, concentration is only one of a number of factors to be considered in the assessment of competition in a market.

According to Abbott and Makeham (1981) conduct refers to the market behavior of all firms. In what way do they compete? Are they looking for new techniques and do they apply them as practicable? Are they looking for new investment opportunities, or are they disinvesting and transferring funds elsewhere?

Market performance is reflection of the impact of structure and conduct on product price, costs and the volume and quality of output (Cramers and Jensen, 1982). If the market

structure in an industry resembles monopoly rather than pure competition, then one expects poor market performance.

## **2.6. Review of Empirical Studies**

### **2.6.1. Factors affecting market supply**

The market supply refers to the amount actually taken to the markets irrespective of the needs for home consumption and other requirements. Whereas, the marketed surplus is the residual with the producer after meeting the requirement of seed, payment in kind, and consumption by farmer (Wolday, 1994).

Study by Wolelaw (2005) found out the major factors that affect the marketable supply of rice at Fogera district using multiple linear regression model. He investigated the relationship between the determinant factors of supply and the marketable supply of rice and his study revealed that the current price, lagged price, amount of rice production at farm level and consumption at household level had influenced marketable supply of rice at the district.

Study undertaken by Kinde (2007) also indicated the major factors that affect marketable supply of sesame in Metema district by using cross-sectional data and multiple linear regression model to identify the relationship between the marketable supply of sesame and the hypothesized explanatory variables. His study acknowledged that amount of sesame productivity, use of modern inputs, number of language spoken by the household head, number of oxen owned, sesame area and time of selling of sesame influenced marketable supply of sesame positively.

Ayelech (2011) identified factors affecting the marketable surplus of fruits by using OLS regression. 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. Study of Mohammed (2011), using multiple linear regression, has identified that quantity of teff produced, access to market information, access to extension and sex of the household head were found to have positive and significant influence on marketable supply of teff. Likewise, quantity of wheat produced, and access to credit were found to influence marketable supply of wheat positively and significantly.

Abraham (2013), using multiple regression model indicated that marketable supply is significantly affected by access to market information and quantity of tomato produced in the case of tomato; access to extension service, access to market information, vegetable farming experience and quantity of potato produced in the case of potato; and Woreda dummy, non/off-farm activities, distance to the nearest market and quantity of cabbage produced in the case of cabbage.

### **2.6.2. Determinants of market outlet choices**

Producers choose their marketing plans and assess outside options that are available before participating in any marketing channel. The farm income earned from sales depends on the farmer's experience in producing and selling farm products, the farmer's comparative advantage in bargaining and marketing skills combined with differences in the regional development and accessibility of outlets for farm products.

Using farm-level data, Timothy *et al.* (2011) investigates factors associated with the choice of three direct marketing strategies; direct-to-consumer outlet, intermediated retail outlet and sales to both outlets. They apply a selectivity based approach for the multinomial logit model to assess the relationship between the choices of direct sales marketing strategy on the financial performance of the business. Findings from their study suggest that obtaining an Internet connection and accessing the Internet for farm commerce increases the likelihood of using intermediated marketing outlets. Using the Internet for farm commerce and operating diversified farms (more enterprises) is associated with increases in the likelihood that the farmer relies on direct to consumer marketing outlets. The gender of the operator, the portfolio of input acquisition and management practices, and participation in Federal, State, or local farm program payments is positively associated with total farm sales in all three direct marketing strategies.

Birhanu *et al.* (2013) analyzed milk market outlet choices in Wolaita zone, Ethiopia. Multinomial Logit model results indicate that compared to accessing individual consumer milk market outlet, the likelihood of accessing cooperative milk market outlet was lower among households who owned large number of cows, those who considered price offered by cooperative lower than other market outlets and those who wanted payment other than

cash mode. The likelihood of accessing cooperative milk market outlet was higher for households who were cooperative member, who owned large landholding size, who had been in dairy farming for many years and who received better dairy extension services. Compared to accessing individual consumer milk market outlet, the likelihood of accessing hotel/restaurant milk market outlet was lower among households who were at far away from urban center and higher among households who accessed better dairy extension services and who owned large number of dairy cows.

Study by Abraham (2013) identified variables influencing producers' decision for channel choices. The analysis was based on variables affecting choices of vegetable marketing outlets. Accordingly, the result indicated that the probability to choose the collector outlet was significantly affected by access to extension service, owning transport facility, membership to any cooperatives and post harvest value addition compared to wholesale outlet. Similarly, the probability of choosing retailer marketing outlet was affected by Woreda dummy, educational status of household head, access to extension services and owning transport facility compared to wholesale outlet.

According to Mamo and Degnet (2012), gender and educational status of the household head together with household access to free aid, agricultural extension services, market information, non-farm income, adoption of modern livestock inputs, volume of sales, and time spent to reach the market have statistically significant effect on whether or not a farmer participates in the livestock market and his/her choice of a market channel. They used binary logit and multinomial logit to explore the patterns and determinants of smallholder livestock farmer's market participation and market channel choice using a micro-level survey data from Ethiopia.

### **2.6.3. Factors affecting value addition decision**

Value addition refers to the act of adding value(s) to a product to create form, place, and time utility which increase the customer value offered by a product or service. It is an innovation that enhances or improves an existing product or introduces new products or new product uses (Fleming, 2005).

Punjabi (2007) observed that it has become clear worldwide that the most rapid growth in agriculture has been occurring on the part of post-production activities. This is being driven by growth of middle income consumers even in low income countries and their demands for better quality value added products. Absence of agro-industry and agribusiness resulting in low levels of value addition of agricultural commodities has been one of the main causes of stagnation in rural incomes. A substantial agribusiness sector generating a high outflow of value added commodities is always correlated with high agricultural GDP and high rural incomes.

Karantininis *et al.* (2008) investigated what determines innovation in the agro-food industry. They used the number of products launched (zero inflated Poisson model) and investments in innovation as a percentage of sales (heckman sample selection model) as proxies for innovation activity of the firm. They noted that number of products launched is a misleading indicator as it is heavily influenced by product proliferation and not innovation. They concluded that organization, stage in the value chain and market power are important to innovation, and that wholesalers and retailers tend to have a larger number of new products, whereas manufacturing firms tend to invest more in research and development.

Brewin *et al* (2009), examined the adoption of product and process innovations in the Canadian food processing industry using multivariate probit model. Their findings suggest that firms that conduct both process and product innovations in-house are better able to enjoy complementarities that arise in the discovery process. They also found that firms were more likely to innovate in response to keeping pace with competitors.

## **2.7. Conceptual Framework**

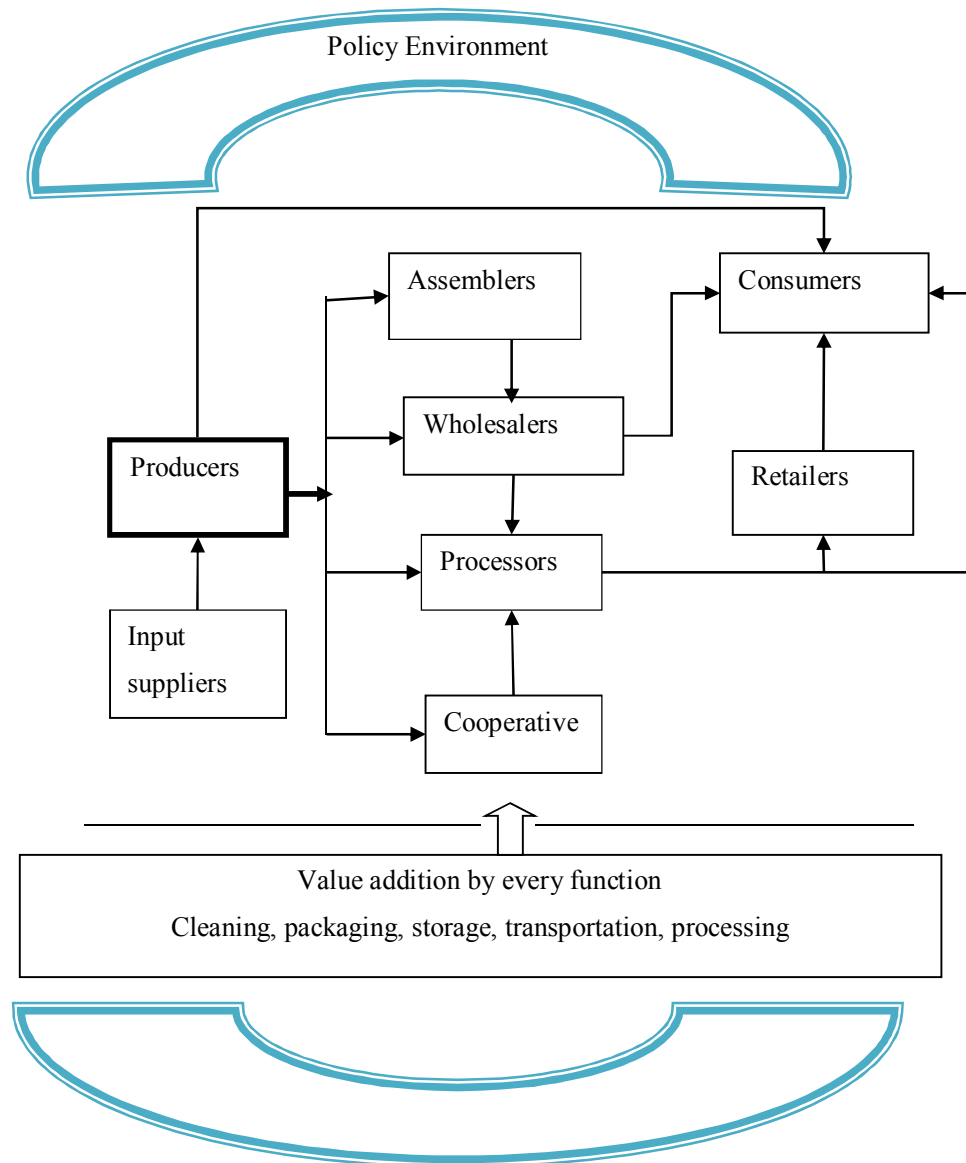
A widely accepted conceptual framework in industrial organization studies holds that structural conditions determine the behaviour (conduct) and subsequent performance of a firm. To assess market, conduct and performance, and to properly understand the roles of each element, Waldman and Jensen (2001), linked those elements and attributes that have direct relationship. In perfectly competitive markets, an atomistic market structure results in

efficient economic performance with price equals to marginal cost, efficient firms driven from the market, and long-run economic profits equal to zero.

Value chains include process actors such as input suppliers, producers, processors, traders and consumers. At one end are the producers – the farmers who grow the crops and raise the animals. At the other end are consumers who eat, drink and wear the final products. In the middle may be many individuals and firms, each performing one small step in the chain: transporting, processing, storing, selling, buying, packaging, checking, monitoring and making decisions. A value chain also includes a range of services needed including technical support (extension), business enabling and financial services, innovation and communication, and information brokering. The value chain actors and service providers interact in different ways starting from the local to national and international levels.

The value chain includes direct actors who are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors who provide services or support the functioning of value chain. These include financial or non-financial service providers such as bankers and credit agencies, business service providers, government, researchers and extension agents. Figure 2 illustrates the general framework for value chain actors and support system.

Figure 2: Wheat value chain framework



Source: Own design

The chains can be simple when producers directly sell to the consumers but long and complex when the other actors play role in buying, processing, transporting and selling to the end user, the consumer. The complex chain, however, offers a multitude of choice to farmers. They may choose to supply a specific market segment, and produce the crop or animal that is tailored to that segment. That will increase their bargaining power in the chain, and improve their price they get for their product. This in turn increases farmers' comparative advantage by increasing the volume of supply, quality of the product and consistency of supply, which is often possible when farmers act as a group (Mayoux, 2003).

### 3. METHODOLOGY

This chapter presents the features of the study area where the research was conducted and the methodologies adopted in the sampling and data analysis including data types and data sources, methods of sampling, methods of data collection and analysis.

#### 3.1. Description of the Study Area

##### 3.1.1. Overview of Bale zone

Bale zone is one of the 18 administrative zones in Oromia national regional state which is located in south-eastern Ethiopia. It has borderlines with Arsi, Guji, West and East Hararge zones as well as Somali and Southern Nations and Nationalities and Peoples' Regional States. It has 18 districts out of which nine are located in highland agro-ecology whereas the remaining nine are located in mid and lowland respectively. The zone is found in Southeast of Oromia Regional State that extends from 5° 22'S – 8° 08'N latitude and 38° 41'W – 40° 44'E longitudes. Bale zone has four agro-ecological zones namely extreme highlands 0.04%, highland 14.93%, midland 21.5%, and lowland 63.53%. The altitude ranges from below 1000 in the lowlands to 4377m above sea level in the highlands.

Total area of Bale zone is about 63,555 km<sup>2</sup> which is 16.2% of Oromia region. About 10.6% of the land is arable land used for crop production, 24.6% grazing land, 41.8% forest, and others 25% (BZADO, 2012). Most of the districts in Bale highlands are known for their bimodal rainfall patterns and are therefore highly suitable for agriculture. They have two distinct seasons i.e. Belg (from March to July) and Meher (from August to January). About 274,785 hectares of land in Bale zone is cultivated during Belg season while 371,628 hectares is cultivated during Meher season.

. The area receives an average annual rainfall of 400-2500mm and min and max temp 3.5<sup>0</sup>c and 35<sup>0</sup>c and altitude ranges from 300 to 4377masl.

Based on the figure from BZADO (2012) report Bale zone has an estimated total population of 1,741,197 out of which 881,559 are male and 859,638 are female.

More than 95% of the rural population is dependent on agriculture and 88% lives in rural areas. Forests and shrubs covered about 34.4% of the zone, while about 4.8% of the zone was degraded and others. Major crops grown in the zone are wheat, barley, maize, teff, sorghum, faba beans, field pea, and linseeds. Enset, coffee and chat are also grown in the zone.

### **3.1.2. An overview of Sinana district**

Sinana district is located in the north western part of Bale zone (figure 1). The total area of the district is about 1168 km<sup>2</sup>. The district has 20 rural kebeles. The altitude of the district ranges from 1650 to 2950 m a.s.l. From the total area of the district about 73.54 % is plain land, 3.7% is hills, 9.6 % is mountains, 12.3 % is rugged and 0.86 % is gorge. The annual average temperature is 16.5°C where as the minimum and maximum temperature is 9°C and 23°C respectively. The annual average rainfall is 1105mm where as the minimum and maximum rainfall is 1060 and 1150mm respectively (BOFED, 2009). Farmers in the district experienced mixed farming system of both crop and livestock. The major crops produced in the district are wheat, barley, pulses and oil crops. Rainfall pattern of the district is characterized by bi-modal rain fall distribution. The district has two distinct seasons, i.e. Belg which extends from March to July and Meher which extends from August to January (BZADO, 2012).

The presence of Sinana Agricultural Research Center (SARC) and Oromia Seed Enterprise creates good opportunity for the farmers in the study area. Farmers in the study area have access to improved agricultural technologies mainly because of their proximity to Sinana Agricultural Research Center and Oromia Seed Enterprise, Bale branch.

