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

BY:

Niguse Kebede Megersa

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A RESEARCH PAPER SUBMITTED IN PARTIALY FULFILMENT FOR REQUIREMENT OF MSC DEGERE IN DEVELOPMENTAL ECONOMICS

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As Thesis Research advisor, I hereby certify that I have read and evaluated this thesis prepared, under my guidance, by **Niguse Kebede Megersa**, entitled **Wheat Value Chain: The Case of Sinana District, Bale Zone, Oromia Region, Ethiopia.** I recommend that it be submitted as fulfilment of the Thesis requirement.

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Place: Madda Walabu University, Robe Date of Submission:_____

ACRONYMS

ADLI	Agricultural Development Led Industrialization
ATA	Agricultural Transformation Agency
BLUE	Best Linear Unbiased Estimator
BZADO	Bale Zone Agricultural Development Organization
CC	Contingency Coefficients
CSA	Central Statistical Agency
EAAPP	Eastern Africa Agricultural Productivity Project
FAO	Food and Agriculture Organization of United Nations
GDP	Gross Domestic Product
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
HH	Household
KM	Kilometre
HFS	Household family size
LPM	Linear probability model
m.a.s.l.	meter above sea level
MVP	Multivariate Probit
MoFED	Ministry of Finance and Economic Development
NMM	Net marketing margin
OoTI	Office of Trade and Industry
OECD	Organization of Economic Cooperative and Development
OLS	Ordinary Least Squares
SARC	Sinana Agricultural Research Centre
S-C-P	Structure Conduct and Performance
SNNPR	Southern Nations Nationalities and Peoples Region
SSA	Sub-Saharan Africa
TGMM	Total Gross Marketing Margin
UNIDO	United Nations Industrial Development Organization
VIF	Variance Inflection Factor

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BIOGRAPHIICAL SKETCH

Niguse Kebede Megersa was born in Lemu and Bilbilo Woreda, Arsi zone of Oromiya Regional State in December 1984 G.C. He attended his primary education at Lemu Sirba elementary school and his junior at Lemu elementary and junior school. He attended his secondary and preparatory school education at Bekoji senior secondary high school in Arsi zone.

Firstly, after completion of his high school education, he joined Adama Science and Technology University School of Engineering and Information Technology in October 2007 and graduated with BSc. Degree in Civil Engineering. Soon after his graduation, he was employed by Addis Abebe Water and Sewerage Authority. Latter, employed by Oromia Roads Construction Enterprise and served as Site Engineer for two years. Lastly, he Employed by Oromia Roads Authorities.

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ABSTRACT

This study was conducted in Sinana district of Bale zone in Oromia region. The main focus of this thesis was analyzing wheat value chain. The study attempted to investigate value chain of wheat in the area. The study was conducted in order to identify production and marketing support services, structure-conduct-performance of the market, determinants of supply and value addition and the choice of market outlet in the area.

Primary data were collected from 393 farmers and 25 wheat traders using structured questionnaires. Descriptive statistics and Econometrics models were used to analyze the collected data. Results show that the main wheat value chain actors in the study area are input suppliers, farmers/producers, assemblers, wholesalers, processors, retailers, commission agents and cooperatives. Market concentration ratio at district level was 54.62% which indicated oligopolistic market structure.

In this study, a multivariate probit model was used to analyze producers 'channel' choice. Here, wheat producers in the study had four major types of market outlets via which to sell their wheat. In this study, the logit model was preferred over probit model in estimating the propensity score. Therefore, logit model was used for estimation of factors affecting the probabilities of the farmer households to add values to wheat and the marginal effect measured at the means. The study used Variance inflation factor (VIF) to investigate the degree of multicollinearity among continuous explanatory variables and contingency coefficient (CC) among discrete (dummy) variables. All VIF values are less than 10.

Education has a positive relationship with the amount of wheat delivered to market at a 1% significance level. This study shows that as the level of educational grade attended by the household's increases, the market supply of wheat produce increases.

Farming Experience influenced wheat market supply in a significant and positive way. Farmer's frequency of extension contacts has significance effect at 1% significant level for wheat quantity supplied to market. Market information has a significant effect on wheat supplied to market at a 1% significance level. As the multiple regression model result indicates, the variable access to credit had positive and significant influence on volume of wheat supply at 5% significance level. The study showed that amount of wheat produced has significant effect at 1% significance level for wheat supplied to market with expected positive sign. Distance from the nearest market was found to have negative and significance relationship with the likelihood of choosing wholesaler outlet while positive and significance relationship with the likelihood of choosing local collector market outlet at 5% and 1% significant level respectively.

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Ethiopia is a large and a diverse country. It has made enormous progress in terms of economic growth, agricultural development, and poverty reduction since the famines of the 1970s and 1980s (Hill et al. 2016; Bachewe et al. 2017; Dorosh and Rashid 2012). Accordingly, Ethiopia is primarily an agricultural country and hence Agriculture is the main pillar of Ethiopian Economy as a whole.

Agriculture plays an important role for increasing the growth domestic products (GDP) of the world, which accounts 31.3% (CIA, 2014); more than 60 percent of the world's population depends on agriculture for survival (FAO, 2015). Form this, Latin America and sub Saharan Africa covers the highest percentage (90%) so that the economy of most African countries is depending on the agriculture. In Ethiopia, it, contributes about 43% of GDP, generates 90% of export value and supply 70% of the industrial raw materials for domestic industries (MoA, 2011; Abdu et al., 2016). Therefore, the agricultural sector is crucial for the overall performance of the many countries' economy, especially developing countries like Ethiopia.

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

The Agriculture sector significantly contributes about 27.5 billion dollars or 34.1% to the GDP, employs about 79% of the population, accounts for 79% of foreign currency earnings,

and is the major sources of raw material and capital for investment and market (Diriba, 2020).

The most important Crops in Ethiopian Agriculture are Cereal crops such as Wheat, Barley, Maize, Sorghum and teff (GAIN, 2014). In Ethiopia, cereal production and marketing is the means of living for millions of smallholder families and it includes the single largest sub-sector in the economy. Due to this, Cereal Crop production and marketing provide a source of income for millions of smallholder households, accounting for 60 percent of rural employment, 80 percent of total cultivated land, over 40 percent of typical household food expenditures, and more than 60 percent of total caloric intake (CSA, 2017).

In Sub-Saharan Africa, Ethiopia is the largest wheat producer, representing for more than half of total production (Brasesco et al., 2019), and the only country where smallholders account for the majority of production (Spielman et al., 2010; Shiferaw et al., 2014).

Wheat is one of the largest cereal crops produced for consumption and marketing purpose in the country. In terms of production, it ranks fourth next to maize, sorghum and teff in total cereals production that constitutes 13.25% (1.63 million per hectare), the volume produced 3.9 million tons (CSA, 2013). Moreover, 4.7 million farmers engage in wheat production with an average productivity of 2.4 tons per hectare from total cereal production (CSA (Central Statistical Agency), 2014).

But this crop is not only covering the substantial share of the cereal production, but also it is selected as one of the target crops in the strategic goal of achieving national food independence in Ethiopia (Amare et al., 2015). Nonetheless, most of the farmers in Ethiopia are smallholder farmers, producing mostly for own consumption and producing only a little marketed surplus; mostly produced for consumption purpose with a meager contribution for commercialization (Amentae et al., 2017; Endalew et al., 2020). Even though it has a massive potential in terms of production, only 20% of the total wheat production is traded, whereas 80% of its total production is used for household consumption, seed, in-kind expenditures for labour, and animal feed (Kim et al., 2016).

Based on FAO(Food and Agriculture Organization), 2014 report, the country's wheat surplus producing regions are Oromia (Bale, East Arsi, West Arsi, Western and Eastern Shoa), Southern Nations, Nationalities and Peoples' Region (SNNPR) (Hadiya and Kembata) and Central and Southern Amhara(East Gojjam, North Shoa). Except for a few Governement-

Owned Large scale farms and Commercial Farms that produce wheat in the country, almost all wheat is grown by small scale farmers under rain-fed Conditions (Demeke and Di, 2013).

Wheat consumption has increased faster than any other major food grain in the country, particularly for pasta and Bread, and is expected to continue to do so in the future (Minot et al., 2019). It is staple food in the diets of many Ethiopians, accounting for roughly 15 percent of the country's caloric intake for the country's over 90 million people (FAO (Food and Agriculture Organization), 2014). According to Mamo et al. (2018), domestic wheat consumption increased by 41 percent from 3.72 million tons in 2010 to 5.25 million tons in 2014. Even though wheat production has increased significantly over the last two decades as a result of various government programs and efforts aimed at improving agricultural growth and food security in the country, domestic wheat grain and flour self-sufficiency remains a long way off (Gebreselassieet al., 2017). Although most of the wheat grown in Ethiopia is bread wheat, there is some durum wheat which is often grown mixed with bread wheat (Demeke and Di Marcantonio, 2013).

However, the country has a large potential for wheat production, which has yet to be fully realized due to various production-related issues. For example, Hei et al. (2017), Abate (2018), Tesfaye et al. (2018), and Ayele et al. (2019) found that a lack of improved varieties, poor seed supply systems, producers' reliance on local seeds, high fertilizer and seed costs, poor agronomic practices, weeds, pests, and diseases, weak farmers organizations, poor market information systems, and little research support to increase yields and climate change are major constraints to Ethiopian wheat production. On the other hand, Ethiopian wheat output markets are characterized by an insufficient transportation network, a small number of traders, insufficient capital facilities, high handling costs, an insufficient market information system, farmers' poor bargaining power, and underdeveloped industrial sectors (Mohammed and Addisu, 2016; Mamo et al., 2018).

According to Mahamud (2016) and Shikur et al. (2020), price cheating by traders, farmers' lack of bargaining power in the market, and unfair competition from illegal traders are the major marketing challenges faced by Ethiopian wheat farmers. To reduce the influence of local collectors, traders, and transporters on the pricing process, it is critical to establish marketing centers and cooperatives based on value chain studies (Tarekegn et al., 2020).

Porter (1985) theory was one of the proposed solutions to popularize the concept of the value chain as a collection of generic activities that operate within a company and collaborate to provide value to customers. Value chains include all production factors as well as all

economic activities such as input supply, production, transformation, handling, transportation, marketing, and distribution that are required to create, sell, and deliver a product to a specific location (Mango et al., 2015). Corrective measures can be identified by revealing strengths and weaknesses along the value chain, which improves overall value-chain performance and benefits all stakeholders (United Nations Industrial Development Organization, 2009).

1.2. Statement of the problem

Ethiopia is one of the developing countries in which its economy was mainly dependent on Agriculture. Hence, it is obligatory to prepare and follow the best strategy to address the planned goals. Many more than two decades, Ethiopia is following the policy which is called 'Agricultural Development Led Industrialization (ADLI)'. According to CSA, 2017 agriculture plays significant role in Ethiopia to achieve economic, political and social stability. The Federal Democratic Republic of Ethiopia underscores one basic objective with regard to economic development to build a market economy in which (i) a broad spectrum of the Ethiopian people are beneficiaries, (ii) dependence on food aid is eliminated; and, (iii) rapid economic growth is assured. Due to this, Development policy of Ethiopia has placed emphasis on an increasing agricultural production to serve as a base for rural development. Despite the fact there has been an increase in agricultural production; there were shortcomings with regards to many households limited participation in the markets. The limited market participation of many agricultural households face is considered to be a major constraint to combating poverty (Best et al., 2005). This shows that an efficient, integrated and responsive market that is marked with good performance is of crucial importance for optimal allocation of resources and stimulating households to increase output (FAO, 2003).

