MARKET SUPPLY AND VALUE CHAIN ANALYSIS OF WHEAT: THE CASE OF TIYO AND HETOSA DISTRICTS IN ARSI, ETHIOPIA

M.Sc. Thesis

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Jimma University

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By

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DEDICATION

I dedicated this thesis manuscript to my beloved mother, Sure Hamade, for the dedication she made in the success of my life.

STATEMENT OF AUTHOR

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BIOGRAPHICAL SKETCH

The author was born on August 16, 1991 in Diksis district, Arsi Zone, Oromia National Regional State. He attended his elementary school in Watera Misa elementary school which is found in Diksis district.

The author attended his secondary school in Hamda Diksis Secondary School and part of it in Huruta Senior Secondary School which found in Huruta town. Then he joined Adama Science and Technology University , Asela School of Agriculture and graduated with B.Sc. degree in Agribusiness Management and Marketing(ABMM) in July,08, 2012. Immediately, he was employed in Plan International Ethiopia as data collector for two month around Adama area, West Shoa Zone. Then, he joined Ambo University School of Agriculture and Veterinary Science, Department of Agribusiness and Value Chain Managements as Graduate assistant I, until he joined Jimma University, College of Agriculture and veterinary Medicine to pursue M.Sc. in Agribusiness and Value Chain Management in March, 213.

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ABBREVIATIONS AND ACRONYMS

AAFC	Agriculture and Agri-food Canada
AISE	Agricultural Inputs Supply Enterprise
CSA	Central Statistics Agency
EGTE	Ethiopian Grain Trade Enterprise
EIAR	Ethiopian Institute of Agricultural Research
ESE	Ethiopian Seed Enterprise
FAO	Food and Agricultural Organizations
GDP	Gross Domestic Product
GMM	Gross Marketing Margin
HDoARD	Hetosa District Office of Agriculture and Rural Development
HFCU	Hetosa Farmers' Cooperative Union
MAFAP	Monitoring, African Food and Agricultural Policy
MoFED	Ministry of Finance and Economic Development
NMM	Net Marketing Margin
TDoARD	Tiyo District Office of Agriculture and Rural Development
USAID	United Stated Agency for International Development
VIF	Variance Inflation Factor
WFP	World Food Program

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ABSTRACT

The study was aimed at market supply and value chain analyses of wheat in Hetosa and Tiyo districts of Oromia region with specific objectives of mapping wheat value chain actors and their value addition, analyzing performance of wheat market and, estimating the intensity and determinants' of marketed surplus of wheat by small holders in the study area. The primary data for this study were collected from 150 households, 85 traders; 5 cooperatives, 18 processors and 20 consumers based on three stage random sampling method. Value chains tools were used to map wheat value chain, S-C-P model to analyzing performance of wheat market, and Tobit model to analyze factors affecting marketed surplus of wheat in the study areas. The study result showed Constraints hindering the development of production and marketing of wheat were shortage of improved wheat variety, diseases, theft on the field and at market level price setting problem, theft and others. Value chain analyses revealed that the major actors in wheat value chain were input suppliers, farmers, traders, brokers, processors, retailers, and consumers. Each of these actors adds value in the process of changing product title. Based on the market concentration ratio we conclude that both Eteya (26.5%) and Asela (37.7 %) markets are classified as monopolistic competition forms of market structure. Lack of capital is found to be the major trade barriers in the study area. Wheat producers added 34% of the total value, collectors, wholesalers, retailers and processors are responsible for value addition of 4%, 2%, 4% and 56%, respectively. The result of Tobit model indicated that value adding activities, livestock holding, access to credit, family size, to non-farm income, type of seed used and cultivated land for wheat influenced the amount of wheat marketed surplus significantly. Therefore, policy aiming at increasing farmers' access to modern inputs, developing and improving infrastructure, cooperative development and improving extension and marketing system are recommended to accelerate the chain's development.

Key words: Value chain analyses, actors, wheat, Tobit model

1. INTRODUCTION

1.1. Background

Agriculture has always been an important sector in Ethiopia. About 85% of the population is directly or indirectly engaged in agriculture. It contributes about 46.4% of the gross domestic product of the country; the sector is also the main source of foreign exchange earnings since, it accounts for about 90% of the total export income of the country; the export diversification prospect is mainly focused on agricultural products and this would also bolster the contribution of agriculture for the export sector (MOFED, 2012).

Food grains (cereals, pulses and oil crops) constitute the major source of food in Ethiopia; accounting for 82% and 70% of total calorie intake and food expenditure, respectively (CSA, 1988; Abebe, 2000). Hence, concern over marketed food grain surplus has always been at the center of the country's policy formulation and implementation. The crucial importance of ensuring sustained levels of marketed food surplus, both in terms of quantities and fair prices, cannot be overemphasized if food security is to be attained in Ethiopia. However, government policies have been more focused on aspects of production and marketing and less on what happens in between production and consumption. Estimates suggest that the magnitude of post-harvest loss in Ethiopia was tremendous ranging from 5% to 26% for different crops (Dereje, 2000). This figure is quite large especially for Ethiopia where a great majority of people are food insecure. It is ironical that the immediate victims of food insecurity have traditionally been farmers, i.e., the very producers of food. Each year, despite weather condition, hundreds of thousands of rural households suffer food insecurity.

In Ethiopia, cereal production and marketing is the means of livelihood for millions of smallholder households and it constitutes the single largest sub-sector in the economy. Cereal accounts for roughly 60% of rural employment, 80% of total cultivated land, more than 40% of a household's food expenditure, and provide about 70% of the average Ethiopian's calorie intake (FAO, 2012).

Wheat is one of the most important cereals cultivated in Ethiopia. It ranks fourth after teff, Maize and Sorghum, in area coverage and third in total production. The total wheat production of Ethiopia in 2010/2011 was 28.5 million quintals; the crop is grown at an altitude ranging from 1500 to 3000 meters above sea level (masl); the most suitable agro-ecological zones, however, fall between 1900 and 2700 masl; it is largely grown in the highlands of the country, constitutes roughly 10% of the annual cereal production, and plays an appreciable role in supplying the population with carbohydrates, protein and minerals (Schulthesset *et al.*, 1997).

Wheat is produced by Small holder farmers, state farms and commercial farms. Almost all wheat producer in the country produce, predominantly, under rain-fed conditions. The wheat consumption trend in Ethiopia is gradually increasing in urban areas due to high population growth (about 2.6% a year), migration of people to urban areas, and changes in life styles(Ethiopia Grain Trade,2013).

In Ethiopia, wheat grain is used in the preparation of a range of products such as the traditional staple pancake ("injera"), bread ("dabo"), local beer ("tella"), and several others local food items (i.e., "dabokolo","ganfo", "kinche"). Besides, wheat straw is commonly used as a roof thatching material, and as a feed for animals. Wheat contributes approximately 200 kcal/day in urban areas, and about 310 kcal/day in rural areas; it accounts for about 11% of the national calorie intake *(Guush et al, 2011).*

Wheat production has been exercised in all zones of Oromia region. However, Arsi, Bale, West Shewa, East Shewa and West Arsi are major wheat producing zones in the region with annual production of more than one million quintals (Bekele *et al.*, 2000). Arsi zone produces a number of different varieties of agricultural crops ranging from cereals to pulses, vegetables, fruit, oilseeds and spices. Crop production by area is predominantly cereals followed by pulses, vegetables, oilseeds and fruit crops. The zone is referred as surplus grain producing areas in the country, specifically by wheat production. Hetosa and Tiyo districts are among the districts of Arsi zone known by the production of barley and wheat (CSA, 2012).

Even though Ethiopia has high potential for the production of wheat, the product supply and production are not conduct in response to customers' needs. In addition to this, poor linkages among wheat value chain actors (farmers, wholesalers, retailers, exporters and processors), is the other factor contributing to low returns from the sub-sector. Until now market, orientation in Ethiopia is poorly developed (Wijnands *et al.*, 2009)

So as to exploit the opportunity of the current growing demand for wheat and wheat products, development programs and approaches which bring all wheat actors together is fundamental to improve quality and strengthen linkages. Therefore, this study aims at analysis of wheat value chain and marketing in the study area.

1.2. Statement of the Problem

Value-added agriculture has attracted considerable attention in recent years as a means to increase and/or stabilize farm incomes. Value-added activities are born from the necessity to adapt to the wide-ranging changes affecting the agriculture and agri-food industry. These changes stem from many interacting factors: the quick expansion of agricultural trade and the resulting concentration in the agri-food industry, an increasingly segmented consumer base, shifting consumer preferences, changing demographics and income profiles, innovation in food and non-food uses of agricultural products and trade related issues, including border closures, in an increasingly integrated global market (AAFC, 2004).

Increased competition because of globalization has resulted in lower returns for actors in African agriculture, including farmers and agro-processors, as they have continued to lag behind their competitors in innovation and the ability to set their products apart. With globalization, product distinction and branding are becoming increasingly important ingredients for market differentiation and upgrading strategies. This is especially due to greater consumer awareness, with demand for superior and differentiated products (FAO, 2003).

Agricultural marketing is a very important factor in economic development and lack of a well-functioning agricultural marketing system severely hinders the increase of social welfare, income distribution, and food security of developing countries (Wolday, 1994).

The proper use of the forces of marketing for economic development requires critical evaluation of the existing marketing system, introduction of appropriate marketing policies and procedures with the aim of conceiving and formulating practically workable solutions to the marketing problems. Introduction of appropriate marketing policies and procedures calls for an understanding of whether the system is performing well or not. To ascertain this there is a need to evaluate and control the existing marketing (Elias, 2005).

In spite of potential for production and growing demand for wheat, in the country market, the supply is constrained by different factors in the country. The constraints are observed at four different supply chain levels (farmers, traders, processors and importers). Opportunities for well-organized wheat value chain are not fully exploited yet because of inefficient marketing, improper cleaning and sometimes-poor contract discipline (Berhanu *et al, 2010*).

Many smallholders in the Ethiopian wheat value chain depend on intermediaries, due to the small quantities involved. This complicates tracking out the origin of the product and meeting the requirements of highly developed consumer markets (like European markets). This requires professionally managed supply chains with tracking and tracing systems (Wijnands *et al*., 2007).

Hetosa and Tiyo districts are among wheat producing districts which has benefited from researches on wheat and subsequent transfers of improved wheat varieties and agronomic practices. While success stories can be anticipated regarding wheat value chain ,no published study discussing the wheat value chain has been found (to the best of the authors knowledge). A few studies conducted so far in similar agro ecologies (but different districts) could identify factors affecting the adoption of improved wheat technologies (e.g. Bekele, *et al*, 2000; Tesfaye, *et al,* 2001; Hailu, 2008) but didn't go further for value chain analysis.

There is production, productivity and marketing problems of several wheat farmers in the country, which needs the specific focus of researchers to conduct wheat value chain analysis in these specific areas as it incorporates factors influencing production, productivity, and producer's shares of end consumer's prices in it. Furthermore, in Ethiopia no study followed value chain framework to describe the work process and actors involved in wheat value chain analysis so far. Cognizant of these facts, this study was undertaken to narrow the wide research gap that has been observed currently on wheat value chain analysis in the study area.

1.3. Objectives of the Study

The general objective of the study was to analyze market supply and wheat value chain in the study area. The specific objectives of the study are:

1. To map Wheat value chain actors and their value addition in the study area;
2. To assess market structure-conduct- performance of wheat in the study area; and
3. To estimate the intensity and determinants of marketed surplus of wheat by small holders in the study area.

1.4. Research Questions

The study attempted to answer the following research questions:

1. Who are the participants of wheat value chain?
2. What is the function of each actor along the chain?
3. How do actors behave in the marketing and price setting mechanism?
4. How is structure-conduct -performance of wheat market in the study area?
5. What factors affect the amount of marketed surplus of wheat?

1.5. Significance of the Study

Analyzing wheat value chain indicates the gaps to improve wheat production, marketing and benefit policy makers and implementers in the area to fill the gaps. In addition to this, it also help to make appropriate marketing decisions by the producers, consumers, traders, investors, and others, specially help producers and traders to understand the production and marketing

problems then by implementing them based on the recommendation that will increase to some extent production and marketing efficiency.

The study was conducted in the area in which wheat production is their main stay and it evaluates whether the marketing performance is well or not and evaluating the performance helps to prepare a further strategy to develop the institutional arrangement and improve farmers' economic position. The other benefit that would be anticipated is its significance as a source for further and detailed studies of wheat value chain at the regional and country level.

1.6. Scope and Limitations of the Study

As the study is being the first in the region, it lacks many detailed investigations, which could be reinforcing understanding of the whole system especially in relation to demand side and consumption preference studies. The study narrowed down to concentrate on wheat value chain in Hetosa and Tiyo district as well as final market of the product. Furthermore, other wheat products were not included due to time and budget constraint. Hence, the study was limited spatially as well as temporally to make the study more representative in terms of wider range of area, 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. However, it may be useful for areas with similar context with the study areas.

1.7. Organization of the Thesis

Subsequent part of this paper is organized into five sections/chapters. A review of the selected conceptual and methodological frameworks is dealt in chapter two. Chapter three introduces background information about the study area and verifies the methods of data collection and data analyses, followed by chapter four that presents the results of the study. Finally, chapter five offers a brief summary, conclusion and policy recommendation of findings.

2. LITERATURE REVIEW

2.1. Definition and Basic Concepts of Value Chain

A value chain describes the full range of activities that are required to bring a product or service from conception, through the intermediary 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 (Kaplisnky and Morris, 2001; ILO, 2009). This includes activities such as design, production, marketing, and distribution and support services up to the final consumer. As the product passes through several stages of the value chain, the value of the product increases (ILO, 2009).

The idea of value chain is quite intuitive. It exists when all of the actors in the chain operate in a way that maximises the generation of value along the chain. Value chain can be in a narrow or in a broad sense. In the narrow sense, a value chain includes the range of activities performed within a firm to produce a certain output. In other words all activities constitute the chain which links producers to consumers and each activity adds value to the final product. The broad approach does not only look at the activities implemented by a single enterprise. Rather, it includes all its backward and forward linkages, until the level in which the raw material is produced will be linked to the final consumers (Kaplisnky and Morris, 2001).

A useful methodology for understanding how markets operate, for a particular good, is value chain analysis. A value chain is a set of value-adding activities through which a product passes from the initial production or design stage to final delivery to the consumer; can be local, national, regional or international in scope (Kanji *et al*., 2005).

Supply chain is taken to mean the physical flow of goods that are required for raw materials to be transformed in to 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)

In its simplest definition, the term supply chain, market chain are synonymously used to describe all participants involved in an economic activity which uses inputs and services to enable a product to be made and delivered to a final consumer. A value chain is understood as a strategic network between a numbers of independent business organizations. According to Hobbs *et al*. (2000), a value chain is differentiated from a production/supply chain because participants in the value chain have a long term strategic vision, disposed to work together, oriented by demand and not by supply, shared commitment to control product quality and have a high level of confidence in one another that allows greater security in business and facilitates the development of common goals and objectives.

The goal of a value chain is to optimize performance in that industry using the combined expertise and abilities of the members of the chain. Successful chains depend on integration, coordination, communication and cooperation between partners with the traditional measure of success being the return on investment (Dunne, 2001; Bryceson and Kandampully, 2004).

According to Kaplisnky *et al*. (2000), there are four major key concepts guiding agricultural value chain analysis. These are: effective demand, production, value chain governance, and upgrading.

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).

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Production: In agricultural value chain analysis, a stage of production can be referred to as any operating stage capable of producing a saleable product serving as an input to the next stage in the chain or for final consumption or use. Typical value chain linkages include input supply, production, assembly, transport, storage, processing, wholesaling, retailing, and utilization, with exportation included as a major stage for products destined for international markets. A stage of production in a value chain performs a function that makes significant contribution to the effective operation of the value chain and in the process adds value (Anandajayasekeram and Berhanu, 2009).

Producing the required amount effectively is a necessary condition for responsible and sustainable relationships among chain actors. Thus, one of the aims of agricultural value chain analysis is to increase the quantity of agricultural production. Understanding the mechanisms of the agricultural production greatly help to design appropriate policy that bring more gain to farmers and the whole society at large. For a long time, sector analyses have been used to measure the different economic aspects of production. However, sector analyses have not been without weaknesses. In particular, sector analysis tends to be static and suffers from the weakness of its own bounded parameters. Such analysis struggles to deal with dynamic linkages between productive activities that go beyond that particular sector (Kaplinsky and Morris, 2000). By going beyond the traditional narrow focus on production, value chain analysis scrutinize interactions and synergies among actors. Thus, it overcomes several important limitations of traditional sector assessments.

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 Morries, 2000). Value chains imply repetitiveness of linkage interactions. Governance ensures that interactions between actors along a value chain reflect organization, rather than randomness. The governance of value chains emanate from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in activities, roles and functions. It is important to note that governance and coordination sometimes appear as synonymous or interchangeable terms in the literature. Already in the 1980s, Williamson (1979, 1985) used the term governance to define the set of

institutional arrangements in which a transaction is organized. As Gereffi's work on global commodity Chains and the role of governance appeared, the term coordination took on a new meaning, basically, the vertical organization of activities. The application of contract/private ordering/governance leads to naturally into the reconceptualization of the firm not as a production function (in the science of choice tradition) but as a governance structure (Williamson, 2002).

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

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

Chain governance should also be viewed in terms of 'richness' and 'reach', *i.e.,* in terms of its depth and pervasiveness (Evans and Wurster, 2000). Richness or depth of value chain governance refers to the extent to which governance affects the core activities of individual actors in the chain. Reach or pervasiveness refers to how widely the governance is applied

and whether or not 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).

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 (Kaplisnky 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 (*e.g.* Humphrey and Schmitz, 2000; Humphrey, 2003; Humphrey and Memedovic, 2006) provide evidence of the importance of upgrading in the agricultural sector

2.2 .The Basics of Marketing

Market and marketing

The word "market" has many connotations. Bain and Howells (1988), define "markets" as a single arrangement in which one thing is exchanged for another. A market according to Kohls and Uhl (2002) is an arena for organizing and facilitating business activities and for answering the basic economic questions: what to produce, how much to produce, how to produce, and how to distribute production.

According to Kotler and Armstrong (2004) defined marketing as a social and managerial process by which individuals and groups obtain what they want and need through creating and exchanging products and value with others. According to Lamb *et al*, (2004) Marketing is the process of planning and executing the consumption, pricing, promotion and distribution of idea, goods and services to create exchange that satisfy individual and organizational goals. Marketing is productive because it adds form, time and place utility (or satisfaction).

Marketing system

The concept of marketing system includes both the physical distribution of economic input and products, and the mechanism of process or coordinating production and distribution (cited in Andargachew 1990). Branson and Norvel (1983) define the marketing system in terms of what is otherwise known as marketing channel. In broad terms, marketing system may be defined as the totality of product channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. Marketing system operates through a set of intermediaries performing useful commercial functions in chain formations all the way from the producer to the final consumers (Islam *et al*., 2001).

Marketing channel

The term channel is derived from the Latin word canals, which means canal. Marketing channel is the set of interdependence organization that ease the transfer of ownership as products move from producer to consumer (Lamb, *et al*, 2004). Usually marketing follows a fairly well established channel from producers to consumers. Mendoza (1995) defined marketing channel as the path the goods follow from their sources of original production to their ultimate destination for final use.

Marketing chain is a term used to describe the numerous links that connect all actors and transactions involved in the movement of agricultural goods from the farm or point of production to consumers or final destinations (CIAT, 2004).

Marketable and marketed surplus:

Marketable surplus is the excess product which is made available after meeting producer needs (seed, home consumption, animal feed, in-kind labor payments and transfers). Thus, marketable surplus shows the quantity left out for sale in the market. Marketed surplus is the actual quantity sold or the residual that remains with the producer after meeting the requirement of seed, payment in kind, and consumption by farmer or quantity actually sold (Wolday, 1994).

Marketable Surplus is a theoretical ex ante concept which represents the surplus which the farmer/producer has available with himself for disposal once the genuine requirements of the farmer for family consumption, payment of wages in kind, feed, seed, wastage and purchases have been met. Marketed Surplus as compared to marketable surplus is a practical ex post concept and refers to that part of the marketable surplus which is marketed by the producer i.e. not only the part which is available for disposal but that part which is made available to the market or to the disposal of the non-farm rural and urban population (Nehru, J., & Vishwa, K., 2014).

2.3. Value Chain Methodological Framework

Value chains are a key framework for understanding how a product moves from the producer to the customer. The value chain perspective provides an important means to understand the business-business relationships, mechanisms for increasing efficiency, and ways to enable business to increase productivity and add value. It provides a reference point for improvements in services and the business environment. It is a vehicle for pro-poor initiatives and for linking small businesses with the market. Value chains include process actors like input suppliers, producers, processors, traders and consumers. At one end are the producers-the farmers who grow the crop and raise the animals. At the other end are consumers, who eat, drink and wear the final products. In the middle are hundreds and thousands of individuals and firms, each performing one small step in the chain: transporting, processing, storing, selling, buying, packaging, checking, monitoring, making decision, etc. It also includes a range of services needed in the value chain including technical support (extension), business enabling and financial services, innovation and communication, information brokering etc. The value chain actors and service providers interact in different ways starting from local to national levels (Bezabeh and Mengistu, 2011).

According to (AAFC, 2004) adding value to export and domestic commodities is believed to generate substantial profits and employment along the chains and in this way contributes to poverty alleviation. The promotion of value chains in agribusiness aims to improve the competitiveness of agriculture in national and international markets and to generate greater

value added within the country or region. The key criterion in this context is broad impact, i.e., growth that benefits the rural poor to the greatest possible extent, or at least, does not worsen their position relative to other demographic groups.

According to ILO (2009) there are five triggers (the means) by which to achieve value chain development. Using them as a methodological framework helps to identify opportunities and constraints to making the local target sector more competitive and integrate it more effectively into value chains and markets. The five triggers are discussed below:

System efficiency: It is a function and rule that ensure that a given target (market and demand) requirement is achieved and the (economic, social) costs associated with this process is low. It has two aspects: Productive efficiency, which describes the ratio between costs and benefits (or inputs and output) of certain productive activities with regard to specified targets and allocate efficiency is characterized by the degree as to which supply meets consumer demand and a tendency of market prices going towards long-term marginal costs (means costs per unit).