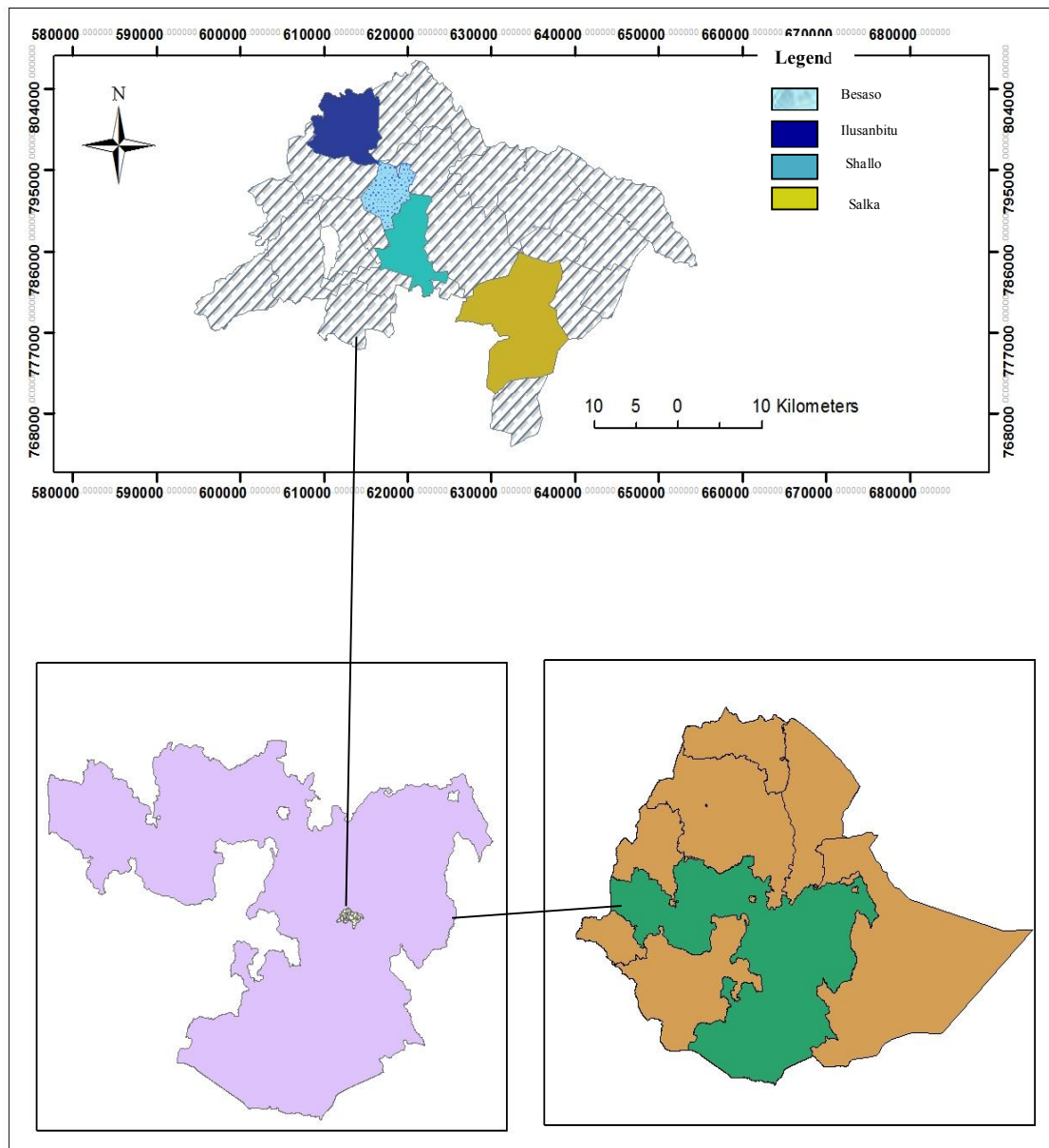


Figure 1 : Map of the study area

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

#### **Data Sources and Types**

The data for this study were collected from primary and secondary sources. Formal and informal sample survey methods were used to collect primary and secondary data. Primary data were collected from producers, wholesalers, assemblers, retailers, processors, cooperatives and agricultural input suppliers. The main data types collected include production, buying and selling, pricing, input delivery and distribution, market supply of wheat, market outlets, constraints and opportunities characteristics of the actors involved in wheat crop production and marketing in the study area.

Secondary information were gathered from published and unpublished materials, district agriculture and rural development offices, farmers' organizations, input suppliers, marketing agencies and from different development organizations of the study area.

#### **Methods of Data Collection**

Primary data were collected using structured interviews and Rapid Market Appraisal (PRA. Informal survey was conducted using Rapid Market Appraisal (RMA) technique using checklists. Formal survey was undertaken with randomly selected farmers, wholesalers, retailers, processors, input suppliers and cooperative representatives using a pre-tested structured questionnaire for each group. Secondary data relevant for this study were gathered from published and unpublished materials using questionnaire.

### 3.3. Sampling Procedure and Sample Size

A multistage purposive random sampling procedure was used to select representative households in the study area. In the first stage, Sinana district was selected purposely as it has the largest area under wheat production in the study zone. In second stage out of 20 PAs of Sinana district, four Kebeles were selected randomly as all kebeles are producers of wheat in the district.

#### 3.3.1. Farmers sampling

A list of wheat producers along with area allocated under wheat was prepared by the researcher. Finally appropriate numbers of sample farmers from four kebeles were selected in proportional to population size using Yemane (1967) formula. Accordingly, the required sample size at 95% confidence level with degree of variability of 5% and level of precision equal to 9% are recommended to obtain a sample size required which represent a true population.

$$n = \frac{N}{1 + \frac{N \cdot e^2}{k^2}}$$

Where, n = sample size, N= Population size and e = level of precision assumed 9%. Using the above formula, totally 123 farm household heads were selected from the total woreda farmer household heads of 15,835 and interviewed.

#### 3.3.2. Wholesalers, retailers, millers and cooperatives sampling

In addition to farmer households, sample wholesalers, assemblers, millers, and retailers were interviewed. The lists of wholesalers, millers and retailers were obtained from the district Office of Trade and Industry (OoTI). Based on the number of wholesalers available in the district, ten wholesalers and ten assemblers were selected randomly. Since processing/milling of wheat is only conducted in zonal town Robe, all five flour mills available in Robe town were interviewed.. Finally four cooperatives, one from each PA were interviewed.

### **3.4.Methods of Data Analysis**

Descriptive statistics, inferential statistics and econometric analysis were used to analyze the data collected from wheat producers and traders involved in wheat marketing.

#### **3.4.1. Descriptive statistics**

Descriptive statistics such as mean, maximum, minimum, standard deviation, frequencies, percentages and graphs in the process of examining and describing demographic outputs and marketing functions was applied.

##### **3.4.1.1.Value chain analysis**

The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use. The analysis of wheat value chains will highlight the need for enterprise development, enhancement of product quality, and quantitative measurement of value addition along the chain, promotion of coordinated linkages among producers and improvement of the competitive position of individual enterprises in the marketplace. The following four steps of value chain analysis were applied in this study:

1. Mapping the value chain: This helps to understand characteristics of the chain actors and the relationships among them, including all actors in the chain, the flow of wheat through the chain, employment features, and the destination and volumes of domestic sales. This information will be obtained by conducting surveys and interviews as well as by collecting secondary data from various sources.
2. Identifying the distribution of actors' and benefits in the chain: This involves analyzing the margins and profits within the chain and therefore will determine who benefits from participating in the chain and who will need support to improve performance and gains.

3. Defining upgrading needed within the chain: By assessing profitability within the chain and identifying chain constraints, upgrading solutions will be defined. These will include interventions to improve product design and quality, reorganize the production system or invest in new technology to upgrade the process and enhance chain efficiencies, introduce new functions in the chain to increase the overall skill content of activities; and adapt the knowledge gained in particular chain functions in order to redeploy it.
4. Emphasizing the governance role: By focusing on governance, actors that may require support to improve capabilities in the value chain, increase value addition in the sector and correct distributional distortions will be identified. Thus, governance constituted a key factor in defining how the upgrading objectives could be achieved. Following the above procedure, the main aspects of wheat value chain analysis will be conducted by applying some quantitative and qualitative analysis.

#### **3.4.1.2. Structure-Conduct-Performance (S-C-P) of wheat market**

The model examines the causal relationships between market structure, conduct, and performance, and is usually referred to as the structure conduct and performance (S-C-P) model. In agricultural economics, the most frequently used model for evaluating market performance is based on the industrial organization model. Different scholars like Wolday (1994) and Mohamed (2011) also used this model to evaluate food grain market in Halaba special district. I also, used S-C-P model to evaluate how efficiently wheat market in the study area is functioning.

##### **a) Structure of market**

Market structure is defined as characteristics of the organization of a market which seems to influence strategically the nature of competition and pricing behavior within the market. Structural characteristics like market concentration, industry maturity, government participation, product differentiation, barriers to entry, and diversification, will be some of the basis to be considered. The perfect competition model will be used as a standard to study the structure of the market.

##### **Market concentration**

Market concentration which refers to number and size of distribution of sellers and buyers in the market, the firm's objectives, barriers to entry, economies of scale, and assumptions about rival firm's behaviours are relevant in determining the degree of concentration and behaviours and performance (Schere, 1980). As an economic tool market concentration is useful because it reflects the degree of competition in the market. The original concern with market concentration may be based on the relationship between high concentration and collusion. There are theoretical models of market interaction that predict that an increase in market concentration will result in higher prices and lower consumer welfare even in the absence of explicit collusion.

The concentration ratio of an industry is used as an indicator of the relative size of firms in relation to the industry as a whole. It is calculated as the sum of the percent market share of the top  $n$  firms. This may also assist in determining the market structure of the industry. One commonly used concentration ratio, the *four-firm concentration ratio*, or  $C_4$ , consists of the market share of the four largest firms as a percentage of the total volume of goods or services mobilized in the total industry.

The greater the degree of concentration, the greater will be the possibility of non-competitive behaviour, such as collusion, existing in the market. The concentration ratio (market ratio) of individual will be calculated using a formula:

$$C_n = \frac{\sum_{i=1}^n MS_i}{\sum MS_i} \quad (1)$$

Where  $MS_i$ - market share of buyer  $i$

$V_i$  - amount of product handled by buyer  $i$

$\sum V_i$  - Total amount of product handled

Market concentration ratio is, therefore, traditionally measured as:

$$C_k = \sum_{i=1}^k S_i \quad (2)$$

Where  $C_k$  - concentration ratio for the first  $k$  largest firms

$S_i$  - percentage share of the  $i^{\text{th}}$  firm

$r$  - Number of largest firms for which the ratio is going to be calculated.

Kohl's and Uhl (1985) bring into play as a rule of thumb, four largest enterprises' concentration ratio of 50% or more (an indication of a strongly oligopolistic industry), 33-

50% (a weak oligopoly) and less than that (competitive industry). The problem associated with this index is the arbitrary selection of  $r$  (the number of firms that are taken to compare the ratio).

### **b) Market conduct**

Market conduct refers to the patterns of behaviour that firms follow in adapting or adjusting to the markets in which they sell or buy. There are no agreed up on procedures for analyzing the element of market conduct. It is a systematic way to detect indication of unfair price setting practices and the conditions under which such practices are likely to prevail. More specifically they cover the following topics: The existence of formal and informal marketing groups that perpetuate unfair price setting practices; Formal and informal producer groups that affect bargaining power; The availability of price information and its impact on prevailing prices; The distance from the major market and its impact on prices; and the feasibility of utilizing alternative market outlets.

Market conduct definition given above implies to the analysis of human behaviour patterns that are not readily identifiable, obtainable, or quantifiable. Thus, in the absence of a theoretical framework for market analysis, there is a tendency to treat conduct variables in a descriptive manner, or as a spill-over in the assessment of market performance. The features or elements of market conduct include (1) cooperation, (2) integration, (3) strategies, and (4) services. Generally the conduct of a market can be characterized by the following practices:

1. Pricing strategy – predatory, exclusionary, collusive;
2. Product strategy;
3. Responsiveness to change; and
4. Research and innovation.

For this research the following few questions will be taken into consideration to systematically detect indicators of unfair price setting practices and conditions in places or areas where such market injustices are likely to prevail. The issues that will be considered are the existence of formal and informal marketing groups that affect the bargaining power and the availability of price information as well as its impact on prevailing prices.

### c) Market performance

Market performance refers to the impact of structure and conduct as measured in terms of variables such as prices, costs, and volume of output. By analyzing the level of marketing margins and their cost components, it is possible to evaluate the impact of structure and conduct characteristics on market performance. For most countries, it is generally acknowledged that a distribution system displaying acceptable performance is one that (1) allows technological progress, (2) has the ability to adapt, (3) innovates and utilizes resources efficiently, and (4) transmits prices that reflect costs.

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

The major indicators or measures of market performance are: Net returns, marketing margins; marketing costs; producer's share; and value added 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, Wohlgengnant and Mullen, 1987; Schroeter and Azlam, 1995; Holt, 1993) and (Sexton *et al.* 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 competition, additional factors such as seasonality, technological changes, and sales volume may also explain the variations in the margin. For this study marketing margin is selected to analyze the performance of marketing systems in study area.

**Marketing margin:** Margin determination surveys should be conducted parallel to channel survey. To determine the channel, one asks the questions "From whom did you buy?" and "To whom did you sell?" Scott (1995) pointed out to obtain information concerning the margins, agents have to answer the question "what price did you pay?" and "what was the selling price?"

The cost and price information used to construct marketing cost and margin will be gathered during field work conducted. Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer and is expressed as 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).

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 study, gross marketing margin was considered instead of net marketing margin, as it was difficult to estimate the implicit costs incurred during transaction of wheat in highland of Bale.

Marketing margin was calculated taking the difference between producers and retail prices. The producers’ share is the commonly employed ratio calculated mathematically as, the ratio of producers’ price (ex-vessel) to consumers’ price (retail). Mathematically, producers’ share can be expressed as:

$$PS = \frac{Px}{Pr} = 1 - \frac{MM}{Pr} \quad (3)$$

Where: PS = Producers’ share

Px = Producers price of wheat

Pr = Retail price of wheat which is consumer price

MM = marketing margin

Total marketing margin is given by the formula:

$$TGMM = \frac{Pr - Px}{Pr} \times 100 \quad (4)$$

Where TGMM-Total gross marketing margin



### 3.5.2. Factors affecting market outlet choices

To identify factors affecting wheat market outlet choices, multinomial logit model was used. If there are a finite number of choices (greater than two), multinomial logit estimation is appropriate to analyze the effect of exogenous variables on choices. The multinomial logit model has been widely used by researchers such as Schup *et al.* (1999), and Ferto and Szabo (2002). It is a simple extension of the binary choice model and is the most frequently used model for nominal outcomes that are often used when a dependent variable has more than two choices.

This study assumes that farmer's decision is generated based on its utility maximization. This implies that each alternative marketing outlet choice entails different private costs and benefits, and hence different utility, to a household decision maker. The analytical model is constructed as follows. Suppose that the utility to a household of alternative  $j$  is  $U_{ij}$ , where  $j = 0, 1, 2, \dots$ . From the decision maker's perspective, the best alternative is simply the one that maximizes net private benefit at the margin. In other words, household  $i$  will choose marketing outlet  $j$  if and only if  $U_{ij} > U_{ik}, \dots, \forall j \neq K$ . It is important to note that household's utility cannot be observed in practice. What a researcher observe are the factors influencing the household's utility such as household and personal characteristics and attributes of the choice set experienced by the household. Based on McFadden (1978), a household's utility function from using alternative  $j$  can then be expressed as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (7)$$

Where,

$U_{ij}$  is the overall utility,

$V_{ij}$  is an indirect utility function and

$\varepsilon_{ij}$  is a random error term.

The probability that household  $i$  select alternative  $j$  can be specified as:

$$\Pr(y_i = j) = \Pr(U_{ij} \geq U_{ik}), \text{ for all } k$$

$$= \Pr(U_{ik} - U_{ij} \leq 0), \text{ all } k$$

$$P_{ij} = \Pr(\varepsilon_{ik} - \varepsilon_{ij} \leq V_{ij} - V_{ik}, \forall K \neq j), \text{ all } k \quad (8)$$

Assuming that the error terms are identically and independently distributed with type I extreme value distribution, the probability that a household chooses alternative  $j$  can be explained by a multinomial logit model (Greene, 2000) as follows:

$$\text{Prob}(Y_i = j) = \frac{\exp(\beta_j X_{ij})}{\sum_{j=1}^J \exp(\beta_j X_{ij})} \quad (9)$$

$X_{ij}$  is a vector of household of the  $i^{\text{th}}$  respondent facing alternative  $j$

$\beta_j$  is a vector of regression parameter estimates associated with alternative  $j$ .

Following equation (9) above, we can adapt the MNL model fitting to this study can be expressed as follow:

$$P(Y_i = j/X_i) = \frac{\exp(\beta_j X_{ij})}{\sum_{j=1}^J \exp(\beta_j X_{ij})} \quad (10)$$

Where,

$i$  represents  $i^{\text{th}}$  farm household, and  $i=1,2,3,\dots,154$ .

$j$  represents different marketing outlets,  $j=1$  for sale to wholesalers,  $j=2$  for sale to cooperatives  $j=3$  for sale to assemblers and  $j=4$  for sale to processor.

$P$  = represents the probability of wheat marketing outlet  $j$  to be chosen by farm household  $i$ ;

$\text{CHOICE}_{ij} = j$  means that wheat marketing outlet  $j$  is chosen by farm household  $i$ ;

$X_i$  = is independent variables

It is a common practice in econometric specification of the MNL model to normalize equation by one of the response categories such that  $\beta_j = 0$ . In this regard, the MNL model can alternatively be specified as follow:

$$P_{ij} = \frac{\exp(\beta_j X_{ij})}{\sum_{j=1}^J \exp(\beta_j X_{ij})} \quad (11)$$

The coefficients of explanatory variables on the omitted or base category are assumed to be zero.