Accordingly, in the study area the supply of agricultural crop is subjected to seasonal variations where surplus supply at harvest is the main feature. And also the nature of the product on the one hand and lack of properly functioning marketing system on the other, often resulted in lower producers' price. Hence several studies have in the past examined the marketing system of various agricultural commodities and its implications for agricultural and economic development in Ethiopia in general have employed the market value chain approach on different enterprises. There are few studies conducted on the analysis of wheat market value chain in Bale highlands, which is the main source of wheat for Ethiopia, was

not conducted yet well. The studies conducted in the district have a methodological problem regarding the market outlet choices and sample size.

There are a number of challenges that obstacle the farmers' production and marketing activities of wheat. The most common challenges that obstruct the commercialization activity of wheat production are poor linkage to the market and post-harvest losses. Facing these issues, the wheat farm households in the country earn little economic benefit from their wheat produce due to lower rate of wheat commercialization. Therefore, wheat value chain development is vital to harness the untapped commercialization potential of the crop to achieve food security at the national and household level (Amentae et al., 2017; Endalew et al., 2020).

Even though cereals, particularly wheat, are the most common crop in the Sinana district where this study was conducted, the overall potential for wheat production and marketing, as well as comparative advantages and existing bottlenecks across the value chain, have not been well documented in order to assess possible value chain development strategies for upgrading wheat value chain. Moreover, there is an imbalance between supply and demand of wheat product. In order to close the supply and demand gap in the sector, a strategic approach will be required. One of these strategies is value chain analysis. Therefore, this study aimed to analyze the value chain of wheat in Sinana district, Bale Zone of Oromia, Ethiopia.

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

1.3. Objective of the study

1.3.1 General Objective

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

1.3.2 Specific Objectives

The specific objectives of the study were:

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

1.4. Research Questions

The study was tried to answer the following research questions:

1. Does structure conduct performance of wheat market look like in the study area?
2. What factors determine the marketed supply of wheat in the study area?
3. What are Marketing channels of wheat and factors affecting outlet choice decisions of wheat producers?
4. What are factors affecting wheat value addition in wheat marketing value chains?

1.5. Scope of the study

This study was focused on the entire wheat value chain from input supplier to the consumer within Bale Zone, Sinana district. During the study was conducting in the study area, important information has been collected from sample households and marketing actors involved in the marketing of wheat in the study area. For the purpose of the specified conducted research, the researcher has been taken the Sample of 393 household respondents and 25 marketing actors in the study area.

1.6. Limitations of the Study

Geographically, Sinana District is surrounded with other Bale Zone Districts and it is wide in area. In the study area, there is also a wide variety of crop production undertaking. However, there are spatial as well as temporal limitations to make the study more representatives in terms of wider range of area coverage. Furthermore, since Ethiopia has wide range of diverse agro-ecologies, institutional capacities, organizations and environmental conditions, the result of the study have limitations to make generalizations and make them applicable to the country as a whole. This is because; there were to do so.

The study was limited to only Wheat value chain out of the crops producing in the study area. The study was conducted in four kebeles that are found in Sinana District, Bale zones that have a high potential of Wheat crop production, and it might not represent the entire value chain of Wheat yields in the country. Not only this but also, there were a number of limitations to touch the country as a whole and make interview for sampled farmers living in different Regions and different Zones of Ethiopia. These limitations were mainly due to shortage of transportation facilities, no sufficient facilities, lack of infrastructure, no good communication services in the study area such as internet network, telephone network etc.

1.7. Significance of the Study

The study analyzed the value chain of Wheat yields from input supplier to the consumer in Sinana districts. The conducted study has been provided a general picture of existing challenges, opportunities and entry points in the wheat value chain in the study area. In addition, the study has been also provided information on the determinants of wheat supply to the market, the determinants of market outlet choice decisions, marketing margin, benefit share of actors, and identifies opportunities and constraints of wheat value chain in the study area. And also, the information was valuable input that helps market participants to understand supply potential and performance of wheat marketing and come up with important recommendations that helps in delivering required efforts to enhance the production and utilization of wheat at larger scale to bring about economic development in the area.

Finally, the information that has been generated in this study can help a number of organizations including: national and international research institutions, development organizations, traders, producers, policy makers, extension service providers, government and nongovernmental organizations to assess their activities and redesign their mode of operations and ultimately influence the design and implementation of policies and strategies. It could also help different actors to identify and analyze new ways of stimulating innovation.

1.8. Organization of the study

The study is organized into five broad chapters, from which chapter one covers the background, statement of the problem, Objectives of the study, research questions, , significance of the study, scope of the study and limitation of the study.

Chapter two is include review literatures both theoretical and empirical on Wheat Value chain of Sinana District. Chapter three presents the methodologies implemented for this study together with brief description of the study area related issues, Research Design, sampling procedure and sample size drawn for the study, methods of data collection and definition of variables.

In chapter four both the descriptive and econometric results are presented and are discussed in detail. Finally, chapter five proved summary, conclusion and recommendation based on the result drawn from the study.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

A literature review is a summary of research that has been conducted in the past on a certain subject of interest. The purpose of the literature review is to discover the gaps in literature. The literature review helps to form the theoretical basis of the research.

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

2.2. Theoretical Review of Literature

2.2.1. Definition and Basic Concepts

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

Market: The term market has got a variety of meanings. Along its evolutionary development process; from merely product oriented to market oriented definition.
Market can be defined as an area in which one or more sellers of given products/services and their close substitutes exchange with and compete for the patronage of a group of buyers. Originally, the term market stood for the place where buyers and sellers are gathered to exchange their goods, such as village square.
*Backman and Davidson (196*2) defined market as point, or a place or sphere within which price making force operates and in which exchanges of title tend to be accompanied by the actual movement of the goods affected.
FAO (2008) defined markets are places where buyers and sellers come together to trade. 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.

Ramin and Ali (2011) described market is not necessarily a geographical location. They are social arrangements that allow buyers and sellers to obtain information and exchange commodities. Hence Products and services are purchased over the phone, through mail and electronic mail, as well as online through the internet thus it is arrangement between a seller and a buyer in which the seller agrees to supply the goods or the service and the buyer agrees to pay the price.

According to *IFAD (2003)* Markets are where, as producers, they buy their agricultural inputs and sell their products; and where, as consumers, they use their income from the sale of crops, or from their non-agricultural activities, to buy their food requirements and consumption goods.

Marketing: It is the term that has different variety of meanings by different scholars. Kotler and *Armstrong (2004)* marketing defined 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.

It is a societal process, by which individuals and groups obtain what they need through creating, offering and freely exchanging products, services and values with others. It also includes all activities of exchange conducted by producers and middlemen in exchange for the purpose of satisfying consumer demand (Kilingo and Kariuki 2001). Marketing also involves the movement of produces from their point of production to the point of consumption (Gindi et al., 2014).

As stated in *John Burnett (2008)* the American society of management defined Marketing as the process of planning and executing the conception pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual (customer) and organizational objectives.

The chartered institute of marketing *(2009)* defined marketing as a management process responsible for identifying, anticipating and satisfying customer requirements profitably. In addition it highlighted that marketing is sometimes wrongly defined within the narrow context of advertising or selling, but this is not the whole story. Marketing is a key management discipline that enables that enables the producer's goods and services to interpret customer wants, needs and desires and match or exceed them in delivery to their target customers.

Marketing is not simply an extension of the production process but its only purpose as Adam Smith emphasized when, in his text The Wealth of Nations (1776), he said that:

“Consumption is the sole end purpose of all production: and the interest of the producer ought to be attended to only so far as it may be necessary for promoting that of the consumer.”

Marketing chain: It 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). This means, it is the path that agricultural goods and products flow up the chain and money flows down the chain from their source of original production to ultimate destination for final use. The marketing supply chain is the chain of suppliers that an organization relies on to produce marketing materials (print, promotional products and point of sale) to market their products and services.

Marketing channel: The term channel is derived from the Latin word canals, which means canal. The marketing channel can be viewed as large canal or pipeline through which products, their ownership, communication, financing and payment, and accompanying risk flow to the consumer (Backman and Davidson, 1962). A marketing channel is the people, organizations and activities that make goods and services available for use by consumers. It transfers the ownership of goods from the point of production to the point of consumption. Examples include trade shows, industry events, targeted emails, outbound calling, display advertising and direct sales.

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. Hence, the analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (consumer).

A marketing channel is a business structure of interdependent organizations that reach from the point of product origin to the consumer with the purpose of moving products to their final consumption destination (Kotler and Armstong, 2003). Marketing channels are alternative routes of product flows from producers to consumer and it can be either short or long depending on kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam et al., 2001). Peoples market channel and outlet as substitute to one another. However, market outlets refer alternative routes of product flow that producers used directly to supply there produce rather than considering the possible path of product flow in the commodity chain.

Agricultural produce is normally channeled through the following types of market:

a) *Rural Primary Markets:* In rural markets, trade is characterized by direct sales of small quantities of produce by producers to village traders and by sales by retailers to rural consumers. Rural markets form part of a trade network and are normally arranged on a periodic basis on specific weekdays, and are commonly organized at a central place in a village or district center or beside the village's access road. In some instances, provincial and district-level markets also serve this function, as well as providing an assembly function (i.e. assembling produce in larger quantities for onward sale to outside buyers).

b) *Assembly Markets:* Larger rural markets are found where greater quantities of produce are traded, either by the producers themselves or by traders. These "assembly" markets (often combined with local rural markets), are normally situated on main highways, or near to ferries and other local transport nodes. Produce is predominantly bought by traders or collection agents on their own behalf or on behalf of urban wholesalers.

c) *Wholesale Markets:* Terminal wholesale and semi-wholesale markets are located within or near major cities (usually with populations exceeding 0.5 million). These markets may be supplied by purchasing or assembly centers in the rural areas or directly from farms, either by traders or by large farmers. Transactions are predominantly handled by traders although many wholesale markets incorporate "farmers' markets" where farmers can sell directly to retailers. Some markets also allow traders to sell to retailers "off the back of the truck".

d) *Retail Markets:* These are markets directly serving consumers and are found in main urban areas, such as provincial, town and city centers. Although primarily retail, they may have some semi-wholesale functions, particularly if they allow farmers to trade. In that case, they are often called farmers' markets. This form is very typical in developing countries, but there has also been a strong trend in the USA, the UK and other parts of Europe to create farmers' markets for the sale of specialized produce, such as organically-grown fruits and vegetables.

e) *Other Marketing Channels:* Channels other than markets often exist, particularly in the case of horticultural produce. These include on-farm sales, where collectors purchase the produce (usually under contracts between the producers and distributors) and arrange transport to wholesale outlets, packing houses or supermarkets. The extent to which this is done depends primarily on the general state of development of the economy and the demands of consumers.

Some common marketing channels for wheat have been identified as follows:

(i) Farmer → Consumers;

(ii) Farmer → Village trader → Consumer;

(iii) Farmer → Wholesaler → Retailer → Consumer;

(iv) Farmer → Village trader → Wholesaler → Retailer → Consumer;

(v) Farmer → Co-operative marketing society → retailer → consumer;

(vi) Farmer → Govt. agency (FCI, etc.) → Fair price shop → consumer;

(vii) Farmer → wholesaler → flour miller → retailer → consumer.