Product quality and specifications: It is mechanism that guarantees the production process along the value chain meet market requirement and demand condition. Markets today are changing fast and competition is becoming increasingly fierce. If enterprises want to stay in the market, they need to make sure that their products and services meet continuously changing market requirements and demand conditions. What counts, is the end product that the consumer receives, and the level of satisfaction that it creates.

Product differentiation (competition): Function and rule that ensure that the overall value chain in terms of price/cost or product quality differentiation. The better stakeholders cooperate along the value chain and coordinate their activities, the harder it will become for competitors to copy the product and the production process because it is not just the product they need to copy, but the entire system. It is therefore important to understand what competitors are doing, and how they are doing it, and then to find ways of achieving competitive advantage over them. This is mainly a matter of continuous innovation and

learning within in the value chain. Innovation and learning has to take place throughout the entire value chain if sectors want to remain competitive on world markets.

Improve social and environmental standards: Function and rule that reduce the negative external effect on social and external effect and ecological environmental and also ensure the economic gains along value chain results in win-win for all market players. Ensuring good social and environmental standards means being able to trace products and services' all the way back to their origin. This requires that businesses along the value chain cooperate. Retail and multinational companies are feeling pressure from consumer organizations, media, governments and Non Governmental Organizations (NGOs) to improve social standards in their supply/retail chains and to minimize environmental impact. Here again, it is more than a matter of doing business in a socially responsible way: it is in the commercial interests of companies to react.

Business environments: It is an external to the specific value chain sector or not directly part of production process along value chain but plays a crucial role in shaping the political, social and economic environment in which value chain operates. Value chains do not exist in isolation but they are embedded into a highly complex social, economic, political and cultural environment, which determines the nature and success of business transactions within the chain. Apart from the immediate and sector-specific environment, there is also a wider business environment, consisting of broader government policies, macro-economic stability, public services, international and bilateral trade agreements, but also cultural and social factors (such as attitudes to doing business and demographic trends) and climatic and environmental conditions.

Measuring value chain

A fundamental aspect of global value chain research is how 'value' itself, is conceptualized and measured. According to Gereffi's (1999) profit, value addition and price markups are indications of income shares across value chain actors. Value–added shares can be calculated for different links in the chain. A second way to calculate value added is to look its distribution by each value chain actors of vegetable market and decomposing for each actor to

get approximations of each value-added share. Marketing margin is the difference between the value of a product or a group of products at one stage in the marketing process and the value of an equivalent product or group of products at another stage. Measuring this margin indicates how much has been paid for the processing and marketing services applied to the product(s) at that particular stage in the marketing process (Smith, 1992).

2.4. Approaches and Methods to the Study Marketing Problems

The study of marketing involves various approaches. These include; the functional approach, the system or institutional approach and the individual or commodity approach (Mendoza, 1995; Branson and Norvell, 1983).

Functional approach

In this approach we took 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. Functional approach studies marketing in terms of the various activities that are performed in getting farm product from the producer to the consumer; these activities are called functions (Crammers and Jensen, 1997).

Physical distribution (i.e. functions) and economic activity (i.e. buying, selling) are two dimensions of marketing carried out by institutions or people. An analysis of these two dimensions of agricultural marketing is intimately linked to the institutions created by law or by corporate standards or simply by established procedure, that have emerged as a result of the social and economic relation between the participants in the marketing process (middlemen, consumers, and producers) and this approach helps to compare cost and benefits of different functions. The widely accepted functions are: a) exchange (buying and selling), b) physical (processing, storage, and transportation), and c) facilitating (standardization, financing, risk bearing, and market information). Most of these functions are performed in the marketing of nearly all commodities.

The institutional (system) approach

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Institutional approach examines the activities of business organizations or people in marketing. The institutional approach focuses on the study of the various institutions, which perform the marketing activities. These organizations or people are middlemen who perform the operations necessary to transfer goods from the producer to consumer, because of the benefit of specialization and scale that exist in marketing as well as production (Cramer and Jensen, 1982).

Commodity (individual) approach

In a commodity approach, a specific commodity or groups of commodities are taken and the functions and institutions involved in the marketing process are analyzed. This approach focuses on what is being done to the product after its transfer from its original production place to the consumer (Kohls and Uhl, 1985). It helps to pinpoint the specific marketing problems of each commodity as well as improvement measures. The approach follows the commodity along the path between producer and consumer and is concerned with describing what is done and how the commodity could be handled more efficiently. This approach had been used in this study as a guideline to identify different aspects of the problem.

Market performance can be evaluated by analysis of costs and margins of marketing agents in different channels, and market integration. A commonly used measure of system performance is the marketing margin or price spread. Margin or spreads can be useful descriptive statistics if used to show how the consumer's food price is divided among participants at different levels of the marketing system (Getachew, 2002).

Marketing costs: Marketing costs refers to those costs, which are incurred to perform various marketing activities in the shipment of goods from producers to consumers. Marketing cost includes: Handling cost (packing and unpacking, loading and unloading putting inshore and taken out again), transport cost, product loss (particularly for perishable fruits and vegetable), storage costs, processing cost, and capital cost (interest on loan), market fees, commission and unofficial payments (Heltberg and Tarp, 2001).

Marketing margin: A marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The total marketing margin is the

difference between what the consumer pays and what the producer/farmer receives for his product. In other words it is the difference between retail price and farm price (Cramers and Jensen, 1982). A wide margin means usually high prices to consumers and low prices to producers. The total marketing margin may be subdivided into different components: all the costs of marketing services and the profit margins or net returns. The marketing margin in an imperfect market is likely to be higher than that in a competitive market because of the expected abnormal profit. But marketing margins can also be high, even in competitive market due to high real market cost (Wolday, 1994).

There are three methods used in estimating marketing margin (Abbot, 1958): (a) following specific lots of consignments through the marketing system and assessing the cost involved at each of the different stages (time lag); (b) submission of average gross purchase by the number of units transacted for each type of marketing agency; and (c) comparison of prices at different levels of marketing over the same period of time (concurrent method). Because the first two methods are time consuming, in this study the third method was used.

Market integration

Distortions introduced by governments are in the form of policies either at the border, or as price support mechanisms that weaken the link between the international and domestic markets. Agricultural policy instruments such as import tariffs, tariff rate quotas, and export subsidies or taxes, intervention mechanisms, as well as exchange rate policies insulate the domestic markets and hinder the full transmission of international price signals by affecting the excess demand or supply schedules of domestic commodity markets (Abdulai *et* al., 2000).

Apart from policies, domestic markets can also be partly insulated by large marketing margins that arise due to high transfer costs. High transfer costs and marketing margins hinder the transmission of price signals, as they may prohibit arbitrage (Sexton *et al*., 1991).

Price transmission studies are apparently empirical that test the predictions of economic theories and provide important insights as to how changes in one market are transmitted to

another, thus reflecting the degree of market integration, as well as the extent to which markets function efficiently (Rapsomanikis *et. al.,* 2003).

Producer marketing decisions are based on market price information, and poorly integrated markets may convey inaccurate price information, leading to inefficient product movements (Goodwin and Schroeder, 1991). For developing countries, there are some additional cases to be made for well-integrated market systems. Linkages to marketing centers have been found to contribute significantly to rural household's escape from of poverty (Kishana, *et al*., 2004). Furthermore, the existence, extent, and persistence of famines in market economies are also closely linked to market integration.

2.5. Review of Empirical Studies

2.5.1. Value chain approach

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

The application of value chain analysis in agriculture is growing due to market failure and non competitive setting of small scale agricultural production. Value chain and innovations are also interlinked. Improvement in productivity and competitiveness of the value chain is the litmus test for value chain innovation (Anandajayasekeram and Gebremedhin, 2009). The concept of value chains has been extended to the analysis of globalization (Gereffi and Korzeniewicz, 1994; Kaplinsky, 1999).

However, value chain research related to wheat is scanty. Most literature and research in the past has focused on wheat production and some on marketing. The wheat value chain seminar conducted in Ethiopia (Mohammed Hassena, 2009) discusses value chain concept and its application to Wheat, constraints and opportunity for wheat production and marketing in Ethiopia.

There are a number of studies that have employed the value chain approach to other agricultural commodities. Dereje (2007) used value chain approach to study the competitiveness of Ethiopian coffee in the international market. The study indicates that Ethiopian farmers have low level of education, large family size with small farmland and get only 3% of the retail price in the German market. Thus, policy intervention was suggested to improve farmers' performance.

The study conducted by Stanley. K. and Alfred, (2010), on conduct market assessment of staple foods in Kenya include a value chain analysis, identified factors affecting growth of both production and trade of staple food crops such as persistent drought, high cost of input, weak extension services, weak research extension, and subdivision of land and high post harvest loss of crop. They found that horizontal linkages at the producer and marketing levels are generally very weak .Vertical linkage at all levels of the value chains are extremely weak-with the exception of large scale of wheat and maize production where some farmers have business relationships with millers; The staple food sector are characterized by very limited and narrow-based value-addition with the exception of wheat. There is lack of structured trading systems (i.e. absence of contract farming, underdeveloped Commodity Exchange and Warehouse Receipting systems); there is inadequate market information at all levels of the staple foods value chains (nationally and regionally).

Working paper conducted on pulses value chain, constraints and opportunity for enhancing export by International Food Policy Research Institute (2010) in Ethiopia indicated a set of constraints span the pulses value-chain in production, aggregation and trading, and demand sinks/export. The pulse value chain in Ethiopia is far from efficient and fraught with several

challenges. This paper identified the various impediments in order to develop possible interventions that can improve the performance of the value chain.

Chain study conducted on off-season vegetables by USAID (2011) in Nepal indicated that the subsector faces some challenges such as unavailability of quality planting materials, lack of knowledge among the producers of the proper usage of fertilizers and pesticides as well as poor soil fertility management, lack of irrigation facilities, labor shortage, postharvest loss due the perishable nature of vegetables, limited access to reliable market information, unorganized market center, limited collection centers, and lack of proper packaging and transportation facilities. The study recommended short-term and long term infrastructural and institutional innovation to reduce the above challenges.

Analyzing value chain of vegetables in Habro and Kombolcha Woredas of Oromia Region conducted by Abraham T. (2013).He identified the major actors in the Woredas and value chain activities. He used multiple regression models to identify marketable surplus of vegetable. He found 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. The multinomial logit model results also 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.

Horticulture value chain study conducted in Eastern parts of Ethiopia identified different problems on the chain (Bezabih, 2008). The major constraints of marketing identified by the same study include lack of markets to absorb the production, low price for the products, large number of middlemen in the marketing system, lack of marketing institutions safeguarding farmers' interest and rights over their marketable produces (e.g. cooperatives), lack of coordination among producers to increase their bargaining power, poor product handling and

packaging, imperfect pricing system and lack of transparency in market information communications.

Value chain study conducted on mango by Dendena *et al.* (2009) indicated that the subsector faces some challenges. Among others: highly disorganized and fragmented industry with weak value chain linkages, long and inefficient supply chains, inadequate information flows and lack of appropriate production are explained as the major problems. The study recommended institutional innovation to reduce the above challenges.

2.5.2. Determinants of marketable and marketed surplus

The study of marketable surplus turned out to be very vital for agricultural based countries because the transition of smallholder farmers towards commercial production is determined by it. Getachew (2009) has noted that the transition of the small-scale sector towards commercial production will ultimately be determined by the ability and willingness of producers to provide a commodity. Similarly, Mamo (2009) argued that the development of markets, trade and the subsequent market supply that characterize commercialization are fundamental to economic growth.

There are a number of empirical studies on factors affecting the marketable surplus of agricultural commodities. According to Wolday (1994) marketable supply of agricultural product could be affected by different factors including the size of land holding, the output level, family size, market access, price, inputs, formal education, oxen number, accesses to extension and credit services, distance to market, time of selling, access to labor and age.

Ayelech (2011), identified factors affecting the marketable surplus of fruits by using OLS regression, 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.

Abay (2007) applied Heckman two-stage model to analyze the determinants of vegetable market supply. Accordingly, the study found out that marketable supply of vegetables were significantly affected by family size, distance from main road, number of oxen owned, extension service and lagged price.

Some studies made on different surplus markets in different parts of Ethiopia showed that transaction costs and other socioeconomic factors influenced farm households' market participation. Different studies applied the Heckman-Two-Stage model to identify the determinant of the probability and the level of surplus market participation of red pepper, vegetable, dairy, cereal and poultry surplus markets (Rehima, 2006; Abay, 2007; Berhanu and Hoekstra, 2007;Woldemichael, 2008; Astewel, 2010; Dawit, 2010). Other studies (Kindie, 2007; Assefa, 2009) used OLS regression model to identify the determinants of sesame and honey market participation. Adugna (2009) also applied Cobb Dagula's production function to analyze factors affecting farm level papaya, onion and tomato supply in Alamata District. He observed that non-transaction costs affected the level of market participation. Getachew and Nuppenanu (2009) also employed two limits Tobit model and observed that transaction costs affected banana markets in Ethiopia. Some scholars argued transaction and non-transaction factors influenced dairy supply by using Tobit model (Holloway *et al.,* 2005; Gizachew, 2006). However, none of these studies take into account the market participation of households as buyers.

Muhammad Urgessa (2011) studied market chain analysis of teff and wheat in Halaba Special woreda, Southern Ethiopia by multi linear regression model found that quantity produced access to credit and price of other crop significantly affected volume of teff and wheat supplied to the market. The study recommends providing policies that improve teff and wheat production capacity by identifying new technologies create stable demand for surplus production would enhance farmers' decision in marketed surplus.

Mohammed (n.d) studied marketed surplus function of major agricultural commodities in Pakistan, the discussion and results presented indicated the fact that the marketed surplus is not the function of any one single variable. He identified that 93 and 71 % of the variation in

the "marketed surplus" of food grains in East and West Pakistan is explained by production and family size respectively. He recommended that improvement in the yields of crops and reduction of family size are the most important measures for increasing the size of marketed surplus in the country.

Nehru, J., & Vishwa, K. (2014) studied assessment of marketable & marketed surplus of wheat, gram & tur in Hoshangabad, Vidisha and Narshingpur districts of M.P. India. Their result indicate that as quantity kept for seed, family consumption, quantity retained for payment in kind (q.), and distance from the mandi gave negative and non significant response over marketed surplus. Hence, efforts should be made to ensured good quality of hybrid/HYVs seed for sowing, enhanced awareness of family planning program at village level and establishment of more new sub *mandis* of regulated markets particularly at *janpad panchayat* level.

In sum, empirical evidences indicate that marketable and marketed supply approach has become an important framework to analyze economic agents in agricultural sector. In this study an attempt were made to estimate marketed surplus of wheat in the study area by using Tobit model.

3. RESEARCH METHODOLOGY

3.1. Description of Study Area

This study was undertaken in south Eastern Part of Ethiopia in two potential districts (namely Hetosa and Tiyo districts of Oromia regional state) in wheat production. Description for each district is given below.

Hetosa: Hetosa district[1] is one of Administrative unit under Oromia Regional State, Southeast Ethiopia, part of the Arsi zone. The district composed of 21 rural kebeles[2] and 2 urban kebeles. Hetosa district is located about 123 Kms southeast of Addis Ababa and 50kms northeast of Asella town, the capital of Arsi Zone of Oromia Region. The district is strategically located between the two main towns Asella and Adama. In addition, due to its proximity to Addis Abeba, the district has access to potential markets in the area.

Hetosa is bordered on the south by Digeluna Tijo, on the Southwest by Tiyo, on the west by Ziway Dugda, on the northwest by the Misraq Shewa Zone, on the northeast by Dodotana Sire, and on the east by Tena. The administrative center of the district is Iteya; other towns include Borujawi and Ligaba.

The 2007 national census reported a total population for this district of 124,179, of whom 62,445 were men and 61,734 were women; 18,478 or 14.9+% of its population were urban dwellers. The majority of the inhabitants are Muslim, with 53.77% of the population reporting they observed this belief, while 44.72% of the population practiced Ethiopian Orthodox Christianity, and 1.3% of the population were Protestant(CSA,2007).

The altitude of the district stretches between 1700 and 4000 m.a.s.l. The agro- ecology in Hetosa comprises highland (20%), midland (48%) and lowland (32%) agro climatic zones.

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[1] District is the fourth level in Ethiopian formal administrative structure next to Federal and Regional level governments.
[2] A kebele is the lowest level in Ethiopian formal administrative structure which is next to district.

The temperature varies between $14C^0$-$27C^0$. Average annual temperature is $21c^0$ .The annual rainfall ranges from 800mm to 1400mm and the average rainy days are about 120 days in the year. The rainfall pattern is bi-modal: a short rainy season (Belg) from February to March) and a long rainy season (Meher) from June to September.
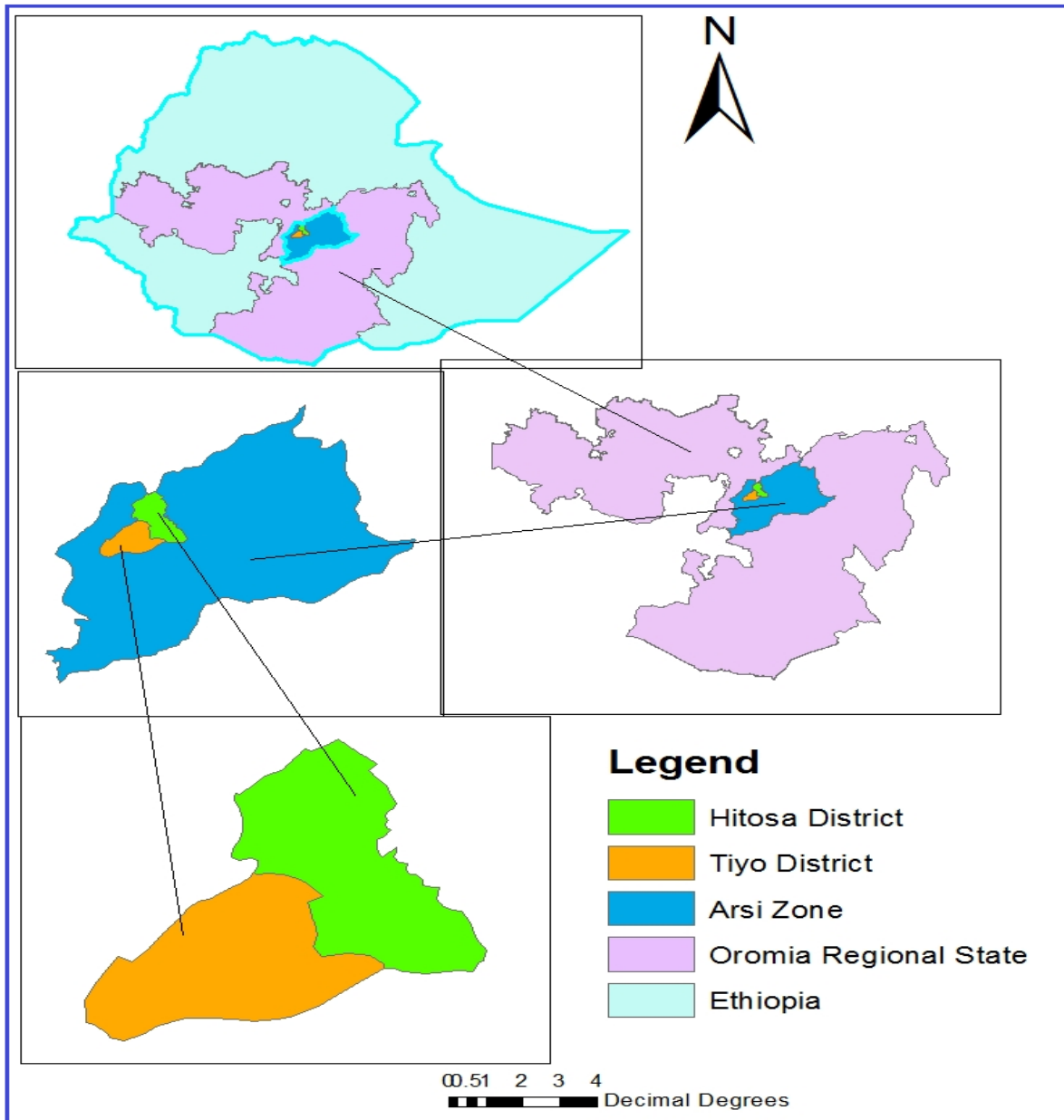
Figure 1: Geographical location of the study areas

Wheat is the major crop produced in the area. For instance, it covered more than 33% of the total cultivated land in 2012 in Arsi Zone (where the study area is located) (CSA, 2012). In addition to wheat, various types of crops, such as barley, teff, maize, horse beans, field peas, and various types of oil seeds, are cultivated in the area. Moreover, livestock such as cattle, sheep, goats, pack animals, and poultry, are important sources of livelihoods in the area (HDoARD, 2014).

Tiyo: is one of Administrative unit under Oromia Regional State, Southeast Ethiopia, Part of the Arsi Zone, The district composed of 18 rural kebeles and 3 urban kebeles. Tiyo district is located about 154 Kms southeast of Addis Ababa and Asella town, the capital of Arsi Zone is found in this district. Due to its proximity to Asella town, the district has access to potential infrastructure in the zone than other. Tiyo is bordered on the south by Munesa, on the west by ZiwayDugda, on the northeast by Hetosa, and on the southeast by DigelunaTijo. The administrative center of the woreda and Zone is Asella; other towns in Tiyo include Gonde. (TDoARD, 2014).

The 2007 national census reported a total population for this district of 86,761, of whom 43,463 were men and 43,298 were women; 6,525 or 7.52% of its population were urban dwellers. The majority of the inhabitants said they practiced Ethiopian Orthodox Christianity, with 58.5% of the population reporting they observed this belief, while 40.24% of the population were Muslim, and 1.05% of the population were Protestant. Tiyo has an estimated population density of 285.4 people per square kilometer, which is greater than the Zone average of 132.2(TDoARD, 2014).