The probability that a base category will be chosen can be calculated as follows:

$$P_j = \frac{e^{\beta_j'X_j}}{\sum_{j=1}^J e^{\beta_j'X_j}} \quad (12)$$

The marginal effects of the attributes on probability of choice are determined by differentiating equation 12.

$$\delta_j = \frac{\partial P_j}{\partial X_j} = P_j(\beta_j - \sum_{k=1}^J P_k \beta_k) \text{ for } j=1, 2, 3 \dots J \quad (13)$$

Where,

$P_j$  is the probability that farmers choose market outlet  $j$

$\beta_j$  is a vector of regression parameter estimates associated with alternative  $j$ .

The dependent variables (the marketing outlet (CHOICE) chosen) in the analysis are measured by the probability of selling wheat to either of these markets outlets.

### 3.5.3. Factors affecting wheat value addition

Probit model was used to determine the factors affecting the decision to engage in value addition of wheat. The decision to use probit was based on the fact that the decision to add value is discrete and dichotomous (one either adds value or not), discrete decisions are analyzed using qualitative response models one of which is probit. The other qualitative response models are logit and linear probability model (LPM). Logit models are used to analyze data that has a logistic cumulative distribution function while LPM has a number of shortcomings that make it unsuitable; it can generate probability values that lie below zero or above one, which would be unrealistic. LPM also leads to questionable values of  $R^2$  as a measure of goodness of fit (Gujarati, 2004). This study assumes a normal cumulative distribution function and hence the choice of probit. Empirically the model is presented as follows:

$$y^* = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \epsilon \quad (14)$$

$$y = 1 \text{ if } y^* > 0$$

$$y = 0 \text{ if } y^* < 0$$

Where,

$y^*$  = is a latent (unobservable) variable representing farmers discrete decision whether to add values to wheat or not

$\beta_i$  = a vector of parameters to be estimated

$\alpha$  = Constant

$\varepsilon_i$  = is normally distributed disturbance with mean (0) and standard deviation of  $\delta_i$  and captures all unmeasured variables

$Y$  = is a dependent variable which takes the value of 1 if the farmers add values on wheat and 0 otherwise.

### Specification tests

It is important to check multicollinearity, heteroscedasticity and endogeneity problems before running the model. Multicollinearity problem arises due to a linear relationship among explanatory variables; and becomes difficult to identify the separate effect of independent variables on the dependent variable because there exists strong relationship among them (Gujarati, 2003). Variance inflation factors (VIF) technique was employed to detect multicollinearity in continuous explanatory variables. According to Gujarati (2003) VIF ( $X_j$ ) can be defined as:

$$VIF(X_j) = \frac{1}{1 - R_j^2} \quad (15)$$

Where,  $R_j$  is the multiple correlation coefficient between  $X_j$  and other explanatory variables. If the value of VIF is 10 and above, the variables are said to be collinear.

Contingency coefficient was used to investigate multicollinearity problem in discrete variables.

$$CC = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

Where,  $N$  is the total sample size

If  $CC$  is greater than 0.75, the variables are said to be collinear.

In order to check existence of heteroscedasticity problem in the data set, the parameter estimates of the coefficients of the independent variables cannot be BLUE. Therefore, Breusch-Pagan test of heteroscedasticity which does not require ordering of observations but requires the assumption of normality was employed for detecting heteroscedasticity in this study.

The problem of endogeneity occurs when an explanatory variable is correlated with the error term in the population data generating process, which causes, the ordinary least squares estimators of the relevant model parameters to be biased and inconsistent. The source of endogeneity could be omitted variables, measurement error and simultaneity (Wooldridge, 2000). If we do not have endogeneity, both OLS and IV are consistent. In order to test problem of endogeneity, Hausman test was employed. The idea of Hausman test is to see if the estimates from OLS and IV are different.

The result of endogeneity test using Hausman test indicated that the variable quantity produced of wheat was endogenous to volume of wheat supplied to market.

In order to use multinomial logit model the conditions of Independent Irrelevant Alternative assumption must be fulfilled. IIA implies that the decision between two alternatives is independent from the existence of more alternatives. The validity of IIA assumption can be also tested using Hausman's specification test. Following (Green, 2003) the statistics is given as:

$$H^2 = (b_s - b_f)' (V_s - V_f)^{-1} (b_s - b_f) \quad (16)$$

Where, s indicates estimators based on the restricted (constrained) subsets, f indicates estimators based on the full set of choices (Unconstrained). Therefore,  $b_s$  and  $b_f$  are the respective coefficients, and  $V_s$  and  $V_f$  are the respective estimated covariance matrices. Accordingly the Hausman specification test was checked for IIA before applying the model to study.

### 3.6. Definition of Variables and Hypothesis

To identify factors affecting wheat supply to the market, value addition and choice of market outlets that actors involved in the marketing of the crop, the following variables were assumed to affect dependent variables and used for this study.

### **3.6.1. Dependent variables**

**Quantity of wheat supplied to the market:** It is dependent variable which represents the amount of wheat actually supplied to the market by household in the year 2013/14 which is measured in quintals.

**Market outlets:** This is a categorical variable that represents wheat market outlets in the study area. It assumes 1 for wholesalers, 2 for cooperatives, 3 for processors and 4 for assemblers.

**Factors affecting value addition:** It is dependent variable which represents whether the farmer participates in value addition or not. Value addition considered for these study are time value (storage), place value (transportation) and product value (cleaning). It is dummy variable that takes 1= if the farmers participate in value addition and 0=otherwise.

### **3.6.2. Independent variables**

The independent variables hypothesized to affect the dependent variables are presented as follows.

#### **a) Independent variables for factors affecting quantity of wheat supplied to market and participation in value addition**

**Access to market information:** This is dummy variable assigned 1 if the farmer has access to market information and 0 otherwise. A study by Muhammed (2011) revealed that if wheat producer gets market information, the amount of wheat supplied to the market increases. Alemayehu (2012) also found that access to market information positively affected amount of ginger supplied to market. The study by Abraham (2013) indicated that access to market information affected marketed supply of potato and tomato positively and significantly.

Therefore it is hypothesized that access to market information positively affects amount of wheat supplied to market and decision to participate in value addition.

**Access to extension service:** This is a dummy independent variable taking the value 1 if a household had access to extension services and 0 otherwise. Different studies conducted previously revealed that extension agent visits had direct relationship with market outlet choices (Holloway and Ehui, 2002; Rehima, 2006). Thus access to wheat extension service is hypothesized to affect quantity of wheat supply to market and decision to be engaged in value addition positively.

**Size of farmland:** It is a continuous variable referring to the total area of farmland a farmer owned, rented in and/or shared in during 2013/14 production year, including shared and rented in, measured in hectare. It is assumed that the larger the total area of the farmland the farmer owns, the larger land is allocated for wheat and the higher would be the output. Alemayehu (2012), indicated that a unit increase in land allocated for ginger, would give rise to 11.1qt increase in the amount of ginger supplied to market. So it is hypothesized that size of land holding positively influences volume of market supply.

**Livestock:** This is a continuous variable measured in tropical livestock unit (TLU). Farmers who have many livestock are anticipated to specialize in livestock production so that they allocate large share of their land for pasture. Study by Rehima (2006) on pepper marketing showed that TLU had a negative sign on quantity of pepper sales. On the other hand, it is assumed that household with larger TLU have better economic strength and financial position to purchase sufficient amount of input (Kinde, 2007). For this study livestock ownership is hypothesized to influences volume of wheat sales positively.

**Farming experience:** This is a continuous independent variable measured in year's household engaged in farming activities. Abraham (2013) also proved that farmers who have more experience provide more of their potato product to market. Hence it is hypothesized that experience of the farmers on farming activities positively influences both supply of wheat and decision of participation in value addition.

**Quantity of wheat produced:** It is the total amount of wheat produced in quintals in 2013/14 production season in the study area. An increase in volume of production has a

significant effect on market supply and motivates farmers of to increase the supply of commodity to the market. Ayelech (2011) found that the amount of tomato, papaya, avocado and mango produced by farming households has augmented marketable supply of the commodities significantly. Abraham (2013) also found that the amount produced of tomato, potato and cabbage significantly affects quantity supplied to market. Therefore, it is hypothesized that quantity of wheat produced positively affects the supply of wheat to market and the decision of participating in value addition.

**Lagged price of wheat per quintal:** This is a continuous variable that measured annual average price of wheat in the reference market. The variable market price of wheat was measured in Birr per quintal. Tomek and Robinson (1985) argued that product price has direct relations with marketable supply and hence it was expected to affect the household marketable supply of wheat positively in such a way that prices of 2012/13 can stimulate production of wheat, and thus marketable supply for 2013/14. So, it is hypothesized that lagged price positively affects wheat supply to the market.

**Education level of household head:** This variable was measured using formal schooling of the household head and hypothesized to affect marketable supply positively. It takedummy values 1 if the household head attended any formal education and 0 otherwise. This is due to the fact that a farmer with good knowledge can adopt better practices than illiterates that would increase marketable supply. Holloway *et al.* (1999) argued that education had positive significant effect on quantity of milk marketed in Ethiopian highlands. Thus, it is hypothesized that education has positive effect towards quantity supplied to market and decision of participating in value addition.

**Age of household head:** It is a continuous variable which refers to the age of the household head measured in years. It believed that age can serve as a proxy for experience. Aged household heads are believed to be wise in resource use, and it is expected to have a positive effect on market participation and marketable surplus. Tshiunza *et al.* (2001) used age as the major farmers' characteristics that significantly affected the proportion of cooking banana planted for market. He found that younger farmers tended to produce and sale more cooking banana for market than older farmers. On the other hand Abraham (2013) also proved that aged farmers provide more of their vegetable product to market. The result suggests that as farmers have high potato production experience the amount of potato supplied to the market

increased through its effect on potato production in the first stage. For this study, it is hypothesized that age has positive effect.

**Family size:** This is a continuous independent variable that is measured in terms of the number of members in a household. Household size increases domestic consumption requirements and may render households more risk averse. Controlling for labor supply, larger households are expected to have lower market participation. Lapar *et al.* (2003), Edmeades (2006) and Berhanu and Moti (2010) found out negative relationship between household size and market participation of households. In this study the variable is hypothesised to affect volume supplied to market negatively and significantly. But it is hypothesized to affect value addition positively and significantly.

**Sex of the household head:** In mixed farming system, both men and women take part in crop production and management. Generally, women contribute more labor input in area of land preparation, planting, weeding, harvesting and sale of wheat. However, obstacles, such as lack of capital, and access to institutional credit, access to extension service, may affect women's participation and efficiency in teff and wheat production (Tanga *et al.*, 2000). Therefore, it is not possible to tell a priori about the likely sign of the coefficient of sex in sales volume.

#### **b) Independent variables for factors affecting market outlet choices**

**Family size:** This is a continuous independent variable that is measured in terms of the number of members in a household. Household size increases domestic consumption requirements and may render households more risk averse. Controlling for labor supply, larger households are expected to have lower market participation. Lapar *et al.* (2003), Edmeades (2006) and Berhanu and Moti (2010) found out negative relationship between household size and market participation of households. Therefore, it is hypothesized that it will affect accessing cooperative wheat market outlet choice positively as compared with accessing other wheat market outlets.

**Access to extension services:** This is a dummy independent variable taking the values 1 if the wheat producer farmers have access to extension services and zero otherwise. It is expected that wheat extension service widens household knowledge with regard to use of

improved wheat technologies. Agricultural extension services are expected to enhance households' skills and knowledge, link households with technology and markets (Lerman, 2004). Birhanu *et al* (2013) found that access to dairy extension services such as dairy technology information, training, field days, field visits and field tours received by households positively and significantly affected accessing cooperative milk market outlet as compared with accessing individual consumer milk market outlet. Different studies conducted previously revealed that extension agent visits had direct relationship with market outlet choices (Holloway and Ehui, 2002; Rehima, 2006). Thus access to wheat extension service is hypothesized to affect accessing cooperative wheat market outlet choice positively as compared with accessing other wheat market outlets.

**Distance to nearest market:** This is a continuous independent variable measured in kilometre. The closer a household to the nearest urban center, the lesser would be transportation costs, loss due to spoilage and better access to market information and facilities. Berhanu and Moti (2010) found out negative relationship between market participation and distance to the nearest urban market center. Therefore, households who are at far away from urban center are hypothesized to affect the likelihood of accessing cooperative wheat market outlet positively as compared with accessing other wheat market outlets.

**Membership to cooperative:** This is defined as dummy variable that takes 1 if the household is member of cooperative and 0 otherwise. Farmers who are members of cooperative are supposed to sell to cooperative rather than other market outlets. Abraham (2013) found that membership to cooperative affects negatively and was significant related with retail outlet choice. His result indicated that for those households who were members of cooperatives the probability of choosing collector outlet decreased by 23.4% compared to base category. Hence, membership to cooperative is hypothesized to affect accessing cooperative market outlets positively as compared to accessing other market outlets.

**Income from non/off farm activities:** This is treated as a dummy variable and measured as 1 if the household obtained income from off/nonfarm activities, and 0 otherwise. Rehima (2006) found that if pepper producer have non-farm income, the amount of pepper supplied to the market decreases. Again, farmers who gain more income from non/off farm income want to supply their vegetable to any nearest market outlet with low price than to go far.

Therefore it is hypothesized that off/non-farm income influence market outlet choice decision of wheat producers positively.

**Access to credit:** This is a dummy variable that takes 1 if the household takes loan and zero otherwise. Access to credit would enhance the financial capacity of the farmer to purchase inputs, thereby increasing production and market share size. Therefore, it is hypothesized that access to credit would have positive influence on level of production and sales. Alemnewu (2010) and Muhammed (2011) found that if pepper and teff producer gets credit, the amount of pepper and teff supplied to the market increased. Due to these, it is hypothesized that access to credit will have influence on wholesale market outlet choice decisions.

**Ownership of market transport facilities:** Specifically vehicles, carts and transport animals would be used to measure the availability of produce transportation facilities by households. In cases where households owned transportation facilities, the variable took the value of one, and zero if the household did not own any form of transport facility. This variable is expected to have influence on the market outlet choice of wheat producers positively. The availability of transportation facilities helps reduce long market distance constraint, offering greater depth in marketing choices (Jagwe, 2007).

**Own price of the commodity:** It is continuous variable, which is, price given for the commodity with different market outlets per quintal. Each market outlet average price will be asked. According to Birhanu *et al* (2013) price offered by milk market outlet per liter of milk significantly and negatively affected accessing cooperative milk market outlet as compared with accessing individual consumer milk market outlet. Hence, it is hypothesized that price given by market outlets negatively affects cooperative market outlet choice.

## **4. RESULTS AND DISCUSSION**

This chapter presents the major findings of the study. Both descriptive statistics and econometric methods were used to analyze the primary data. Descriptive statistics were employed to describe the demographic characteristics of sample farmers and traders. Econometric models were used to identify factors affecting volume of wheat supplied to market and factors affecting wheat market outlet choices in the study area.

### **4.1.Descriptive Statistics**

#### **4.1.1. Demographics and Socioeconomics Characteristics of Households**

The variables used to describe demographic characteristics of sample farmers were religion, educational level, sex, marital status, age and family size. The results presented in Table 1 depicts that 59.2% and 40.2% of the respondents were Muslim and Orthodox respectively. The results of the study also indicated that 88.3% of the respondents were male household heads. While the remaining 11.7% were female household heads. The result also reveal that 91.7% of them were married, 5% widowed and 3.3% were divorced.

Table 1: Demographic and socioeconomic characteristics of respondents

Variables		Frequency	Percent
		N=120	N=120
Religion	Muslim	71	59.2
	Orthodox	49	40.8
Sex	Male	106	88.3
	Female	14	11.7
Education level	Illiterate	13	10.8
	Read and write	7	5.8
	Primary (1-4)	47	39.2
	Junior (5-8)	38	31.7
	Secondary (9-10)	14	11.7
	Preparatory (11-12)	1	0.8
Marital status	Married	110	91.7
	Widowed	6	5
	Divorced	4	3.3
	Total	120	100
Age	Mean	46.28	
		(12.82)	
Family size	Mean	7.13	
		(2.58)	

Source: Own computation

Age is one of the important characteristics of the community. It reflects on the productivity of the population as it has a bearing on the overall health situation within the community. In developing countries, aged members are more prone to diseases and thus are less productive. It has a bearing on the employment pattern, spatial mobility and quality of work done. Age plays a significant role in any kind of business, particularly in agriculture, because the use of child labor on the farms is quite high. Accordingly, the maximum and minimum age of the respondent was 29 and 98 years respectively with mean age of 46.2 years.

Educational level of the household head can influence how he or she views the new technologies and new ways of doing business. It can affect technology adoption decision. Education can also contribute to decision-making processes that alter the paths people take in life. Educational level of the sample household heads in the study area ranges from illiteracy to tertiary levels. The proportion of household heads that were illiterate was 10.8%,

those who can read and write were 5.8%, those who were at primary, junior, secondary and preparatory educational levels were 39.2%, 31.7%, 11.7% and 0.8% respectively.