(viii) Farmer → Broker → wholesaler → flour miller → retailer → consumer

(ix) Farmer → Commission Agent → Wholesaler → flour miller → Consumer

Marketing system: Marketing System is a consistent pattern of provisioning relationships in society that exists between members of society including individuals, firms, communities and institutions. While marketing, in the sense of firm's micro marketing activities, can be the same across contexts, cultures, and nations, a marketing system is a unique market structure pertaining to a specific context (e.g. agricultural marketing systems in Africa).

Marketing system is a differentiated subset of social system. Marketing system is a general term that represents how different patterns of the flows of goods/services from producers to consumers are culturally (uniquely) organized, whereas terms such as market system (a market based economic system of the West), horizontal marketing system (cooperation between two firms at the same level), and digital marketing system (a specific type of centralized channel distribution) represent its context-specific variations. Marketing systems are mostly researched within the discipline of macro marketing.

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).

Agricultural market: It is institutions in which exchange of agricultural produce or service takes place or a system where buyers and sellers interact to buy sell agricultural produce. Agricultural market can be a physical place where goods and services are exchanged (Birhanu et al., 2012).

Agricultural marketing: Agricultural marketing has many definitions. It is part and percale of marketing that undertakes various activities. Hence it involves in moving agricultural outputs from their area of productions to the end users. Moreover, as Tejinder (2011) indicate, agricultural marketing perform various interconnected functions starting from planning of production, growing, harvesting, grading, packaging, transportation, storage processing, distributions, advertising and sales all together.

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

2.2.2. Production and Productivity of Wheat in Ethiopia

Wheat is a cereal crop, which is produced in most parts of the country, Ethiopia. Value-added agriculture has involved substantial attention in recent years as a means to increase and stabilize farm incomes and to revitalize primary agriculture and the rural economy. The move to value-added agriculture is basically market-driven. Value-added activities are born from the necessity to adapt to the wide-ranging changes affecting the agriculture and agro-food industry (Tura et al., 2016).

However, smallholder farmers' decision to select appropriate market outlets can be affected by various factors such as demographic, institutional factors, socioeconomic factors and access of market outlets. There are different studies in different parts of the country that explored the major determinants of value chain development of cereal crops. For example: Endalew et al. (2020) studied the determinants of wheat commercialization among smallholder farmers in Debre Elias Woreda, Ethiopia. The result of the study showed that 23.4%, 51.9%, and 24.7% of smallholder farmers were subsistence, semi commercialized and commercialized, respectively. The result indicated that the majority of smallholder farmers are semi commercial wheat producers. Moreover, the beta regression result indicated that educational status, number of oxen, land size allocated to wheat production, farming

experience in wheat production, extension service, and market distance are major factors for smallholder farmer's wheat commercialization.

Ethiopia is the second next to Egypt in Africa in wheat production which is 4.54 million tons in 2016 (CSA, 2017). The major types of wheat grown in Ethiopia consist of: Bread wheat (Triticumaestivum), Durum wheat (Triticumturgidum durum) and Emmer wheat (Triticumturgidum dicoccoides). Emmer wheat is the wild originator of the domesticated durum and bread wheat varieties. Bread wheat account for about half of the area planted, and is generally grown in the highland and semi-highland areas of the Oromia, Amhara, Southern Nations, Nationalities and Peoples of Ethiopia, Sidama, South Ethiopian Peoples and Tigrai Region. Durum wheat covers about 40% of the national wheat area. A small amount of emmer wheat is also grown, primarily in the Oromia region (Peleg et al., 2008; Dixon et al., 2009; Gugerty et al. 2012).

The main wheat growing areas of Ethiopia are the highlands of the central, south-eastern and northwest parts of the country. In terms of regional contribution, the production of wheat originates from Oromia (57.4%), Amhara (27%), SNNP (8.7%) and Tigray (6.2%); and more than 41% of the annual wheat production comes from only three zones in Oromia and one in Amhara regions (CSA, 2011-2013). According to ASS of 2014, there are 4.7 million wheat farmers in Ethiopia, and live in Oromia and Amhara (78%), SNNP (13 %) Tigray (8 %) and less than 1% of wheat farmers live in other regions of Ethiopia. In the same year, the average largest wheat area per farm was 0.43 ha/farm in Oromia region where as the smallest was recorded in SNNPs (0.19 ha/farm). The majorities of the farmers are smallholder farmers; and are producing mostly for own consumption and supplying only small marketed surplus (EDRI, 2012).

2.3. The Concepts of Market Chains

There are two terms used for market chains. These two terms are "Value chain" and "supply Chain" of the Market. Most scholars use these two terms interchangeably. But these two terms are basically different in concept.

Value Chain

Value chains are a key framework for understanding how a product moves from the producer to the customer. The term value chain is used to characterize the set of interconnected and coordinated links and linkages during this product movement (Kirimi et al., 2011). The value chain perspective provides an important means to understand the business to business

relationships, mechanisms to increase efficiency, and ways to enable business to increase productivity and add value (Mohammed, 2009). It addresses the nature and determinants of competitiveness, and makes a particular contribution in raising the sights from the individual firm to the group of interconnected firms. In addition, it provides a reference point for enhancements in supporting services and the business environment (Webber and Labaste, 2010).

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. Value chains focus more on innovation and quality product development, increase system efficiency and developing differentiated product.

The main actors in the value chain are smallholder farmers who tend to sell large quantities of their production during and soon after the main (meher) harvest, but further sales may occur as they off- load grain stocks to avoid damage and loss caused by storage pests (Walker and Wandschneider, 2005).

Michael Porter was the first person who introduced the term “Value Chain’ in his book Competitive advantage: Creating and Sustaining Superior Performance (Porter 1985). Michael Porter defines “Value Chain’’ as a representation of a firm’s value-adding activities, based on its pricing strategy and cost structure. The ability of any firm to understand its own capabilities and the needs of the customer is crucial for competitive strategy to be successful.

Supply Chain

A supply chain is the network of all the individuals, organizations, resources, activities and technology involved in the creation and sale of a product. A supply chain encompasses everything from the delivery of source materials from the supplier to the manufacturer through to its eventual delivery to the end user. The supply chain segment involved with getting the finished product from the manufacturer to the consumer is known as the distribution channel. For La Londe and Masters (1994), the SC is a set of enterprises (organizations) that move materials forward. It can be assumed that, in reference to materials, they are also speaking of products, products in process, parts, components and raw materials. Lambert, Stock, and Ellram (1998) define a SC as the association of companies that deliver products and services to market.

A supply chain is a network between a company and its suppliers to produce and distribute a specific product or service. The entities in the supply chain include producers, vendors, warehouses, transportation companies, distribution centers, and retailers.

Supply chain is a group of functions and processes focused on optimizing the flow of products, services and related information from sources of supply to customers or points of demand. It stretches across multiple tiers in the supplier network to customers and to customers of those customers. It includes supply chain planning, sourcing and procurement, manufacturing, distribution, transportation, and services within a company and its ecosystem of partners.

Steps in the supply chain

The fundamental steps of a supply chain in order are as follows:

- Sourcing raw materials.
- Refining those materials into basic parts.
- Combining those basic parts to create a product.
- Order fulfillment/Sales.
- Product delivery.
- Customer support and return services.

Chen and Paulraj (2004) stated that a typical supply chain is a network of materials, information, and services processing links with the characteristics of supply, transformation and demand, as you can see in the figure below (Figure 1):

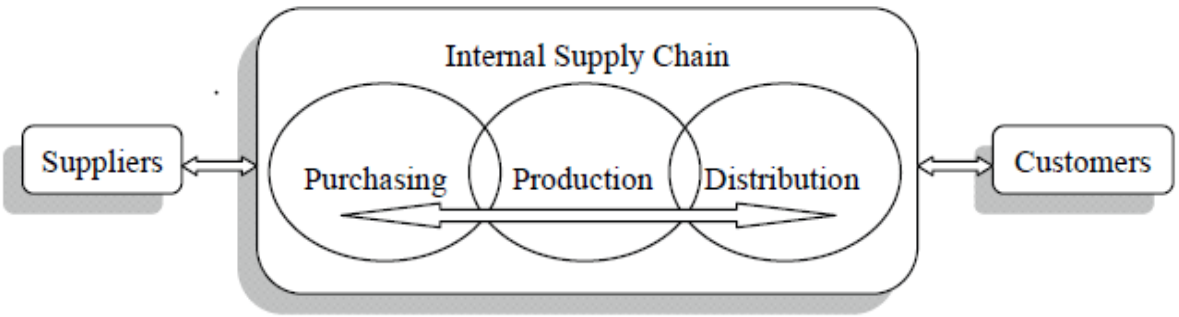

Figure 1: An illustration of supply chain

Source: Chen and Paulraj, 2004

2.3.1. Supply Chains versus Value Chains

The term value chain refers to the process in which businesses receive raw materials, add value to them through production, manufacturing, and other processes to create a finished product, and then sell the finished product to consumers. A supply chain represents the steps it takes to get the product or service to the customer, often dealing with OEM and aftermarket parts. While a supply chain involves all parties in fulfilling a customer request and leading to customer satisfaction, a value chain is a set of interrelated activities a company uses to create a competitive advantage.

2.3.1.1 Agricultural Value Chains

According to Kula et al.,(2006) Value chains encompass the full range of activities and services required to bring a product or service from its conception to sale in its final markets whether local, national, regional or global. Value chains include input suppliers, producers, processors and buyers. They are supported by a range of technical, business and financial service providers. Value chains have both structural and dynamic components. The structure of the value chain influences the dynamics of firm behavior and these dynamics influence how well the value chain performs.

The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use(Kalpinsky and Morris 2001).

2.3.1.2. Why Value Chain Analysis?

The value chain analysis is the important parameters used in the agriculture market activates. Hence, Value chain analysis is a useful analytical tool that helps understand overall trends of industrial reorganization and identify change agents and leverage points for policy and technical interventions. Value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. The analysis consists of identifying chain actors at each stage and discerning their functions and relationships; determining the chain governance, or leadership, to facilitate chain formation and strengthening; and identifying value adding activities in the chain and assigning costs and added value to each of those activities. The flows of goods, information and finance through

the various stages of the chain are evaluated in order to detect problems or identify opportunities to improve the contribution of specific actors and the overall performance of the chain (UNIDO, 2009). The value chain can help you answer questions regarding:

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

2.4. Market Structure, Conduct and Performance Analysis (S-C-P)

The development of stable and reliable marketing system has been an important element in commercialization and specialization in the agricultural sector. To study how markets are functioning, many researchers used the approach known as Structure-Conduct-Performance (S-C-P) approach.

The structure conduct performance (S-C-P) approach was developed in the United States as a tool to analyze the market organization of the industrial sector and it was later applied to assess the agricultural marketing system. It was designed by Madson in pioneering works in 1939 and followed by Brain, Clerk, Claves, and Scherer (Redi, 1987; cited in Wolday, 1994).

Abbot and Makeham (1981) indicated that factors accounting for efficiency can be evaluated by examining enterprises for structure, conduct and performance. These elements measure the extent of deviation from the perfectly competitive norm. The larger the deviation, the more imperfectly competitive is the market, that is on extreme case would be monopoly.

One important approach to the study of market performance, namely the study of market organization or market structure analysis, suggests that relationship exists between structural characteristics of a market and competitive behavior of market participants and that their behavior intern influences the performance of the market (Scarborough and Kydd 1992; Scott,1995 cited in Gebremeskel *et al.*,1998). Subsequently, the Structural-Conduct-Performance approach was applied in the functioning of markets in the agricultural sectors, and served as a tool to evaluate the performance of the commercial system. The approach comprises of three related levels; the structure of the market, the conduct of the market, and the performance of the market.