3.2. Types, Sources and Methods of Data Collection

Data on different variables such as data on wheat production, wheat marketed, prices of wheat supplied, distance to districts market, distance to all weather roads, age of the household head, extension service, educational status of the household head, family size, access to market information, credit facility, and type of sellers and buyers were collected. Survey was made to obtain this data. Qualitative and quantitative types of data were collected from primary and

secondary data sources. The primary data of both types were collected from main value chain actors such as sample farmers, collectors, cooperatives, traders, processor and consumers by using semi-structured questionnaires and focus group discussion. Secondary data was taken from Central Statistical Agency (CSA), Bureau of Agriculture (BoARD), and Research Center (Kulumsa) and other sources.

3.3. Sampling Procedure and Sample Size

The study of wheat value chain Analyses was undertaken in Arsi zone of Oromia Region which is known by the production of wheat From Arsi zone of Oromia region, Hetosa and Tiyo were ranked first by production of wheat.

For this study, in order to select a representative sample three-stage random sampling technique was implemented to select wheat producer kebeles and sample farmer households. In the first stage, with the consultation of districts agricultural experts and development agents, out of 23 and 21 kebeles of Hetosa and Tiyo districts, 6 and 8 wheat producer kebeles were purposively selected based on the level of production. In the second stage from the identified or selected rural kebeles, 7 kebeles were selected randomly from the two study districts (three from Hetosa and four from Tiyo) (Table 1). In the third stage from the selected rural kebeles, given the available resource and time at the disposal of the researcher, using the household list of the sampled kebeles 150 (60 Hetosa districts and 90 in Tiyo districts) sample farmers were selected randomly based on proportional to the population size of the selected kebeles.

The next step was determining total sample size of the survey, based on the established sample frame for the selected kebeles. There are several approaches to determining the sample size. These include using a census for small populations, imitating a sample size of similar studies, using published tables, and applying formulas to calculate a sample size. For this study applying formula to calculate a sample size is selected, for populations that are large, Cochran (1963:75) developed the Equation 1 to yield a representative sample for proportions.

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$$n_O = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2(0.11)(0.89)}{(0.05)^2} \approx 150 \dots\dots\dots(1)$$

Where n_o is the sample size, Z^2 [3]is the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level, e.g., 95%) e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is 1-p.

Table 1: Distributions of sample households across districts and sampled kebeles

Districts	Kebeles	Number of households	Proportion	Sample house holds
	Bonayaeda'o	860	0.2	25
Hetosa	Borulenca	413	0.1	23
	Seroankato	818	0.1	12
	Subtotal	2091	0.4	60
Tiyo	Dosha	669	0.1	21
	Gora silingo	750	0.2	23
	Hate	779	0.2	24
	Oda	672	0.1	22
	Subtotal	2870	0.6	90
Total		4961	1	150

Source: Own computation from OoARD and kebele administration data, 2014

Data from traders and consumers were included. The lists of wholesalers were obtained from the respective districts of Office of Trade and Industry (OoTI) and for other trader; there is no recorded list for retailers and collectors. According to Office of Trade and Industry of the respective district, there are 45 and 55 wholesalers in the Hetosa and Tiyo districts respectively, accordingly 20 and 25 wholesalers were selected randomly from Hetosa and Tiyo district respectively. Totally 45 wholesaler were included. In addition, there were many retailers and collectors at village and town, among those 12 retailers and 8 collectors were

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[3] The value for Z is found in statistical tables which contain the area under the normal curve.

randomly selected from each district, constituting a total of 40 retailers and collectors would be included. Totally 85 traders from Iteya, Asella, Adama and Addis Abeba markets were sampled accordingly. Furthermore, 10 consumers were interviewed from each district by selecting randomly, 15 miller and three flour factory were included.

3.4. Methods of Data Analysis

Two types of data analyses, namely descriptive statistics and econometric analysis were used for analyzing the data collected from wheat producers, traders, processors and consumers in the study area.

3.4.1. Descriptive analysis

Descriptive statistics used were percentages, means, standard deviations, t-test, χ^2-test and maps in the process of examining and describing actors and marketing functions, facilities, services, and household characteristics.

Wheat value chain analysis

As products move successively through the various stages, transactions take place between multiple chain actors, money and information are exchanged and value is progressively be added. The analysis of wheat value chains highlights 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. Moreover, individual enterprises may feed into numerous chains; hence, which chain (or chains) is/are targeted depends largely on the point of entry for the research inquiries (Kaplinsky and Morris, 2001).

The following four steps of value chain analysis were applied for the study:
1. Mapping the value chain to understand the characteristics of the chain actors and the relationships among them, including the study of all actors in the chain, of the flow of wheat

through the chain, of employment features, and of the destination and volumes of domestic sales. This information was obtained by conducting surveys and interviews as well as by collected secondary data from various sources.

2. Identifying the distribution of actors' benefits in the chain. This involves analyzing the margins and profits within the chain and therefore determines who benefits from participating in the chain and who would need support to improve performance and gains. In the prevailed context of market liberalization, this step is particularly important, since the poor involved in value chain promotion were the most vulnerable.

3. Defining upgrading needed within the chain. By assessing profitability within the chain and identifying chain constraints, upgrading solutions could be defined. These may include interventions to: (i) improve product design and quality and move into more sophisticated product lines to gain higher value and/or diversify production; (ii) reorganize the production system or invest in new technology to upgrade the process and enhance chain efficiencies; (iii) introduce new functions where in the chain to increase the overall skill content of activities; and (iv) adapt the knowledge gained in particular chain functions in order to redeploy it.

4. Emphasizing the governance role. Within the concept of value chain, governance defines the structure of relationships and coordination mechanisms that exist among chain actors. By focusing on governance, the analysis identified actors that may require support to improve capabilities in the value chain, increase value added in the sector and correct distributional distortions. Thus, governance constituted a key factor in defining how the upgrading objectives could be achieved.

Market structure-conduct- Performance
Structure conduct and performance (S-C-P) model was applied. 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. Wolday (1994) also used this model to evaluate food grain market in Alaba Siraro district. Rehima (2006) and Kindie (2007) used this model to analyze the market performance of pepper and sesame. Thus, this study used S-C-P to evaluate performance of wheat market in the study area.

Market Concentration

The concentration ratio is a way of measuring the concentration of market share held by particular suppliers in a market. "It is the percentage of total market sales accounted for by a given number of leading firms". Thus a four-firm concentration ratio is the total market share of the four firms with the largest market shares. The greater degree of concentration is the greater the possibility of non-competitive behavior existing in the market. For an efficient market, there should be sufficient number of firms (buyers and sellers).Market concentration is defined as a number and size distribution of sellers and buyers in the market (Scherer, 1980).

$$C = \sum_{i=1}^{r} S_i$$ --- (2)

Where C= concentration ratio handleS_i=Percentage share of ith firm r=number of largest firm for which the ratio is going to be calculated

Marketing Margin- It measures the share of the final selling price that is captured by a particular agent in the marketing chain (Mendoza, 1995). 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 were gathered during field work. 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).

$$TGMM = \frac{Consumer price - \Pr oducer price}{Consumer price} *100$$ --- (3)

Where, TGMM = Total gross marketing margin

It is useful to introduce the idea of 'farmer's portion', or 'producer's gross margin' (GMMp) which is the share of the price paid by the consumer that goes to the producer. The producer's margin is calculated as:

$$GMM_p = \frac{Price\ paid\ by\ consumer - Marketing\ gross\ margin}{Price\ paid\ by\ consumer} * 100$$ --------------------------------

(4)

Where GMM$_P$= Producer share in consumer price

The net marketing margin (NMM) is the percentage over the final price earned by the intermediaries as his/her net income once his marketing costs are deducted. The percentages of net income, which can be classified as pure profit, depend on the extension to such factors as the middlemen's own (working capital) costs.

$$NMM = \frac{Gross\ margin - Marketing\ cost}{Price\ paid\ by\ the\ consumer} * 100$$ --- (5)

The producer's share is the ratio of producer price (ex-vessel) to consumer price (retail) (Mudiantono, 1990) and can be expressed as:

$$PS = \frac{P_x}{P_Y} = 1 - \frac{MM}{P_r}$$ --- (6)

Where: PS = the producer share

P$_x$ = producer price of wheat, p$_y$= consumer price of wheat, MM= marketing margin

3.4.2. Econometric analysis
Determinants of marketed surplus of wheat

To investigate determinants of wheat marketed surplus (a continuous-valued choice about how much quantity sold) Tobit model was used. Because of the restrictions put on the values

taken by the regress and, this model can be called limited dependent variable regression model. The data have a censored sample as dependent variable, 12% of household didn't supply wheat even if they produce wheat from the total of 150 samples, the data are censored, and Tobit estimation is relevant. If zero values of dependent variables were the result of rational choice of farmers, a Tobit model would be more appropriate (Abrar, 2004). Thus, maximum likelihood Tobit estimation (Tobin, 1958) was used in the analysis of factors affecting sales volume. One can concern with the model; recall that in a Tobit with left-censoring at zero.

The Tobit model was applied for analyzing factors influencing the marketed surplus of wheat as shown below. Tobit model is an extension of probit model and it is one of the approaches dealing with the problem of censored data (Johnston and Dandiro, 1997). It is superior over the probit dichotomous regression models in that the probit only attempts to explain the probability of marketing by the farm households rather than the amount of marketed surplus. In such cases, Tobit model, which has both discrete and continuous part, is appropriate because it handles both the probability of marketing and amount of marketed surplus at the same time. Following Amemiya (1985), Maddala (1992), and Johnston and Dandiro (1997), the Tobit model for the continuous variable amount of wheat marketed surplus index, can be defined as:

$$y_i^* = \mathbf{x_1}\boldsymbol{\beta}_1 + \varepsilon_{1i}, \qquad (7)$$

$$y_i = \begin{cases} y^* = \beta X_i + U_i \; if \; y_i^* > 0 \\ 0 \; if \; y_i^* \le 0 \end{cases}$$

$$U_i \approx IN(0, \sigma^2) \qquad (8)$$

Where: Y_i^*= is latent variable and the solution to utility maximization problem of marketed surplus subject to a set of constraints per household and conditional on being above certain limit,

Y_i=marketed surplus index for i^{th} farmer X_i=vector of factors affecting amount of wheat marketed surplus B_i=vector of unknown parameters

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3.5. Hypothesis and definition of variables

Dependent variable

Quantity of wheat marketed: It is a continuous variable which represents dependent variable; it is the actual marketed amount of wheat by farm household to the market.

Independent Variables

Sex of household head (sex): It is a dummy variable taking 1 if male and 0 otherwise. Male headed households have been observed to have a better tendency than female headed household to enter into market of wheat. Tshiunza *et al*. (2001) discussed the determinants of market production of cooking banana in Nigeria. In their study, the male farmers tended to produce more cooking banana for market than female farmers. Thus, it is hypothesized that being male households would have positive influence on the marketed surplus of wheat.

Literacy status of household head(edu): It is a categorical variable taking 1 if respondent is primary level,2, if respondent is secondary 3,if the respondent is tertiary, Those households who are literate determines their readiness to accept new ideas and innovations, and easy to get supply, demand and price information. Holloway *et al.,* (1999) argued that education had positive significant effect on quantity of milk marketed in Ethiopian highlands. Therefore, in this study, literacy status is hypothesized to positively influence marketed surplus of wheat.

Wheat farming experience (exp): It is a continuous variable, which is total number of years a farmer stays in production of wheat. A household with better experience in wheat farming is expected to produce more amounts of wheat and, as a result, S/he is expected to supply more amounts of wheat to market. Farmers with longer farming experience are expected to be more knowledgeable and skillful (Ayelech, 2011).Therefore, this variable is hypothesized to influence positively marketed surplus of wheat.

Family size (famsize): It is a continuous variable, measured in number of family size i.e. the number of family size which affects the availability of active labor force in the household, which affects farmer's decisions to participate in market. Since production is the function of

labor, availability of labor is assumed to have positive relation with volume of supply. Larger family size requires larger amounts for consumption, reducing marketable surplus. Family size is expected to have positive impact on marketed surplus. Singh and Rai (1998) found marketed surplus of buffalo milk to be negatively affected by family size. Therefore it is hypothesized that it would have negative impact on the marketed surplus of wheat.

Distance to the nearest market (dsmrkt): It is a continuous variable, measured in kilometer that a farmer travels to sell the product to the market. If the farmer is located in a village far away from the market, he/she has limited access to the market and vice versa. Aklilu (2007) on village poultry in Ethiopia, distance to markets influenced negatively poultry marketing. Therefore, it is hypothesized that this variable is negatively related to marketed surplus of wheat.

Land allocated for wheat production (culndw): This variable is a continuous variable measured in terms of number of hectares the farmer allocated for wheat production and is affect the household level of wheat supply positively (Tomek and Robinson, 1985). This is because, producers who own big area holding can produce more than a producers who own less area and thus to supply more to the market. Wolday (1994) observed that output of food grains (wheat, teff and maize) has positive effect on quantity marketed to the market. The amount of wheat production is expected to have positive relation to land allocated for wheat which determines the amount of marketed surplus of wheat.

Access to non/off farm income (nfrmincm): It is a dummy variable measured in terms of whether the household obtained income from off or non-farming activities. It is one, if the household is involved in non/off farm activities and 0, otherwise. This income may strengthen farming activity on one side and may weaken it on the other side. Rehima (2006) who 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 wheat to any nearest market outlet with low price than to go far. But for this study it is assumed to have inverse relation with volume of wheat sales.

Access to credit (credit): This is a dummy variable, which indicates credit taken for wheat production. It is one, if house hold access to credit, and zero otherwise. Black and Knutson (1985) showed credit users showing better production and market participation. Therefore, it is hypothesized that accesses to credit would have positive influence on amount of production which, determine marketed surplus of wheat produce.

Distance to urban centers (dsurbn): It is a continuous variable measured in kilometers. Farmers marketing decisions are based on market price information, and poorly integrated markets may convey inaccurate price information, leading to inefficient product movement. Therefore, distance to urban center has great relation with access to information. Goetz (1992) found that better information, significantly raised the probability of market participation for potential selling households. Therefore, it is hypothesized that distance to market is negatively related to marketed surplus of wheat.

Livestock holding (lskholdng): This is a continuous variable, measured in tropical livestock unit. Farmers who have a number of 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 livestock holding showed a negative sign on quantity of pepper sales. On the other hand, it is assumed that household with larger livestock have better economic strength and financial position to purchase sufficient amount of input (Kinde, 2007). But for this study livestock holding is hypothesized to influences volume of wheat sales negatively.

Type of seed used (seed): This is a dummy variable taking a value of 1, if the farmer uses improved wheat variety and 0, otherwise. This variable will be expected to affect the household marketed surplus of wheat positively, because, if a producer uses improved wheat variety, this will increases production and productivity thus, increases the marketed surplus of wheat.

Value Adding activities (VAdd): It is a dummy variable measured in terms of whether the household practices value adding activities on his farm or not. It takes a value one, if a

household practice value adding activities, and zero, otherwise. Farmers who practice better value adding activities like (using improved seed, fertilizer, on time harvesting etc) will increase productivity which have direct relationship with marketed surplus and have high probability to sell wheat. Therefore, it is hypothesized that the ability to add value influences marketed surplus of decisions of producers positively.

Perception on lagged wheat price (lagprice): This dummy variable, taking the value 1, if the perception of the farmer on the lagged price is good, o otherwise. Perception on last-year price of wheat affect the quantity of wheat supplied to market, if the price is good, the producer supplied more. Tomek and Robinson (1985) argued that the product price has direct relations with marketable supply and hence it will expected to affect the household marketable supply of wheat positively in such a way that prices of 2012/13 can stimulate production of wheat in 2013/2014, and thus marketed surplus for 2013/14. Perception on lagged price of wheat affect the supply of wheat to the market, so it is hypothesized that, it have positive influence on quantity supplied to market.

District (dstrct): This variable is a dummy taking the value one, if the district is Hetosa and 0 if the district is Tiyo, which consists of a number of characteristics of the districts. This is related to the difference between districts in access to information, access to market, production potential etc. This variable influences quantity of wheat sales either positively or negatively and is hypothesized to have positive influence on quantity of marketed surplus of wheat, if the district is Hetosa.

Table 2: Definition, measurement and hypothesis of variables

Variable	Measurement	Expected effect
Sex of household head	1=Male,0=female	+
Literacy status of household head	1=primary,2=secondary 3=tertiary	+
Wheat farming experience	In years	+
Family size	In number	-
Distance to the nearest market	In Kilometers	-
Land allocated for wheat production	In hectares	+
Access to non/off farm income	1,if involved in nonfarm activities, o otherwise	-
Access to credit	1,if access to credit , other wise	+
Distance to urban centers	In Kilometers	-
Livestock holding	In numbers	-
Type of seed used	One ,if used local ,0 otherwise	+
Value adding activities	One,if perfomed,0 otherwise	+
Perception on current-year wheat price	One, if perception is good, 0 otherwise.	-
Perception on lagged wheat price	One ,if perception is good 0, otherwise	+
District	1,if district is Hetosa,0 ,otherwise	+

4. RESULTS AND DISCUSSION

This chapter presents the major findings of the study. It has five main sections. The first section deals with description of factors of wheat production and supply. The second section presents factors of wheat trading. The third section presents wheat value chain analysis which includes value chain map, actors and their roles, and value chain governance. The fourth section presents performance of wheat market which includes marketing costs and margins, and benefit shares of actors in the value chain. The fifth section presents results of econometric analysis which contains the determinants of marketed surplus of wheat by using Tobit model.

4.1. Description of Factors of Wheat Production and Supply

4.1.1. Wheat market participation

In this study, different stakeholders were involved in bringing wheat from the point of production (farm gate) till it reached the final destination (consumers). According to the data obtained market participant identified in the transaction process of wheat in the study areas include farmers/producers, farmer traders, urban assemblers, regional wholesalers, retailers, processors (millers, flour mill) and commission agent. The description of variables of market participants and non-participants involved in different activities (wholesale, retail, assembly etc), in the study areas were described below (Table3).

The average family size of the total sample respondents was found to be 6.65 and 8.83 person for wheat market participants and non-participants, respectively. Family size showed variation at 5% significance level. From the result we infer that wheat market participants have less family size than non participants, which affect wheat production and marketing. As the family size increases the consumption increase which decrease marketed surplus of wheat produces.

Table 3: Description of variables by market participation status of wheat producers

Variable		Mean/proportion			t-/χ^2-value
		All samples	Participants	Non-participants	
Age of household head		44.9	44.72	46.2	0.40
Family size		6.85	6.65	8.33	2.07**
Sex of house hold (male)		83.33	88	12	0.00
Wheat farming experience		24.28	24.62	21.72	-0.83
Distance to nearest Mkt		0.73	0.74	0.70	-1.28
Total land owned		2.23	2.24	2.05	-0.25
Land rented in		0.66	0.72	0.18	-2.48**
Cultivated land		2.56	2.70	1.65	-3.51
Land allocated for wheat		1.53	1.61	0.88	-3.40***
Access to off farm income(yes)		40.67	42.42	7.78	1.40
Literacy status	Illiterate	32	95.83	4.17	
	Primary	41.33	74.19	25.81	
	Secondary	25.33	100	0	19.4***
	College and above	1.33	100	0	
Access to credit(yes)		36	32.58	767.42	5.60**
Livestock holding		6.4	7.11	1.21	-5.58***
Distance to urban centers		3.05	3.00	3.44	1.03
Type of wheat variety used	Improved	80.6	89.26	10.74	
	Local	15.4	78	22	3.06
	Both	4	100	0	
Perception on lagged wheat price	Low	12.7	68.42	31.58	8.00**
	Medium	86.7	90.77	9.23	
	High	0.67	100	0	
Producer price		730.96	736.00	660.5	-2.73
Access to training(yes)		86	92.42	7.8	51.40***
Wheat production		72.67	75.67	30.70	-0.83
Wheat consumption		14.24	14.10	16.20	0.76

Note: ***, ** and *, are statistically significant at 1%, 5% and 10% significance level
 Source: Own computation from survey result, 2014

The survey result revealed that about 54% of the sample households rented in land during 2013/14 cropping seasons. The ranted land size of sample households varies from 0.25 hectare to 5 hectare with an average of 0.72 and 0.18 hectare for wheat market participants and non-participants respectively. There is significant difference between wheat market participants and non-participants on renting in land at 10% significant level. This is due to the fact that wheat market participants need more land to produce more not only for consumption but also, for marketing purposes.

Land allocated for wheat production in the year 2013/14 was 1.65 and 0.88 hectare for wheat market participants and non-participants respectively. There is significant difference at 1% significance level on land allocated for wheat between wheat market participants and non-participants. These may be due to different in the objective of production and land cultivated; hence, the area allocated to wheat production is large for wheat market participants compared to non-participants of wheat market in the study area. Even though, both wheat market participants and non-participants produce wheat for consumption purpose, wheat market participants produce not only for consumption purpose but also for marketing purpose. The allocated lands restrict them to produce what the amount they need, which determine marketed surplus of wheat as they need.

The educational background of the sample household heads is believed to be an important feature that determines the readiness of household heads to accept new ideas and innovations. About 32%, 40.6%, 25.4% and 1.35% of the sample household heads were illiterate, primary, secondary and, college and above have school background, respectively. However, among illiterate 95.83% were wheat market participants, among the respondents who followed primary school 74.19% of the sample households were wheat market participants. Among the respondents who followed secondary school, college and above, all of them (100%) were wheat market participants. However, no one was non-participants. The chi-square test indicates that there is a significant difference between wheat market participants and non-participants at 1% significance level in their education.

Livestock have an important role in the rural economy. They are source of drought power, food, animal dung for organic fertilizer and fuel, and a means of transport. In addition in the rural area the number of cattle owned or held is a measure of wealth. Farmers in the study area owned different species of livestock. The livestock species found in the study area are cattle, goat, sheep, donkey, horse, poultry and bee colony. To assess the livestock holding of each household, the Tropical livestock unit (TLU) per household was calculated (see appendix Table 1). The livestock holding of sample households ranged from 0 to 27.32 TLU for sample wheat producers, implying the existence of large variation among the households in livestock ownership. The average livestock holding for wheat market participants and non-participants were 7.11 and 1.21 TLU, respectively. The analysis of independent t_test revealed that there is significant difference in livestock holding at 1% significance level between wheat market participant and non-participants. Hence, households with larger livestock holding have better access to draft power than those with less. Livestock holding is also one of the main cash sources to purchase agricultural inputs which increase the productivity of wheat, which is responsible for wheat producer to participate in the wheat market.