The livelihood of rural farm households mainly relies on agriculture which requires more labor for various activities like land preparation, planting, weeding, cultivation, harvesting, threshing, animal keeping, fetching water and fire wood collection and so on. The family size with age composition is important to carry out different agricultural activities. The average family size in the study area was 7.3 with standard deviation of 2.58.

#### **4.1.2. Land Use**

Land is perhaps the single most important factor of production and measure of wealth in the study area. It is the main source of income and increases the status of people in the community. The average land size of respondents was 3.91 hectare (Table 2). The average rented in and out land for household was 0.2 and 0.11 hectare respectively. The minimum and maximum size of landholding of the respondent farmers was 0.3 and 13.0 hectares respectively. Out of the total land, the respondents allocated most of their plots for wheat production, which was an average of 2.92 hectare on average out of total holding, since the area is known as wheat belt of the country. All of the sample respondents indicated that they are participating in wheat production activity.

Besides of wheat cultivation, different crops were grown by farmers. Crops like barley, maize, faba bean, field pea, emmer wheat and potato are the major ones.

Table 2: Land holding

Variables (ha)	Minimum	Maximum	Mean	Std. Deviation
Area of owned land	0.30	13.00	3.91	2.49
Area of rented in land	0.00	2.20	0.20	0.47
Area of rented out land	0.00	2.00	0.11	0.31
Area of shared in land	0.00	2.00	0.21	0.46
Area of rented out land	0.00	2.00	0.09	0.30
Area allocated for wheat in 2006/7	0.25	11.00	2.92	1.99

Source: Own computation from survey data

#### **4.1.3. Access to services**

Provision of adequate services for the communities enhances the communities' socio-economic development in general and the well-being of individuals in particular. It has important contribution in improving production and productivity and thereby increasing marketable surplus and ultimately for increasing the income of smallholder farmers. The most important services that are expected to promote production and marketing of wheat in the study area include access to credit, access to extension service, and access to market information.

##### **4.1.3.1. Access to market information**

Access to agricultural markets and marketing information are essential factors in promoting competitive markets and improving agricultural sector development. A well-organized market intelligence information system helps all the producers and traders freely interact with one another in arriving at prices. Access to reliable market information help farmers sell their surpluses of wheat and choose modes of transaction, each of which yields a different benefit. It has been postulated that farmers will choose a profitable mode of transaction if they can receive reliable market information on the prevailing market conditions.

Access to price information and source information of respondents in Table 3 showed that the major source of information was friends/neighbour farmers, which is 98.3%. About 71.1% and 70% of the respondents can get market information from radio and traders

respectively. Additionally development agents and television helped as sources of information by serving about 25.1% and 31.7% respondents respectively. Market bulletins and message blackboards was source for only 2.5% of respondents.

Table 3: Sources of market information for respondents

Sources of information	Percent
Traders	70.0
Friends/Neighbours	98.3
Development Agents	25.8
Market Bulletins	2.5
Radio	71.7
Television	31.7
Message Blackboard	2.5

Source: own survey computation

#### 4.1.3.2. Access to credit

The availability of financial sources for credit is crucial for farmers. Some farmers are using as an important input for agricultural activities. (Annex --) shows that 89.2% of respondents have access to credit. However, only 18.3% of the respondents have taken credit from the available sources in the study area. Factors that hinder farmers from taking credit in study area were religion and self sufficiency. The credit source for these farmers was cooperatives, local money lenders and microfinance. In addition, Oromia Credit and Saving Institution provide credit to farmers. However, the credit provision is based on group collateral but farmers are not much interested in this approach in order not to pay for defaulters in their group.

#### 4.1.3.3. Access to extension services

Extension service in agriculture is indispensable and it provides assistance for farmers in improvement of production and productivity, it also enables flow of information and transfer of knowledge and scientific findings to practice. Access to agricultural information services makes farmers to be aware of and get better understanding and ultimately leads to decision to take risk for improved agricultural practices. It helps in disseminating new innovations and ideas that emerges from research findings and improves better understanding of

technologies that benefit farmer's production and productivity. In addition, access to agricultural extension services helps to facilitate dissemination and adoption of improved technologies and ensure the local availability of these technologies for the majority of smallholders.

Currently in Ethiopia the government has been attempting to fill the required knowledge and achieve food self sufficiency in the country by placing in each Kebele administration three development agents (DAs) and building a farmer training center (FTC). Development agents are assigned as better source of extension services for farmers at kebele level that strengthens intensive method of extension work. However, some development agents revealed that district level bosses from different streams influenced them to do different activities out of agricultural extension professionally. The key informant discussions pointed out that some development agents have no time to deliver technical advice to farmers sufficiently. The result in Table 4 below indicated that 95.83% of respondent farmers have access to agricultural extension services.

Table 4: Access to agricultural extension services

PAs	Who have access to Agricultural Extension Service (N=120)	Percent
Ilu Sanbitu	26	21.67
Basaso	27	22.50
Selka	32	26.67
Shallo	30	25.00
Total	115	95.83

Source: Own computation from survey

#### 4.1.4. Input utilization

Inputs used by farmers of the study area are fertilizer, seed, herbicides and pesticides. These inputs are supplied to farmers either by cooperative/unions and private traders.

Cooperatives and unions are major suppliers of fertilizer for producers in the study area. Government (National Input Supply Enterprise) supplies to the unions with DAP and Urea fertilizers and then the unions can either sell to primary cooperatives, state farm, university, national and international research institutions or sell directly to investors who are engaged

agricultural activities. Fertilizer application is one of the most important agricultural practices that are used by wheat growers in the study area. Moreover, proper application of the recommended fertilizer rate is important to obtain the required production and marketable supply. However, farmers in the study area apply varying fertilizer rate, which is below the blanket recommendation rate given by Sinana Agricultural Research Centre. The recommendation rate given by Sinana Agricultural Research Centre is to apply 100kg of DAP and 50kg of UREA per hectare.

The survey result indicated that all sample respondents applied DAP (Di Ammonium Phosphate) and only 62.5% of them used UREA fertilizer on their wheat field. The rate of application was 96.81 and 43.65kg's on average for DAP and UREA respectively as indicated in table 5 below.

Table 5: Amount of seed and fertilizers used per hectare by the respondents in kilogram

Variables (N=120)	Minimum	Maximum	Mean	Std. Deviation
Improved seed used	100.00	350.00	201.23	35.28
DAP	50.00	200.00	96.81	17.87
UREA	10.10	100.00	43.65	16.76

Source: own computation from survey result

Major pesticides used by respondents of the study area were Pallas 45-OD, Topic, 2-4D, Tilt, Rexoudo, Mankozebe, Helarate and Bumper. Herbicides and insecticides used by farmers of the study area are supplied by sole proprietors, unions and primary cooperatives. Unions deal with herbicides and fungicides only while sole proprietor and primary cooperative trade in herbicides, fungicides and pesticides. Herbicides are supplied by private companies and unions to sole proprietors and primary cooperatives. They are bought from within the district, and from importers in Addis Ababa. Unions supply chemicals like 2, 4-D, Pallas, Topic and Tilt from private companies for users in the study area. Primary cooperatives also supply Pallas 45-OD and Topic chemicals for farmers at their kebele level.

Batu Agro chemical, Yerosan Pest control and Biyolesa private shops which supply different chemicals in the zone were also interviewed. Among these, Yerosan Pest Control was a wholesaler in Robe. They were supplying Pallas, 2, 4-D, Topic, Tilt, Rexoudo, Mankozebe, Helarate, Malathine, Bumper and Novofil. Their major suppliers of these chemicals (100%)

were private companies in Addis Ababa. The average quantity purchased per year varied among the private shops depending on their capital and availability of the market. Besides selling chemicals, chemical suppliers do other services such as supplying farm implements, vegetable seeds, and advices on chemical application to farmers.

Seed distribution remains largely informal and farmer-to-farmer exchanges account for as much as 90% of the seed trade. The government-owned Ethiopian Seed Enterprise (ESE) and Regional Seed Enterprises are the only public sector organizations involved in seed production, processing, and distribution. Research institutions provide foundation seed and breeding lines for improved varieties to the seed enterprises, which then multiplies seed in response to demand projections from the regional bureaus of agriculture. Seed Enterprises then distributes seed to farmers' cooperative unions via regional, zonal and woreda bureaus of agriculture.

Use of improved seed varieties with its appropriate recommendation is also believed to improve production and productivity of wheat crop in the study area. The major suppliers of seed for the study were seed producers and suppliers farmers, one union, two primary cooperatives, Oromia Seed Enterprise and Sinana Agricultural Research Centre in the district. The source of seed for the union comes from Ethiopia and Oromia Seed Enterprises and Sinana Agricultural Research Center. The union delivers seed to primary cooperatives and farmers. There are also wheat seed producer primary cooperatives (one is involved in production and one is on processing of seeds) that serve farmers in the area. Some of wheat varieties produced and supplied are Digelu, Danda'a, Tusi, Madawalabu, Ejersa, Bakalcha, Obsa and Sofumar.

During the survey respondents were also asked the amount of seed they used per hectare. The result in table 5 depicted that respondent's maximum and minimum use of seed per hectare was 100 and 350kg's per hectare with an average of 201.23 kg. This is almost 100% higher than the recommended rate (blanket) of seed per hectare which is 100kg per hectare for the area. The area calls for further attention and trainings that will save farmers cost and again improve productivity in the area.

#### **4.1.5. Wheat production**

Wheat is one of the major few crops which national food security depends on in Ethiopia. South East Oromia is particularly known for its extensive wheat production and sometimes called “wheat belt of Ethiopia”. Wheat is dominant cereal crop that grows in Bale zone, so that all of the respondents (100%) in Sinana district were wheat growers and allocates large proportion of the average land holding for the crop compared to other crops. Zonal wheat production accounts for more than 16% of wheat production in Ethiopia (CSA, 2012/2013).

The result of study indicates that on average respondents allocated 2.92ha for wheat which is 74.70% of their total average landholding. On average, a farmer household produced 67.5qt and 7.8qt of wheat in Bona and Ganna season respectively. The average productivities of the crop were 27.4qt/ha and 24.8qt/ha in Bona and Ganna seasons respectively.

Table 6: Area allocated and productivity of wheat per hectare

Variables (N=120)	Mean	Std. Deviation
Area allocated for wheat in 2006/7 in hectare	2.92	1.99
Productivity of wheat per hectare in Bona season (quintal)	27.36	10.33
Productivity of wheat per hectare in Ganna season (quintal)	24.83	14.14

Source: Own computation from survey result

## 4.2. Demographic Characteristics of Traders

Age is one of the demographic factors which is useful to describe traders experience and networking. The average age of all sample traders was 43.5 years. With respect to the sex, unfortunately all respondent traders were male. The marital status of traders also depicts that all traders interviewed were married. In terms of education most of traders were educated. Only 10% of the traders were illiterate.

Table 7: Demographic characteristics of traders

Variables	Measurement (N=30)	
Age in years	Mean	43.5
Experience in years	Mean	9.2

Education (%)	Illiterate	10
	Primary	50
	Secondary	30
	College/above	10
Gender (%)	Male	100
Marital Status (%)	Married	100

Source: Own computation from survey result

### 4.3. Analysis of Value Chains

Cereal production and marketing are the means of livelihood for millions of households in Ethiopia. It is the single largest sub-sector within Ethiopia's agriculture, far exceeding all other crops in terms of its share in rural employment, agricultural land use, calorie intake, and contribution to national income. In the same manner, Bale highland is known for its cereal crop production and the sector contributes more in terms of food self sufficiency and income generation. Wheat is one of cereal crops that contribute more for the livelihood of community.

#### 4.3.1. Characteristics and roles of wheat value chain actors

**Input suppliers:** The availability of quality input supply at the right time and place plays a crucial role for farmers to improve production and productivity. 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. Currently OoARD, primary cooperatives/ union and private input suppliers are the main source of input supply. The above mentioned actors are responsible for providing seed of improved varieties, fertilizer, herbicide, pesticide and farm implements for the farmers in the study area.

Unions/cooperatives deal with fertilizers, herbicides and fungicides. Herbicides are supplied by private companies and unions to sole proprietors and primary cooperatives. They are bought from within the district, and from importers in Addis Ababa. The purchased chemicals are then transported by hired vehicles; public transport while other outlets do not use vehicles. The major buyers of herbicides are individual farmers, primary cooperatives, NGOs and government institutions where only cash terms of payments are used. Suppliers

set price plus commission to determine the selling price in the market but prices are largely guided by the market forces.

The unions purchased the following crop chemicals: 2, 4-D, Pallas, Topic and Tilt from private companies in Addis Ababa. The unions purchased all their requirements in Addis Ababa. The average quantity of 2, 4-D, Pallas, Topic and Tilt purchased was 2395 litres, 974 litres, 6796 litres and 300 litres/year, respectively. Their respective purchase prices were ETB 78, 2000, 600 and 300, in that order. They used a hired vehicle as a means of transport from Addis Ababa to Robe.

Pesticides and fungicides are also supplied by private shops within the district, neighbouring and other distant districts. Besides selling chemicals, chemical suppliers do other services such as supplying farm implements, vegetable seeds, and advices on chemical application to farmers.

**Farmers/producers:** Producers are smallholder wheat producer farmers. They are major actor involved in production and marketing of surpluses they produce. Mainly they start from input preparation, produce, store and provide surplus to market. Wheat producers in Sinana district supply their product either to nearest market or zonal market using horse cart, pack animal or traders come to farm gate and buy from them. According to the study, 68.3% and 20.9% sold within village and outside village respectively. The remaining 10.8% sold at both within and outside village. Producers have several options to sell their product: sell to wholesalers, retailers, assemblers, cooperatives and processors (flour factory)

**Assemblers (Collectors):** Assemblers play an important role in collecting produce from smallholder producers at farm gate and delivering to wholesalers at different levels. They are the first actor that links producers to other participating traders. The major market places where wheat assemblers in and around the district undertake transactions are: Robe, Ilu-Sanbitu, Selka, Hisu, Alemgana, Shallo, Ali, Maliyu and Homa.

**Wholesalers:** These were those participants of the marketing system who used to buy wheat on the farm field with a larger volume than other actors. Wholesalers buy wheat grain mainly from individual farmers, some collectors/small traders and a few other wholesalers within

the district and districts around the business. Wheat wholesalers sell grain to individual farmers, processors, collectors and wholesalers from within the district and beyond district.

**Millers/processors:** The surveyed flour processors purchase wheat grain from individual farmers, wholesalers, university and commission agents/brokers within the district and the surrounding districts. On average 36,940 kg is purchased per week per flour processor. The main sources of wheat for flour factories are Sinana, Gasera, Goro, Agarfa, Gindhir and Adaba districts by suppliers who use hired vehicles. Some processors pick wheat grain from suppliers using own vehicles.

Flour processors process grains into flour as well as wheat bran before selling to end consumers, retailers and wholesalers. On the other hand, bakeries process flour into bread, cakes, and/or cookies and then sell to end consumers.

All processors have stores with capacities of 360,000 kg for flour processors and 280,000 kg for bakeries. With respect to training, less than half of traders have participated in training on wheat storage and processing between 2006 and 2013.

The highest grain supplies to flour processors are made in January and February while the lowest supplies are experienced from June to November. Processors engage in grading, labelling and packaging before selling the products. The value added is reflected by the differences in prices charged per kilogram of processed products.

**Retailers:** Retailers are market actors operating at the last stage of the marketing channels selling to consumers. They buy from wholesalers and farmers in their surroundings and directly sell wheat to consumers. They perform several value addition activities such as buying, transporting, storing and selling to end users. The problem raised by retailers during the survey was limited financial capacity that hinders them from being involved in larger trade.