Among the major structural characteristics of a market is the degree of concentration, that is, the number of market participants and their size distribution; the relative ease or difficulty for market participants to secure an entry into the market. Market conduct refers to the behavior

of firms or the strategy they use with respect to, for example, pricing, buying, selling, etc., which may take the form of informal cooperation or collusion (Gebremeskel, *et al.*, 1998).

2.4.1 The structure of the market

Market structure is defined as characteristics of the organization of a market which seems to influence strategically the nature of competition by pricing behavior with in the market (Bain, 1968; cited in Scott, 1995). Market structure is the description of the number and nature of participants in a market (Cramer and Jenson, 1982 and Abbott and Makeham,1981).

Structural characteristics may be used as a basis for classifying markets. Markets may be perfectly competitive, monopolistic, or oligopolistic (Scott, 1995).

The four salient aspects of market structures include the degree of seller concentration, the degree of buyer concentration, the degree of product differentiation, and the condition of entry (Koch, 1980, cited in Scott, 1995).

(a) Degree of buyers and sellers concentration;-refers to the number and size distribution of buyers and sellers in the market. According to Khuls and Uhl (2004), market concentration, the portion of the industry sales made by the largest firms, is another source of imperfect competition. Successful competitors frequently eliminate their rivals or discourage new firms entry, contributing to more concentrated market. In general, the higher the level of market concentration, the less perfectly competitive the market is. The common methods of measuring market concentration are the following.

(i) Market concentration ratio (c)

$$C = \sum_{1}^{n} S_i \qquad \text{---------- (1)}$$

i= 1, 2, 3……. N

Where S_i = the percentage market share of i^{th} firm and n =the number of largest firms for which the ratio is going to be calculated. Very recently the concentration ratio was the numerical index most widely used by industrial organizations for measuring the size of distribution of firms in market (Shughart, 1990; cited in Admasu, 1998).While it is possible use any economic variable such as employment, total assets or value added, for calculating C, sales or purchase figures have been the most popular basis for the index (Admasu, 1998). Kohls and Uhl (1985) suggested that as a rule of thumb, four largest enterprises concentration ratio of 50 percent or more is an indication of a strongly oligopolistic industry, 33 to 50 percent a weak oligopoly, and less than that, an un concentrated industry. The problem

associated with this index is the arbitrary selection of n (the number of firms that are taken to calculate the ratio).The ratio does not indicate the size distribution of the n firms.

(ii) Hirschman Herfindahi Index (HHI):

$$HHI = \sum_{1}^{n} S_i^2 \quad \text{..... (2)}$$

i =1, 2, 3, ----, n

Where S_i, is the percentage market share of i^{th} firm, and n is total number of firms. This index takes into account all points on the concentration curve. It also considers the number and size distribution of all firms. In addition, squaring the individual market shares gives more weight to the shares of the largest firms which is an advantage over concentration ratio. A very small index indicates the percentage of many firms of comparable size, whilst an index of one or near one suggest that the number of firms in small and /or that they have very unequal shares in the market (Scarborough and Kydd, 1992; cited in Admasu, 1998).This method is limited in its application for it imposes additional burden in so far as more data must be collected (Admasu, 1998). In this study the researcher will use market concentration ratio method.

(b) Condition of entry: refers to the relative ease or difficulty with which new dealers in to the market.

(C) Degree of product differentiation: refers to the extent to which competing products in a market are differentiated is expected to influence the competitive interrelationship of sellers in the market.

2.4.2. Conduct of the market

The structure and the conduct of market participants have a direct implication for the nature of production price relationships between different marketing levels and the direction of causality.

Conduct of the market refers to the strategies that firms pursue with regard to price, product and promotions, and the linkages/relationships between and among firms. The market behavior of firms will determine whether or not they compete and whether they are acting innovatively to improve market efficiency. Informal association between even a small numbers of firms (collusion) can cause price distortions, and seemingly independent firms can have joint ownership (subsidiaries).

Market conduct refers to the practices or strategies of traders in maximizing their profits. Among these practices are the use of regular partners, long-term relations with clients, and suppliers, the use of intermediaries, and trade within personalized networks (Wolday, 1994).

Market conduct deals with the behavior of firms that are price-searchers are expected to act differently than those in a price-taker type of industry (Cramers and Jensen, 1982). Price searchers can determine their selling prices or quantity of output they sell. In addition, they could use their market power to weaken or eliminate competitors example reducing price.

According to Abbott and Makeham (1981) conduct refers to the market behavior of all firms. In what way do they compete? Are they looking for new techniques and do they apply them as practicable? Are they looking for new investment opportunities, or are they disinvesting and transferring funds elsewhere? Meijer (1994) said that, "conduct is pattern of behavior which enterprises follow in adopting or adjusting to the market in which they sell or buy", in other words the strategies of the actors operating in the market.

There are no agreed upon procedures for analyzing the elements of market conduct. Rather, previous researchers' point to some guide lines in the form of questions. These questions provide a systematic way to detect indications of unfair price setting practice and the condition under which such practice are likely to prevail. More specifically, they cover the following topics: the existence of formal and informal marketing groups that perpetuate such practice; formal and informal producer groups that affect bargaining power; the availability of price information and its impact on prevailing price; the distance from the major market and its impact on price; and the feasibility of utilizing alternative market outlets. The questions also provide an indication of the type of data needed and data collection procedures (Scott, 1995)

2.4.3 Performance of the market

Performance of the market is reflection of the impact of structure and conduct on product price, costs and the volume and quality of output (Cramers and Jensen, 1982). If the market structure in an industry resembles monopoly rather than pure competition, then one expects poor market performance.

According to Bain (1968) and Bressler and King (1970), market performance is the effect of the market structure and conduct as measured in terms of variables such as prices, costs, and volume of output by analyzing the level of marketing margins and their cost components. Thus, wheat marketing performance is the effectiveness and efficiencies of wheat marketing activities (revenue, growth, and market share). It is evaluated by considering associated costs, returns and marketing margins.

Market performance refers to the impact of structure and conduct as a measured in terms of variables such as prices, costs, and volume of output (Bressler and king, 1970; cited in Scott,

1995). By analyzing the level of marketing margin and their cost components, it is possible to evaluate the impact of the structure and conduct characteristic on market performance (Bain 1968; cited in Scott, 1995). As a method for analysis the S-C-P paradigm postulates that the relationship exists between the three levels distinguished. One can imagine a causal relations starting from the structure, which determine the conduct, which together determine the performance (technological progressiveness, growth orientation of marketing firms, efficiency of resource use, and product improvement and maximum market services at the least possible cost) of agricultural marketing system in developing countries (Meijer, 1994). Here, the researcher used the structure-conduct-performance (SCP) approach to analyze the teff and wheat market performance of Halaba special woreda.

2.5 Methods of Evaluating Market performance

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).

2.5.1 Marketing costs and margins

Marketing cost: It 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, capital cost (interest on loan), market fees, commission and unofficial payments (Heltberg and Tarp, 2001).

Wheat marketing cost is the total cost associated with delivering goods or services to customers. It may include expenses associated with transferring title of goods to a customer, storing goods in warehouses pending delivery, promoting the goods or services being sold, or the distribution of the product to points of sale.

Marketing margin: Marketing margin is one of the commonly used measures of the performance of a marketing system. Marketing margin is the difference between the price the consumers pay and the price the producers receive.

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 will be used.

2.5.2 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 (Baffes and Ajwad, 2001; Abdulai, 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, 2004; Kishana, et al., 2004). Furthermore, the existence, extent, and persistence of famines in market economies are also closely linked to market integration.

2.6. Empirical Review of Literature

Empirical literature review is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief. An empirical literature review is more commonly called a systematic literature review and it examines past empirical studies to answer a particular research question.

2.6.1 Cereal Production in Ethiopia

Cereal crop is widely producing in Ethiopia as well in Oromia. In the study District also four major cereals took the lion share interims of area coverage and production. Measured in terms of contributions to total cereal production, Wheat, Barley, maize, Pea and Beans are the most important cereal crops in that order. However, the relative importance of the crops changes slightly when compared in terms of their contribution to total cereal area covered due to differences in productivity.

2.6.2. Determinants of market outlet choices

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

Shewaye (2016) used multivariate probit (MVP) model to identify factors affecting haricot bean market outlet choices in Misrak Badawacho district, Southern Ethiopia. The result of MVP model revealed that distance to all weather roads and distance to the nearest district market positively affect the probability to choose rural assemblers market outlet whereas number of equine owned and use of credit has a negative effect. Number of equine owned positively affects the probability to choose direct consumers outlet. Number of equine owned,

use of credit, membership in cooperative and price information positively affect the probability to choose urban traders outlet, whereas distance to the nearest district market negatively affect the probability to choose the urban traders outlet.

Addisu (2018) employed multivariate probit (MVP) model to identify factors affecting market outlet choice of teff producers in Dendi district of Oromia, central Ethiopia. The multivariate probit model results revealed that variables like household size number of equines owned, education level of the household head, size of land under tef production, distance from the nearest market, current market prices of tef, and cooperative membership affected the choice of appropriate market outlets of producers.

Mekonin (2017) used Multivariate Probit model to determine market outlet choice and livelihood outcomes of coffee producing farmers in Lalo Assabi district, Oromiya, Ethiopia and they confirmed that, extension contact, education, market distance, non/off-farm income, and cooperative membership influence outlet choice decisions in all outlet channels selected.

Sunga (2011) identified on the basic factors influencing bean producers 'choice of marketing channels in Zambia. His results from Multivariate probit model indicated that the choice of marketing channel is directly influenced by the price of beans, scale of operation (as measured by the quantity of beans harvested, and quantity sold), distance to the market, farming mechanization used and livestock ownership were significant determinants of bean producers' choice in Zambia.

Takele et al. (2017) identified on important determinants of market outlet choice of smallholder mango producers in Boloso Bombe Woreda, Wolaita zone, Southern Ethiopia using Multivariate Probit model. The result showed that variables such as family size, distance to the market, quantity of mango produced, the price offered, access to market information and access to non- farm income determined the decision of choice of wholesaler, collector, retailer and consumer market outlets at different significance level.

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

educational status of household head, access to extension services and owning transport facility compared to wholesale outlet.

2.6.3. Factors Affecting Market Supply

Supply refers to the quantity of a good that the producer plans to sell in the market. Supply will be determined by factors such as price, the number of suppliers, the state of technology, government subsidies, weather conditions and the availability of workers to produce the good. Here the market supply refers to the amount actually taken to the markets regardless of the needs for home consumption and other home requirements. Whereas, the marketed surplus is the residual with the producer after meeting the requirement of seed, payment in kind, and consumption by farmer (Wolday, 1994).

Ayelech (2011) identified factors affecting the marketable surplus of fruits by using OLS regression. She found that fruit marketable supply was affected by; education level of household head, quantity of fruit produced, fruit production experience, extension contact, lagged price and distance to market.

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

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

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

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

2.6.4. Factors affecting value addition decision

The term Value Addition is the core activities in agricultural activities. It refers to the act of adding value(s) to a product to create form, place, and time utility which increase the customer value offered by a product or service. It asks the individual efforts and activities to address the planned target. And also, it is an innovation that enhances or improves an existing product or introduces new products or new product uses (Fleming, 2005).