The product price has direct relations with marketed surplus and hence, it affected the household marketed supply of wheat positively in such a way that prices of 2012/13 can stimulate production of wheat in 2013/2014, and thus marketed surplus for 2013/14. Among the respondents who said last year price was low, 68.42% were wheat market participants, other respondent said medium, among those 90.77% were wheat market participants. Few of the respondents said its high, among those; all of them were wheat market participants. The analysis of chi-square test revealed that there was significant difference on perception of lagged wheat price at 1% significance level between wheat market participant and non-participants.

The institutional services are required to increase agricultural productivity through the adoption of new technology and providing updated information. Extension services, input availability and access to credit are among the institutional services which support farmers in boosting productivity and production that given to farmers through training. During the

survey the respondents asked whether they got access to training or not .Among the respondents who said we got training on wheat production and marketing 92.42% and 7.8% were wheat market participants and non-participants respectively. There is significant difference between wheat market participants and non -participants on training of wheat production and marketing at 1 % significance level. The survey showed that the sample households who participate on wheat marketing have a better access to extension services by frequent visit of development agents and having built farmers training centers in nearby.

4.1.2. Spatial differences in wheat production and marketing

Tables 3 present Factors of wheat production and marketing by districts which include sex of household, level of education, marital status, farming experiences, family size ,distance to the nearest market, land allocated for wheat, access to non-farm income and others.

Educational status of the two districts, 33.3% and 31.1% were illiterate in Hetosa and Tiyo districts, respectively. 50% of the respondents in Hetosa districts attend primary school, 16.7% attend secondary school but none of them attend the university. Among the respondents of Tiyo district 35.5%, 31.1%, and 2.2% attend primary, secondary and university respectively. The chi-square test indicates that there is a significant difference between the districts at 5 % significance level in their education. The level of education affect the adaptation of new technology ,the more the educated people the more they adapt new technology which is responsible for the increment of the productivity which in turn increases marketed surplus of wheat.

Proximity to urban centers is one of the important factors that affect wheat production and marketing. Regarding the distance taken to travel from home to the nearest urban centers where they sold their product, sample Hetosa and Tiyo districts reported that they had to travel an average of 4.5 and 2.08 hours respectively. The analysis of independent t_test revealed that there was significant difference in distance to urban centers at 10% significance level between Hetosa and Tiyo district.

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Table 4: Factors of wheat production and marketing by district

Variable		Mean/proportion			t-/χ^2-value
		All samples	Hetosa	Tiyo	
Age of household head		44.9	46.25	44	0.95
Family size		6.85	7.05	6.72	0.60
Sex(male)		83.3	80	85.5	0.80
Wheat farming experience		24.28	25.45	23.5	0.84
Distance to nearest market		0.73	0.677	0.76	-1.18
Land allocated for wheat		1.52	1.67	1.43	1.70*
Access to off farm income(yes)		40.67	46.67	36.67	1.49
Literacy status	Illiterate	32	33.3	31.1	
	Primary	41.3	50	35.56	
	Secondary	25.33	16.7	31.11	6.17*
	College and Above	1.33	0	2.22	
Access to credit(yes)		14	15	13.33	0.01
Livestock holding		6.41	7.05	5.98	1.40
Distance to urban centers		3.05	4.5	2.08	12.09***
Type of wheat variety used	Improved	80.67	90	74.4	
	Local	15.33	10	18.89	6.93**
	Both	4	0	6.67	
Price of wheat		730.96	728.5	732.61	-0.28
Perception on current-year wheat price	Very low	3.33	20	80	
	Slightly lower	11.33	5.88	94.12	
	as expected	15.33	39.13	60.87	11.94**
	Slightly higher	69.33	47.12	52.88	
	Very high	0.67	0	100	
Perception on lagged wheat price	Low	12.67	18.3	8.89	3.50
	Medium	86.7	81.67	90	
	High	0.67	0	1.11	
Wheat production		72.67	97.15	56.35	1.50
Wheat yield		39.16	39.86	38	0.57
Wheat consumption		14.24	15.67	13.28	1.70*
Cost of production ETB/qt		577	554	600	2.35**

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level

Source: Own computation from survey result, 2014.

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Adequate size of landholding is a basic factor in the process of boosting productivity and production of wheat. As elsewhere in Ethiopia the farmers in the study area have a land fragmented and small in size. In terms of allocation, 1.52 hectare was allocated to wheat production for all sample respondents. Allocated land for wheat production in the year 2014 was 1.67 and 1.427 hectares for Hetosa and Tiyo district, respectively. The analysis of independent t_test revealed that there was significant difference in land allocation to wheat production at 10% significance level between Hetosa and Tiyo district. This may due to different in population density, land size in Hetosa district compared to the land size in Tiyo districts.

In the study area use of improved wheat variety was high as compared to other districts for wheat production. From the total respondents who were asked whether they used improved wheat variety or not, about 90% and 74.4% of the respondents of Hetosa and Tiyo pointed out that they used improved wheat variety respectively. Only 10% and 18.89% of the respondents of Hetosa and Tiyo respectively said that they didn't use improved wheat variety in the year 2013/14. The chi-square result shows that there is statistically significant difference at 5% significance level on improved wheat variety usage between the districts. Wheat producers of Hetosa used more improved wheat variety than Tiyo due to the fact that market and credit accesses were important factors for the usage of improved wheat varieties. This is due to the fact that a relatively closer distance of farmers' home to the market enables and facilitates marketing of inputs and outputs.

Current year Prices of wheat were higher in the town market than in village market for all agricultural commodities produced in the study area. Among the respondents who said that, the current year price was very low, 20% and 80% were Hetosa and Tiyo district, respectively. Among the respondents who said the current year price is slightly lower, 5.88% and 94.2% were Hetosa and Tiyo district, respectively. Among the respondents who said that the current year price is as expected, 39.13% and 60.87% were Hetosa and Tiyo district, respectively. Among the respondents who said the current year price is slightly higher, 47.12% and 52.88% were Hetosa and Tiyo respectively. Others were respondents who said the current year price is very high compared to last year wheat price; all of them were Tiyo

district. Analysis of chi-square revealed that there was significant difference on current year wheat price at 5% significance level between Hetosa and Tiyo districts. This due to the fact that, the difference on information of wheat price between the districts.

In the study area wheat was produced for both consumption and market. On average 15.67 quintals of wheat was consumed in Hetosa district and 13.28 quintals was consumed in Tiyo district. There is significant difference between the two district at10% significance level. This may be due to fact that, in Tiyo district the consumption of barley was high because the productivity of the crop is high in the district than Hetosa. Total and per capita wheat consumption has gradually increased in Ethiopia. According to the official USDA FAS estimates, 100% of wheat consumption is for food, seed, and industrial consumption; however, estimates from the FAS post in Addis Ababa indicate that a small amount (roughly 5% of consumption in 2011/12) is used for animal feed and residual consumption. The Ethiopian Commodity Exchange (n.d.) estimates that household consumption accounts for about 60% of domestically produced wheat, 20% for sales, and a combination of seed, in-kind payments for labor, and animal feed for the remainder. The share of wheat in total cereal consumption has increased, from about 16 % in 1971-1980 to about 22% in 2001-2007. The shift wheat is likely to have been influenced by a growing consumption of bread in urban areas and food aid (mainly in the form of wheat) in vulnerable areas.

The average Wheat production cost was estimated at Birr 554 per quintals at Hetosa and Birr 600 per quintals at Tiyo. There is significant difference on average wheat production cost between the districts at 5% significance level. This is due to the differences of input costs between the districts. The largest input cost is the seed and it appears that the producers in the Tiyo have access to relatively cheap improved wheat seed as compared to their counterparts in Hetosa. But in Tiyo the cost of ranted land and labor is high as compared to Hetosa.

Production of wheat

Wheat is the major source of income for farmers in the study area. Production of wheat in the study area is a rain-fed with only once in a year harvest. The study area receives well distributed rainfall both in amount and season. This characteristics makes the study area good

potential for production of various agricultural crops. Wheat is a major crop and it accounts for 42% of the total cereal area cultivated in the study area, with total output of 5.12 million quintals from 0.21 million hectares of cultivated land (CSA, 2013).
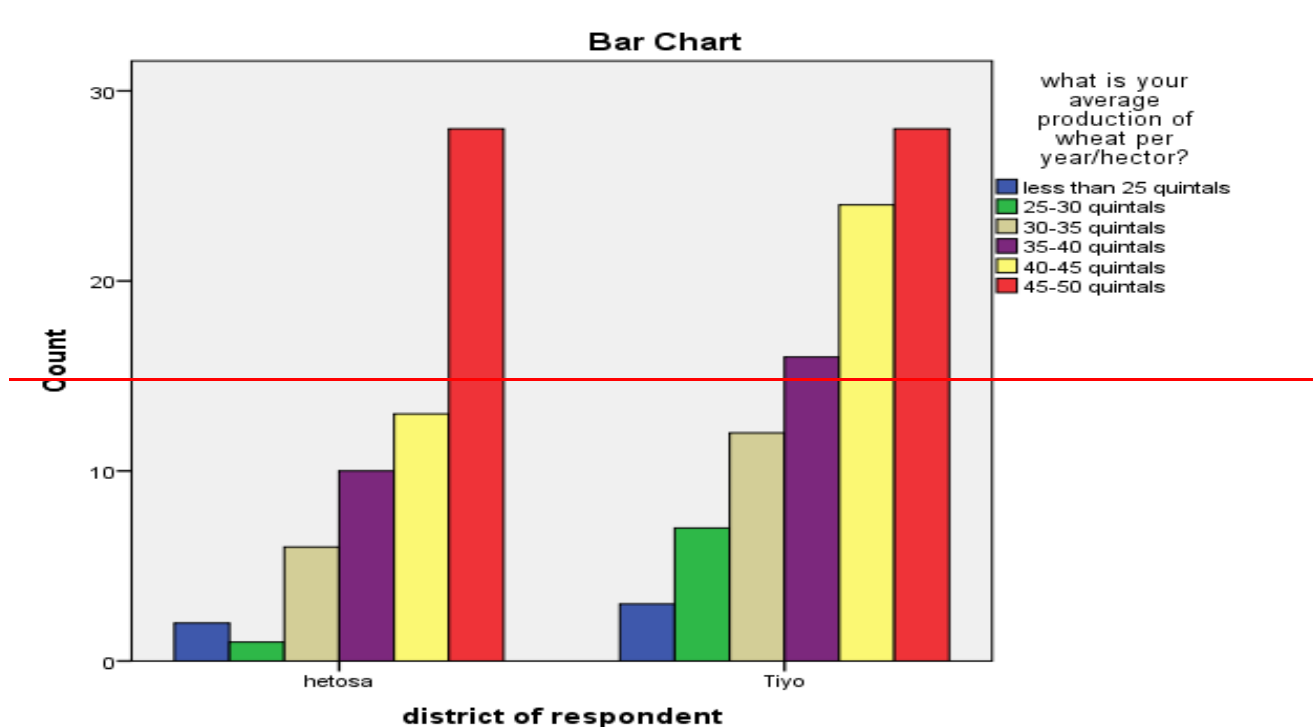
Figure 2: Range of wheat production per hectors
Source: own computation from survey result, 2014

The average wheat productivity in Hetosa district is higher than Tiyo district. In Hetosa district the mean productivity of wheat was 39.86 qt/ha with standard deviation of 11.51 and in Tiyo district the mean productivity of wheat 38.70 qt/ha with standard deviation of 12.47 . In both districts the average yield is higher than the national average (CSA, 2012). Average production of wheat within the district almost the same but there is huge differences among households which ranges from 15quintals to 89 quintals. 3.33 % of households produce less than 25 qt/ha, 5.33 % of households produce 25 to30 qt/ha, 12% of household produce 30 to 35qt/ha, 17.37 % of household produce 35 to 40qt/ha, 24.66% of households produce 40 to 45 qt/ha and 37.33% of household produce more than 45 qt/ha.

4.1.3. Production and marketing constraints of wheat producers

Prearranged the current production levels and the production of wheat for consumption and market as a deriving motive, there appears that the farmers have market problem. However, the less possibility of improved production and expansion of wheat might decrease the amount of wheat sold and create problems in marketing.

Table 5: Production and marketing problems of farmers by districts

Constraints	Mean/proportion			t-/ χ^2 -value
	All samples	Hetosa	Tiyo	
Disease (yes)	64	56.67	68.89	2.33
Shortage of Fertilizer supply(yes)	4.67	5	4.44	0.02
Shortage of seed supply(yes)	75.33	71.67	77.78	0.72
Shortage of land(yes)	54	46.67	58.89	2.16
Theft(yes)	25.33	36.67	17.78	6.79***
Price setting(yes)	76.67	88.33	68.89	7.60***
Tax(yes)	1.33	1.67	1.11	0.08
Demand problem(yes)	36	38.33	34.44	0.23
Chemical	91.33	90	92.22	0.22

Note: ***is statistically significant at 1%, significance Level
 Source: Own computation from survey result,   2014

There are many production and marketing problem of farmers which affect farmer's efficiency on the production and marketing of wheat. Among the problem theft and price setting problems shows variation at1% significance level.

From total sample respondents about 25.33% of the respondents said there is problem of theft of wheat on the field and at storage .Among the respondents of Hetosa district 36.67% of respondents said there is problem of wheat but 65.33% said no problem of wheat theft. From

Tiyo 17.78% said yes and 82.22% said no problem of theft. There is a high significant difference in facing the problem of theft between the districts at 1% significance level. This is because of the difference in distance of the districts from urban. As respondents said people came from urban and stolen our product at night from field so as the distance closes to urban the chance to face the problem of theft is more.

Price setting is the major problem of farmers in the study area.76.67% of the total respondents said that there is problem of price setting but only 23.33% of the total respondents said there is no problem of price setting. From Hetosa district 88.3% said that there is problem of price setting of not only for wheat but also for other crop but only 11.67% said no. In Tiyo 68.89% said yes and 31.11% said no. The analysis of independent chi-square test revealed that there is a high significant difference by price setting problem between the two districts at 1% significance level. This may be due to the fact that in Tiyo district price was displayed and controlled by office of trade of the district than in Hetosa district.

4.1.4. Income distribution of wheat producers.

Often agricultural households' income is determined by household's production activities and changes in factors influencing production activities. The household cash income was estimated based on the sales of crops, livestock and their products and off-farm income that the farmer or any of the household members earned in the year. However, farmers are reluctant to reliably estimate their income.

The total income from other farm income sources of sample respondents was Birr 10106.27. The average other farm income of actively participating on wheat market 10359.19 Birr/year and exceeds the average other farm income of the non- participants of wheat market by 63.4% (6565.5 Birr/year). The major sources of cash income were from the sale of other home cereals, pulses and vegetables.

The average total income from wheat income sources of sample respondents was 23,374.91 Birr/year. The average wheat income of actively participating wheat market is 25,025.89 Birr/year and exceeds the average wheat income of the non- participants of wheat market by almost100 % (261.1Birr/year). The major cash income for wheat market participants are sale of wheat crop and selling of wheat straw but for none participants of market they sale only straw of wheat. There was significant difference in the mean annual income from wheat between two sample groups at 1 % significance level.

The total income from livestock income sources of sample respondents was 6,897.373Birr/year. The average livestock income of actively participating on wheat market is 7,270.329 Birr/year and exceeds the average other farm income of the non- participants of wheat market (1,676 Birr/year). The major sources of cash income were from the sale of livestock, sale of egg, rented oxen and donkeys and sale of milk and milk products.

The total income from non-farm income sources of sample respondents was 6,393.08Birr/year. The average non-farm income of respondents actively participating on wheat market is 6,758.3 Birr/year and exceeds the average other farm income of the non-participants of wheat market (1,280Birr/year). The income earned from non-farm is from labor employment, handcrafts, remittance, renting house, trade, salary and pension. The income generated from off-farm/non-farm activity ranges from no income to a maximum of Birr 50,000 per household within the study year. It is usual in the study area that farmers used to engage in various income generating activities. This is so because the farm produce is inadequate to fulfill their demand for consumption expenditure as well as purchase of livestock. Among the non-farm income source remittance is major one for the respondents. There was significant difference in the mean annual income from off-farm/non-farm activity between two sample groups at 1 % significance level.
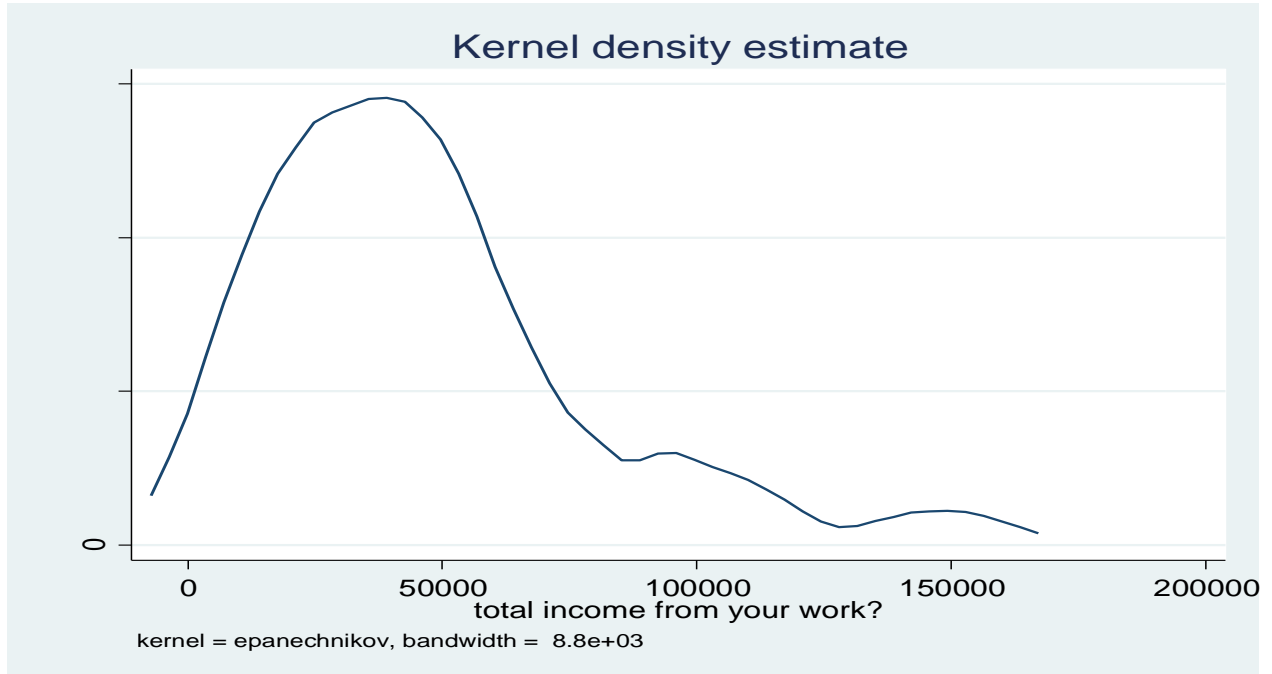
Source: Own computation from survey result, 2014

Figure 3: Kernel density estimates of income of wheat producers

The total annual income of the households in study area is a function of other farm income, livestock, wheat productions and employment on off-farm/non-farm activities. The distribution of households' total annual income in relation to participation in wheat market is explained below. The average household income of the sample respondents was found to be Birr. 46,771.63.The average annual income for wheat market participants was Birr 49,413 and Birr 9,782.6 for non -participants .The mean difference between two groups was Birr 39,631.11which is highly substantial. The t-test showed that there is significant difference in total annual income of household between households who are participating in wheat market and non- participants at 1 % significant level.

Table 6 shows the Gini coefficients of the income of households participating and not participating in the wheat market; the decomposition of the Gini coefficient among the income components and it shows the impact of a marginal change of income components on the Gini. The Gini coefficient for total income of households participating and not participating in the wheat market is 0.34 and 0.42 respectively.

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Table 6; indicated that the marginal effects, when there is a 1% increase in the different sources of income for households participating in the wheat market. For some of the two income sources, inequality is increased whereas for some two it decreases. Increase in income from nonfarm causes the largest increase in the Gini coefficient, namely, 8.58%; income from livestock income causes the second largest increase in the Gini coefficient, namely 7.29%; a 1% increase from other farm activities and income from wheat sources have negative impacts on the Gini coefficient. Thus, if the households participating in the wheat market in the study area have a marginal income increases, in the other farm income and income from wheat sources, the Gini will decrease and the income distributions will become more equal .1% income increases from the other farm income will reduces the Gini most, namely by 10.88% and 1% income increase from wheat income will reduce the gini by 4.99%.

Table 6: Decomposition of income inequality among wheat producers (marginal effects)

Source of income	Marginal effects (% change)	
	Participants	Non-participants
Other Farm income	-0.1088	-0.1914
Livestock income	0.0729	0.1135
Wheat income	-0.0499	-0.0074
Non-farm income	0.0858	0.0854
Total income (Gini)	0.3420	0.4198

Source: own computation from survey result, 2014

From the Table 6 we see also the corresponding marginal effects for different income sources of households not participating in wheat market. It indicates that for some of the two income sources, inequality is increased whereas for some two it decreases. An increase in income from livestock income causes the largest increase in the marginal effects, namely 11.35%; Increase in income from nonfarm causes the second largest increase in the Gini coefficient, namely, 8.54%. 1% increase from other farm activities and income from wheat sources have negative impacts on the marginal effects. Thus, if the households not participating in the wheat market in the study area have a marginal income increase in the other farm income and

income from wheat sources, the Gini will decrease and the income distribution will become more equal .1% income increase from the other farm income will be reduce the Gini most, namely by 19.4% and 1% income increase from wheat income will reduce the gini by 0.74% which is less than for the households participating in the wheat market.

4.2. Factors of Wheat Trading

Factors of wheat trading are factors which affect the trading of wheat in the study area such as sex, age, family size, marital status of traders, trading experience, literacy status, and access to credit, Initial working capital and others.