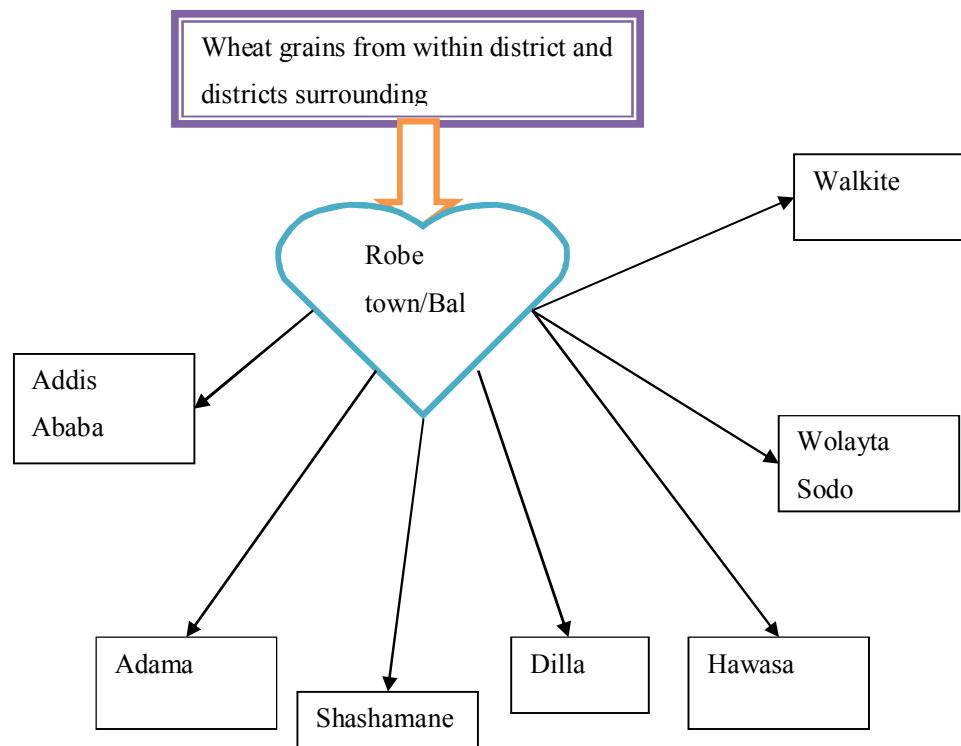
**Commission agents:** Agent middlemen who physically handle products for buyers and sellers and paid for the service they delivered per quintal bases. Mostly they work between producers and processors.

**Cooperatives:** Cooperatives in the study area play crucial role in supplying inputs to the farmers. They are involved in buying agricultural output from farmers at harvest time. Especially in one of kebele used for this study cooperatives help member farmers through providing credit during harvesting time and also serving as storage point for output. However, they are not efficient enough in terms of timely provisions of agricultural input, buying of harvested products and financial management.

#### **4.3.2. Wheat marketing routes of the study area**

Wheat marketing routes sketched below is drawn based up on primary data taken from traders and farmers of the study area. Traders in Sinana district buy wheat grain from different supplier markets within district and districts around Sinana. The wheat distribution system which starts from Robe town flow principally to different market places within country as it can be seen from figure below.

Figure 3: Wheat marketing routes taking Robe town as-Hub



Source: Own design

#### 4.3.3. Wheat market channels

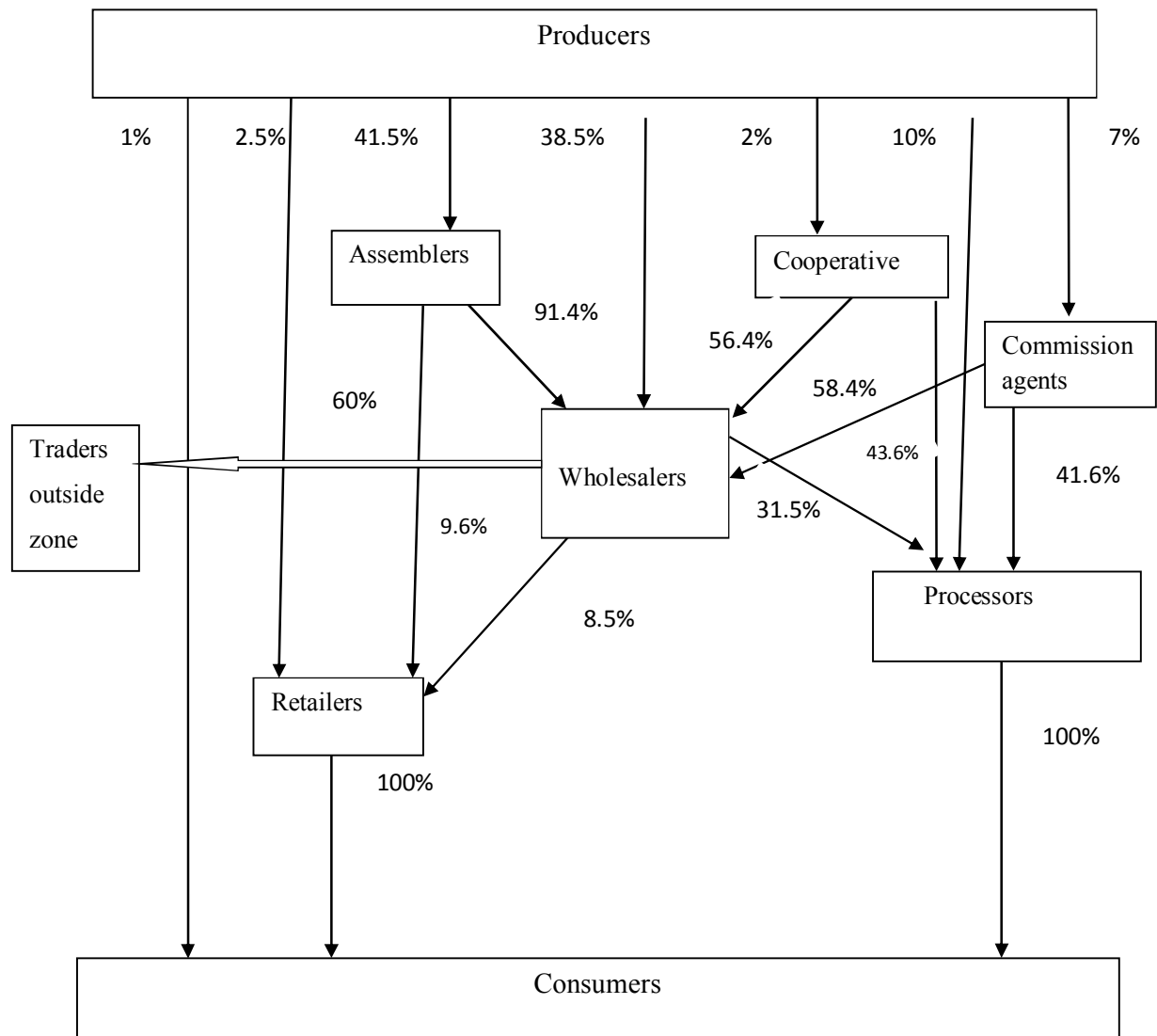
The marketing channel is a trade or distribution network and it is defined by Stern *et al.* (1996) as sets of interdependent organizations involved in the process of making the product or service available for consumption. One of the most important and core for analyzing value chain system is value chain mapping. Value chain mapping means drawing of the visual representation of the value chain system. Maps identify business operations (functions), chain operators and their linkages, as well as the chain supporters within the value chain. Quantifying and describing value chains in detail includes attaching numbers to the basic chain map, e.g. numbers of actors, the volume of produce or the market shares of particular segments in the chain. Mapping market channels functions facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain.

During 2006/7 production season, the total wheat production in Sinana district was estimated to be 738737.12 quintals. As per the study finding the total surplus of wheat which would

follow to market through all channels were estimated to be 51711.98 quintals. Accordingly, the total volume of surplus that flow through each channel was calculated by multiplying whole marketed surplus by their respective share in the channel.

According to this survey finding, thirteen marketing channels were identified for wheat. The main receivers of wheat from farmers are assemblers and wholesalers respectively. They take 41.5% and 38.5% of the total sales conducted by farmers respectively. Following assemblers and wholesalers, processors are the third actors that shares ten percent of wheat sold by farmers in the study area. Processors are flour mills that buy quality wheat compared to other actors.

Figure 4: Wheat marketing channel map of Sinana district in Bale zone



The major fourteen identified channels are explained below:

- Channel 1: Producer-consumer
- Channel 2: Producer-retailer-consumer
- Channel 3: Producer-Assembler-retailer-consumer
- channel 4: Producer-assembler-wholesaler-processor-consumer
- Channel 5: Producer-assembler-wholesaler-retailer-consumer
- Channel 6: Producer-wholesaler-retailer-consumer
- Channel 7: Producer-wholesaler-processor-consumer
- Channel 8: Producer-wholesaler-retailer-consumer
- Channel 9: Producer-coop-processor-consumer

Channel 10:	Producer-coop-wholesaler-retailer-consumer
Channel 11:	Producer-coop-wholesaler-processor-consumer
Channel 12:	Producer-processor-consumer
Channel 13:	Producer-commission agents-wholesaler-processor-consumer
Channel 14:	Producer-Commission agents-processor-consumer

## **4.4. Analysis of Wheat Market Structure-Conduct and Performance**

### **4.4.1. Structure of wheat market**

Market structure is defined as characteristics of the organization of a market which seem to influence strategically the nature of competition and pricing behaviour within the market. In agricultural marketing studies, market structural characteristics are used as a basis for classification of three categories of market: competitive, oligopolistic and monopolistic. For this study, wheat market structure was evaluated using market concentration, transparency and barriers to entry (licensing, capital limitations).

#### **4.4.1.1. Market concentration**

Market concentration which refers to number and size of distribution of sellers and buyers in the market, the firm's objectives, barriers to entry, economies of scale, and assumptions about rival firm's behaviours are relevant in determining the degree of concentration and behaviours and performance (Schere, 1980).

The concentration ratio is expressed in terms of CR<sub>x</sub>, which stands for the percentage of the market sector controlled by the biggest X firms. The extent of concentration represents the control of an individual firm or group of firms over the buying and selling of the produce. Four firms (CR<sub>4</sub>) concentration ratio is the most typical concentration ratio for judging the market structure (Kohls and Uhl, 1985). A CR<sub>4</sub> of over 50% is generally considered as strong oligopoly; CR<sub>4</sub> between 33% and 50% is generally considered a weak oligopoly and a CR<sub>4</sub> of less than 33% is not concentrated market.

For these study major actors which participate in wheat buying and selling activity was taken for considering market structure. Calculation of the concentration ratio by considering an average volume of wheat handled by largest wholesaler per week in peak production season basing the four firm criteria indicated the existence of oligopoly market power. Four firms control 88.7% of the total amount of wheat sold in market during peak production season at Robe town which is zonal and woreda market at the same time. Hence, it is concluded that wheat market at woreda level is inefficient and non competitive.

Table 8: Concentration ratio of top four traders

Trader	Total volume of product handled per week (quintal)	Market share (%)
1	70	11.29
2	90	14.52
3	120	19.35
4	140	22.58
5	200	32.26
Total	620	

Source: Own computation from survey.

$$C4 = C1 + C2 + C3 + C4 = 88.7\%$$

#### 4.4.1.2. Barriers to entry

**Licensing procedure:** According to the survey result, 75%, and 45% of the retailers and rural assemblers had license respectively. Wholesalers involved in wheat buying and selling activity were also all licensed. They paid some amount of money every year as per the Inland Revenue decision. Wholesalers buy wheat and transport to different marketing routes such as Addis Abeba, Shashamane, Hawasa, Dilla, Adama and Walkite. However, retailers and assemblers indicated shortage of capital limited them from expanding their business venture. Even though availability of credit providers were admitted, there was no simplified credit system to solve capital limitation systems faced by retailers and assemblers. Some of them explained that religious beliefs limited them from taking credit.

Although, theoretically it is compulsory to have license to enter into the grain market, the simplicity to have grain license and absence of strong restriction to enter into the grain market with respect to licensing made grain marketing relatively free to enter. Traders explained that informal rural assemblers (which do not own license) were involved in buying

and selling of wheat especially during peak production season and high demand time. There is no strong regulatory action that controls non licensed market participant at kebele level and small towns in the district.

**Skill (experience):** The survey result indicated that traders experience ranges from 4 up to 20 years with an average experience of 11.13 years. The existence of wider gap between traders indicated that experience was not a barrier to enter in to wheat trading in the study area.

**Capital:** Capital requirements serve as an entry barrier because only those who can afford such a monetary can enter the market. In order to handle reasonable quantity of the commodity, traders need sufficient amount of money that assists their business to operate in healthy way.

#### **4.4.1.3. Product differentiation**

According to the response obtained during discussion, traders in the study area classified wheat into hard wheat and soft wheat and pay different prices. They used variety to classify wheat in to hard and soft wheat. According to traders response hard wheat was directly supplied to pasta and macaroni processing factory. Additionally traders consider quality of seed (size), cleanness and season of production to afford different price for suppliers. Respondent farmers also approved that different price was paid based on variety difference; quality of product supplied and season of production.

#### **4.4.1.4. Market transparency**

Market information supply was not transparent between levels that created high price variability and difference among farmers engaged in selling of wheat. Wholesalers got information from their partners far in Addis, Hawasa, Dilla, Shashamane or Adama using mobile phone while farmers did not get relevant information. The low returns of agriculture produce to smallholder farmers are associated to lack of market access and the marketing information (Ekola, 2005). Due to lack of reliable market information, farmers were failing to negotiate better on the prices of their produces and thus are paid lower prices. Market information sources for the farmers of the study area included traders, neighbours, friends,

development agents, radio and television. The finding indicated that farmers exchange each other market information than other sources which was 98.3%. About 70% of information was also acquired from traders. However, information provided by traders was not up-to date and mostly not true. They used to depress price of products down by delivering historical and biased information to producers.

#### **4.4.2. Conduct of wheat market**

##### **4.4.2.1. Price setting strategy**

The survey result indicated that 52.5% of the respondents reported that wheat price decision was set by traders. About 46.7% of the respondents reported that market price was through negotiation of farmers and traders. The remaining 0.8% reported that they decide on the price of their product taken to market themselves.

##### **4.4.2.2. Buying and selling strategy**

Out of the interviewed farmers, majority of them (63.3%) decide to sell their product by assessing market price. The remaining 46.7% of respondents supply to market when they need money for different purposes. All of the respondents confirmed that price was the determining factor which influences them for whom to sell among the buyer outlet choices. All respondents indicated that the selling system was based on cash payment. Additionally, respondents pointed out that some traders cheat on weighing scales by manipulating installations of the instrument. Once they identify traders behaving like this, they will not sell to him/her again.

#### **4.4.3. Performance of wheat market**

Market performance of wheat was evaluated based on level of market margins and associated marketing costs.

#### 4.4.3.1. Marketing margin

Marketing margin is one of the commonly used measures of the performance of a marketing system. It is defined as the difference between the price the consumers pay and the price the producers receive. Computing the total gross marketing margin (TGMM) is always related to the final price or the price paid by the end consumer, expressed in percentage (Mendoza, 1995).

Gross marketing margin (GMM) is the gap between prices at consecutive levels in the marketing channel. Therefore for this study the marketing margins were computed as following.

$$\text{GMM of Wholesaler} = (P_R - P_F)$$

$$\text{GMM of retailer} = (P_R - P_W)$$

Where,  $P_F$  = Price of farmer

$P_R$  = Price of retailer

$P_W$  = Price of wholesaler

In Table 9 below GMMp, GMMr, GMMa, GMMc, GMMpr, GMMw and GMMca means gross marketing margins for producers, retailers, assemblers, cooperatives, processors, wholesalers and commission agents respectively.

Table 9: Marketing margin (Birr/kg)

Channels	GMMp	GMMr	GMMa	GMMc	GMMpr	GMMw	GMMca	TGMM
I	100.00	-	-	-	-	-	-	0.00
II	85.00	1.20	-	-	-	-	-	15.00
III	82.50	0.80	0.60	-	-	-	-	17.50
IV	72.63	-	0.60	-	1.50	0.50	-	27.37
V	83.33	0.55	0.50	-	-	0.25	-	16.67
VI	86.42	0.60	-	-	-	0.50	-	13.58
VII	74.21	-	-	-	1.70	0.75	-	25.79
VIII	87.50	0.60	-	-	-	0.40	-	12.50
IX	72.63	-	-	0.60	2.00	-	-	27.37
X	84.15	-	-	0.60	-	0.30	-	15.85
XI	71.58	0.40	-	0.40	2.00	0.30	-	28.42
XII	78.95	-	-	-	2.00	-	-	21.05
XIII	75.79	-	-	-	1.50	0.50	0.30	24.21
XIV	75.79	-	-	-	1.70	0.40	0.20	24.21

Source: Own computation from survey result

Total gross marketing margin is the highest in channel XI which is 28.42%. Without considering channel I, which farmers sell directly to consumers, producers gross marketing margin is the highest in channel VIII which is 87.50%.

## **4.5. Major Constraints and Opportunities in Production and Marketing of Wheat**

Factor affecting wheat production and marketing sector takes into account the systematic analysis of the problems that exist across the value chain from input supply to marketing of the final product which affects value addition at different stages. The identification of problems and opportunities at all stages of the chain helps to upgrade the wheat value chain sector that exist across the value chain from input supply to marketing of the final product.