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

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

2.6.5. Dimensions of Value Chain

Value chain analysis can used to address supply issues such as raw product supply, quality and consistency of raw product in the chains to shrink gap between demand and supply (Bryceson, 2008). This Value chain analysis can be an important tool with which one examines structural change. Al together, a value chain comprises five dimensions; these are the technical structure, the actors in a chain, the territorial, the input output and the governance structure (Gereffi, 2009). The analysis of these structures will give answers to a set of questions: How does the production process run? Who participates at which stage? Where do the different stages take place? How are they inter-linked? Who has which benefits, etc.? They are needed to find the relevant points of intervention for a successful integration of poor population sections. The different dimensions of a value chain are explained below.

2.6.5.1. Technical structure and actors

This is very important to be understood. Hence technical production process can generally be separated in to five stages: input supply, primary production, processing, marketing and consumption. One very stage, one to several different actors can be found. Trading activities do not only take place between the stages of processing and consumption but also between production and processing or input supply and production. Nevertheless, it is not mentioned as an own stage of the chain there. It is assumed that between these stages trading activities are mostly undertaken by the participants of the respective stages as a pure transfer of goods within the production process without specific marketing activities (Schipmann, 2010).

2.6.5.2. Territorial structure

These the territorial structure is understood as the geographic concentration or dispersion of production and marketing and which gives an overview of the location of the single stages of a value chain (Stamm, 2013). This is the spatial boundaries of a value chain. The geography implies that some value Chains can be international, while others could be national, regional or local (McCormick and Schmitz, 2011).

2.6.5.3. Input-output structure

The input output structure is a set of products and services linked together in a sequence of value- adding economic activities (McCormick and Schmitz, 2011). It concerns the link of inputs, activities and actors involved in the production, trade and finalization of the commodity for the Consumer market and the geographical coverage (Tuvhag, 2008). The input output structure gives mainly an over view about four aspects of the amount and quality of a good that is needed from one stage of the chain to fulfill the requirements of the following stage, the value that is Created on each stage, the profit distribution in a chain and the information flow between the single stages of a chain (Schipmann, 2009).

2.6.5.4. Governance structure

The researcher Nadvi (2008) described the governance of various institutional involved in value chains. He defined governance as the institutional structure by which rules are set and implemented. Governance is a central concept to value chain analysis and can be defined as non- market coordination of economic activity. Governance ensures that interaction between firms along a Value chain exhibits some reflection of organization rather than being simply random.

Another important feature of governance is that it involves the ability of one firm in the chain to influence or determine the activities of other firms in the chain. This influence can extend to defining the products to be produced by suppliers. This power is exercised through the lead firms control over key resources needed in the chain, decisions about entry to and exit from the chain and Monitoring of suppliers (Rounder, 2007). Humphrey and Shmitz (2011) argue that the issue of governance in value chain is important for market access, fast track to acquisition of production possibilities, distribution of gains, advantage points for policy initiatives, and channel for technical assistance.

2.7. Framework for Value Chain Analysis

2.7.1. Theoretical framework

Value chain approach is used by many organizations across the globe. Following the pioneering contributions of (Porter, 2011) that focused on how individual firms can create Value and build up their competitive advantage and Gereffi (2009) who focused primarily on

the economic governance patterns in “global” value chains, different institutions and individuals applied value chain approach.

A value chain approach presents a number of features which can serve to expand financial services into underserved rural areas (Charitonen koetal., 2008), and an analysis of the entire value chain needs to be conducted in order to better understand the extent to which financing is a constraint, where in the chain it may be a constraint, and whether there are other pre-disposing conditions impeding the access and best use of capital (Jansen, 2007).

The main aim of a value chain approach is to produce value added products or services for a market; by transforming resources and by the use of infrastructures within the opportunities and constraints of its institutional environment. However, developing countries face many challenges that hinder from achieving value chain development. The constraints are related to market access (local, regional, international), market orientation (Grunertet al., 2010), available resource, physical infrastructures and institutions (Scott, 2007). Therefore, to be able to participate in high value adding value chains, various parties in the chain up to the primary producer should have knowledge of and be willing to comply to demands in the value chain‟s end-market (Grunertet al., 20011). Therefore, a key condition for producers to be included in successful value chains is that they have access to market information and possess the ability to translate it to market intelligence.

Actors networking value chain theory suggests that the value chain map should be simple, easy and clear. But the real world can be much more complex than mapped because of the involvement of different actors and channels. In order to simply understand the ground situation, the map should simply describe the flow of inputs, product and information among the actors. The analysis also should to recommend on how to strength the relationship among the actors (Kaplinksy and Moris, 2010). The value chain map of maize also has many channels and different integrations among the actors either vertical or horizontal

2.7.2. Methodological framework

It involves an assessment of the relationships between the different stakeholders which, coupled with the effective flow of information, enables the economic and environmental optimization of material flows, allocating time, people and technology appropriately and with minimal impacts on the environment. According to Webber (2009), the value chain analysis methodology focuses on three key issues: The dynamics of information in the value chain

from final consumption through to primary production and input suppliers, the creation and flow of value at each stage in the eyes of the final consumer, and the nature of relationships among the actors. Value chain analysis model integrates analysis of commodity supply chain and associated enabling environment with entry point of product and process flow, information and money flow, and the enabling environment.

According to Berg et al. (2014) the value chain approaches apply six tools and steps. The analysis starts with prioritizing a commodity for value chain development and then mapping of the value chain; analysis of the value chain performance in terms of costs, prices and margins; analysis of technology, knowledge and upgrading possibilities through assessment of gaps in technology and knowledge and existing or future opportunities; value chain governance which is used to identify stakeholders influencing governance, rules and regulations and their enforcement and finally linkages and relationships among the stakeholder is analyzed. Value chain can be analyzed through mapping value chain which describes the full set of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation, and the input of various producer services), and delivery to final consumers (Kaplinsky and Morris, 2009).

Value chain mapping helps to illustrate and understand the process by which a product goes through several stages until it reaches the final customer (i.e. the core transactions). And understanding about the different levels in a value chain is also a precondition for identifying bottlenecks that are preventing the achievement of certain targets. Value chain maps can explore market opportunities and it also shows up different market channels through which products and services reach the final customer. These maps can also provide additional information on the relevance of individual market channels and the nature of relationships (e.g. number of competitors, size of market, number of workers, value chain governance, etc.).

However value chain analyses have provided a number of important insights, it has a number of limitation. Webber (2009), observed as value chain analysis too often focuses simply on improvements within the given value chain, rather than on how value chains can be shifted to target different, more attractive markets and business strategies and also it lacks the ability to analyse specific, chain-level upgrading strategies and assessment of their impacts. More specifically, objective assessment and ranking of impacts of upgrading strategies and optimal entry points for intervention are lacking.

According to Raikes et al. (2009), value chain analysis lacks quantitative analysis or methods embedded in the approach. It mainly focuses in the analysis of profitability and margins within the chain whose measurement of profits within the chain is problematic and confined to abstraction rather than quantification. Lalonde and Pohlen (2006) observed that available performance measures do not cross boundaries between functions in the chain, and are not focused on individual products or relationships. Qualitative approaches recognize that value chain and their relationships are dynamic. Value chains are not fixed in terms of composition, relationships, or market positioning, and that there is a competitive need to alter and improve the value chain in light of strategic choices that businesses can make regarding the markets in which they compete.

While a value chain's purpose is to link production to the target market advantageously, it is the private sector that decides which markets and where to compete and alters the value chain accordingly. So it is better to consider its variability. But, less attention has been paid to the potential unintended consequences of interventions or changes to one part of the value chain over time (Lee et al., 2007). Therefore, considering its dynamics is very important for policy intervention. Still another important drawback is that value chain analysis is resource (finance and time) demanding to generate baseline information to identify and prioritize chain constraints and come up with upgrading strategies. This is because it deploys both participatory and analytical tools to concretize policy based interventions.

2.8. Conceptual Framework

Under here, a widely accepted conceptual framework in industrial organization studies holds that structural conditions determine the behavior (conduct) and subsequent performance of a firm. To assess market, conduct and performance, and to properly understand the roles of each element, Waldman and Jensen (2001), linked those elements and attributes that have direct relationship. In perfectly competitive markets, an atomistic market structure results inefficient economic performance with price equals to marginal cost, efficient firms driven from the market, and long-run economic profits equal to zero. Value chains include process actors such as input suppliers, producers, processors, traders and consumers.

At one end are the producers the farmers who grow the crops and raise the animals. At the other end are consumers who eat, drink and wear the final products. In the middle may be many individuals and firms, each performing one small step in the chain: transporting, processing, storing, selling, buying, packaging, checking, monitoring and making decisions.

A value chain also includes a range of services needed including technical support (extension), business enabling and financial services, innovation and communication, and information brokering. The value chain actors and service providers interact in different ways starting from the local to national and international levels. The value chain includes direct actors who are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors who provide services or support the functioning of value chain. These include financial or non-financial service providers such as bankers and credit agencies, business service providers, government, researcher and extension agents.

According to Kaplinksy and Morris (2001), conceptual frame of the malt barely value addition is the task of all value chain functions from input supply and production to wholesaler, retailer and consumption. In order to reduce unfair market and benefit share in the value chain, there is a need to identify major factors affecting the malt barely market participation and quantity supply, constraints and opportunities to help small scale producers and business in order to improve productivity and competitiveness of the value chain. With this ground, the schematic representation of the conceptual framework applied for this study is represented here after.

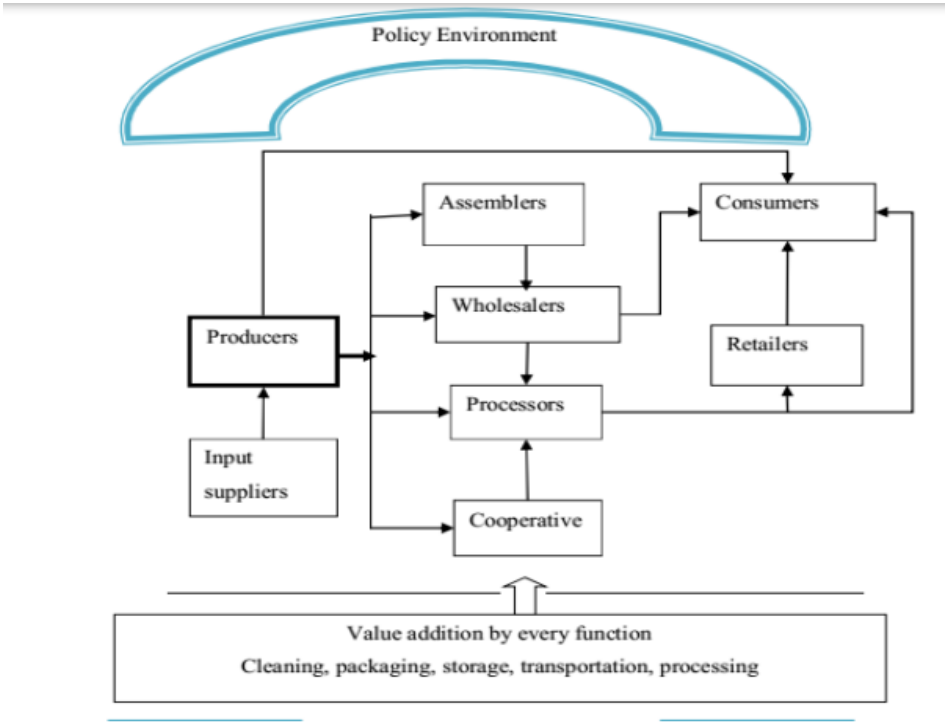

Figure 2: Conceptual Frame work of the Study

From the above figure 2, we can see that there is different chain complexity might be occur depending on the producer to consumer or producer to other market actor. From here we have seen that the chains was simple when producers directly sell to the consumers but long and

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

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

3.1.1. An Overview of Bale Zone

Bale Zone is a zone in Oromia Region of Ethiopia. Bale is bordered on the south by the Ganale Dorya River which separates it from Guji Zone, on the west by the West Arsi Zone, on the north by Arsi Zone, on the northeast by East Bale Zone. *Tullu Dimtu* is on the Sanetti Plateau in the *Bale* Mountains of Oromia Region in southeast Ethiopia, within *Bale* Mountains National Park. Tullu Dimtu is about Elevation: 4,377 m. above mean sea level. Bale zone is connected with neighboring zones and region by national highway. It is connected with Finfinne via Robe highway. The economy of the zone is mainly dominated by agriculture.