Age is one of the factors of wheat trading that is useful to describe traders experience and networking. The age of sample traders ranged from 20 to 74 years. The average age of all sample traders was 39.03 years and its standard deviation was 9.83 years. The average age of wheat sample traders of Tiyo district (42.50 years) is relatively higher than wheat sample traders of Hetosa district i.e. 35.25 years. There is significant difference between the districts at 1% significance level. This is may be due to the difference in the availability of job opportunity in the districts and the easiness and profitability of wheat trading among the districts.

The average family size of the total sample respondents of traders was found to be 6.8 people. The average family sizes were 9.025 and 4.86 peoples for Hetosa and Tiyo districts, respectively. Family size also showed variation at 1% significance level. These indicate that wheat traders in Hetosa district have more family size than Tiyo due to difference in information, training on family planning among the district. Family size affects wheat production and marketing. As the family size increase, the labor increases, this responsible for the increment of wheat marketed surplus and the inverse is that consumption may increase which decrease marketed surplus of wheat produces.

Table 7: Description of factors of wheat trade by district

Variable	Mean/proportion				t-/ χ^2 -
	All samples		Hetosa	Tiyo	value
Age	39.03		35.25	42.50	-3.59***
Family size	6.82		9	4.86	7.48***
Trade experience	15.25		9.9	20	-4.61***
Literacy status	Primary level	61.18	60	62.22	
	Secondary	34.12	35	33.33	0.04
	Preparatory	2.35	2.5	2.22	
	Diploma	2.35	2.5	2.22	
Access to credit (yes)	36.47		17.5	53.3	11.73***
Initial working capital	9812.235		9670	9938.667	-0.05
Net capital now	260867.6		267238.8	255204.6	0.15
	Married	76.47	72.50	80	1.94
Marital status of trader	Single	22.35	27.50	17.78	
	Divorced	1.18	0	2.22%	
Sex (Male)		60	52.5	66.67	1.77

Note: *** is statistically significant at 1% significance Level
Source: Own computation from survey result, 2014

Experience plays an important role in improving trading activities and marketing efficiency. The trading experience of sample traders ranges from 1 up to 55 years. The average trading experience of sample traders' respondents was 15.25 years and the standard deviation was 5.5 years. However, Tiyo district sample traders had higher trading experience (20 years) than Hetosa sample traders (9.9).There is significant difference between the districts on wheat trading experience at 1% significance level.

The survey result indicated that about 36.47% of the sampled wheat traders access to credit but the majority of them (63.53%) did not take credit both on-cash and in-kind to use as working capital and for others purposes. In Hetosa district 17.5% of sample respondents have

access to credit. However in Tiyo district 53.3% access to credit .There is a high significant difference in accessing credit between districts at 1% significance level. This is because fearing of interest rate and defaulters (to make grouping as means of collateral) and religious purposes.

4.3. Wheat Value Chain

Value chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. It also helps to identify the different actors involved in the wheat value chain, and to understand their roles and linkages (McCormick and Schmitz, 2002). Consequently, the current value chain map of wheat in Hetosa and Tiyo district is depicted in Figure 4.

Figure 4: wheat value chain map

Functions (leftmost column, top to bottom):
- Consumption
- Marketing
- Production
- Input supply

Actors (central diagram):

Consumers

Bakeries and Food Company

Restaurant

F.Retailers'

Flour wholesalers

Imported — Flour factory

EGTE

Wholesalers

Cooperative

Collectors

Retailers

Farmers

Cooperative   Private vendors   NGO

Supporters (rightmost column, top to bottom):
- Bank
- NGO
- Kulumsa Research
- District Administration
- Informal credit suppliers
- OCSI

Functions   Actors   Supporters

— — — → Represents one way flow of money

———→ Represents physical flow of Inputs and Products

←——→ Represents two way flow of Information and Technology

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4.3.1. Actors and their role in wheat value chain

The value chain map highlighted the involvement of diverse actors who are participated directly or indirectly in the value chain. Chain mapping is the core of value chain analysis as it reduce the complexity of economic reality with its diverse functions, multiple stakeholders, interdependencies and relationships to a comprehensible visual model (GTZ, 2007).

Value chain actors are classified as those individuals who take ownership of a product, through the exchange of money or equivalent goods or services, during the transaction process of moving the product from conception to the end user. Those individuals or firms providing a service without taking ownership of the product are classified as service providers.

4.3.1.1. Primary Actors

A variety of actors are involved in moving wheat from producers to consumers. The most important actors of wheat value chain in Hetosa and Tiyo districts in general are listed as: input suppliers, producers(farmers), cooperatives(primary and Union), traders, processors and consumers.

Primary actor include farmers, who produce and sell wheat; cooperatives, who collect members produces' and sell to other traders, government organizations and NGOs; traders, including retailers, collectors and wholesalers; and consumers who purchase the final good in rural or urban markets. Each of these actors adds value in the process of changing product title. Some functions or roles are performed by more than one actor, and some actors perform more than one role.

Input suppliers

There are many actors who are involved directly or indirectly in agricultural input supply in the study area. Currently private vendors, primary cooperatives and Non government organization are the main source of input supply. Wheat growing farmers also participated

in this stage especially for wheat seed supply in Hetosa, and Techno serve which is non-government organization is also participated in such activity in Tiyo district. All such actors are responsible to supply agricultural inputs like improved seed varieties, fertilizers, herbicides, insecticide and farm implements which are essential inputs at the production stage.

Table 8. Type of farm inputs, sources and mode of payments

Variables	Inputs	Input sources			Mode of payments		
		cooperative	Market	Own production	Cash	Credit	Own production
Wheat	DAP	93.3%	6.7%	-	100%	-	-
	Urea	95%	5%	-	100%	-	-
	Organic fertilizer	-	-	100%	-	-	100%
	Improved seed	41.3%	40.7%	18%	80%	20%	-
	Local seed	-	30%	70%	40%	-	60%
	Herbicide	50%	50%	0	100%	-	-
	Insecticide	36.7%	65.3%	-	100	-	-

Source: own computation from survey result, 2014

Table 8 indicated that, cooperative association and local market are the main sources and suppliers of chemical fertilizer (DAP and Urea). About 93.3% and 95% of wheat producing sample households bought DAP and Urea from Cooperative Associations and district Office of Agriculture respectively. However, only about 6.7% and 5% of respondents bought DAP and Urea from market respectively. Cooperative associations were again the major source of improved seed supply. About 41.03% sample respondents bought improved wheat seeds required from cooperative, 40.7% of the respondents bought improved wheat variety from Local markets were supplied and the remaining 18% of wheat producing sample respondents used seeds obtained from their own source, instead of using improved wheat variety as seed, even though it is less productive as compared to improved wheat varieties in the next season.

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Regarding to the mode of payment for inputs, the study discovered that 100% of Wheat producing respondents bought fertilizer on cash basis. No one bought chemical fertilizer by credit basis from either cooperative or other organization. With regard to the mode of payment for improved seed, it was understood that, 80% of wheat producing sample respondents in the study area bought improved seeds on cash basis. However, only 20% of wheat producing sample households used improved seed by credit.

Table 9: Agricultural input uses by district

	Mean/proportions			
Variable	All samples	Hetosa	Tiyo	t-/ χ^2 -value
DAP (Yes)	99.33	98.33	100	1.51
Urea(Yes)	72	63.33	77.78	3.72*
Organic fertilizer(yes)	62	65	60	0.38
Herbicide (yes)	91.33	90	92.2	0.22
Insecticide(yes)	72	76.67	68.8	1.08
DAP used Kg/ha	105.5	103.3	106.94	-0.42
Urea used Kg/ha	42.74	37.5125	46.27	-1.29
Herbicide used liter/ha	0.9167	0.8875	0.936	-0.56
Insecticide used liter/ha	0.625	0.65	0.608	0.39

Note: * is statistically significant at 10% significance Level
Source: Own computation from survey result, 2014

Fertilizer application is one of the most important agricultural practices that used by wheat growers in the study area. Moreover, proper application of the recommended fertilizer rate is important to obtain the required production and marketed surplus of wheat. Farmers in the study area use varying fertilizer rate, which is above the national level blanket recommended rate for DAP. Almost all sample respondents use DAP (Di Ammonium Sulphate) fertilizer to produce wheat.

The other type of fertilizer used for the production of wheat in the study area as input was Urea. Although, application of Urea has several advantages beside production increment, only 63.3 % and 77.8% wheat producing sample respondents of Hetosa and Tiyo applied Urea fertilizer in the production respectively. The rate of application is varying from

household to household. There is significant difference between districts on the Urea application at 10% significance level. The average application rate of Urea fertilizer by wheat producers was 37.5Kg and 46.2 Kg per hectare for Hetosa and Tiyo respectively. This figure indicated that Urea used per hectare of land was much below the recommended rate.

Sample farmers indicated different reasons for applying lower rate of fertilizer. The first reason was lack of financial capacity. This was followed by unavailability of fertilizer at the right time. In their view, the amount of fertilizer to be applied per hectare of land depends on intensity of land preparation and fertility status of the plot. The result will assist in revisiting the blanket recommendations for the entire districts. There is a need to conduct site-specific trails by the farmers themselves.

Producers

Producers are the main source of wheat produce in the wheat value chain. They are generally smallholder farmers having different land size. Producers are the major actors who perform most of the value chain functions right from farm inputs preparation on their farms or procurement of the inputs from other sources to post harvest handling and marketing. Farmers produced and harvest their wheat. The major value adding activities that wheat producers perform include ploughing, planting, fertilization, weeding, pest/disease controlling, harvesting and post harvest handling.

The study area received well diverse agro-climatic conditions both in amount and season. This characteristic makes the area good potential for production of various agricultural crops and can make producing wheat highly cost-effective and competitive, and provide vast opportunities in the study area. Unfortunately, these opportunities have not been exploited by the farmers due to the lower share they receive for their wheat produce in the markets, as well as bearing the cost of post-harvest losses. Wheat is a major crop and it accounts for 42% of the total cereal area cultivated in the study area, with total output of 5.12 million quintals from 0.21 million hectares of cultivated land (CSA, 2013).

Wheat production in these two districts was based on rain fed system totally (100%); no one was used irrigation system both in Hetosa and Tiyo districts. Sole (mono) cropping is

the major practiced production system in the study area. Among all sample farmers about 92% of the respondents use mono cropping system. However, only 8% use intercropping systems. About 96.67% and 88.89 % of the respondent from Hetosa and Tiyo used mono cropping systems respectively. There is significant difference between the districts on cropping systems at 10% significance level.

Post harvest handling, which includes different activities like sorting, grading, packing, storing, transportation, loading and unloading, is done by the farmers themselves or traders or brokers. If wheat is sold at the village market which is the case in Hetosa, all aforementioned activities are performed by the buyer (traders or broker). Most of the farmers used sacks, Gotera and ground floor of their residential house as a store and sacks and ground floor as store in Tiyo district. There were high postharvest losses due to improper harvesting, handling, packaging and poor facilities to market. Among the sample respondents 73.33 % of the respondents said that there were post harvest losses of wheat during post harvest activities. About 66.7 % and 77.78% of Hetosa and Tiyo district said that there were post harvest losses of wheat during post harvest activities respectively. There is significant difference on post harvest losses between the districts at 10% significance level.

Table 10: Cropping system, value adding and post harvest losses of wheat producers

Variables		All samples (%)	Hetosa (%)	Tiyo (%)	t-/ χ^2-value
Cropping system	Mono	92	96.67	88.89	2.95*
	Inter	8	3.33	11.11	
Value adding(yes)		88	75	96.67	16.00***
Post-harvest loss(yes)		73.33	66.67	77.78	2.27*

Note: *** and * is statistically significant at 1% and 10% significance Level
Source: Own computation from survey result, 2014

Survey result also shows that 88% of sample producers conduct value adding activities of wheat by cleaning, sorting and transporting when needed before they take it to the market. There is a significant difference on value adding activities between districts at 1% significance level. This because producers' from Tiyo practice more value adding activities, since they sell to flour factories, most of time, that need quality wheat ,to meet these qualities they add value as much as they can. From the survey result about 96.67%

of the respondents of Tiyo district said that as they added value to the wheat produce but only 3.35% said no we didn't practiced value adding activities.

Transport mode is the major issue for the producer to sell their produce on time. Producer transports from field, to homestead, to milling house and to the market. Means of transportation varies among district but predominately producers use pack animals and vehicles. Wheat producer in Hetosa district used most of time tractor, pack donkeys, car and human labor, 73.33%, 16.63%, 8.33% and1.675% from field to home respectively. The respondents from Tiyo 51.11%, 31.11%, 12.33, 3.33.1.11% and1.11% used pack donkeys, tractor, animal cart, hand cart and human labor respectively. There is a significant difference on transport mode usage from field to homestead between districts at 1% significance level (Table 11).

Table 11: Transportation means to take wheat grain to home, milling house and market

Transport mode to		Hetosa (%)	Tiyo (%)	t-/ χ^2 -value
Field to homestead	Car	8.33	1.11	
	Tractors	73.33	31.11	
	Bicycle	0	0	37.88***
	Animal cart	0	12.22	
	Hand cart	0	1.11	
	Pack donkeys	16.67	51.11	
	Human labor	1.67	3.33	
To mill house	Car	0	0	
	Tractors	0	0	
	Bicycle	0	0	7.04**
	Animal cart	33.33	17.78	
	Hand cart	1.67	0	
	Pack donkeys	65	81.11	
	Human labor	0	1.11	
Market	Car	1.67	0	
	Tractors	0	0	
	Bicycle	0	0	10.22**
	Animal cart	38.33	17.78	
	Hand cart	0	0	
	Pack donkeys	60	81.11	
	Human labor	0	1.11	

Note: ***, **, and * are statistically significant at 1%, 5% and 10%significance Level
Source: Own computation from survey result, 2014

Producer used wheat by processing at home and at processing center/milling house. During these they transport wheat from home to the milling house. Among respondents of Hetosa districts 65%, 33.33%, and 1.67% used to transport their wheat produce to the milling house by donkey, animal cart and handcraft respectively. The respondents From Tiyo 81.11%, 17.78% and 1.115 used donkeys, animal cart and human labor respectively. There is a significant difference on transport mode usage from home to milling house between districts at 5% significance level.

They transport wheat to the nearest markets on head/backload, using pack animals or car over a distance. They had several transport mode options like car, animal cart, human labor and pack donkeys. Among respondents of Hetosa districts 60%, 38.33%, and 1.67% used to transport their wheat produce to the market by donkey, animal cart and car respectively. Among the respondents of Tiyo 81.11%, 17.78% and 1.115 used donkeys, animal cart and human labor respectively. There is a significant difference on transport mode usage from home to market among districts at 10% significance level.

Collectors/Assemblers

Collectors are farmers or part time traders who collect wheat from farmers at village market/Town market for the purpose of reselling to wholesalers, retailers and consumers. The assemblers play an important role in the system of assembly. It is the first link between producers and other traders. They have capital limitation. Hence, most of them receive money in advance from wholesalers of the same market or other markets to resell it back to them. In contrary to this, there are few farmer traders who compete with wholesalers. When it is imposable to them to meet quantities of their demand, they employ brokers to collect wheat by paying a commission.

Collectors use their financial resources and local knowledge to bulk wheat from the surrounding areas. They play important role and they do know area of surplus well .The trading activities of collectors include buying and assembling, repacking, sorting, transporting and selling to wholesale markets. The assemblers, mainly consisting of farmer traders, buy wheat from farmers at rural markets or in the town markets during market days collecting directly from farmers with the purpose of reselling it to wholesalers or directly to consumers in the study area or take it to zonal market (Asella) and Adama to resell to consumers, retailers and/or regional wholesalers.

Table 12: Capital of collectors and their demographic behavior

Variable	All sample	Hetosa	Tiyo	t-/ χ^2 -value
Sex(male)	62.5	50	75	1.06
Experiences	9.93	6.37	13.5	-7.40***
Family size	6.87	9.37	4.37	7.37***
Access to credit(yes)	50	25	75	4.00**
Establishment capital	2708.75	2637.5	2780	-0.16
Net capital now	12218.75	12625	11812.5	0.27
Purchased wheat/year	265.875	383.75	148	1.43

Note: ***, and ** are statistically significant at 1%, and 5% significance Level
Source: Own computation from survey result, 2014

The trading experiences of sampled collectors ranges from 5 to 16 years. The average trading experience of sampled collector's respondents was 6.37 and13.5 years for Hetosa and Tiyo respectively. There is significant difference between the districts on wheat trading experience at 1% significance level. From the result we infer that Tiyo district sample collectors had higher trading experience than Hetosa sample collectors which plays an important role in improving trading activities and marketing efficiency.

The average family sizes for all sample collectors were 6.87 peoples. The average family sizes of the collectors were 9.37 and 4.37 people for sample of collectors from Hetosa and Tiyo districts respectively. There is a significant difference between the districts at 1% significance level. As the family size increases consumption also increases, which decreases the marketed surplus of wheat.

Access to credit is also the other factors affecting the wheat trading of collectors such as ability to buy in bulkiness amount, storage time and others. During survey the respondents asked whether they get access to credit or not, among the respondents 25% and 75% of Hetosa and Tiyo districts responded as they get access to credit respectively. There is a significant difference between the districts at 5% significance level. This is also due to the difference between districts in accessing infrastructures and religious aspect of the respondents on credit usage.

Wholesalers

These are licensed wheat traders who store large bulk and assemble wheat in either direction. Wholesalers are traders who have permanent market place or stores and may or may not move from one market to another to buy and resale grains. Some wholesalers in the study area bought wheat directly from the farmers in the market and some used to buy wheat from other district market town and brought to resale in the study area. Among the wholesalers in the Hetosa district 83.33% settle in Eteya market and trade wheat produce, the rest 16.7% settle in village market which is called Boru Jawi. 77.7% of the wholesalers from Tiyo settle in Asela Town only 22.33% of wholesalers settle in Gonde. They do not trade only wheat but all other cereal crops that grown around the study area. There is significant difference between the two districts at 1% significance level on settled market place.

Table 13: Wholesalers capitals, transport and market place

Variables	All samples		Hetosa	Tiyo	t-/ χ^2-value
Experiences	18.62		8.16	25.59	-5.67***
Market place	Asella	46.7%	0	77.77%	
	Eteya	33.3%	83.33%	0	14.59***
	Gonde	13.33%	0	22.3%	
	Borujawi	6.7%	16.7%	0	
Transport owner	Owned	24.4%	27.78%	22.22%	0.18
	Rented	75.56%	72.22%	77.78%	
Post harvest loss	Loss at storage	2.24	1.32	2.736	-1.36
Kg/qt	Loss at transport	1.13	1.72	0.88	1.04
Started capital	20833.33		23000	193888.89	0.28
Net capital now	364211		214111	464211	-2.28**
Wheat purchased	1413.13		985.61	1698.15	-1.42

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level
Source: Own computation from survey result, 2014

The experience of sample wheat wholesalers was 8.16 and 25.19 years for Hetosa and Tiyo district respectively. There is significant difference in experience between the two districts at 1% significance level. Wholesalers from Tiyo were more experienced in wheat

trading than Hetosa because the Tiyo district near the capital town of Arsi zone, Asella, they get more facility than Hetosa district on time and it related with the establishment of the town.

The current net capital for sampled wholesalers was Birr 364,211. Wholesalers from Hetosa and Tiyo districts have net capital Birr 214,111and 464,211, respectively. There was significant difference between the districts at 5% significance level. By using their capital wholesalers were mainly involved in buying wheat from collectors and producers in larger volume than any other actors and supplying them to flour factory, other wholesalers and retailers and consumers. On average wholesalers from Hetosa and Tiyo district buy and sale, 985.61 and 1698.15 quintals of wheat respectively. They also store product, usually for a maximum of three to four month for expectation of price increasing. Survey result indicates that wholesale markets were the main assembly centers for wheat in their respective surrounding areas. They have better storage, transport and communication access than other traders. Almost all wholesalers have a warehouse in a market either self owned or rental basis. They were located in Asella, Eteya, Borujawi and Gonde market towns but the numbers of wholesalers in Asella market were higher than all other market towns.

Cooperatives

Cooperatives as a form of business organization are distinct from the more common investor-owned firms (traders). Farmer's cooperatives can serve their members in many ways such as Input distribution, Providing better market access and information, Expanding education in farmer's area and Credit service. Cooperatives help to sell their members' farm products and maximize the return that they receive for these goods including bargaining for better prices, storing and selling members' wheat. Fifteen agricultural primary Cooperatives and Hetosa Farmer's Cooperative Union, which have 72 primary cooperatives members, among these 15 primary cooperatives, are present in the study area, with the objective of increasing farmers bargaining power and to benefit them from economies of scale.

The primary cooperatives bought the wheat from members and sell to the Hetosa union. The union in Hetosa districts is very strong cooperative unions in Arsi zone. Union highly participates in wheat marketing. As the sample households explained in 2013/14 crop

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season unlike the past years the cooperative unions used to purchase wheat directly from cooperative members only. They sell to different processor like flour factory, food complex company by auction. Accordingly the union sells wheat to Adama brother's complex company, Diredawa food complex company, Arba Minch floor factory and others.

Table 14: Cooperatives and their major activities

Primary cooperative		Hetosa farmers cooperative union			
Suppliers	Buyer	Suppliers	Buyers	Selling method	Major activities
Farmers	HFCU		Adama brothers food complex company		Input distribution
		72 members primary cooperatives			
Collectors	HFCU		Diredawa food company	By auction	Providing better market access and information
Others			Arbaminch flour factory		Expanding education in farmer's area.
			Cilalo food complex company		Credit service

Source: Hetosa Farmers Cooperative Union data (HFCU), 2014

The union use auction method to sale the members produce, accordingly the one who fit the criteria can bought the wheat produce. The price was set by board of directors committee of the cooperative by viewing the current market. In 2014 the wheat marketing share of unions at local market level was increasing in the study area and this can testify the interest of farmers using cooperative of become growing.