### **4.5.1. Production constraints and opportunities**

Major wheat production constraints reported in the study area include: diseases, especially rust diseases that frequently put high yielding improved varieties of bread wheat out of production, weeds especially grass weeds in wheat mono-cropping areas, low soil fertility that farmers cannot grow wheat without application of chemical fertilizers and/or compost, and shortage/unavailability of seed of improved variety. The other mentioned constraint was farmers in mechanized wheat production areas cannot get pure seed from own harvest due to varietal mixing during combine harvesting of farmers' fields after farmers' fields planted to different types of varieties. Similarly, combine harvesting of small scale farmers' fields after farmers' fields aggravates spread of weed seeds from farm to farm was also a problem. less farmers awareness of improved crop management practices, high cost of combine harvesting since Sinana district farmers follow mechanized wheat production system, lack of credit, less availability and efficacy of many pesticides available in the market, untimely supply of fertilizers and shortage of capital to buy farm inputs were also remaining constraints explained by farmers as factors that affected production and productivity of wheat in the study area.

The interest of farmers in improved varieties; the availability of market for the crop; strong interest of national and international research organizations in the crop improvement; the

importance of the crop in food self-sufficiency as strategic crop at regional and national levels; the diverse use value of the crop; availability of various processing plants for various products; and availability of human resource and knowledge in the improvement and development of the crop are some of the major opportunities available for the crop improvement and expansion of its production in the study area.

#### **4.5.2. Marketing constraints and opportunities**

The major marketing constraints raised by farmers and traders of the study area were: unfair pricing and cheating of traders on balance; lack of timely and sufficient market information; low price of commodities at harvest time; high price of seeds, chemical fertilizers and pesticides; weak market linkages among value chain actors and less bargaining power of farmers in the market. There are also regular market fluctuations and shortage of storage facilities in addition to poor transportation.

Processors main challenges were lack of uniformity in quality of flour for bread, cakes and cookies all which do not have standards established for them. There are also high production costs relative to selling price, unstable prices of flour, unfair competition from illegal traders and finally frequent electric power and water interruptions were also mentioned as constraint.

Different actors involved in wheat production and marketing acknowledge that there are different quality problems. Quality problem was not only from side of producers, it was caused by different actors involved in wheat market value chain. There are also quality problem in the actual production and harvesting of cereal grains. This is related to poor weeding and inferior harvest management techniques. In addition to this, rain during the harvesting period sometimes spoils large volumes of grains. The small scale farmer does not have an insurance mechanism that safeguards its harvest from natural hazards, such as unwanted rain. Due to the above problems farmers supply different quality products to actors involved in wheat business in the study area.

Traders collect their merchandise from different sources, places and individuals and don't have quality standards. What traders tend to do is to purchase any quantity from anyone offering the same price for whatever quality or offering a lesser price for inferior quality

products. After purchasing, the traders then don't pack the products they have collected in accordance with the different grades of quality. Rather they tend to mix up the good and bad quality grains together and sell it at the price of good quality as the prevailing price doesn't give quality premium. Traders do this for two reasons, one they increase their profit margin and secondly because buyers are unable to check the quality and pay quality price for quality produce.

Despite the considerable constraints listed above, there are many opportunities for the wheat value chains actors in Sinana district. The potential marketing opportunities of the area are the build up of asphalt road that connects zone market to different towns in the country which creates potential demand for the products produced in the area. Obviously the increased demand would be followed by better farm price for producers. As a result farmers will have an incentive to expand their output. Furthermore, the increasing food processing plants in and around Robe town is creating additional demand for agricultural commodities like wheat. Consequently, this contributes for commercialization of rural economy and creates many off-farm jobs opportunities. Furthermore, provision of infrastructure facilities like telecommunication, power supply and financial institutions (Banks, Micro-Finance) supports the marketing activities in the study area.

## **4.6. Econometrics Model Results**

In this section factors affecting volume of wheat supplied to market and market outlet choices of producers are presented and discussed.

### **4.6.1. Determinants of market Supply**

Factors that determine supply of wheat to the market was estimated using OLS model since all respondents used for this study supplied their wheat to the market. The hypothesized variables that were assumed to influence marketable supply were: Access to market information, access to extension service, access to credit service, size of land holding, livestock (TLU), farming experience, quantity produced of wheat, lagged price, educational level of household head, own price of the commodity and age of household head.

Robust regression option was used in STATA to analyze and correct heteroscedasticity problem. Multicollinearity problem was also tested using VIF. The result indicated no multicollinearity problem since VIF was less than 10 (Annex Table 1). The independent variables included for analysis explained 92.06% of the variation in dependent variable. Test of endogeneity showed that the quantity of wheat produced is endogenous to the model ( $F=3.61$  ( $p=0.05$ ). This problem can be overcome by using two stages least square (2SLS) method for wheat market supply.

To overcome the problem of endogeneity we have to apply two stages least squares (2SLS) estimations method because instrumental variables are used to cut correlations between the error term and independent variables. The method involves two successive applications. The first stage is made by regressing the suspected endogenous variables over the pre-determined or pure exogenous variables to get their predicted values. Then the predicted values of the endogenous variables in the first stage are used to estimate the supply equation. Here quantity of fertilizer used and farmers experience were used as instrument to quantity of wheat produced. The instrumental variable should fulfil two requirements to be used as instrument. One the instrument must be uncorrelated with error term and second requires the linear projection of endogenous variable onto all the exogenous variables. So the instrumental variables were selected by checking its correlation with the endogenous and exogenous variables.

**Quantity produced of wheat:** It is the total amount of wheat produced in quintals in 2013/14 production season in the study area. It was hypothesized that quantity produced of wheat affects marketable supply positively. Accordingly the result indicated that quantity of wheat produced affects market supply positively and significantly at 1% probability level. Positive sign of coefficients indicate that farmers who produce more quantity of wheat supply increase volume of marketable supply. Ayelech (2011) found that the amount of tomato, papaya, avocado and mango produced by farming households has augmented marketable supply of the commodities significantly. Abraham (2013) also found that the amount produced of tomato, potato and cabbage significantly affects quantity supplied to market positively.

**Size of landholding:** It is a continuous variable refers to the total area of farmland a farmer owned. It is assumed that the larger the total area of the farmland the farmer owns, the larger land is allocated for wheat and the higher would be the output that influences large quantity

of wheat supplied to market. So it is hypothesized that size of land holding positively and significantly at 1% probability level influences volume of wheat supplied to market. Accordingly the size of landholding affects quantity of wheat positively and significantly. As the area of landholding by farmer increased by one hectare, the quantity of wheat supplied to market would increase by 4.25 quantals. The finding by Alemayehu (2012) also indicated that a unit increase in land allocated for ginger, would give rise to 11.1qt increase in the amount of ginger supplied to market.

Table 10: 2SLS results for factors influencing volume of wheat supplied to market

Variables	Coefficients	Robust Std.Err	t-value	p >  t
QPRO	0.623**	0.309	2.02	0.046
TLU	0.374**	0.180	2.08	0.039
EXTCONT	-2.905	7.506	-0.39	0.700
LAGPR	0.021	0.022	0.98	0.328
MKINFO	2.924	3.342	0.87	0.384
ACCRE	0.536	2.867	0.19	0.852
TOTAREA	4.257**	1.756	2.42	0.017
FAMSZ	-0.051*	0.534	-1.73	0.086
EDULV	0.119	1.312	0.09	0.928
AGEHH	-0.194	0.233	-0.84	0.405
DSTMKT	-0.022	0.031	-0.74	0.464
SEXHH	0.998	2.928	0.35	0.75
Constant	-22.151	23.900	-0.93	0.356

N=120, R<sup>2</sup>=0.92, \*\*\*, \*\* and \* significant at 1%, 5% and 10% respectively

Source: own computation from survey result

**Livestock (TLU):** It is a continuous variable measured in tropical livestock unit. It affects quantity of wheat supplied to market positively and significantly. As farmers livestock ownership increased by one unit the amount of wheat supplied to market is increased by 0.37 quintal. This is because livestock ownership in highlands of Bale are an important input for wheat production.

**Family size:** It is the number of members living household. The variable affects supply of wheat to market negatively and significantly. The negative effect of the variable shows that as the number of household members increased more part of wheat produce is allocated for household consumption. As the member of household is increased by one, volume of wheat supplied to market is decreased by 0.05 quintal.

#### 4.6.2. Factors affecting wheat market outlet choices

Multinomial logistic regression was used to analyze factors affecting choice of wheat marketing outlets with four alternative categories. If there are a finite number of choices (greater than two), multinomial logit estimation is appropriate to analyze the effect of exogenous variables on choices. The model was tested for the independence of irrelevant alternatives (IIA) assumption based on Hausman test. The possible heteroscedasticity and multicollinearity problems are also corrected. The command robust (in STATA) was used to correct for heteroscedasticity. There is no multicollinearity problem because the result of VIF is less than 10 for all variables (Annex Table 1).

Producers choose their marketing plans and assess outside options that are available before participating in any marketing outlet. The producer's choice of a marketing outlet is based on utility maximization among the existing alternatives. After identifying choices of outlets, they choose where and for who to sell based on comparative advantage in bargaining and accessibility of outlets for farm products.

The alternative “assembler” was used as a base category. This implies that the discussion of the results focuses on the impact of the explanatory variables on a use of cooperatives, wholesaler and processors category relative to use of assemblers (the base category). The result of MNL and its marginal effect is explained below in Table 12.

**Distance from market place:** Distance from the closest market place positively and significantly affected accessing millers/processors market outlet as compared with accessing assembler market outlet. It also affected wholesaler market outlet negatively and significantly. The marginal effect indicates that probability of choosing millers/processors increases by 0.02% as compared with accessing assembler market outlet for a unit decrease in kilometre. The likelihood of accessing wholesaler market outlet decreases by 0.4% for a unit increase in kilometre from market place.

Table 11: Results of Multinomial Logit and marginal effects for choice of wheat market outlets

	Coefficient	Robust Std.err	z-value	dy/dx	Robust Std.err	z-value
<b>Wholesalers</b>						
EXTCON	0.85*	0.452	1.88	0.211	0.112	1.89
COPMEMB	1.223*	0.725	1.69	0.307	0.180	1.7
LAGPRC	0.068***	0.016	4.26	0.017	0.004	4.36
OWNTR	-0.771	0.712	1.08	-0.182	0.178	-1.02
ACCRE	0.464	1.684	0.28	0.102	0.423	0.24
OFFINC	0.657	0.644	1.02	0.156	0.159	0.98
DSTMRK	-0.168*	0.099	-1.71	-0.040	0.025	-1.64
FAMILSZ	-0.065	0.086	-0.76	-0.015	0.022	-0.72
Constant	-55.02***	11.523	-4.78			
<b>Cooperatives</b>						
EXTNCON	0.076	0.480	0.16	-0.008	0.012	-0.72
COPMEMB	-0.099	0.644	-0.15	-0.017	0.023	-0.73
LAGPRC	-0.030*	0.017	-1.75	-0.001	0.001	-1.41
OWNTRANS	-0.936	0.981	-0.95	-0.012	0.024	-0.52
ACCRE	1.190	1.033	1.15	0.022	0.039	0.56
OFFINC	0.678	0.650	1.04	0.008	0.014	0.49
DSTMRK	-0.150*	0.091	-1.64	-0.001	0.002	-0.60
FAMILSZ	-0.094	0.113	-0.83	-0.001	0.003	-0.48
Constant	20.314	12.933	1.57			
<b>Processors</b>						
EXTNCON	-1.418	0.896	-1.58	-0.000	0.00008	-0.25
COPMEMB	-0.609	1.794	-0.34	-0.000	0.00006	-0.25
LAGPR	0.107***	0.021	4.99	8.170	0.00000	0.25
OWNTRANS	-2.957**	1.478	-2.00	-0.0003	0.00012	-0.24
ACCRE	1.671	1.586	1.05	0.0002	0.00007	0.22
OFFINC	-0.469	1.224	-0.38	-9.070	0.00004	-0.21
DISTMRK	1.404*	0.787	1.78	0.0002	0.00006	0.28
FAMILSZ	0.069	0.210	0.23	1.160	0.00001	0.18
Constant	-95.29*	20.587	-4.63			

Number of observation =120, Log pseudo likelihood = -68.51\*\*\*, Pseudo  $R^2$  = 0.49, Wald chi - square(24) = 74.27, \*\*\*, \*\* and \* are statistically significant at 1%, 5% and 10% respectively

Source: own computation from survey result

**Frequency of extension contact:** Frequency of extension contact positively and significantly affected accessing wholesales market outlet choices as compared with assembler market outlet choices at 10% probability level. The marginal effect result shows that the likelihood of accessing wholesale market outlet choice increases by 21.1% as compared to assembler market outlet choices for a unit contact of extension services.

**Own price of the commodity:** It is continuous variable, which was, price given for the commodity with different market outlets per hundred kilograms. Hence, it was hypothesized that price given by market outlets can negatively affect cooperative market outlet choice.

Price offered by wheat market outlet per kilogram significantly and negatively affected accessing cooperative wheat market outlet as compared with accessing assembler wheat market outlet. It also affected wholesaler and processor wheat market outlets positively and significantly at 1% probability level respectively. The marginal effect result shows that the likelihood of accessing cooperative wheat market outlet decreases by 0.1% for a birr increase per kg, the likelihood of accessing wholesaler outlet increases by 1.07% for a birr increase per kg and the likelihood of accessing processor outlet increases by 81.7% for a birr increase per kg of wheat as compared with accessing assembler wheat market outlet. The study by Birhanu (2013) also found out that price offered by milk market outlet per liter of milk significantly and negatively affected accessing cooperative milk market outlet as compared with accessing individual consumer milk market outlet.

**Membership to cooperative:** It influences positively and significantly wholesaler market outlet as compared to accessing assemblers wheat market outlet. The likelihood of accessing wholesaler market outlet increases by 30.1% for those persons who were member of cooperatives as compared to base category.

**Ownership of market transport facilities:** This variable affects negatively and significantly accessing processors wheat market outlet. Ownership of market transport facilities decreased the likelihood of choosing processors market outlet by 0.03% compared to accessing assemblers' market outlet.

#### **4.6.3. Factors affecting decision of participation in value addition**

Probit model was used for estimation of factors affecting the probabilities of the farmer households to add values to wheat are given in Table 7. The Table also contains the values of marginal effects which are evaluated at the means of all other independent variables. Marginal effects indicate the effects of one unit change in an exogenous variable on the probability that an operator adds value to his product. Pseudo  $R^2$  indicated that the independent variables included in the probit regression explain significant proportion of the variations in the wheat producer farmers' likelihood to add values to wheat. The probit model explains 55.8% of the variations in the likelihood of wheat producer farmers to add values to their product.

Table 12: Probit result for factors influencing value addition

Variables	Coefficients	Std. Error	Marginal effect (dy/dx)	P> z
MRKTINF	1.304***	0.453	0.123	0.004
EXTCONT	1.373**	0.579	0.129	0.018
FRMEXP	0.002	0.016	0.000	0.895
ARWHEA	0.042	0.222	0.004	0.850
FAMILSZ	-0.109	0.075	-0.011	0.148
EDLEVE	-0.030	0.081	-0.009	0.712
DISTMRT	-0.095**	0.056	-0.003	0.088
ACCECRE	0.948**	0.454	0.004	0.037
QUANPR	-0.045***	0.014	-0.090	0.002
Constant	4.269***	1.651		0.010

Number of observations =120, Pseudo R<sup>2</sup> = 0.59, LR Chi<sup>2</sup> =80.11, \*\*\*, \*\* and \* are statistically significant at 1%, 5% and 10% respectively

Source: own computation from survey result

**Quantity of wheat produced:** Amount of wheat produced in quintals by farmers affects decision of value addition negatively and statistically significant at 1% significance level. As yield of wheat increase by one quintal the probability of farmers to add value decreased by 9%. This could be attributed to the fact that farmers who produce larger amount of wheat get better income from the bulk sale of the product. Farmers who produced smaller amount of quintals adds value to get better price from the smaller amount produced.

**Distance from market place:** distance to the nearest urban center is statistically significant and negatively associated with farmer's likelihood to add values to wheat produce. This indicates that as farmer's distance from the nearest urban center increases by a km, farmer's likelihood to add values to wheat produce decreased by 0.3%. The reason behind this is that famers nearest to market sale most their wheat grain to processors. This could be attributed to the reality that wheat processors need quality product compared to other actors involved in wheat marketing system in the study area.

**Access to credit:** Access to credit positively and significantly affected the probability of farmer's to participate in value addition to wheat produce. The result indicated that farmers access to credit services increase the probability of adding values to wheat produce by 0.4%. This may be due to the fact that most part of value addition by farmers are conducted during

financial shortage times that requires money. Because of this, farmers who can get credit can participate in value addition of wheat.

**Access to market information:** Access to market information statistically significant and positively associated to value additions. The marginal effect shows that access to market information increase the probability of adding values to wheat produce by 12.3%.