Bale zone has four agro-ecological zones namely extreme highlands 0.04%, highland 14.93%, midland 21.5%, and lowland 63.53% (Int. J. Adv. Res. Biol. Sci.(2020).7(5): 81-90).

Total area of Bale zone is about 63,555 km2 which is 16.2% of Oromia region. About 10.6% of the land is arable land used for crop production, 24.6% grazing land, 41.8% forest, and others 25% (BZADO, 2012). Most of the districts in Bale highlands are known for their bimodal rainfall patterns and are therefore highly suitable for agriculture. They have two distinct seasons i.e. Belg (from March to July) and Meher (from August to January). About 274,785 hectares of land in Bale zone is cultivated during Belg season while 371,628 hectares is cultivated during Meher season.

Altitude of Bale zone extends from less than 300 meters around Meda Welabu, southeast of Rayitu and Gura Damole districts; to more than 4377 meters above sea level in Goba district namely Mount Tulu Dimtu. The annual average temperature of Bale zone is 19.25 °C. The maximum and minimum temperature is 35 °C and 3.5 °C respectively. The mean annual average rainfall is 875mm, whereas maximum 1200mm and 550mm minimum annual rainfall was recorded in the zone.

3.1.2. An Overview of Sinana Woreda

Sinana is one of the woredas in the Oromia Region of Ethiopia. Sinana district is located in the north western part of Bale zone (figure 3). It is part of the Bale Zone. Sinana Woreda is located about 430 kms South East of Addis Ababa on the way from Addis Ababa to Robe Town. According to CSA 2007, the total population for this woreda of 119,208, of whom 62,280 were men and 56,928 were women; none of its population were urban dwellers (CSA 2007).

The Woreda is made up of rural areas, and it is divided in to twenty Kebeles. The Woreda is administered by its councils and has Agricultural and Rural Development Office at Woreda level and in each Kebele agricultural offices established. The Woreda's population livelihood depends on mainly in crop, livestock and other nonfarm activities.

In the study district crop production is major economic activity followed by animal production. Farming in Sinana Woreda is a common and traditional activity which is conducted in plots by using traditional production system. Production of grains in the Woreda is practiced in mixed way both in a traditional way by plowing with a pair of oxen and mechanized way by plowing with a Tractor. Production of wheat is a rain-fed with two harvest in a year. Farmers in the district experienced mixed farming system of both crop and livestock. Cereals took the lion share interims of production and area coverage. The main crops grown are dominantly wheat and Barley. But other likes pulses, oil crops, maize, Pea, Beans are grown in the woreda. Wheat, Beans, pea and Oil crop are the major crops produced for market supply.

The average altitude of the Sinana District is 1650 to 2950 m a.s.l. From the total area of the district about 73.54 % is plain land, 3.7% is hills, 9.6 % is mountains, 12.3 % is rugged and 0.86 % is gorge. The annual average temperature is $16.5c^0$ whereas the minimum and maximum temperature is $9c^0$ and $23c^0$ respectively. The annual average rainfall is 1105mm whereas the minimum and maximum rainfall is 1060 and 1150mm respectively (BOFED, 2009).

Rainfall pattern of the district is characterized by bi-modal rain fall distribution. The district has two distinct seasons, i.e. Belg which extends from March to July and Meher which extends from August to January (BZADO, 2012).

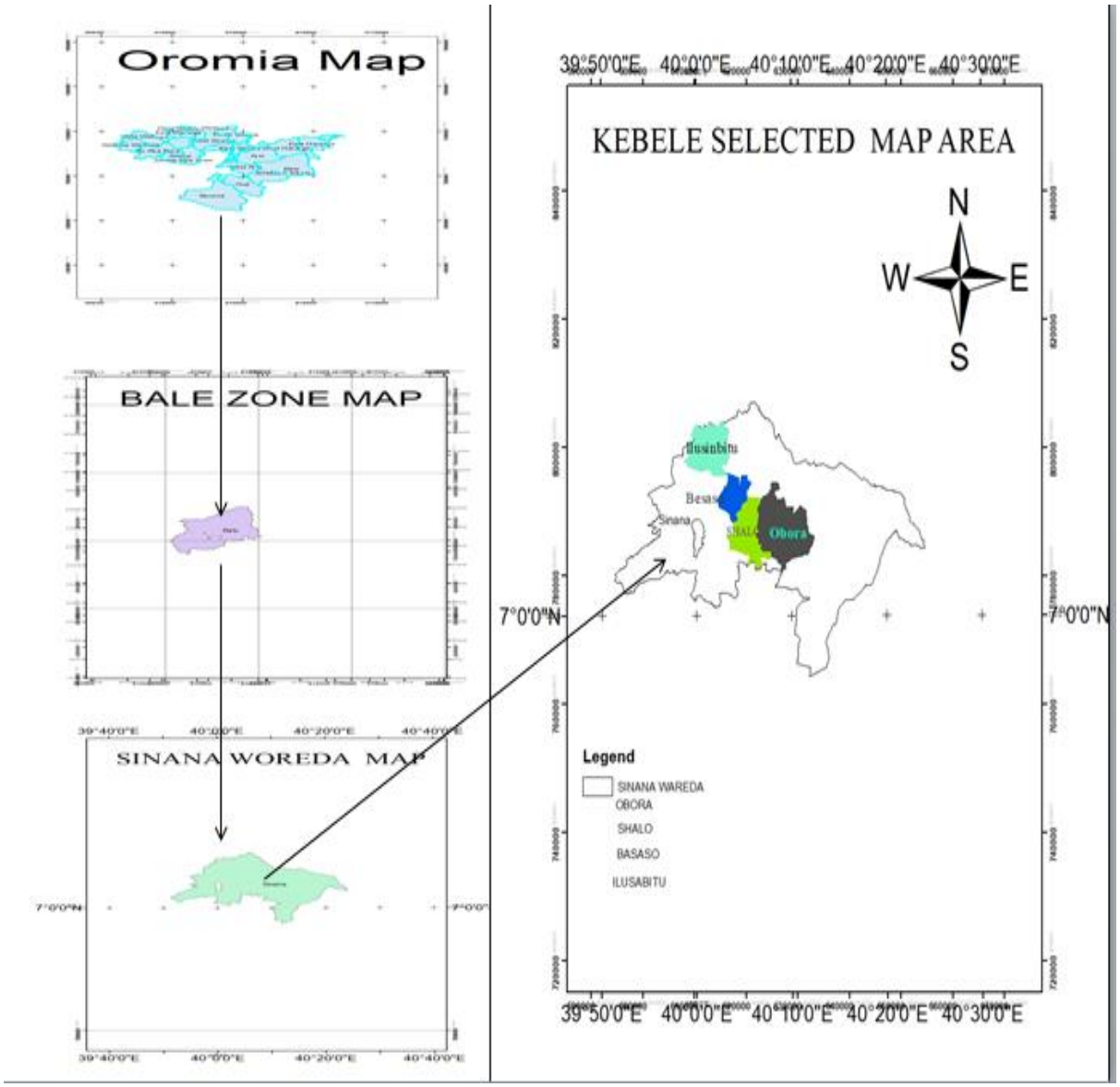

Figure 3: Map of the study area

3.2. Research Design

The study was used across-sectional data with descriptive research design in which qualitative and quantitative data were collected form smallholder farmers who produce wheat in Sinana District during 2021/22 production season.

3.3. Methods of Data Collection and Data Sources

3.3.1. Data Sources and Types

Sources of data are very important for the best research to be undertaken. These sources of datum are selected technically based on the targeted results. So, different sources would be used in order to collect qualitative and quantitative data on small household farmers. For this study, both primary and secondary data source were used. Therefore, in this study both primary and secondary data sources are used. The detail descriptions for each are as under.

3.3.2. Methods of Data Collection

Primary data were collected from sampled households based on 2021/22 wheat production season. These Primary data was collected through personal interviews by using data collection instruments and questionnaires with structured interviews schedules and key informant discussion.

The questionnaires had been incorporated issues on the demographic and other characteristics of farmer, farm characteristics, institutional factors, input types, resources endowment and input amount used and output obtained by sample households during wheat production season.

For primary data collection four, enumerators were selected from the study area. Enumerators who know about the study area, acceptance from local farmers, experience in data collection and speaking local language. The questionnaires had been ready after making necessary corrections and pre-test before actual use in order to obtain more clear information. During interview, the researcher as well as respective enumerators had been provided precise and enough information about the objectives of the study to let alone potential bias from the sample households in responding to questions.

Generally more effort had been employed in each activity of the sample to assure data quality. Sufficient time was given in order to set up questionnaire very well in such way that

the enumerators can easily understand it. Especial attentions was given towards simplifying clarity and logical order of questionnaire measurement tool of variable, definitions of technical terms and concepts to avoid possible bias that can emanate from it.

The secondary data which are relevant to the research topic would be used as supplementary information to support the primary information provided by the sampled households for rational and unbiased conclusion on research result. These include both published and documents which were collected from Agriculture office, Non-Governmental Organizations (NGO), Research Centers and Central Statistical Agency (CSA).

3.4. Sampling Procedure and Sample Size

In this study, multistage purposive sampling was employed to select representative households in the study area. At the first stage, the study site (Bale Zone) was selected for the reason that the area consists of vast areas of different variety of cereal crops and Bale Zone was selected purposively based on wheat production potential. For this study, multi-stage sampling techniques would be used to attain an accurate cross-sectional data from sample households in study area.

At the second stage, Sinana woreda was selected purposively out of the 11 woredas in Bale Zone due to adequate data availability and that it has the largest area under wheat production in the study zone. At the third stage, Even though the study district comprises of 20 rural Kebeles in which in all the Kebeles wheat production is undertaking, four kebeles were namely Ilu Sambitu, Obera, Besaso and Shallo were selected randomly as all kebeles are producers of wheat in the district. Finally, the total households in the four kebeles were obtained from the registration book of their respective kebeles. During fourth stage, using the sample frame of the sampled Kebeles, list of sample farmers for interview were selected. From each kebele based on proportions to the population sample households were selected using systematic random sampling to have 393 household for survey in Sinana Woreda taking into consideration the nature of the sample, nature of the data, nature of the instruments used. Hence, 106 House hold members from Sambitu, 88 House hold members from Shalo, 139 Household members from Obera and 60 House hold members from Basaso were selected randomly.

3.4.1. Farmers sampling

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

$$n = \frac{N}{1+N(e)^2} \quad \text{.....(3)}$$

$$n = \frac{20{,}845}{1+20{,}845\ (0.052)} = 392.47 \approx 393$$

Where, n = sample size, N= Population size and e = level of precision 5%.