Retailers

Retailers are persons or company that sells commodity to end users according to requirement and purchasing power of the buyers. The majority of wheat retailers in the study area are characterized by, no stores and weighing scale, often trading wheat purchased from wholesalers or urban assemblers and most of all from farmers at the local market.

Retailer's involvement in the wheat chain includes buying of wheat, transport to retail place, displaying and selling to consumers. Retailers are key actors in wheat value chain in both districts. They are the last link between producers and consumers. They mostly buy directly from farmers and sell to urban consumers. Sometimes they could also buy from the wholesalers and sell. Consumers usually buy the product from retailers as they offer according to requirement and purchasing power of the buyers. Retailers can be divided in to urban and rural in the case of wheat in the study area. Rural retailers are based on village market and mainly purchase wheat from farmers, and sell to consumers and urban retailers. Urban retailers purchase from framers and rural retailers in village market and sale to urban consumers.

Table 15: Retailers market place and capitals

Variables	Mean/proportion		Hetosa (%)	Tiyo (%)	t-/ χ^2-value
	All samples (%)				
Experiences	11.83		10.66	13	-0.56
Market place	Asella	33.33	25	41.67	
	Eteya	37.5	41.67	33.33	0.94
	Gonde	12.5	16.67	8.33	
	Boru jawi	16.67	16.67	16.67	
When you do your wheat trading?	Year round	62.5	41.67	83.33	
	When price low	25	41.67	8.33	4.66*
	During harvest	12.5	16.67	8.33	
Started capital	4466.65		3808	5125	-0.61
Net capital now	190314		350962	29666	2.31**
Wheat purchased	596		743	448	1.56

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level
Source: Own computation from survey result, 2014

Retailers in the study area trade wheat in different time. Among sample traders about 62.5%, 25% and 12.5% of retailers trade wheat year round, when price low and during harvesting respectively. Among the sample retailers from Hetosa district 41.67%, 41.67% and 16.67% of retailer trade wheat year round, when price low and during harvesting respectively. 83.33%, 8.33%, and 8.33% of sample retailers of Tiyo trade wheat year round, when price low and during harvesting respectively. There is significant difference between the districts on the time when they do businesses at 1% significance level.

The current net capital for sampled retailers was Birr190, 314 on average. Retailers from Hetosa and Tiyo districts have net capital Birr 350,962 and 29,666 respectively. There was significant difference between the districts on current net capitals at 10% significance level.

Wheat Consumers

Consumers are those purchasing the wheat produce for consumption. About three types of wheat consumers were identified: households, restaurants and institutions which give services such as higher education institutions, hospitals, etc. The private consumers are employees, and urban and rural dwellers who purchase and consume wheat with average wheat consumed 15.67 quintals and13.28 quintals per annum in Hetosa and Tiyo districts, respectively. There is a significant difference between the districts on the consumption of wheat at 10% significance level.

Institutions purchase wheat directly from producers, retailers and wholesalers though most of the institution purchase from wholesalers. The survey result also showed that, on average, 40 quintals and 15,785 quintals of wheat consumed in 2013/14 in Hetosa and Tiyo districts respectively. There is a significant difference between the districts on the consumption of wheat at 10% significance level. This is due to the fact that in Hetosa there is no flour factory, hospitals and others, which consume wheat, produce but only small bakeries. Institutions purchase their product from wholesaler who has the capacity to supply sustainably based on contractual agreements. In general consumers have their own quality criteria to purchase wheat.

Table 16: Consumer type and amount consumed

Type of consumers	Mean/proportion		t-/ χ^2 -value
	Hetosa	Tiyo	
	Amount consumed per year(qt)		
Private consumers :	15.67	13.28	1.71*
Employees,			
Urban and rural dwellers			
Restaurants	27.5	28	0.85
Institutions :Asella hospitals ,Adama	40	15,785	-8.65***
Science and Technology University			
and flour factory			

Note: ***, and * are statistically significant at 1%, and 10% significance Level
Source: Own computation from survey result, 2014

4.3.1.2. Supporting Actors

Support service providers are essential for value chain development and include sector specific input and equipment providers, financial services, business management services, and market information access and dissemination, technology suppliers, advisory service, etc. According to Martin *et al*. (2007), access to information or knowledge, technology and finance determines the state of success of value chain actors. OoARD, primary cooperatives, micro finance, NGO and Kulumsa Research center are main supporting actors who play a central role in the stipulation of such services in the study area.

Training and Extension Services

Wheat production and marketing training in both districts was most of time given by DAs and OoARD. The survey result revealed that 53.3% and 73.3% of sample respondents participated in wheat training that were organized in the last years in Hetosa and Tiyo districts; respectively .There is significant difference between the districts on training of wheat production at 5% significance level.

With regard to the frequency of training given among the total respondents the result showed that most of the trainings were given for farmers more than five times in a year in Hetosa districts. Among the respondents of Hetosa and Tiyo district 46.67% and 26.67%,

said we took training more than five times in a year respectively. 43.33% and27.78% of the respondents of Hetosa and Tiyo districts said we took training five times in a year respectively. The training was given on general farming practice, input use of wheat, improved seed and technology, transportation of wheat produce and packaging of wheat produce. Specifically on Fertilizer application, row plantation and the other trainings such as crop management, harvesting and post harvest handling are given in composition. Trainings were not given on wheat value chain till now. The remaining respondents said that we took training on wheat production and marketing less than three times in a year. There is significant difference between the districts on frequency of training wheat production and marketing at 1% significance level (Table 18).

Table 17: Training and extension of farmers

Variables		Mean/proportion			t-/ χ^2 value
		All samples (%)	Hetosa (%)	Tiyo (%)	
Have you ever taken any training related wheat production and marketing activity? (Yes %)		65.33	53.3	73.3	28.11**
Frequency of Training in a year					
Once in year (yes)	10		1.67	15.55	
Twice in a year (yes)	6		0	10	28.1***
Three times in a year(yes)	15.33		8.33	20	
Five times in a years(yes)	34		43.33	27.78	
More than five times a year(yes)	34.67		46.67	26.67	
Credit(yes)	36.67		35.56	35.56	0.02
Source of Credit	Banks	3.9	4.54	3.125	9.72***
	Micro finance	68.51	54.45	78.125	
	Business partners	3.703	4.54	3.125	
	Cooperatives	5.55	13.63	0	
	Local lenders	9.25	18.18	3.125	
	Relatives	9.25	4.54	12.15	

Note: ***, **, and * are statistically significant at 1%, 5% and 10%significance Level
Source: Own computation from survey result, 2014.

Regarding extension service, among the total sample farmers no one have been taken extension services on the wheat value chain in Hetosa district and all of sample respondents in Tiyo district .OoARD through its DA backed by the district subject matter specialists is the major actor who provides information and advisory service on wheat production and management practices. However, there is no value chain expert in both districts, who can give service for the community, so, it is important to give value chain training for DA at district level. Furthermore, sample farmers indicated that they are getting information particularly of input availability and price from primary cooperatives and kebele administration but not on value chain case.

Financial services

In the study area Oromia Credit and Saving Institution (OCSI), cooperative, business relation partner, relatives/friends and individual lenders have been identified as a potential source for credit both in kind or on a cash basis. out of sampled farmers who took credit, 68.5% respondents took credit from OCSI that found in the district, 9.25% ,respondents from relatives,9.25% farmers from local money lenders,5.55% respondents from service cooperatives, 3.9% from banks that found in the district ,and only 3.07% from business relation partner Table(18).There is significant difference between the districts on source of credit at 1% significance level.

4.3.2. Value chain governance

The dominant value chain actors play facilitation role. They determine the flow of commodities and level of prices. In effect they govern the value chain and most other chain actors subscribe to the rules set in the marketing process. The assessment made indicates that the wholesalers assisted by the collectors are the key value chain governors. They have sufficient information about the supply of wheat and which direction it flows along the marketing channels and markets in different parts of the country. They also set prices. Price was the major determining factor that affects the wheat producer decision as to whom and which market to sell their produce. The method of price formation is critical importance.

About 41.18% of the sampled traders said that, purchasing and selling price was set by processor at central market, 24.71% of sample traders reported that, they set price by

colluding with other traders, 24.71% of the traders said that, price was set by office of trade and industry of respective districts. Only 9.41% said traders themselves. Consequently, price information is important information for traders' wheat marketing strategies. There is significant difference between the districts on trader's price setting at 5% significance level. In order to obtain market information on prices, supply and demand, traders follow an average of 2 markets on a weekly basis.

In light of traders' reliance upon personal and commercial contacts for obtaining market information, recent telecommunication changes have played an important role in traders' access to information. Among those traders who own cell phones, all traders reported that their cell phones have had an important impact upon their commercial operations. It enables traders to search for prices over a greater number of markets and to have more market contacts and sell in more markets. This result is similar with Ashanafi Amare which is done on analyzing of grain market in southern Ethiopia (2010).

Table 18: Traders price setting strategy

Variables	Mean /proportions				t-/ χ^2 -value
	All samples		Hetosa	Tiyo	
Who set price?	Traders	9.41	15	4.44	
	Negotiations	24.71	32.50	24.71	
	Processors	41.18	40	41.18	8.95**
	Traders office	24.71	12.50	24.71	
	Brokers	0	0	0	

Note: ** is statistically significant at 5% and significance Level
Source: Own computation from survey result, 2014

The wholesalers in different markets are well networked but informally. For instances wheat wholesalers in Eteya networks via telephone communication with wholesaler in Asela, Adama, Dire Dawa, Addis Ababa, etc. These traders exchange information on wheat prices, local supply situation and the prospects of harvest in their area. Then, they agree on the price at which the buyer is willing to take the price, so that, the seller determines the farmers' price taking into account his/her profit margins. Except this networking and business relation, there is no formal collateral when the transaction takes

place. Money is transferred through banks and often the wholesalers in the different markets had never personally met.

The wholesalers exchange information on wheat prices, local supply situation and the prospects of harvest in their area with processors, again they agree on the price but some time there is a case when price is determined by the processor at central market like Addis Abeba and Adama. The smallholder farmers are not organized and are not governing the value chain. Hence, they are price takers and hardly negotiate the price due to the need of money at the time for expenses resembling tax and other, in case the product is not sold. The value chain governance is similar both in the Hetosa and Tiyo districts. The major source of market information is the neighbors who sold wheat during the previous market days. Recently the use of cell phone, Television and Radio in the rural areas is increasing. It is a rare phenomenon for the farmers to receive market price through mass media.

4.4. Market Structure-Conduct- Performance of Wheat Market

4.4.1. Structure of the wheat market

The composition of the wheat marketing system should be evaluated in terms of the degree of market concentration, barrier to entry (licensing procedure, lack of capital and know how, and policy barriers), and the degree of transparency (Pender *et. al* 2004). In this study the structure of the wheat market is explained using the following indicators: market concentration, the degree of clearness (market information) and entry conditions (licensing procedure, lack of capital and know how).

4.4.1.1. Degree of market concentration

The concentration ratio of traders in the study area is used as an indicator of the relative size of traders in relation to the market as a whole. It is calculated as the sum of the percent market share of the top four traders. One commonly used concentration ratios is the four-trader concentration ratio, or C_4, consists of the market share of the four largest traders as a percentage of the total volume of goods or services mobilized in the total market. The higher the concentration ratio, the greater the market power of the leading traders. The information for the total wheat traded in the markets was collected from the

bureau of agriculture and rural development estimated prices and amount of wheat traded weekly market report, from the district finance bureau the estimated sales of wheat traders for tax payment and from the interviews conducted with the sample traders. The degree of inequality in market share at the local market level varies from district to district and also its common, it varies from crop to crop. The result was similar to Ashenafi Amera(2010) in which he stated that at the local market level the degree of inequality in market share varies from crop to crop.

The degree of market concentration was estimated for the licensed wheat traders in Eteya and Asella town using the four firm concentration ratios.

Table 19: Concentration Ratio for Eteya and Asela Markets in 2014

Traders	Eteya market Volume (in qt)	Market share (%)	Traders	Asela Market Volume (in qt)	Market share (%)
Wholesalers1	1200	3.8	Wholesalers1	2100	4.4
Wholesalers2	2000	6.4	Wholesalers2	3375	7
Wholesalers3	1300	4.2	Wholesalers3	2300	4.8
Wholesalers4	2300	7.3	Wholesalers4	3800	8
Wholesalers5	1600	5.1	Wholesalers5	2500	5.2
Wholesalers6	2500	8	Wholesalers6	8365	17.5
All other traders	20262	65	All others traders	25521	53
Total	31162	100		47961	100

Source: computation from survey result, 2014

Taking the four largest traders from the survey the concentration ratio was computed. As indicated in the Tables 20 above, the levels of market concentrations (CR4) for Eteya market is:

$$C_4 = S_1 + S_2 + S_3 + S_4$$

$$= 5.1 + 8 + 7.3 + 6.4 = 26.8\%$$

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These concentration ratios in Eteya market indicate a low degree of concentration. In the market four firms control 26.8% of the wheat sold in the market.

The level of market concentrations (CR4) for Asela market is:

$$C_4 = S_1 + S_2 + S_3 + S_4$$

=5.2+17.5+8+7 = 37.7 %

These concentration ratios in Asela market indicate a high degree of concentration. In the market four firms control 37.7 % of the total wheat sold in the market. These indicate a high degree of concentration as compared to Eteya market and thus less competition than the Eteya market. Based on the concentration ratio we conclude that both Eteya and Asela market are classified as monopolistic competition forms market structure.

4.4.1.2. Degree of clearness (market information)

According to the survey result, sample traders obtained price information, supply and demand condition of wheat through others traders, brokers, telephone, personal observation, price ticker board, mass media like radio, television, news papers.

Table 20: Market information and its source for traders

Variables	Total (%)	Wholesaler (%)	Collector (%)	Retailer (%)	X^2-t value
Market information(yes)	92.94	97.78	87.50	87.50	3.41
Source information					
Other traders(yes)	97.65	100	87.50	100	8.83**
Radio (yes)	74.12	62.22	87.50	87.50	7.05**
Telephone (yes)	100	100	100	100	-
Personal observation(yes)	82.35	77.78	87.50	82.35	1.37
Broker (yes)	3.53	6.67	0	0	2.76
Price tickers (yes)	37.65	40	18.75	45.83	3.22
News papers(yes)	12.94	8.89	12.50	20.83	1.98
Television	83.53	97.78	18.75	100	60.17***

Note: ***, and ** are statistically significant at 1%, and 5% significance Level
Source: Own computation from survey result, 2014

About 97.65% of sample traders reported that, they obtained price information through other traders, only 2.35% said we did not get information of wheat price, demand and supply condition from other traders. They asked whether they get information from other traders or not, from the survey result all wholesalers and retailers (100%) said that we get information from other traders and among the sampled collectors, 87.5% of collectors said as they get information from other traders' .There is significant difference between the traders at 5% significance level. This is also due to the difference between traders in relationship with others and communication abilities.

Although, media such as television and radio play the greatest role in provision of market information in shortest possible time over larger area of coverage, its effect in addressing wheat market information to users was limited. Despite the fact that, no trader had accessed mass Medias as an information source. Among the total sample traders about 74.12% of the traders said that, they used radio as source of information on wheat price, demand and supply condition. About 62.22%, 87.50%, 87.50% of wholesalers, collectors and retailers used radio as source of information. There is a significant difference between the traders at 5% significance level. This is also due to the difference between traders in accessing the radio.

Television is used for different purposes among that, it transmits about agricultural price such as coffee, wheat and teff price. Among the respondents 83.53% of respondents used television as source of information on wheat price, demand and supply conditions. Almost all wholesalers (97.78%) of sample wholesalers used TV as source of information on wheat price. All sample retailers said that they used TV as source of information on wheat price. Among the sample collectors only 18.75% used TV as source of information on wheat price, demand and supply conditions .There is a significant difference between the traders at 1% significance level. This is also due the difference between traders in accessing TV, different infrastructures like light for instances almost all collectors are from rural area, at rural it is difficult to them to get TV, because there is no light there.

Only 37.65 % of the sample traders use price sticker board as source of information, they are the traders who have completed education level secondary school and more, up to degree level. Others cannot understand the displayed information from price ticker.

4.4.1.3. Barrier to entry

The barriers to entry into the grain market reflect the competitive relationships between existing traders and potential entrants. If the barriers to entry are low, new traders can easily enter into grain markets and compete with established traders. Trade barriers have often laid the groundwork for market imperfection. Whether by intent or not, many regulatory actions by state or local units have the result of restricting freedom to entry and the free flow of goods and services (Kohls and Uhl, 1985).

The major barriers to entry in to wheat trade in the study areas included lack of working capital, licensing and high competition with the cooperative unions.

Table 21: Barriers to wheat market entry

Barriers		All samples (%)	Hetosa (%)	Tiyo (%)	X^2-t value
Trading licenses (yes)		45	65	48	1.25
Lack of capital(yes)		90	85	95	2.32**
Competition cooperative(yes)	with	60	55	65	1.73*
Initial capital (Birr)		9812.23	9670	9938.66	-0.0534

Note: **, and * are statistically significant at 5% and 10% significance Level
Source: Own computation from survey result, 2014

Licensing: In study area, not all traders had trade license with the exception of wholesalers and very few retailers and collectors traders residing in district town markets of Eteya and Asela, which is the Tiyo district town as well as zone town. In Eteya market all 20 wholesalers have trading license but only 5 retailers have trading license. All sampled 25 wholesalers in Asela market have trading license, not like Eteya market almost all retailers in Asela market have trading license. According to the information obtained from some key informants in Asela Town Small Scale, Trade and Industry Office, there were more than 65 traders licensed on the bases of the amount of initial capital they possessed. There are two types of licenses in the study area; those who have an initial capital of 10,000 Birr classified as wholesalers. They can purchase wheat in regional markets and transport it to the deficit terminal markets (Adama, Addis Abeba, Dire Dawa

etc). Those who received a license with initial capital of 1000 Birr are licensed as retailer/urban assemblers and can purchase and sell grain within the regional markets only.

However, from the sampled respondent more than 85% of wheat traders (all traders residing in the town) have wheat-trade license where as the remaining 15% of the sample farmer traders who reside in rural markets had no grain-trade license. According to the survey result, all traders having wheat-trade license and residing in the town reported that it is very simple to get wheat trade license, so long as they fulfill the required initial capital not verified by the office. Only 45% of the respondent said that trade licenses was barrier to wheat market entry. Although, theoretically it is compulsory to have license to enter in to the wheat market, the simplicity to have wheat license and absence of strong restriction to enter into the grain market with respect to licensing made wheat marketing relatively free to enter. Thus, entry in to wheat trading is easy.

Lack of capital

Lack of capital is not only the major problem in wheat trading; it's the major problem for the whole grain marketing. It is the real barrier to enter in to grain markets. Lack of working capital was reported to be an important barrier to entry thereby resulting in imperfection of food grain, pepper and rice markets in Southern and North East Ethiopia (Wolday, 1994; Rehima, 2005; Wolelaw 2005).

In the survey about 90% of the sample traders respond that major problem to run their business was lack of capital. Although the working capital required was reported to vary depending upon the price level and quantity of grain to be purchased, high amount of initial working capital was required to compute with wholesalers, collectors and the emerging marketing cooperatives. To enter in to the market more capital is needed because they have to purchase more wheat and they have to pay cash on hand at the time of purchase. In addition high capital is required for store construction and for appropriate and adequate storage facilities. In these cases, capital requirement discourage entry into wheat trading (Table 21).

Even if there was credit access from different source the religions the sampled traders follow restrict them to search credit from formal source, the other case the respondent

reported about formal credit was the amount given was very small for the wholesalers and assemblers.

About 53% and 12% of sample traders were using their own capital, and borrowing from other traders and friends respectively. The rest 35% of traders (mainly wholesalers) had access to formal financial sources to expand their trading activities. Thus, access to capital was one of the major factors discouraging entry into wheat trading (Table 18).

Lack of trading experience

According to the survey result, trading experience of sample traders ranges from 1 to 48 years with an average experience of 15.25 years (Table 6). The presence of wider range of experience years among traders indicates that experience is a barrier to enter into Wheat market.

4.4.2. Wheat market conduct

Market conduct refers to firm's behavior for example pricing and selling policies and tactics, overt or tacit inter firm cooperation, or rivalry, and product or market related research and development activities (Scarborough and Kiddy, 1992).According to Bain, (1968). Market conduct refers to the patterns of behavior that firms follow in adopting or adjusting to the markets in which they sell or buy in this study conduct of the wheat market is analyzed in terms of producer and trader's price setting, purchasing and selling strategies.

4.4.2.1. Price setting strategy

Producer's price setting strategy

According to the survey result, about 82% of sample farmer respondents said that, market price was set by buyers and 7.3% respondents said that, price was set by the supply and demand. The remaining 6.7% and 7.3% of farmer respondents said that the selling price of their produce was set by themselves and negotiation respectively. There is a significant difference between the districts at 10% significance level on the price setting.

The survey further investigated that, situation where wheat they took to market not sold, about 82 % of sample respondents face problem of wheat they took to market not sold but only 18% of the respondent said that, we have no problem of wheat market. There is a significant difference between the districts at 1% significance level on problem of wheat they took to market not sold. This is also due to the difference between productivity of wheat and consumer demand of the districts.

After they face the problem, they asked what the solution they took were, about 63.3% of the farmers said that, sold at low price, 24.66%of sample respondent farmers reported that, they took their product back to home and waited till next market day. The other 6 % of sample respondents took back to home to sale another market, 6 % put their produce in homes of their relatives on market place to be sold some other day other than the market day. There is a significant difference between the districts at 1% significance level on the solution to the problem of wheat they took to market not sold .The majority of farmers identified that price was the major determining factor that affect their decision as to whom and which market to sell their produce. Hence, there existed absence of competitive pricing system, indicating the deviation of market from the competitive market norms.

Table 22 : Producer price setting strategy

Strategy	All samples (%)		Hetosa(%)	Tiyo (%)	t-/ χ^2 -value
Who set price?	Buyer	82	85	80	5.45*
	Supply and demand	7.33	83.35	6.67	
	Negotiation	7.33	1.67	11.11	
	Farmers themselves	3.33	5	2.22	
Wheat not sold at market?	Yes	82	95	66	11.45***
Solution to the problem when wheat taken to market not sold?	Took back to home	24.66	11.66	33.34	
	Took another market	6	5	6.67	14.66***
	Sold at lower price	63.33	75	55.56	
	Store at market	6	8.33	4.44	

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level
Source: Own computation from survey result, 2014.