**Access to extension services:** Access to extension services positively and significantly affected decision to value addition of wheat produce. The marginal effect indicated that access to market services increase the probability of adding values to wheat produce by 12.9%.

## **5. SUMMARY AND RECOMMENDATION**

### **5.6. Summary and Conclusion**

This study was conducted in Sinana district of Bale zone in Oromia region. The main focus of this thesis was analyzing wheat market value chain. The specific objectives of the study include analysing the market structure-conduct-performance of wheat markets in the study area; identifying the determinants of wheat supply to the market in the study area; Identifying marketing channels of wheat and factors affecting outlet choice decisions of wheat producers; and to determine factors affecting wheat value addition at different stages of the marketing chain.

Primary data were collected from 123 sample wheat farmers drawn from four kebeles in Sinana district, 10 wholesalers, 10 assemblers, 5 retailers and 5 processors from three towns (Robe, Selka and Alemgena) were interviewed using structured questionnaire. Additionally, input suppliers at Robe town and cooperatives at each kebele were interviewed. Focus group discussion using Rapid Market Appraisal and key informant interview was also conducted. Secondary data which assisted this study were collected from woreda agriculture office, bureau of development and trade, each kebele offices and from published and unpublished materials. The data were analyzed using econometrics and descriptive statistics tools by employing SPSS and STATA software packages.

Out of the respondents, 88.3% and 11.7% were male and female household heads respectively. The minimum and maximum age of the respondents were 29 and 98 years respectively with mean age of 46.2 years. The average family size in the study area was 7.12. The minimum and maximum sizes of landholding of the respondent farmers were 0.3 and 13.0 hectare respectively with mean landholding of 3.91 hectares. Respondents allocated most of their plots for wheat plantation which was 2.92 hectares on average out of total holding.

Provision of adequate services for the communities enhances the communities' socio-economic development in general and the well-being of individuals in particular. It has important contribution in improving production and productivity and thereby increasing

marketable surplus and ultimately for increasing the income of smallholder farmers. The most important services that are expected to promote production and marketing of wheat in the study area include access to credit, access to extension service, and access to market information. Wheat producer farmer's market major sources of information were friends/neighbour farmers, radio and traders which is 98.3%, 71.1% and 70% respectively. The result also showed that 89.2% of the respondents have access to credit. Extension service in agriculture is indispensable and it provides assistance for farmers in improvement of production and productivity, it also enables flow of information and transfer of knowledge and scientific findings to practice. Out of the interviewed farmers, 95.5% have access to extension services delivered by different stakeholders in the study area.

Inputs used by farmers of the study area are fertilizer, seed, herbicides and pesticides. These inputs are supplied to farmers either by cooperative/unions and private traders. The survey result indicated that all sample respondents applied DAP (Di Ammonium Sulphate) and only 62.5% of them used UREA fertilizer on their wheat field. The rate of application was 96.81 and 43.65kg's on average for DAP and UREA respectively. Major pesticides used by respondents of the study area were Pallas 45-OD, Topic, 2,4-D, Tilt, Rexoudo, Mankozebe, Helarate and Bumper. Seed distribution remains largely informal and farmer-to-farmer exchanges account for as much as 90% of the seed trade.

On average a farmer household produces 67.5qt and 7.8qt of wheat in Bona and Ganna season respectively. The average productivity of the crop was 27.4qt/ha and 24.8qt/ha in Bona and Ganna season respectively.

The main wheat value chain actors in the area are input suppliers, farmers/producers, assemblers (collectors), wholesalers, millers/processors, retailers, commission agents and cooperatives. OoARD, primary cooperatives/ union and private input suppliers are the main source of input supply of the study area. Unions/cooperatives deal with fertilizers, herbicides and fungicides only while sole proprietor trade in herbicides, fungicides and pesticides. Assemblers play an important role in collecting produce from smallholder producers at farm gate and delivering to wholesalers and retailers at different levels. Wholesalers buy wheat grain mainly from individual farmers, assemblers and cooperatives. Flour processors purchase wheat grain from individual farmers, wholesalers, university and commission agents/brokers within the district and the surrounding districts. Retailers are market actors

operating at the last stage of the marketing channels selling to consumers. They buy from wholesalers and farmers in their surroundings and directly sell wheat to consumers. Agent middlemen who physically handle products for buyers and sellers and paid for the service they delivered per quintal bases. Mostly they work between producers and processors. Cooperatives are involved in buying agricultural output from farmers at harvest time.

The rapid break down of disease resistance in bread wheat varieties is the major production constraint of the crop as per the current study. Grass weeds are other major production constraints due to wheat mono-cropping farming systems of the study area. High input cost, low soil fertility, shortage of seeds of improved varieties, less awareness of farmers about improved crop management practices, spread of weeds and difficulty of saving pure seeds from farmers' own harvest in combine harvested areas, and high cost of combine harvesting are among constraints reducing the productivity, production and return from the crop. The major marketing constraints raised by farmers and traders of the study area were: unfair pricing and cheating of traders on balance; lack of timely and sufficient market information; low price of commodities at harvest time; high price of seeds, chemical fertilizers and pesticides; weak market linkages among value chain actors and less bargaining power of farmers in the market.

Out of the 738737.12 quintals of total wheat production in Sinana district total surplus of wheat which would follow to market through all channels were estimated to be 51711.98 quintals. The result of multiple regression indicated that size of landholding and quantity produced of wheat influences amount of wheat supplied to market positively and significantly. This indicated that the two variables should get attention if we are going to increase marketable supply of wheat in the study area.

Factors affecting wheat production and volume supplied to market were also analysed using econometric model. Out of thirteen variables included for affecting wheat production total livestock owned (in TLU), farmers experience in wheat production, total farmland owned by farmers positively and significantly affect wheat production. Amount of fertilizer applied to wheat per hectare of wheat farm negatively and significantly affected wheat production. Quantity produced of wheat, size of landholding, livestock ownership positively and significantly affected volume of wheat supplied to market. Family size affected volume of wheat supplied to market negatively and significantly.

Wheat producers of the study area supply their product to different market outlets. Farmers supply their products to wholesalers, assemblers, cooperatives and processors market outlets. To analyse factors affecting producers choice of the four market outlets, multinomial logistic regression model was used. The model results indicated that the likelihood to choose wholesalers market outlet was significantly influenced by frequency of extension contact, distance from market place, own price of the commodity and membership to cooperative as compared to accessing assemblers wheat market outlet. The likelihood of accessing cooperative wheat market outlet was significantly influenced by price given to the commodity at different outlets as compared to accessing assembler market outlet. Similarly the likelihood of accessing processors market outlet was significantly influenced by price of commodity given at different market outlets, ownership of transportation facilities and distance of processors from production place.

Decision to engage in value addition was influenced by quantity of wheat produced and distance from market place negatively and significantly. Access to market information, access to extension and credit services positively and significantly affected decision to be engaged in value addition.

### **5.7. Recommendation**

Recommendations (policy implications) those are relevant to improve wheat marketing system in the study area which will indicate production and market orientation were set based on the significant variables and raised problems by the value chain actors.

To improve the production and productivity of wheat in the study area resolving the prevailing production problems deems a necessary condition. Among these increasing farmers' awareness on the importance of integrated crop management packages for increased productivity and sustainable production is one of them. Additionally it is important to develop high yielding varieties that combine durable resistance because Bale highlands are mostly susceptible to rust races that immediately breaks resistance of bread wheat varieties and lead to complete loss of harvest. In order to strengthen farmer's production potential, making available credit to farmers for input purchase also needs attention.

To solve shortage of improved varieties seed, improving farmers' knowledge in quality seed production through training is important. Improving knowledge of farmers on production of quality seed by themselves will solve shortage problem and save expenditures incurred by farmers. In addition farmers also reported the existence of grass weed problem in the study area influences production and productivity of the crop. This was caused because of wheat mono-cropping cycles not only in Sinana district but also over all in Bale highlands. In order to avoid the effects of grass weed in Bale highlands promoting importance of crop rotation through training and strengthening the present crop protection services through availing important chemicals are solution.

Market information dissemination is an important issue for producers to help them decide on marketing their products. So it is important to disseminate market information to all the wheat value chain actors throughout the year. In addition to print and electronic media, district trade and industry office could extend this information in collaboration with agricultural extension agents.

The enhancement of wheat producers' bargaining power through cooperatives is the best measure that should target increasing farmer's share of benefit from his marketable produce. Creating access to flexible credit system for traders is also a necessary condition which targets at reducing the oligopolistic market structure in the Robe town market. Strengthening horizontal and vertical linkages of the wheat value chain actors in the study area is also an important input that improves the marketing system of the crop in the study area.

The result of econometric analysis indicates that volume of wheat supplied to market is influenced positively and significantly by quantity of wheat produced, livestock ownership (TLU) and total area of farmland owned by farmers. Therefore, in order to enhance volume of wheat supplied to market, these variables should get attention and promoted. Increasing surplus production through promotion of appropriate input technologies such as seed of improved varieties, recommended fertilizer rates, pesticides and other appropriate agronomic recommendations can improve production and productivity of wheat in the study area. Livestock categories like oxen, small ruminants and equines are used as better input that supports wheat production and this lead to surplus produce by farmers in the study area.

The likelihood to choose wholesalers market outlet was significantly and positively influenced by frequency of extension contact, own price of the commodity given by the outlet and membership to cooperative as compared to accessing assemblers wheat market outlet. Therefore strengthening the extension system to boost surplus production and supporting cooperative membership to increase farmers bargaining powers are important issues to be considered. The likelihood of accessing wholesaler's market outlet is also negatively and significantly influenced by distance from the nearest market place. Improving road infrastructures can improve the delivery of wheat to wholesaler's market outlet because mostly wholesalers are found at market places rather than in villages.

The likelihood of accessing cooperative wheat market outlet was negatively and significantly influenced by price given to the commodity at different outlets and distance from the closest market places as compared to accessing assembler market outlet. Therefore, giving training for cooperative members on pricing system and awareness creation on importance of cooperative can solve the problem. In addition organizing and building marketing cooperatives at every village can support share of cooperative actor in wheat marketing.

The likelihood of accessing processors market outlet was positively and significantly influenced by price of commodity given at different market outlets. Price given to the commodity by the outlet correlated with quality product delivery is an important condition to be encouraged. Ownership of transportation facilities and distance of processors from production place negatively and significantly influences processors outlet as compared to accessing assembler's market outlet. Therefore improving ownership of transportation facilities and road infrastructures can increase accessibility of processors market outlet.

Access to credit positively and significantly affected farmers decision to participate in value addition. Smallholder farmers are not a homogenous group; they differ in their resources and capabilities. The household economic portfolio provides a link between smallholders' resource levels and their abilities to respond to value addition opportunities. they may be unable to invest in agricultural upgrading due to shortages of working capital and lack of liquidity for longer term upgrading investments. Therefore, it is important to create credit access and simplify way of provision for farmers because it will help farmers to participate in value addition activities which will increase their income.

Access to market information affects decision of participation in value addition of wheat positively and significantly. This shows that farmers are willing to participate in value addition if higher value markets for value added agricultural produce information is readily available. Therefore, facilitating and improving the quality and types of market information delivery used by farmers shall take policy attention.

Access to extension services affects the probability of participating in value addition positively and significantly. Extension services in agriculture is indispensable and it offers more than just expert assistance in improvement of production and processing, it also enables flow of information and transfer of knowledge and scientific findings to practice that will help farmers in production of value added products. Therefore, strengthening agricultural extension services should be considered as important input for producing value added products.

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## 7. APPENDICES

### 7.1. Appendix 1: Tables

Appendix Table 1 : VIF for factors affecting volume of wheat supplied to market

Variables	VIF	1/VIF
LIVTLU	3.22	0.31
EXTCON	1.13	0.88
PRICWH	1.08	0.92
MRKINF	1.07	0.93
ACCRE	1.12	0.89
TOTLND	3.07	0.32
FMLSZ	1.12	0.82
EDULEV	1.12	0.66
AGEHH	1.08	0.67
DSTMKT	1.07	0.89
SEXHH	1.06	0.94
Mean VIF		1.55

Appendix Table 2: VIF for MNL model variables

Variables	VIF	1/VIF
PRWH	1.30	0.769
DSTMRT	1.24	0.809
TRPON	1.12	0.894
ACCRE	1.12	0.896
COPMR	1.11	0.900
FMLSZ	1.06	0.940
OFFINC	1.04	0.957
ACEXT	1.05	0.960
Mean VIF		1.13

Appendix Table 3: Hausman test of IIA assumption in MNL

Omitted	Chi2	p>chi2	Evidence
Millers	16	0.88	For Ho
Wholesalers	0.0	0.93	For Ho
Cooperative	1.12	0.89	For Ho

Appendix Table 4: Conversion factor used to compute tropical livestock unit (TLU)

No.	Livestock Type	TLU (Tropical Livestock Unit)
1	Calf	0.20
2	Weaned calf	0.34
3	Heifer	0.75
4	Cow/Oxen	1.00
5	Horse/Mule	1.10
6	Donkey	0.70
7	Sheep/Goat	0.13
8	Camel	1.25
9	Chicken	0.013

## 7.2. Appendix 2: Interview Schedule

### Questionnaire developed for Farmer's Survey

#### Instruction for Enumerators

- ✓ Start with warmly greeting farmers according to the culture of the area
- ✓ Introduce yourself, your organization (from where you come) and objective of your meeting with him.
- ✓ Tell the farmer that information collected for this study will be kept strictly confidential. While the data collected will be used for research purposes, information that could identify you or your household will never be publicly released in any research report or publication and will not be shared with any other government or international institution.
- ✓ Tell him also he has the right to ask questions at any point before the interview, during the interview, or after the interview is completed.
- ✓ Write important information below the page margin
- ✓ Before going to ask questions please identify ambiguous questions and be it clear for you from the survey supervisor.

Name of District \_\_\_\_\_

Name of Peasant Association \_\_\_\_\_

Name of household head (respondents name) \_\_\_\_\_

Contact Address (Mobile Number) \_\_\_\_\_

Enumerator name \_\_\_\_\_

Signature \_\_\_\_\_

Date of Interview \_\_\_\_\_

Distance of respondent residence from the nearest market place \_\_\_\_ km

## I. Respondents' general household information

1. Sex of house hold head	1= Male 2= Female
2. Age of household head in years	
3. Religion of respondent	1. Muslim 2. Orthodox 3. Catholic 4. Protestant 5. Other (specify) _____
4. Educational level of the household head Grade _____	1= None (illiterate) 2= Read and write 3= primary (1-4) 4= Junior (5-8) 5= Secondary (9-10) 6= Preparatory (11-12) 7= Above
Marital status	1= Married 2= Single 3= Widowed 4= Divorced

Family size \_\_\_\_\_

Sex category	<15 years	15 to 65 years	>65 years
Male			
Female			
Total			

## II. Resource ownership

### Land holding and Farming characteristics

1. What is the area of your total land \_\_\_\_\_ ha
2. What is total area of rented in land \_\_\_\_\_ ha , rented out land \_\_\_\_\_ ha
3. What is the area of shared in land \_\_\_\_\_ ha , Shared out land \_\_\_\_\_ ha
4. Total area allocated for wheat in 2006/2007 production year \_\_\_\_\_ ha
5. Have you grazing land? 1. Yes 2. No
6. If No. 4 is 'yes' what is the size of grazing land? \_\_\_\_\_ ha
7. When did you started farming ( farming experience) \_\_\_\_\_ (years)

### 8. Crop produced in 2005/6 E.C

Type of crop	Area in Ganna (ha)	Area in Bona (ha)	Total quantity produced (Qt)		Quantity consumed (Qt)		Quantity sold (Qt)		Total quantity sold (Qt)	Price per Quintal	
			Ganna	Bona	Ganna	Bona	Ganna	Bona		Ganna	Bona
Bread wheat											
Durum wheat											
Emmer wheat											
Barley											
Faba bean											
Field pea											

### 9. Livestock ownership

Type	Number	Number sold last year	Price per animal sold	Total Revenue gained
Oxen				
Cow				
Bull				
Heifer				
Calf				
Sheep				
Goat				
Horse				
Mule				
Hen				
Donkey				

### III. Source of Income

#### Farm income

- What are your major sources of income? Sale of crops =1 Sale of livestock and/or products =2 Off-farm income =3 Others = 4 (specify) \_\_\_\_\_
- Estimate of annual cash income from
  - Sale of crops \_\_\_\_ Birr/year

- b) Sale of livestock \_\_\_\_\_ Birr/year
- c) Sale of livestock products (milk, butter, egg,...) \_\_\_\_\_ Birr/year
- d) Off-farm income \_\_\_\_\_ Birr/year
- e) Other sources \_\_\_\_\_ Birr /year(specify) \_\_\_\_\_
3. Which crops did you sale most of the time? \_\_\_\_\_ (Put in their order of importance by selecting from the following) Wheat =1 Barley =2 Linseed =3 Field pea =4 F.bean =5 Others =6(specify) \_\_\_\_\_