By taking 20,845 Household heads in the Woredas, using the above formula, totally 393 farmer household heads, was selected from the Districts' farmer household heads of 20,845. So, totally 393 farm household heads was selected from the total woreda farmer household heads and will was interviewed. So, Primary data were collected from 393 farmers and 25 wheat traders using structured questionnaires.

Table: 1. Sample size of farmers in Sinana Woreda

No.	Name of Sample Kebeles	Number of Wheat producer Households	Number of sampled Households
1	Ilu Sambitu	1390	106.00
2	Obera	1822	139.00
3	Basaso	786	60.00
4	Shallo	1156	88.00
	Total	**5,154**	**393**

Source: *Sinana Woreda* office of agriculture 2013

In order to answer the research questions, it is doubtful that researcher should be able to collect data from all cases. Thus, there is a need to select a sample. The entire set of cases from which researcher sample is drawn is called the population. Since, researchers neither have time nor the resources to analysis the entire population so they apply sampling technique to reduce the number of cases. Figure 4 illustrates the stages that are likely to go through when conducting sampling.

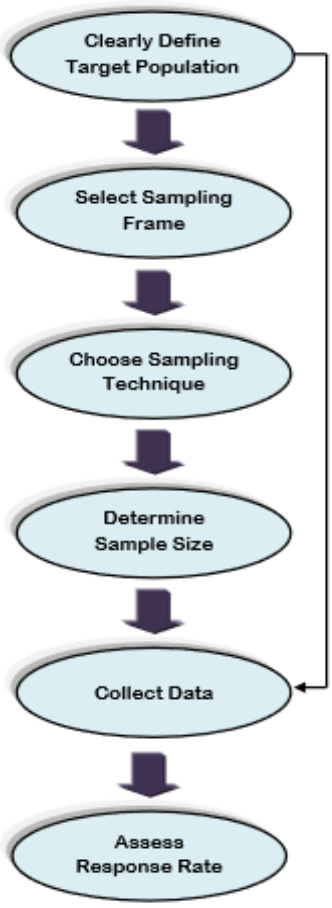

Figure 4: The stages go through when conducting sampling

3.4.2. Wholesalers, retailers, millers and cooperatives sampling

Here, in addition to farmer households, sample wholesalers, assemblers, millers, and retailers were interviewed. The lists of wholesalers, millers and retailers were obtained from the district Office of Trade and Industry (OoTI). Based on the number of wholesalers available in the district, Eleven wholesalers, four processors and ten Retailers were selected randomly. Since processing/milling of wheat is only conducted in zonal town Robe, among the six processors flour mills available in Robe town were interviewed.

3.5. Methods of Data Analysis

In these study two types of data analysis, namely descriptive statistics and econometric analysis were used for analyzing the data collected from wheat producers and traders.

3.5.1. Descriptive statistics

This method of data analysis refers to the use of ratios, percentages, means, and standard deviations in the process of examining and describing marketing functions, facilities, services, household characteristics, role of intermediaries; market and trader characteristics, the structure of production costs, profitability, and major constraints and opportunities of production and supply. The following indicators are used in this type of analysis.

3.5.1.1. Structure Conduct Performance (s-c-p) model

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. Thus, this study used S-C-P model to evaluate how efficiently wheat market of the study area is functioning. Identification of and wheat marketing channels, and the role and linkage of marketing agents in this study; the S-C-P framework was used to meet this objective.

a) Structure of market

Structural characteristics like market concentration, industry maturity, government participation, product differentiation, barriers to entry, and diversification, will be some of the basis to be considered. The perfect competition model will be used as a standard to study the structure of the market.

Market concentration

Market concentration which refers to number and size distribution of sellers and buyers in the market, the firm's objectives, barriers to entry, economies of scale, and assumptions about rival firm's behaviours are relevant in determining the degree of concentration and behaviours and performance (Schere, 1980). The greater the degree of concentration, the greater will be the possibility of non-competitive behaviour, such as collusion, existing in the market. The concentration ratio (market ratio) was calculated using a formula

$$MSi = \frac{V_i}{\sum V_i} \quad \text{.....(4)}$$

Where MSi - market share of buyer i

V_i - amount of product handled by buyer i

ΣV_i - Total amount of product handled

$C = \sum_{i=1}^{r} Si$……(5)

Where C - concentration ratio

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

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

Kohl's and Uhl (1985) bring into play as a rule of thumb, four largest enterprises' concentration ratio of 50% or more (an indication of a strongly oligopolistic industry), 33-50 % (a weak oligopoly) and less than that (competitive industry). The problem associated with this index is the arbitrary selection of r (the number of firms that are taken to compare the ratio).

Barriers to entry

A barrier to entry is simply any advantage held by existing firms over those firms that might potentially produce in a given market. Potential entry barriers will be investigated based on: demand conditions, product differentiation and price elasticity, control over input supplies, legal and institutional factors, scale economies, capital requirement, and technological factors.

b) Market conduct

There are no agreed up on procedures for analyzing the element of market conduct. Market conduct defines the conditions which make possible exploitive relationship between sellers and buyers. It is a systematic way to detect indication of unfair price setting practices and the conditions under which practices are likely to prevail. Moreover, they cover the following topics: The existence of formal and informal marketing groups that perpetuate such practices; Formal and informal producer groups that affect bargaining power; The distance from major market and its impact on prices; and the feasibility of utilizing alternative market out lets.

c) Market Performance

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

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

Marketing Margin- 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 price information used to construct marketing margin were gathered during field work conducted. Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer and is expressed as percentage (Mendoza 1995).

$$TGMM = \frac{\text{End buyer price - First seller price}}{\text{End buyer price}} X100 \quad (6)$$

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 portion of the price paid by the consumer that goes to the producer.

The producer's margin is calculated as:

$$GMMp = \frac{\text{End buyer price - marketing gross margin}}{\text{End buyer price}} X100 \quad (7)$$

Where, GMM_p = the producer's share in consumer price

The net marketing margin (NMM) is the percentage of the final price earned by the intermediaries as their net income after their marketing costs are deducted.

The percentages of net income that can be classified as pure profit (i.e. return on capital), depends on the extension to such factors as the middlemen's own (working capital) costs.

$$NMM = \frac{\text{Gross margin – Marketing costs}}{\text{End buyer price}} X100 \quad (8)$$

Where, NMM = Net marketing margin

3.5.1.2. Model Specification of Factors Affecting Market Supply

The relationship between the dependent variable and the explanatory variables was estimated using econometric analysis. Understanding the effects of various factors on wheat supply to the market has paramount importance. The Ordinary Least Squares regression (OLS) model can be used to estimate market supply influencing factors only if all households are involved in marketing the interest commodity. Using an OLS model and excluding non-participants from the analysis introduces selectivity bias to the model. To address these concerns, two stage procedures such as Tobit, Double Hurdle, and Heckman have been proposed. Probit and logit models can adequately address the issue if only the probability of selling is studied. In study area all the sample farmers interviewed supplied wheat to the market during the 2021/22 production year thus; a multiple linear regression model was used for this study. Gujarati (2004), therefore, defines the multiple linear regression model as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ...\beta_{11} X_{11} + \mu_i \quad \text{……..(9)}$$

Where, Y_i refers the quantity of wheat supplied to the market and X_i are the explanatory variables that are hypothesized to affect the market supply in the study area, β_0 is the intercept; β_i are parameters of the i^{th} explanatory variables, and μ_i is error term.

However, before fitting important variables in to the multiple regression models, it is necessary to test multicollinearity problem among continuous variables and check associations among discrete variables, which seriously affects the parameter estimates. According to Gujarati, (2003) indicates, multicollinearity refers to a situation where it becomes difficult to identify the separate effect of independent variables on the dependent variable because existing strong relationship among them. In other words, multicollinearity is a situation where explanatory variables are highly correlated. There are two measures that are often suggested to test the existence of multicollinearity. These are: Variance Inflation Factor(VIF) for association among the continuous explanatory variables and Contingency Coefficients (CC) for dummy variables.

Thus variance inflation factor (VIF) is used to check multicollinearity of continuous variables. As R^2 increase towards 1, it is a colinearity of explanatory variables. The larger the value of VIF, the more troublesome or collinear is the variable Xi. As a rule of thumb if the VIF greater than 10 the variable is said to be highly collinear (Gujarati, 2003). Multicollinearity of continuous variables can also be tested through Tolerance. Tolerance is 1 if Xi is not correlated with the other explanatory variable, whereas it is zero if it is perfectly related to other explanatory variables. A popular measure of multicollinearity associated with the VIF is defined as

$$VIF(X_j) = (1 - R_j^2)^2 \quad \text{.....(10)}$$

Where, R^2_j is the multiple correlation coefficients between explanatory variables, the larger the value of R^2_j is, the higher the value of VIF (Xj) causing higher collinearity in the variable (Xj).

Contingency coefficient is used to check multicollinearity of discrete variable. It measures the relationship between the raw and column variables of a cross tabulation. The value ranges between 0 - 1 , with 0 indicating no association between the raw and column variables and value close to 1 indicating a high degree of association between variables. The decision criterion (CC < 0.75) is that variables with the contingency coefficient is computed as follows

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

Where, CC is contingency coefficient, χ^2 is chi-square test and N is total sample size.

As cited in Paulos (2002), if the value of CC is greater than 0.75, the variables are said to be collinear. Statistical package STATA 12 was used to compute both VIF and CC. In order to explain farmer's teff and wheat market participation, continuous and discrete variables were identified based on economic theories and the findings of different empirical.

3.5.1.3. Model Specification of Wheat Producer Household Market Outlet Choice

Models, which include a "yes" or "no" type dependent variable, are called dichotomous. Such models approximate the mathematical relationships between explanatory variables and the dependent variable that is always assigned qualitative response variables. The four most commonly used approaches to estimate dummy dependent variable regression models are the

linear probability model (LPM), the logit, the probit and the tobit model. They are applicable in a wide variety of fields (Gujarati, 2003). The probability model, which expresses the dichotomous dependent variable (Y_i) as a linear function of the explanatory variables (X_i), is called linear probability model (LPM). LPM has some econometric like non normality of the disturbances (U_i), heteroscedastic variances of the disturbances, non-fulfillment of $0<E(Y_i/X_i) <1$ and lower value of R^2, as a measure of goodness of fit. Therefore, linear probability model is not appropriate to test the statistical significance of estimated coefficients (Gujarati, 2003). The logit and probit models will guarantee that the estimated probabilities will lie between logical limit 0 and 1.

The market outlets have been categorized into four groups: wholesaler, cooperatives local collectors and consumer market outlets. Each farmer can use one or more marketing outlets or several combinations of different outlets which maximize the expected utility and due to this there is some overlapping and many farmers sell on more than one market outlet. This is to mean that farmers do not sell wheat permanently to the particular market outlet and use the available market outlets alternatively in the absence or presence of the possible choices. Since farmers may market their wheat via multiple outlets, the multinomial logit model would be infeasible due to the resultant very large number of possible choices.

The relative risk of selecting one outlet can be affected by the relative risk of the selecting the other and violate the Hausman assumption of Independence of Irrelevant Alternatives (IIA) in multinomial logit model. If simultaneity in decision-making exists, this approach yields biased, inefficient and inconsistent estimates (Maddala, 1983; Greene, 2003). Thus, the decision of choosing market outlets is inherently multivariate and attempting univariate modeling excludes useful economic information contained in interdependent and simultaneous choice decisions. Failure to capture unobserved factors and inter-relationships among choice decisions regarding different market outlets will lead to bias and inefficient estimates (Menale *et al*.,2012).