4.4.2.2. Traders purchasing and selling strategy

The major grains produced and sold by the sample producer surveyed were wheat, which 100% of suppliers in the study area were farmers. The critical period for wheat purchase was immediately after harvest starting at the end of November to January. Wholesalers traders primarily purchase from farmers, use collectors as second source to purchase and other traders out of the district. All wholesalers in the study area not used brokers and commission agents for purchasing wheat but wholesalers for other agricultural products used brokers, for instance; for onion.

Traders use a variety of criteria to attract their suppliers, 81.2% of respond said that, they attract their suppliers by fair scale weighing and social relation, 8.24% by giving better price relate to others, 7.06 % by giving credit, and the rest by 3.53% by visiting them. This suggests that, while profits are important for traders' marketing behavior, social networks play an important role in these decisions as well. 0nly 8.24% of the traders revealed that their purchasing price of wheat was higher than competitors in order to buy more quantity and resale it in other markets. The entire sample traders claimed that prices of wheat in 2014 slightly increased compared to the previous year and supply of wheat also increased in this year.

According to IFPRI (2014), the broad pattern of the effect of changes in international wheat prices is that, higher prices will reduce the amount of wheat available for Ethiopian consumers, while lower prices increase wheat supply. As expected, higher international prices will reduce wheat imports, but while Ethiopian wheat farmers will increase their production of wheat to cover part of the import supply deficit, they will not supply sufficient domestic wheat to make up the full reduction in wheat imports. Similarly, lower international wheat prices will result in Ethiopian farmers' reducing their production of wheat. On the demand side, lower international prices will work through the model to increase consumption, while higher international prices will result in reduced wheat demand.

Traders in the study area sold their produce to wholesalers, processors, cooperative and consumers. The critical period for wheat sale was two week after harvest to a year.

Wholesale traders primarily sold to processors like flour factory and food complex company. Traders use a variety of criteria to attract their buyers, 81.2% respondent said that, by supplying quality wheat to our buyer, 7.06% by giving lower price relate to others, 2.35% by fair scale weighing and social relation and 2.35% by selling on credit. Among the sample traders almost all of the traders in Hetosa district sale their produce to processor at Adama, Addis Abeba and sometimes to the processors come from Dire Dawa at harvest time.

Table 23: Traders purchasing and selling strategy

Variables	All samples (%)		Wholesalers (%)	Collectors (%)	Retailers (%)	t-/ χ^2 -value
Regular supplier	Farmers		82	95	64	
	Other Collectors		8	5	2.5	1.35
	Other wholesalers		6	0	30	
	Other Retailers		4	0	3.5	
Regular buyer	Processors		90.5	5	8.5	2.35
	Consumers		1.5	3	61.5	
	Other wholesalers		3	70	15	
	Retailers		3.5	20	10	
	Farmers		1.5	2	5	
How do you attract suppliers?	Better price	8.2	15.56	0	0	
	Fair scale	81.2	68.89	87.50	100	18.23***
	Visiting them	3.5	2.22	12.50	0	
	Giving credit	7.1	13.33	0	0	
How do you attract buyer?	Low price	7.1	4.44	0	16.61	
	Fair scale	2.4	86.67	100	83.33	8.5***
	Visiting them	0	0	0	0	
	Giving credit	2.4	4.44	0	0	
	Quality	88.2	4.44	0	0	
Average market number visited per week		1.8	1.86	2.56	1	5.6***

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level
Source: Own computation from survey result, 2014

Traders in the study areas respond to changes in local supply and demand in deciding where to buy and sell wheat. A large percentage of traders focus their marketing strategies on their permanent market place, known as the "principal market". Over 50% of traders'

total purchases and sales occur on the traders' principal market (Asela and Eteya) only. This suggests that the majority of traders' operations occur on their principal markets, with a more limited number of traders trading between markets. Of all the traders, wholesalers change not their purchase and but sales markets the most frequently, followed by collectors. Average number of market visited per week was 1.86, 2.56 and 1 for wholesalers, collectors and retailers respectively. There is a significant difference between the traders at 1% significance level on the number of market visited per week.

4.4.3. Wheat market performance

Marketing performance of wheat markets were analyzed by estimating the marketing margin, by taking into consideration the associated marketing costs for key wheat value chain actors. Based on production costs and purchasing prices of the major market participants along the chain, margins at farmer, collectors, wholesalers and urban retailer's levels were estimated and analyzed.

Marketing costs and benefit shares of actors in wheat value chain

Table 24 indicates different types of marketing cost related to the transaction of wheat by producer, collectors, wholesalers, retailers and processor, and the benefit share of each marketing actors.

The arrangement of marketing cost revealed that postharvest loss is the highest cost for each marketing agents. This is due to the packaging material. Thus, the cost of loss is the highest amount followed by transportation and labor cost.

Each of the wheat value chain actors adds value to the product as the product passes from one actor to another's. In a way, the actors change the form of the product through improving the grade by sorting, cleaning or create space and time utility. Compared to farmers, traders' (collectors, wholesalers, retailers and processors) operating expense is less than half (50%) but their profit margin is more than that of farmers. That means by simply buying from the farmers and selling to consumers, traders took above 66% of the total profit margin. While farmers, doing all the work of producing wheat and bearing the

associated risks, took only 34% of the profit margin. This disproportionate share of benefits is the reflection of power relationship among actors. Wheat producers added 34% of the total value of wheat in the district. Collectors, wholesalers, retailers and processors are responsible for 4%, 2%, 4% and 56%, respectively. The price change from producer's price to consumer price is 55.5%.

Table 24: Wheat marketing costs and benefit shares of actors

Items(birr/qt)	Producer	Collector	Wholesalers	Retailers	Processors	H.sum
Purchase price	_	735	855	900	950	3440
Production cost	450	_	_	_	_	450
Marketing cost						
Labor	30	5	5	4	20	64
Transport	20	10	17.5	2	25	74.5
Loss	45	30	20	5	10	110
Overhead cost	4	3	2	1	10	20
Packaging materials	5	5	5	5	10	30
Tax	_	3	4	3	7.5	17.5
Total marketing cost	104	56	53.5	20	82.5	316
Total cost	554	791	908.5	920	1032.5	4206
Sale price	750	815	915	945	1350	4775
Market margin	300	80	60	45	400	1335
Share market margin	0.2	0.06	0.04	0.03	0.30	1
Profit margin	196	24	6.5	25	317.5	569
Share of profit margin	0.34	0.04	0.01	0.04	0.56	1

Source: own computation from survey result, 2014

4.5. Determinants of Marketed Surplus of Wheat

The econometric analysis was planned to investigate factors affecting, volume of wheat supply to market. In the study area, production of wheat is mainly for consumption and market. It is important cash commodities for sample respondent. Data collected from sample respondents indicated that 54% of wheat produced in the year was supplied to the

market. According to the survey result, most of sample respondents of the two districts were actual market suppliers during the survey period. Several variables are hypothesized to influence the volume of marketed surplus of wheat by sampled producers.

Tobit model was employed to identify the factors. For the parameter estimates to be efficient, unbiased and consistent assumptions of Classical Linear Regression (CLR) model should hold true. Hence, multicollinearity, endogeneity and heteroscedasticity detection test were performed using appropriate test statistics. The Cameron & Trivedi's decomposition of IM-test (in Stata) was used to check for heteroscedasticity (Appendix Table4) and VIF, for multi collinearity. There is no serious multicollinearity problem since VIF results are less than 7 (Appendix Table 2).

Attempts were made to include all theoretically important factors in the Tobit model. Among the variables included in the analysis seven variables such as family size, access to credit, value adding activities, livestock holding, type of seed used, cultivated land for wheat and non-farm income of respondent influenced the amount of marketed surplus significantly. The result of Tobit model is discussed below.

Livestock holding: Number of livestock owned found to be positively related with the marketed surplus of wheat, and significant at 1% significance level. The analysis revealed that an increase of 1 unit of livestock (TLU) increased the quantity of wheat supplied by 0.12 quintals among the whole sample. As the number of livestock increased by one tropical unit, a probability of marketed surplus of wheat increased among non-sellers farmers by 0.001%.The result was contrary to Rehima (2005), where total livestock unit influence quantity of pepper supply negatively. The reason might be as livestock ownership is an indicator of wealth in the study area; those who have large number of livestock would sale livestock and its products bought agricultural input on time and apply. Thus it increases the production of wheat that would enable to increases marketed surplus wheat.

Value adding activities: Value adding activities are also another factor, which positively affects marketed surplus at 5% significance level. As the farmers perform value adding activities to the wheat produce the marketed surplus of wheat increases by 10.44 quintals of wheat. As farmers perform value adding activities increased a probability of wheat

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quantity supplied and marketed increased, among non-sellers farmers by 0.5%. These are due to the fact that, as farmer performing value adding activities, the productivities of wheat increases, which in turn increases the marketed surplus of wheat.

Family size: Family size affected negatively the supply of wheat at 1% significance level. It is different from hypotheses. An increase in one family member indicated that a decrease 1 quintals of marketed surplus of wheat. As family size increases, by one number a probability of wheat quantity supplied decreased among non-participants of wheat market by 0.015%.This means that large amount of wheat is required for consumption when number of family member increases; This is in line with the study by Astewel (2009), as family number increases supply of rice to the market decreases and also with Ashenafi Amera (2010), as family number increases supply of grain to the market decreases.

Cultivated land for wheat: As hypothesized the result from Tobit model for cultivated land for wheat production variable was positively related with marketed surplus of wheat and significant at 1% significance level. As cultivated land for wheat increase by one hectare, marketed surplus of wheat increases by 21.07 quintals of wheat. As cultivated land increased by one hectors, a probability of marketed surplus of wheat increased among non-sellers farmers by 0.03%. The implication is that since, wheat is the major cash crop for the majority (54%) of farmers; markets seemed the most important factor motivating farmers to produce and supply.

Non-farm income: Contrary to hypotheses, it influences volume of marketed wheat significantly and negatively at 1% significance level. From the result as farmer get income from non-farm activities, marketed surplus of wheat decreases by 6.23 quintals. As income from non-farm activities increases a probability of wheat quantity supplied decreased among non-sellers farmers by 0.082%.This is because most of non/off farm activities that are farmers participating in are pity cash trading and produce mixed crop. Farmers participating in pity cash trading were business oriented farmers and they produce wheat completely for consumption. This could be due to the fact that, farmers who have additional income would have the chance to buy other food for consumption at any time by additional income and save their wheat produce up to price increases and may see as wealth in the store for one to two years.

Table 25: Tobit model outputs of determinants of wheat marketed surplus

Variables	Coefficients		Marginal effects	
	Coefficient	Standard errors	Change among the whole $\frac{\partial E(Y_i)}{\partial x_i}$	Change in probability $\frac{\partial F(Z)}{\partial x_i} = f($
Value adding activities	10.42**	3.61	10.44	0.005
Livestock holding	0.12***	0.01	0.12	0.00001
District	3.93	2.83	4.24	0.0005
Sex of household head	2.51	2.73	2.80	0.0.0002
Education status of house hold		2.64		
Primary	0.81		2.1	0.0002
Secondary	5.26*	3.10		
Tertiary	-0.08	8.60		
Wheat Farming experiences	-0.03	0.09	-0.02	-3.69e-06
Family size	-1.05***	0.34	-1.00	-0.00015
Distancetonearest market	-1.96	2.22	-1.84	-0.00025
Distance to urban centers	0.13	0.12	0.15	0.000025
Land allocated to wheat	21.00***	1.67	21.07	0.003
Off farm income	-5.90***	2.12	-6.23	-0.00082
Access to credit	8.67***	2.14	8.81	0.0021
Type of seed used	5.96***	2.10	5.93	0.0008
Perception to lag wheat price	5.70	3.09	6.05	0.0008
Constant	-17.30	10.26		
Log likelihood		-523.11		
LR chi2(16)		323.82		
Pseudo R2		0.27		
Left censored observations		18		
Uncensored observations		132		

Note: ***, **, and * are statistically significant at 1%, 5% and 10% significance Level
Source: Own computation from survey result, 2014

Access to credit: The variable access to credit had positive and significant influence on marketed surplus of wheat at 1 % significance level. If farmers get credit, in production year, the amount of marketed surplus of wheat increases by 8.81 quintals of wheat. As farmers get credit in the production year a probability of marketed surplus of wheat increased, among non-sellers farmers by 0.21%. In the study area, access to credit is determined by availability of cash on hand. As indicated in the descriptive part, the agricultural Office that distributes improved seed and fertilizer almost all on cash bases. In this case, only those farmers who possess cash on hand can benefit from formal credit. On the other hand, farmers who have no cash on hand will be devoid of the opportunity. This implies that access to credit improves the financial capacity of farmers to buy modern inputs, thereby increasing production which is reflected in the marketed supply of wheat. From this result it can be stated that those farmers who have access to formal credit, are more probable to supply wheat than those who have no access to formal credit.

Type of seed used: This variable affects marketed surplus of wheat as hypothesized, it affects positively and significantly at 1% significance level. As the farmer uses improved wheat variety, the marketed surplus of wheat increases by 5.93 quintals. As farmers uses improved variety of wheat, a probability of marketed surplus of wheat increased among non-sellers farmers by 0.08%. If a producer uses improved wheat variety, this will increases production and productivity thus, increases the marketed surplus of wheat.

5. SUMMARY, CONCULUSION AND RECOMMENDATIONS

5.1. Summary and Cconclusion

The study was conducted in south Eastern Part of Ethiopia in two potential districts (namely Hetosa and Tiyo districts of Oromia regional state) in wheat production. The area is known for its surplus production of wheat. The study was aimed at market supply and value chain analyses of wheat. The specific objective of the study include: identifying Wheat value chain actors and their value additions, analyzing performance of wheat market and, estimating the intensity and determinants of marketed surplus of wheat by small holders in the study area. The data were generated from both primary and secondary sources. The primary data were collected from individual interview using pre-tested semi-structured questionnaires.

The primary data for this study were collected from 150 randomly selected households from Hetosa and Tiyo districts, 85 traders from Asella, Eteya, Gonde and Boru jawi markets; cooperatives , 15 miller ,3 flour factory and 20 consumers. The analysis was made using descriptive statistics and econometric models using versions 11 STATA software. All the sampled households were wheat producers. Value chain actors, Market performance and marketed surplus of wheat are found to be important elements in the study of wheat value chain. Therefore, in mapping wheat value chain, value chains tools, analyzing performance of wheat market, S-C-P model and Tobit model was applied to analyze factors affecting marketed surplus of wheat in the study areas. The findings of this study are summarized as follows.

According to the data obtained from survey result, market participants identified in the transaction process of wheat in the study area include farmers, farmer traders, urban assemblers, regional wholesalers, retailers, processors (millers, flour mill) and commission agent. Among factors of production and marketing; land allocated for wheat, literacy status, distances to urban centers, type of wheat variety used, perception on current year wheat price, wheat consumption and cost of production shows significant variation between the districts.

The average wheat productivity in Hetosa district is higher than Tiyo district. In Hetosa district the mean productivity of wheat was 39.86 qt/ha and in Tiyo district; the mean productivity of wheat 38.70 qt/ha; in both districts the average yield is higher than the national average. Constraints hindering the development of production and marketing of wheat are found at all wheat value chain levels. At the farm level wheat producer are faced lack of improved wheat variety, diseases, theft on the field and at market level price setting problem, theft and others.

The total annual income of the households in study area is a function of other farm income, livestock, wheat productions and employment on non-farm activities. The average annual income for wheat market participants and non-participants were Birr 49,413 and 9,782.6 respectively. There is significant difference in total annual income of household between households who were participating in wheat market and non-participants at 1 % significance level. The Gini coefficient for total income of households participating and not participating in the wheat market was 0.3420 and 0.4198 respectively. An increase in income from non-farm causes the largest increase in the Gini coefficient, namely, 8.58% and 8.54% for wheat market participants and non-participants respectively. An increase in income from livestock causes the second largest increase in the Gini coefficient, namely 7.29% and 11.35% for wheat market participants and non-participants respectively. However, 1% income increases from the other farm activities will reduce the Gini most, namely by 10.88% and 19.44% for wheat market participants and non-participants respectively, and1% income increase from wheat income will reduce the gini by 4.99% and 0.74% for the households participating and not-participating in the wheat market respectively.

The primary actors in a wheat value chain in both districts are input suppliers; farmers; traders; brokers; processors; retailers; and consumers. Each of these actors adds value in the process of changing product title. OoARD, primary cooperatives, micro finance, NGOS and Kulumsa Research center are main supporting actors who play a central role in the stipulation of such services. Governance of a value chain is made up of national, regional and local government, the judicial system and major providers of public utilities.

The degree of market concentration was estimated for the licensed wheat traders in Eteya and Asella town using the four firm concentration ratios. Based on the concentration ratio we conclude that both Eteya (26.5%) and Asela (37.7 %) market are classified as monopolistic computation forms of market structure. About 95% of traders reported that they obtained price information through telephone, discussion with other traders, and personal observation. Only 37.6 % of the sample traders use price sticker board as source of information. Among trading licenses, lack of capital and competition with cooperative, lack of capital is found to be the major trade barriers in the study area. So the responsible bodies have to solve this problem by facilitating credit availability.

About 82% of sample farmer's respondents said that market price was set by buyers, 7.3% respondents said that price was set by the supply and demand. The remaining 6.7% and 7.3% of farmer respondents said that the selling price of their produce was set by themselves and negotiation respectively. Traders use a variety of criteria to attract their suppliers, 81.2% respond that by fair scaling weighing and social relation, 8.24% by giving better price relate to others, 7.06 % by giving credit, and the rest 3.53 % by visiting them.

Each of the wheat value chain actors adds value to the product as the product passes from one actor to another. Compared to farmers, traders' operating expense is less than half (50%) but their profit margin is more than that of farmers. Wheat producers added 34% of the total value of wheat in the district. Collectors, wholesalers, retailers and processors are responsible for 4%, 2%, 4% and 56%, respectively. The price change from producer's price to consumer price is 55.5%.

Several variables were hypothesized to influence the volume of marketed surplus of wheat by sampled producers. Tobit models were employed to identify the factors affect marketed surplus of wheat. Attempts were made to include all theoretically important factors in the Tobit model. Among the variables included in the analysis seven variables such as value adding activities, livestock holding of household, access to credit, family size , access to non-farm income ,type of see used, and cultivated land for wheat influence the amount of wheat marketed surplus significantly. Therefore, these variables require special attention if marketed surplus is to be increased.

5.2. Recommendations

Based on the findings of this study, the following policy measures could be recommended. The finding justifies that the problem of improved wheat variety to improve wheat productivities, so in order to increase the productivities the responsible bodies have to strengthen cooperatives/groups that engage in wheat seed production to achieve the economies of scale needed to meet producers' high demand for improved wheat seed. The study found out that Asella area is the focal point of the seed wheat supply for different areas in the country. Farmers of the area have long experience of good quality wheat production for seed or consumption purposes. Farmers of the area have comparative advantage in terms of location and agro ecology. Along with increasing the traditional seed supply system, introducing improved seed production and marketing system can significantly contribute to the solution. The wheat seed producers can then be linked with wheat producers to create access to market for their business.

Collectors operate without license. As they do well in linking buyers and sellers, they also distort prices to make hidden margin from the deal. It is suggested to advocate for licensing the functions of collectors where they will be accountable for their actions. Building their capacity on how cooperation in value chain development is beneficiary and their role.

The poorest groups and producers shared unfair profit distribution comparing with other actors; mainly associated with lower bargaining power and shortage of working capital respectively. Therefore, to make wheat marketing to work in favor of these poor groups, strengthening organizing farmers as cooperatives and linking them to existing farmers' organizations can generate economies of scale and contribute to reduce transaction costs and improve their bargaining power as well as improve joint benefits for both groups. Organize and capacitate producers to enhance their negotiation power and skill. Create value chain forum at district level where the different value chain actors come together and discuss the problems of wheat value chain and solve them.

Creating linkage among producers and processors is not sufficient to benefit the poor group. Hence, further linking producers via cooperatives to processors, wholesalers (in Addis Ababa market), which newly commenced in market Addis Ababa is remedies to

improve farmers' value and profit distributions, since it is through reducing extra intermediaries interferences.

The results of econometric analysis indicate that Wheat marketed surplus is positively and significantly affected by access to credit, value adding activities ,livestock holding and land allocated to wheat . Therefore, these factors must be promoted in order to increase the amount of marketed surplus of wheat. Increasing the production and productivity of wheat per unit area of land or increasing land allocated for wheat is better alternative to increase marketed surplus of wheat. Supplying improved varieties on time, strengthening the use of modern technologies, controlling disease and pest practices should be promoted to increase production.

Marketed surplus is significantly and negatively affected by distance to nearest market, farming experiences, family size and off farm income. Therefore, strengthening efficient and area specific extension systems, improving road infrastructure, supporting DAs by giving continuous capacity building trainings and separating DAs extension work from other administrative activities increases wheat supply to the market.

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6. APPENDIX

Appendix I. Tables

Appendix Table 1: Conversion of livestock number to Tropical Livestock Unit (TLU)

Livestock type	TLU
Oxen/Bull	1.1
Cows	0.8
Heifer	0.5
Calves	0.2
Sheep	0.09
Goats	0.09
Donkeys	0.36
Horses	0.8
Mules	0.8

Source; Gryseels, G. 1988.