### Off/non farm income

4. Do you have off/non farm income? 1. Yes 2. No (if yes proceed to the following table)

Income source	Estimated annual income	Who were responsible (*)
Daily labour		
Petty trade		
Hand craft		
Fire wood sale		
House rent		
Employment		
Remittance		
Others (specify) _____		

\*1=husband 2=wife 3= son 4=daughter

## IV. Wheat production

### Input Supply

1. Have you used agricultural inputs (fertilizer, chemicals, improved seeds etc.) for the production of wheat? (✓) 1. Yes 2. No

Type of input	Did you used for wheat? 1. Yes 2. No	Price per (Qt/Lit)	Amount used per hectare	Source: 1. own 2. government, 3. Cooperative/union 4. Private traders
Improved seed				
Fertilizer	DAP			
	UREA			
Herbicide				
Fungicide				
Insecticide				
Others (specify)				

### Credit services

1. Do you have access to credit? Yes=1 No=0
2. If yes, have you received credit in cash last year? Yes=1 No=0
3. If Q2 is yes, how much it was? \_\_\_\_\_ Birr
4. If Q2 is yes, for what purpose you used? Farm inputs purchase=1 Livestock purchase=2  
HH consumption=3 Land rent=4 Others=5 Specify \_\_\_\_\_
5. From where did you get the credit service? Cooperative=1 Micro finance=2  
NGOs=3 Local money Lender=4 Saving and credit Association=5 Others=6  
(specify) \_\_\_\_\_
6. If answer for Q2 is no, why? High interest rate=1 No need=2 Lack of Collateral=3 Fear  
of inability to repay=4 No service=5 Others=6/specify \_\_\_\_\_
7. What was the precondition to get credit? 1. Membership 2. Personal guarantee 3. Land  
holding 4. Collateral 5. Partial payment 6. Others  
(specify) \_\_\_\_\_
8. Do you have any problems in getting credit? Yes =1 No =0
9. If yes, what is the nature of your credit problem(s)? 1. Few supply 2. Inadequacy of  
credit 3. No diversification 4. Absence of informal sources 5. Unfavorable repayment  
time 6. High interest rates 7. Restrictive procedures 8. Others (specify) \_\_\_\_\_

### Extension and Information Services

1. Did you have an extension contact? Yes =1 No =0
2. If yes how frequently do you meet extension agent? 1. Daily 2. Weekly 3. Monthly  
4. Rarely

No.	Type of training	1. Yes 2. No	By whom(*)	How many times
1	Crop management			
2	use of input			
3	Use of cooperative			
4	Use of credit			
5	Natural resource conservation			
6	Pre and post harvest management			
7	Seed production			
8	Marketing of agricultural products			
9	Field days/demonstration			

\*1. Research Centre 2. Bureau of agriculture 3. University 4. NGOs 5. Others (specify) \_\_\_\_\_

### Farming activities and associated costs

1. What do you use to plough your land? 1. Own Oxen 2. Rented Tractor 3. Rented oxen
2. If rented tractor how much it costs you per hectare \_\_\_\_\_birr , how about if rented oxen \_\_\_\_\_birr/hectare
3. Do you weed wheat manually? 1. Yes 2. No
4. If Q3 is yes, from where do you get labour for weeding? 1. Family 2. Casual labourer 3. Daily labourer
5. If Q4 is causal labourer, how much do you pay him/her per month .....birr
6. If Q4 is daily labourer, how much do you pay per man day .....birr
7. If you employ daily labourer to spray chemical for you, how much it costs you per hectare \_\_\_\_\_birr
8. What do you use to harvest your wheat? 1. Manually harvested 2. Combine harvester
9. If you used combiner for harvesting how much you paid per quintal in 2005/6 harvesting time? \_\_\_\_\_birr, how if manually \_\_\_\_\_birr/man day.
10. What are the major wheat production constraints?

No.	Constraints	Rank (according to importance)	Remark
1	Rust		
2	Low soil fertility		
3	Mono cropping		
4	Weed		
5	Shortage of improved variety seed		
6	Shortage of other inputs		
7	Unavailability of improved variety seed		
8	High price of inputs		
9	Low yield of wheat		
10	Shortage of rain		
11	High rainfall		
12	Others _____		
13			
14			

### V. Marketing

1. Did you sell wheat last year (2006/7)? 1. Yes 2. No
2. If no.1” no” is why didn’t you sell? \_\_\_\_\_
3. If Q1 is yes, which type of wheat is sold? 1. Bread wheat 2. Durum wheat 3. Both

4. If Q1.is yes, to whom did you sell? (More than one answer is possible) 1=consumer  
2=Retailer 3=Wholesaler 4=Cooperatives/Unions 5=brokers 6=millers/processors  
7= commission agents 8= speculators 9 = Assemblers
5. To whom do you usually want to sell? \_\_\_\_\_ (choose from above)
6. Reason for selling to the selected actor? 1. Price difference from others 2. Closeness in distance 3. Transport availability 4. Others (specify)\_\_\_\_\_
7. If you sold to more than one actors in Q4, please estimate volume sale to each of them from 2005/6 production years sale (percentage) \_\_\_\_\_
8. For how many months you store wheat for sale (on average months) \_\_\_\_\_ months
9. What was the price of wheat immediate after harvest in 2005/6? \_\_\_\_\_ birr/100kg
10. Where do you sale/market place? 1. within village 2. outside village 3. within district  
4. outside district
11. Is there a difference in price due to differences in place of sale and the type of buyer?  
1/Yes 2/No
12. If yes, indicate the price when the product is sold to different actors and in different places.

Place of sale	Price when the product is sold to:						
	consumers	Retailers	Wholesalers	Cooperative /union	Processors	agents	speculators
On the farm/farm gate							
Village market							
Woreda market							
Collection points							

13. Means of transportation used to take wheat to the market?  
1. Cart 2. Pack animal 3. Vehicle 4. Others (specify)\_\_\_\_\_
14. Do you owned the type of transportation you used to supply to market place? 1. Yes  
2. No
15. If no, how much it costs you to reach market place per 100kg?  
\_\_\_\_\_ birr

### Marketing Association

1. What type of relationship do farmers have with buyers? 1. No relation 2. Acquaintance  
3. Friend 4. Relative 5. Others (specify )\_\_\_\_\_

2. Do you have long standing customer (buyer)? 1. Yes 2. No
3. Do farmers sell their wheat product on credit basis? 1. Yes 2. No
4. If yes how long do you wait for the payment? \_\_\_\_\_
5. In deciding to whom to sell, what factors do you consider?

### Price information

1. What is the trend of wheat price for the past five years?
  1. Increasing 2. Decreasing 3. Stable

Years	Average Price per 100kg in Birr	Remark
2002		
2003		
2004		
2005		
2006		

2. Who decides on price during selling?
  1. Traders 2. Producers 3. Brokers 3. Negotiation of farmers with traders 4. Others (specify) \_\_\_\_\_
3. If broker/middlemen negotiates on price, who will pay for him? 1. Farmer 2. Trader
4. If farmer, how much do you pay for him per quintal (Total payment per volume of sale) \_\_\_\_\_birr/qt.

### Supply information

1. When do you sold last year's wheat produce?
  1. Immediate after harvest 2. One month later 3. More than two months
2. If you sell immediate after harvest, why you did that?
  1. Better price 2. Storage problem 3. Fear of price fall 4. Bulk of production
  5. Others (specify) \_\_\_\_\_
3. What do you consider to supply your wheat to the market?
  1. Assess price information and supply if better 2. When we need money, we supply
  3. Others (specify) \_\_\_\_\_

### Value addition

4. Is there product quality required by buyers? 1. Yes 2. No
5. If yes, do you keep quality that is required by buyers? 1. Yes 2. No
6. If yes what value adding activities you made?
  1. Cleaning, cost per quintal \_\_\_\_\_
  2. Storage, cost per quintal for storage \_\_\_\_\_
  3. Transportation, cost per quintal to reach sale outlet \_\_\_\_\_
  4. Others (specify, cost) \_\_\_\_\_
7. Is there price difference due to value addition? 1. Yes 2. No
8. If no.7 is yes, do you estimate price difference due to value addition? \_\_\_\_\_ birr/kg

### VI. Source of market information

1. Do you get market information before supplying your product to market? 1. Yes 2. No

Source Category	Source list	1. Yes 2. No
Personal/professional networks	Traders	
	Friends/neighbour	
	Development Agent	
	Others (specify _____)	
Public information system	From market bulletins	
	Radio	
	Television	
	Message blackboards at market places/ECX board	
	Others (specify _____)	

### VII. Average return of wheat

Type of wheat	Selling Price	Total costs birr/qt							
		Packing material	Loading/unloading	transportation	Broker	Weight Loss	Store rent	revenue	Tax
Bread wheat									
Durum wheat									

### VIII. Membership in Cooperatives;

1. Are you a member of farmers cooperative? 1. Yes 2. No
2. If yes, what is the name of cooperative? \_\_\_\_\_
3. Why you joined the cooperative? \_\_\_\_\_

1. The cooperative provide better price
2. The cooperative try to hold the cost down
4. Provide guaranteed outlet (market)
5. Give field service or technical assistance \_\_\_\_
6. The scaling is fair \_\_\_\_\_
7. It makes timely payment \_\_\_\_\_
8. Others (specify)\_\_\_\_\_

### Gender

1. During allocating lands to wheat crop planting, who will decide? 1. Only husband 2. Only wife 3. Both husband and wife through discussion 4. Others (specify) \_\_\_\_\_
2. Who controls the overall crop products you got during storage? 1. Husband 3. Wife 3. Both 4. Others (specify)\_\_\_\_\_
3. Who decides on sell of wheat produces owned by household? 1. Husband 2.wife 3. Both husband and wife 4. Others (specify)\_\_\_\_\_
4. Who will manage the finance after selling your products? 1. Husband 2. Wife 3. Others \_\_\_\_\_
5. Who is the member of cooperative from your family? 1. Husband 2. Wife

### Marketing constraints

No.	Constraints	1. Yes 2. No	Rank according to Severity of problem
1	Low price		
2	Less/no market information		
3	Low bargaining power		
4	Price instability		
5	No buyer or lack of market		
6			
7			
8			
9			

## Checklist for Wheat Value Chains Analysis in Sinana District

### Checklist for traders (wholesalers, Assemblers/collectors, retailers)

#### 1. General Characteristics

1. Name of trader \_\_\_\_\_ Tel: \_\_\_\_\_
2. Age \_\_\_\_\_ Sex \_\_\_\_\_ 1. Male 2. Female
3. Marital status 1. Married 2. Single 3. Divorced 4. Widowed
4. Family size \_\_\_\_\_: Male \_\_\_\_\_ Female \_\_\_\_\_
5. Country----- Region ----- District----- Kebele -----
6. Type of business: 1) Wholesaler 2) Retailer 3) Processor
7. Level of education of respondent \_\_\_\_\_
8. Position of respondent on the business: 1. Owner 2. Spouse of owner 3. Employed manager 4. Relative of business owner 5. Others (Specify) \_\_\_\_\_
9. How long have you been operating the business? \_\_\_\_\_ years
10. Did you trade alone or in partnership? (√); 1. [ ] Alone 2. [ ] Partnership 3. [ ] Other (specify)
11. If partnership, how many are you in the joint venture? \_\_\_\_\_
12. Total number of peoples employed in your business: \_\_\_\_\_

#### 2. Buying

- 2.1 What products do you purchase in your trading center? 1. Bread wheat 2. Durum wheat  
2. Pulse crops (specify \_\_\_\_\_) 4. Other cereal crops (specify \_\_\_\_\_)
- 2.2 If you are involved in more than single commodity trade which one is larger in volume?  
1. Wheat 2. Durum wheat 3. Pulse crops
- 2.3 Who are the major suppliers of bread wheat to you? 1. Farmers 2. Retailers 3. Brokers  
4. Other wholesalers 5. Investors 6. Cooperatives/Unions 7. State farm
- 2.4 If farmers are the major suppliers, where does the transaction take place? 1. Farm gate  
2. Farmers bring their products up to our business center 3. Market place
- 2.5 If they bring products up to your trading centre, do you help them in terms of transportation?  
1. Yes 2. No

2.6 If yes how do you help them? 1. Share part transportation cost 2. Send for them track  
3. Cover the whole cost of transportation 4. Others (Specify)\_\_\_\_\_

2.7 In which months does the demand/supply for products increases/decreases?

	January	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
High demand												
Low demand												
High supply												
Low Supply												

2.8 Factors affecting seasonality in products supply in order of their priority?

No.	Major factors	Rank (1= high priority, 3=low priority)

2.9 Average buying prices for products per 100kg in 2014/15 production season

\_\_\_\_\_ birr (Average of Bona and Ganna season)

2.10 Quality parameters to be considered when buying products-----

-----

2.11 Do traders transfer information on quality considerations to their suppliers? 1. Yes

2. No

2.12 Is there long standing relationship between traders and suppliers? 1. Yes 2. No

2.13 Do traders provide premium prices for their permanent suppliers? 1. Yes 2. No

2.14 If yes, how much (what percent of the price)? -----

2.15 If 1.13 is yes, based on what do traders add premium price for producers or suppliers? \_\_\_\_\_

2.16 How many quintal/kg of wheat grain an average trader buy (weekly) in high supply season? \_\_\_\_\_ How many in low supply season? \_\_\_\_\_

2.17 What are the major problems in buying wheat grain in order of their importance?

Major constraints	Rank (1-3) (1= high priority, 2= medium 3=low priority)


### 3. Selling

- 3.1 To whom do traders sell wheat grain? -----
- 3.2 Where do traders sell (place/s)? -----
- 3.3 Average price per kg when reselling \_\_\_\_\_ birr
- 3.4 Do traders have longstanding customers for selling wheat they bought?
- 3.5 Do you sell on credit? 1. Yes 2. No
- 3.6 If “2.5” is yes, for how long do you wait the payment? -----
- 3.7 Are you/traders in your area supply to flour factory? 1.Yes 2.No
- 3.8 If yes, to which area processors? -----
- 3.9 Do they (processors) have specific criteria for your products? 1. Yes 2. No
- 3.10 What are the requirements of buyers in terms of quality? -----
- 3.11 Do traders know the different grades of wheat that processors want? 1. Yes 2. No
- 3.12 If yes, are they using them? 1. Yes 2.No If no, why? -----
- 3.13 How do you consider the trend in availability of wheat grain/volume of marketed of grain in the market you operated (Increased, decreased, the same)? -----  
Reason for such a trend? -----
- 3.14 Who is the price maker in the wheat market? -----
- 3.15 Factors affecting the price of products and services in the area-----
- 3.16 Do traders (of wheat) usually have any legally binding contract agreement with their suppliers and buyers? 1.yes 2.No
- 3.17 If yes, is there any problem with enforcement of contracts? 1. Yes 2.No
- 3.18 Which market regulations affect your business? -----  
major problems in selling your products? -----
- 3.19

### Transportation

- 3.1.How do traders transport wheat?-----
- 3.2.If traders are transporting using Isuzu trucks, how many quintals can they transport in one load?----- quintals
- 3.3.What are the major problems in transporting? -----  
-----

### Costs

- 5.1. Indicate all costs you incur for marketing the product including taxes, transportation, labor, packaging, telecommunication etc

Cost of marketing	Cost per unit in birr	Remarks
Packing cost		
Loading/unloading cost		
Transportation cost		
Storage cost		
License and tax		
Telephone cost		
Other costs (specify)		

### Market information

- 6.1. How do traders get market information (source)? -----
- 6.2. To whom do they transfer this information? -----
- 6.3. How often do traders get market information? -----

### Credit

- 7.1. How often working capital is a problem for traders
- 7.2. Traders cash sources (own, credit from bank, credit from informal market...)
- 7.3. Any problem related to credit? -----

### Storage

1. Do you own your own storage? 1. Yes 2. No
2. If no.1 yes capacity of your storage? -----quintal at a time
3. If no.1 is 'no' where do you store? 1. Renting 2. Friends store 3. Others (specify)
4. If no.3 is renting, rental cost per month? -----birr/month
5. For how many months do you store products you bought? -----months

How would you rate your suppliers knowledge about these topics (1 = very good, 5 = very bad)

Topics	Ratings				
	1	2	3	4	5
General Marketing					
Awareness of his market position and role					
Quality assurance / standards /					

Storage techniques and post-harvest management					
Distribution and transport logistics					

**THANK YOU FOR YOUR PATIENCE AND TIME ALLOCATION TO RESPOND!**