Appendix Table 2: Variance Inflation Factor for continuous independent variables

Vif		
Variable	VIF	Tolerance
Land allocated to wheat	2.39	0.42
Livestock holding	2.18	0.46
Distance to urban centers	2.05	0.48
Farming experiences	1.69	0.60
Family size	1.35	0.74
Distance to nearest market	1.16	0.86
Mean VIF	1.80	

Source: own computation from survey result, 2014

Appendix Table 3: Link test for model specification

Since -hatsq is insignificant, the link test below indicate that there is no problem of model specification,

Linktest						
Source	SS	Df	MS		Numberofobs=	= 150
Model	154581.71	2	77290.858			
					F(2, 147)	=839.07
Residul	13540.87	147	92.12		Prob > F	= 0.0000
Total	168122.59	149	1128.34		R-squared	= 0.9195
					Adj R-squared	=0.9184
					Root MSE	= 9.5976
marketd	Coef.	Std. Err.	T	p>t	[95% Conf.	Interval]
		p>t				
_hat	1.15	.063	18.21	0.00	1.027369	1.277
_hatsq	-.001	.0034	-1.53	0.12	-.0019	-.0002
_cons	-3.08	1.71	-1.80	0.07	-6.46	.295

Source: Own computation from survey result.2014

Appendix Table 4 :IM-test for checking Hetroscedesticity.

Imtest indicate that there is no serious problem of hetroscedesticity, since p_value is insignificant.

.imtest

Cameron & Trivedi's decomposition of IM-test

Source	Ch2	df	P
Heteroskedasticity	79.66	114	0.1516
Skewness	20.87	14	0.0959
Kurtosis	1.17	1	0.2785
Total	101.7	129	0.175

Source: Own computation from survey result, 2014

Appendix II: Questionnaires

A. Questionnaires for Producers

Instructions for Enumerators:

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

➢ Please fill the interview schedule according to the farmers reply (do not put your own feeling).

➢ Please ask each question clearly and patiently until the farmer gets your points.

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

➢ During the process write answers on the space provided.

➢ Prove that all the questions are asked and the interview schedule format is properly completed.

I. General information

1. Name of Respondent: _____

2. Zone: _____Woreda:_____Kebele: _____Village: _____

3. Farming Experience: _____ (years)

4. Sex of the respondent: 1= Male   2=Female

5. Education level of the respondent: 1= No formal education   2=Primary level
                                    3= Secondary level   4= Tertiary level

6. Marital status: 1= Married   2= Unmarried   3= Divorce   4=Widowed

7. Distance of your residence from the nearest market center: _____Kms.

8. Distance of your residence to the nearest urban center: _____Kms.

10. What is your major means of income generation? 1= crop production   2=Animal rearing   3= mixed farming 4= Crop trading   5= Animals Trading. 6. Others____

Household and Resource Data

1. Family size: _____ Male _____ Female _____Total

2. Number of working persons (14-64 ages): _____Male____ Female _____Total

3. Number of children in school: _____ Male _____Female _____ Total

4. Do you own arable land?   1=Yes   2= No if yes,_____ha

5. Total crop land: _____ ha.   Land allocated for wheat_____

6. Total grazing land: _____ ha.

7. Total irrigable area: _____ha. 8. What is the size of land used twice in a year? ___ ha

9. Do you have livestock? 1= Yes   2= No

10. If your answer for **Q.9** is Yes, livestock Number: Oxen/bulls ___, Cows/heifers ___, Calves ___, Goats ____, Sheep ___Donkeys ____, Horses ____, Camels ___, Mules ___, Chickens ___, Bee hives ___, others

11. **Production of wheat and other agricultural commodity during the last seasons**.

a/. What type crop do you produced last season?

Crops produced	Produced? Yes=1; No=2	Rank of dominance (include coffee)	Walking Distance to plot (full trip in minutes)	Average Area (ha) per crop per year	No. of harvesting Seasons per year (how many times produced?)	Seed Type used (1= improved, 2= local)	Production purpose (consumption=1; sales=2; both=3) * show proportion (%)
wheat							
Maize							
Coffee							
Barley							
Teff							
Beans							
Banan							
Others							

13. Production and input for wheat (Detail) for last production season

Crop type	Area allocated (ha)	Amount of seed needed (kg/ha)		Seed price (Birr/ kg)	Seed source 1= own, 2= Research 3= Agri office 4= Market 5= others(list) 6.ARDU	Yield (qt/ha)	Means of harvesting (1= Manual, 2= Harvester, 3= both)	Duration of harvesting (Start – end) in days	Post harvest Activities practiced (tick if practiced)	
		Improved	Local							
Wheat seed									Harvesting	
									Transporting	
									Threshing	
									Sorting	
									Cleaning	
									Drying	

Fertilizer	Do use fertilizer? 0=No,1=Yes	Where do you get? 1.cooperative 2= Research center 3= Agri office 4= Market 5= others(list)	Amount i n(Kg)	Cost (birr/100 kg)	
List them					

14. Do you obtain Income from non farming activities? 1. Yes 2. NO If your ans.Q.No. is .yes from where do you get income?

Source	From where	How much Birr/month	Total income(Birr/yrs
Income from trade			
Remittances			
Sale of crop residues			
Salaries/wage			
Rented out land			
Rented out livestock like donkey, oxen etc.			
Fattening activities			
Others			

15. How is the trend of volume of crops production during the past 3 years?

Crop type	Increasing	Decreasing	Same
Cereals(wheat)			
Pulses			
Fruit and vegetable			
Others			

16. Did you borrow money for wheat production before? 1=. Yes   = No

17. If your answer for **Q.16**is Yes, from where and for what purpose did you collect the credit? (*Multiple responses are possible)

No.	Source	Purpose(write code)	1.payment for hired labor
1	Micro finance		2.purchase for fertilizer
2	Cooperative/unions		3. purchase for farm implements
3	NGOs(specify)		4.Payment for rented oxen
4	Bank (specify)		5.purchase for transport animals
5	Trader s		6.to rent in land to extend wheat
6	Relative		production
7	Ikub/Idir		7. Others.

18. If your answer for **Q.16 is** yes, have you paid the loan? 1= Yes 2=.No

19. If your answer for **Q.18**is No, what is the reason? _____

20. Did you face any problem in accessing credit? 1= Yes   2=No

21. If your answer for **Q.20** is yes, what are the problems? _____

22. How did you solve these problems? _____

23. Source of Wheat production, marketing and consumption research/innovation in your area?1=Agricultural Research Center (specify)   2= NGOs (specify)

3=. Adama Science Technology University 4.OoARD   5=other (specify) _____

24. Have you ever participated in problem identification and/research-planning? 1.yes 2.no

24. If yes, specify the organization and year, Number of times_____

II.   **Marketing of wheat Aspect**

1. Have you sell wheat in the last season? 1=Yea 0= No

2. If your answer Qo.No 1 No. list the reason? _____

3. If your answer Qo.No 1 is yes answer the following? Otherwise go to number

Crop type	Market (where products sold). 1.Iteya 2.Asella 3.Adama 4.other village market	Buyers at each Market 1= Consumer, 2=Retailer, 3=Whole seller, 4 = Coops/union, 5=other farmers 6= others(list)	Selling price (Birr/qt) at each market	Means of transport products to each Market (1= human back, 2= Animal back, 3= Animal carts, 4= Vehicle, 5=other(specify)	Distance to each market (Walking time in Minutes-full trip)
Wheat					

4. Wheat production and marketing costs

	Units	Price/unit	Average price/kgs
Operational cost			
Land preparation			
Production cost			
Seedlings			
Planting			
Harvesting			
Winnowing			
Threshing			
Storage infrastructure cost			
Cost of bags			
Taxes			
Insurance cost (if incurred)			
Transportation cost			
Market information fee			
Other			
Total cost			

5. What is your perception on the lagged wheat price? 1= High 2=Medium 3=Low

6. What about the perception of current year wheat price? 1=very low 2=slightly lower 3= as expected 4.slightly higher 5. Very high

7. How did you sale your produce in 2013/14?   1= Direct to the purchaser   2 =through broker 3=through commission man to the purchaser   4 =other (specify) ---------

8. If you sell to brokers what was /were problem/s created by brokers in 2013/14?

 1= took to limited client 2= cheating scaling (weighing)   3= charged high brokerage   4 wrong price (market) information   5 others (specify) ---

9. Did you face difficulty in finding buyers when you wanted to sell wheat? 1= yes 2= No

10.If yes, in **Qo.No 9** due to: 1= Inaccessibility of market   2= low price offer   3= Lack of information   4 =other (specify) --------

11. What did you do, when the Wheat you offered to the market was not sold? 1 =Took back home 2= Took to another market on the same day 3= Sold at lower price 5= Sold on other market day

12. Who set your selling price in 2013/14?   1 =Yourself   2 =Buyers 3 = set by demand and supply   4 =negotiations 5   other (specify) --------

13. When did you get the money after your sale?   1= as soon as you sold   2 =after some hours   3 =other days after sale   4 =other (specify) --

14. Did you know the nearby market price before you sold your wheat? 1=Yes 2=no

15. If your answer for Q.No 14 is yes, from where you get information?

1= Media (radio, television) 2. From Agricultural office, 3= cooperative 4= other (list)

16. What type of information did you get? 1= Price information 2= Market place information

3=Buyers' information 4=other (specify)

17. At what time interval do you get the information?

1= Daily 2 =Weekly 3= Monthly 4=other (specify)

18. Was the information you get is valuable?

1= Yes   2= No

19. Have you relation with next actors? 1. Yes 2.no

20 if, yes, list actors and your relation with them_____

_____

_____

B. Questionnaires for Traders

i.   General information

1. Name of Respondent: _____

2. Zone: _____Woreda:_____ Kebele: _____ Village: _____

3. Farming Experience: _____ (years)

4. Sex of the respondent: 1= Male   2=Female

5. Education level of the respondent: 1= No formal education 2= Primary level 3=others

6. Marital status: 1= Married   2= Unmarried   3= Divorce   4= Widowed

7. Distance of your residence from the nearest market center: _____Kms.

8. Distance of your residence to the nearest urban center: _____Kms.

10. What is your major means of income generation? _____

ii. Selling and purchasing of wheat market

Product Type	If traded 1= Yes, 2= No	Suppliers (1= Farmers, 2= Collectors 3= Own farm *(Number)*	Buyers (1= retailer, 2= Consumer, 3= Whole seller 4= other (specify)	Transportation to storage or selling Point (write 1= yes, or 2= no) regarding use of the means		Quantity purchased	What are the causes of losses
Wheat				Vehicle			
				Animal Cart			
				Pack Animal			
				Human labor			
				Wheelbarrow			
				others			

2. Why have you preferred the above mentioned supplier? 1=better quality, 2=high supply

3=shortest distance 4= other (specify) _____

3. Is there different in price when you purchase from different actors? 1=yes 2=no

4. If**Q.no.3** yes by how much do you purchase from each supplier birr/Kg?

   1=farmer ____birr/kg   2=collector _____birr/kg 3= retailer's _____ 4=other_____

5. Is obtaining sufficient volume is a problem? 1= Yes = No

6. Have you ever stopped purchasing due to lack of supply? 1= Yes 2=No

7. With whom do you have Linkage with commercial value chain actors?

1= Retailers 2= Whole sellers 3=Consumers 4=Brokers 5=Collectors 6=others_____

8. Did you get information on time? 1= yes 2= no

9. If **Q.no**. 8 are yes what type of information did you get? 1=Price information 2= Market place information 3= Buyers' information 4= other (specify)

10. At what time interval do you get the information?1=Daily 2=Weekly 3. Other____

11. Was the information you get is valuable? 1= Yes   2=No

12. Do you participate in wheat trading year round? 1= Yes 1=No

13. If your answer to Q.12 is No, at what period of the year do you participate?

1= when purchase price becomes low 2= during high supply wheat3= other _____

14. Do you practice trading other than wheat? 1= Yes   2=No

15. If your answer to Q.14 is Yes, (list it) _____

16 Number of market days in a week? _____

17. What was initial working capital when you start this Wheat trade business?____Birr.

18. What is the amount of your current working capital? _____ Birr.

19. What is your source of working capital? 1=Own 2=Loan 3= Gift 4 =others _____

20. If it was loan, from whom did you borrow? 1=Relative/family 2=Private money lenders. 3=] NGO (specify) 4. = Friend 5=Micro finance institution 6=Bank 7.others

21. How much was the rate of interest? _____Birr for formal, _____ birr for informal.

22. What was the reason behind the loan? 1=to extend wheat trading. 2. [ ] To purchase wheat transporting vehicles/animals. 3. [ ] Others

23. How was the repayment schedule? 1=Monthly 2= Quarterly 3=Semi-annually 4.others.

24 .Is there change in accessing finance for wheat trade these days? (√) 1= Improved 2=Deteriorated 3= No change

25. Do you carry out any physical treatment to maintain product quality? 1=Yes 2= No

26. If your answer to **Q.25**is yes, mention_____

27. Asset owned

Asset	No
Store	
Mobile phone	
Weighting scale	
Shop	
Bicycle	
Motorcycle	
Others	

28. Are there entry barriers in wheat trading? 1= Yes 2= No

29. If your answer to **Q.28**is yes, what are the reasons? 1=Capital 2= Information collusion 3=Administrative problems 4= Stiff competition with unlicensed traders 5= High monopoly with prior control of farmers 6=other (specify)

30. Linkage with commercial value chain actors: (Multiple response is possible) 1=Farmers 2=Retailers 3=Whole sellers 4=Consumers 5=Local collectors 6= Brokers 7=Others (specify)_____

31. What are the major problems you face as a trader or processor? _____

C. **Questionnaires for processor and Restaurants**

1. Name of respondent: _____

2. Zone: _____District:_____Village_____

3. Age of respondent :(_____) years

4. Sex of the respondent: 1. Male   2.Female

5. Education level of the respondent: 1. Illiterate 2. Primary 3. Secondary4. Others_____

6. Marital status: 1. Single   2. Married   3. Divorced   4. Widow   5. Others

7. What is your major means of income generation? 1. Farming 2. Trade   3. Employment   4. Others

8. If you sold "wheat flour" to other person/business institution, what service you obtained fromgovernment? _____

9. What is the selling price of one Kg of wheat flour? _____

10. How much income do you earn per year:_____birr

11. Do you consider any quality requirements to purchase wheat you process? 1. Yes1.No

12. If yes, what quality requirement do you consider for? _____

13. How much and from whom/to whom did you purchase/sell wheat flour?

No	Purchase from Person	Place	Amount in Quintal	Buying Price birr/Quintal	Milling cost	Sold to whom?	Selling price
1	Farmers						
2	Wholesalers						
3	Collectors						
4	Retailer						
5	Injera seller						
6	Consumer						
7	Hotels/Restaurants						
8	Others, specify						

14. What are the constraints hindering sell of wheat flou*r*? Rank horizontally (1= most severe, 2= second severe and etc)

Crop type	Supply shortage	Income shortage	Lack of storage at home	High price of product	Poor product handling	Lack of market information	PHL	Others (specify
wheat								

15. How long can you store the products in the storage before sale? _____

16. Do you believe that losses (quality and quantity) of wheat products are there in your wheat chain?

Yes		No	

17. How much loss (in %) you have encountered during storage of your wheat Products (max estimate)? _____

18. What are the causes of losses during storage? 1. Poor package/container 2. Accidental Physical Loss   3. Quality loss (color change) 4. Weather condition 5. Other/s(list)_____

19. If your answer to the previous questions is yes, to what extent the following factors related wheat product flow process in the value chain affect the level of loss?

20. What are the causes of losses during transport in general? 1. Poor package/container

2. over loading   3. Accidental Physical loss   4. Quality loss (color change) 5. Weather condition   6. Other/s(list):_____

21. Do you process the wheat flour before selling or storage? 0. Yes   1. No

22. If your answer is 'Yes' what kind of processing you do?_____

23. Did you store your wheat Products before selling? 0. Yes Φ   1. No Φ

24. If your answer 'Yes' for above question where did you store your products? 1. At own site   2. At collections centers 3. At own site and ground store 4. Other please specify

25. What are wheat value chain actors in your area (the flow of produce and other)? List

_____

_____

D. Questionnaires for consumers

1. Name of Respondent: _____

2. Zone: _____Woreda:_____Kebele: _____ Village: _____

3. Farming Experience: _____ (years)

4. Sex of the respondent: 1. Male   2.Female

5. Education level of the respondent: 1. No formal education 2. Primary level 3._____

6. Marital status: 1. Married 2.Unmarried   3. Divorce   4. Widowed

7. Distance of your residence from the nearest market center: _____Kms.

8. Distance of your residence to the nearest urban center: _____Kms.

Demand for wheat

1. What is your major means of income generation? 1= Crop production   2=Animal rearing

3=mixed farming 4= Crop trading   5= Animals Trading.   6. Others_____

2. Is wheat consumed in your family? 1= Yes   2=No

3. If question No 2 is yes Experience in wheat products consumption? _____ Years

4. Do you produce and consume or purchase? A/ Purchase   B/Produce

5. If you purchase, what is the proportion of your income used for purchase of wheat? ____

6. From whom do you buy? 1= farmer   2=collector 3=own farm 4=other (specify)

7. How much quantity you purchased per market day? _____

8. What are the numbers of wheat market day per week? _____

9. What is the low price you paid for wheat birr/Kg? _____

10. What are the numbers of months you may buy at lower price? _____

11. What is the high price you paid for wheat birr/Kg? _____

12. What are the numbers of months you may buy at higher price? _____

13. Do you consider any quality requirements to purchase wheat? 1= Yes 2= No

14. If Q.No 13 is yes, what quality requirement do you consider for wheat? _____

15. What are the constraints hindering consumption of wheat?

1=supply shortage   2=income shortage   3=high price of product

4=lack of storage at home 5= lack of market information 6= other (specify)

16. What are the constraints hindering consumption of wheat?(List them)

_____

_____

Questionnaire for cooperatives

1. Name of organization _____

2. When this was organization established: …………………Years

3. What is the role of this organization in the market channel? 1. Wholesaler 2. Collectors 3 Broker 4.Retailer 5.Other

4. What was the establishment capital_____ETB_____sources.

5. What is the source of establishment capital? _____

6. How many members your cooperatives have? _____

7. What are the criteria to be the member of your cooperatives?_____

_____

8. How many labor forces involved in Wheat Product trading/processing/collecting activities in this organization?   Male _____ Female_____

9. How do you attract your supplier?   1 By giving better price relate to others   2 by giving fair dividend 3 by fair scaling weighing   3 by visiting them   4 other (specify)

10. What are the impacts of your organization on other wheat traders? _____

11. How do you attract your buyers? 1 By giving better price relate to others   2 Quality of your product   3 by fair scaling weighing 4 by visiting them   5 by giving credit   6 other

12. When do you do your business? 1. Year round   2. When purchase price becomes low
         3. during high supply 4. Other (specify)_____

13. How much and from whom did you purchase wheat Product last month?

No.	Person	Purchase from		Amount in Quintal	Buying Price birr/Quintal
		Number supplier	Place		
1	Farmers				
2	Wholesalers				
3	Collectors				
4	Retailer				
5	Cooperatives				
6	Others,				

14. How do you transport these wheat Products from the source?

No.	Mode of transportation	Distance of transport (Km)	Owned	Rented	Amount of transport	Amount of loss (%)	Cause of loss
1	Vehicle						
2	Tractor						
3	Bicycle						

15. What are the contributions of these organization/cooperatives to local society/farmers?

_____

_____

16. What wheat processing related activities your organization involved in?

_____

17. What are the causes of losses during transport in general? 1. Poor package/container 2.

Over loading   3. Accidental Physical loss   4. Other/s(list):_____

18.Do you process the wheat products before selling or storage? 0. Yes   1. No

19.If your answer is 'Yes' for above question what kind of processing you do?

_____

20. Did your organization store your wheat Products before selling? 0. Yes   1. No

21.If your answer 'Yes' for above question where did you store your products? 1. At own site

2.At collection center 3. At own site and ground store 4. Other please specify _____

22. How long can you store the products in the storage before sale? _____

23.How much loss (in %) you have encountered during storage of your wheat (estimate)?

24.What are the causes of losses during storage? 1. Poor package/container 2. Accidental

Physical Loss   3. Quality loss (color change) 4. Weather condition 5. Other/s(list)_____

25. How do you sale your produce? 1. Direct to the purchaser 2. Through broker 3.____

What are the challenges this organization face in the past?

_____

26.How much and to whom did you sell wheat Product?

No.	Person	Sold to		Amount in	Selling Price
		Number of buyers	Place	Quintal	birr/Quintal
1	Wholesalers				
2	Collectors				
3	Retailer				
4	Broker				
5	Mill house				
6	Consumers				
7	Bakeries				

27. Indicate your average cost and revenue per quintal in the trading process in 2013/14?

Marketing cost components in the chain	Birr/qt
Packaging material	
Labor employed to fill the bag and stitch	
Loading and unloading	
Brokerage	
Transportation fee	
License fee	
Taxes	
Wage for permanent employee	
Storage cost	
Electricity	
Information cost (mobile/telephone cost)	
Personal travel & other expense	
Total costs	

28. Who sets the price? 1. Traders themselves at central market   2. Brokers   3.

Negotiation4. Other specify _____

29. What method of transport your clients use?   1. Vehicle   2. Tractor   3. Animal cart

4. Pack donkey or horse 5. By human   6. Other please specify____

30. What service your organization provided to your supplier to strength their performance?

_____

_____

31. What service your organization provided to your buyer to make them your regular

customer? _____

_____

Check List for Key Informant Interview

1. Name of the organization: _____

2. Role of the interviewee in the organization:

3. Location and contact information: Region/Zone/Woreda/ Kebele/ P.O.Box/telephone

4. Type of the organization: public/private/NGO/CBO.

5. Organizational mission, vision and objectives

6. What is the role of your organization in wheat value chain in the study area?

7. What are the core processes in the wheat value chain?

8. Who are the actors involved in these processes and what do they actually do?

a. Input supply

   i.   _____

   ii.   _____

         B .production

   i.   ._____

   ii.   _____

   iii.   _____

c. Marketing

   i.   _____

   ii.   _____

   iii.   _____

d. Consumption

i._____

ii._____

iii._____

9. What is the volume of products, the number of actors and jobs?

10. Where does wheat originate from and where does it go?

11. How does the value change along the chain?

12. What types of relationships and linkages exist among actors?

13. What types of services are feeding into the chain?

14. What is the location and position of the poor in the value chain?

15. What key constraints exist at various levels in the wheat value chain and what are potential solutions to those constraints?

16. What are loss factor during various function along wheat value chain?

_____

_____

THE END!

THANK YOU VERY MUCH FOR RESPONDING ALL THE QUESTIONS!