The multivariate probit model takes into account the potential interdependence in market outlet choices and the possible correlation in the choice of alternative outlets. The probability of preferring of any particular market outlet is estimated conditional on the choice of any other related outlet. The multivariate probit model assumes that each subject has distinct binary responses, and a matrix of covariates that can be any mixture of discrete and continuous variables. The multivariate probit model assumes that given a set of explanatory

variables the multivariate response is an indicator of the event that some unobserved latent variable falls within a certain interval.

This model simultaneously incorporate a set of explanatory variables on choice of market outlets, while allowing for the potential correlations between unobserved disturbances as well as the relationship between the choices of deferent market outlets Veugelers R, et al. (2004). The multivariate probit is an extension of the probit model (Greene, 2003) and is used to estimate several correlated binary dependent variables jointly. In the study area, small holder wheat producers face deferent choices of market outlets like: wholesalers, collectors, retailers, cooperatives and farmers. Thus, in this study since wheat is one of the cash crops that enable producers to choose more than one outlets that are not mutually exclusive to get better price. Considering the possibility of simultaneous choices of outlets and the potential correlations among these market outlet choice decisions multivariate probit model is appropriate and is applied to capture household variation in the choice of market outlets and to estimate several correlated binary outcomes jointly. The observed outcome of market outlet choice can be modeled by the following random utility formulation.

Following the literature, the researchers concluded that a producers' decision to sell in an advantageous market derives from the maximization of profit he or she expects to gain from these markets. Econometric models such as multivariate probit/logit, multinomial probit/logit, conditional or mixed, or nested logit are useful models for analysis of categorical choice dependent variables. A number of studies have been done that have revealed factors influencing marketing channel choice decisions. A study by (Bongiwe and Micah ,2013), (Atsbaha, 2015), (Bezabih et al. 2015) and (Kifle et al. 2015) used multinomial logit model in an attempt to determine factors affecting producers' market outlet choice. Whereas (Djalalou et al. 2015),(Addisu , 2016), and (Shewaye , 2016) employed multivariate probit model to analyze factors affecting producers' market outlet choice. Multinomial models are appropriate when individuals can choose only one outcome from among the set of mutually exclusive, collectively exhaustive alternatives.

However, in this study, producers' market outlet choice are not mutually exclusive, considering the possibility of simultaneous choices of outlets and the potential correlations among these market outlet choice decisions. Therefore, based on the empirical studies reviewed, multivariate probit model is to be adopted for this study to estimate several correlated binary outcomes jointly because it simultaneously capture the influence of the set of explanatory variables on each of the different outlet choices, while allowing for the

potential correlations between unobserved disturbances, as well as the relationships between the choices of different market outlets (Greene, 2012).

$Y_{im}=\beta_m x_{im} + \varepsilon_{im}$

Where Y^*_{im} (m=1...k) represent the unobserved latent variable of market outlets chosen by the i^{th} farmer (i=1…n).

Therefore, in this case k = wholesaler, cooperatives, local collector and consumer outlets, Xim is a 1 x k vector of observed variables that affect the market outlets choice, βm is a k× 1 vector of unknown parameters to be estimated, ε_{im}, m = 1,…, M are the error terms distributed as multivariate normal, each with a mean of zero, and variance-covariance matrix V, where V has values of 1 on the leading diagonal and correlations (Cappellari and Jenkins, 2003)

$Y_1^*=x_1 \beta_{1+} \varepsilon_1$ $Y_1=1$ if Y_1^* is > 0, $Y_1=0$ other wise

$Y_2^*=x_2 \beta_{2+} \varepsilon_2$ $Y_2=1$ if Y_2^* is > 0, $Y_2=0$ other wise

$Y_3^*=x_3 \beta_{3+} \varepsilon_3$ $Y_3=1$ if Y_3^* is > 0, $Y_3=0$ other wise

$Y_4^*=x_1 \beta_{4+} \varepsilon_4$ $Y_1=1$ if Y_4^* is > 0, $Y_4=0$ other wise

This system of equations is jointly estimated using maximum likelihood method. There are six joint combinations of preferring and not preferring each of the four market outlets. The probability that all four market outlets have been preferred by household 'i' is

$Pr(y_{1i}=1, y_{2i}=1, y_{3i}=1, y_{4i}=1)= Pr(\varepsilon_{1i}\leq\beta_1 x_{1i}, \varepsilon_{2i}\leq\beta_2 x_{2i}, \varepsilon_{3i}\leq\beta_3 x_{3i}, \varepsilon_{4i}\leq\beta_4 x_{4i}) =$

$Pr(\varepsilon_{4i}\leq\beta_4 x_{4i}/\varepsilon_{3i}\leq\beta_3 x_{3i}/\varepsilon_{2i}\leq\beta_2 x_{2i}, \varepsilon_{1i}\leq\beta_1 x_{1i}$ x $Pr(\varepsilon_{3i}\leq\beta_3 x_{3i}/\varepsilon_{2i}\leq\beta_2 x_{2i}/\varepsilon_{1i}\leq\beta_1 x_{1i}$ x $Pr(\varepsilon_{1i}\beta_1 x_{1i})$

3.5.1.4. Model Specification of Factors Affecting Participation in Value Addition

The econometric part of the analysis uses a proxy variable showing that whether a household is engaged in wheat value addition or not. The following specification is set in Gujarati and Porter, (2009) and Madalla (1992) the dependent variable of Logit model takes binary response, i.e., y = 1 if a given farm household is add value to the wheat product and y = 0 if not. In terms of probability, it can be written as;

P (yi = 1) = P_o

P (yi = 0)= 1- p_o

This simply shows that the probability that a given household are add value to wheat production is Po and the probability that it is no value added is 1-P_o. This can written in equation form of Logistic distribution as

$$P_o = \frac{e^{(\beta o+\beta 1X1+ \beta 2X2+\cdots+ \beta iXi)}}{1 + e^{(\beta o +\beta 1X1 + \beta 2X2+\cdots \beta iXi)}}$$

$$P_o = E(yi = \frac{1}{Xi}) = \frac{1}{1+e^{-(\beta o+ \sum \beta iXi)}}$$

Where Po is the probability, e is an irrational number (2.718), β_o the intercept term and β_i are the coefficient of the predictors X_i. In reality P_o is unobserved variable, but instead we see the proxy variable y_i taking the values $y_i = 1$ if the person Add value to wheat output and $y_i = 0$ if the person not add value to wheat output.

$$P= yi = \frac{1}{Xi}) = \frac{e^{\beta o+\sum \beta iXi}}{1+e^{\beta o+ \sum \beta iXi}}$$

The above equation is expressed in terms of event probability, i.e., the probability that $y_i = 1$ occurs. The non-event probability can be easily be derived from the equation. Since y_i takes only 0 and 1, the probability of $y_i = 1$ and $y_i = 0$ should sum up to 1. Therefore the non –event probability was;

$$P = yi = \frac{0}{Xi}) \ = 1 - yi = \frac{1}{(yi= \frac{1}{Xi})}$$

$$P_o = E(yi = \frac{0}{Xi}) = \frac{1}{1+e^{\beta o+\sum \beta iXi}}$$

By taking the above two equations the terms of odds (probability ratio) can simply written as;

$$\frac{P\left[yi = \frac{1}{Xi}\right]}{P\left[yi = \frac{0}{Xi}\right]} = \frac{P[yi = \frac{1}{Xi}]}{1 - [yi = \frac{1}{Xi}]} = \frac{[\,1 + e^{\beta o+\sum \beta iXi}]\,[e^{\beta o+\sum \beta iXi}]}{[1 + e^{\beta o+ \sum \beta iXi}]} = e^{\beta o+ \sum \beta iXi}$$

The equation is simply the odds in favor of value add to wheat output i.e., the ratio of probability that a given household is the one added value to the probability that is no value added. Equation can be linearized by taking the natural logarithms as;

$$Yi= ln[\frac{p(yi=\frac{1}{Xi}}{1-(yi =\frac{1}{Xi}}] = \beta o + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta nXn$$

Yi is simply the logs odd ratio, which is linear in Xs. Generally for estimation purpose the logit model simply written as;

$$Yi = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots \beta_n X_n + U_i$$

Where, Y_i is dependent variable, X_i's predictors, β_i's are coefficient of predictors X_i, i stands for households and, u_i is error term.

Dependent Variable

#1 Quantity of wheat supplied to the market: It is dependent variable which represents the amount of wheat actually supplied to the market by household in the year 2021/22 which is measured in quintals.

#2 Market Outlets: This is a binary dependent variable measured by the probability of farmers sell their wheat to either of the alternatives market outlets**..** In this regard, producers are expected to choose the best outlets through which they sell their products depending up on various criteria. It was represented in the model as Y_1 for those households who choose to sell wheat to Wholesalers, Y_2 for producers who choose cooperatives, Y_3 for producers who choose local collector and Y_4 for producers who choose consumer Thus, the model assessed the effects of various independent variables on the odds of the four wheat market outlets.

#3 Factors affecting value addition: It is dependent variable which represents whether the farmer participates in value addition or not.

Independent variable

Age of household head: It is a continuous variable measured in years. Aged households are believed to be wise in searching markets which provide high price. In the current study, age of household head was expected to influence wheat market supply, market outlet choice and the participation in value addition positively.

Sex of the household head: It is a dummy variable taking a value of 1 if the household head is male and 0 otherwise. Male farmers have more resource for transportation and time to sell their wheat product to markets even when the markets are far away from their residence.

Therefore, the sex of the household head (being male) was expected to influence wheat market supply, market outlet choice and the participation in value addition.

Education Level: It is a category variable (to incorporate the illiterate and read, and write) that refers to the number of years schooling the household head attended. Educated household heads are expected to have better skill, better access to information and to make better use of

their available resources. Thus, the education level of the household head was expected to influence wheat market supply, market outlet choice and the participation in value addition positively.

Family size: It is a continuous variable measured in terms of active force labour. The availability of an active labour force in a household is assumed to affect the household's decision in market supply, market outlet choice and the participation in the value addition. Therefore, it is hypothesized that the higher family size of the household head was expected to influence wheat market supply, market outlet choice and the participation in value addition positively.

Farming Experience*:* This is a continuous variable, measured in terms of the number of years of experience the households had in wheat farming. Farmers with longer production experience are expected to have more knowledge of market supply, market outlet choice and the participation in the value addition. Therefore, it is hypothesized that the higher farming experience of the household head was expected to influence wheat market supply, market outlet choice and the participation in value addition.

Frequency of Extension contact*:* It is a continuous variable, measured in terms of number of visits per year made by the extension service. It is expected that wheat extension service widens household knowledge with regard to use of improved wheat technologies. Hence, it is hypothesized that frequency of extension contact affects the likelihood of wheat market supply, market outlet choice and the participation in value addition.

Access to market information: This is a dummy variable that takes a value of 1 if a household head has access to market information and 0 otherwise. It is believed that farmers with market information will make an informed decision regarding market supply, market outlet choice and value addition. Therefore, it is hypothesized that the access to market information of the household head was expected to influence wheat market supply, market outlet choice and the participation in value addition positively.

Membership to Cooperative*:* This is a dummy variable that takes a value of 1 if a household head is a member of agricultural cooperatives and 0 otherwise. Membership of a cooperative can also contribute towards reduced transaction costs and strengthen farmers' bargaining power through networking and the provision of up-to-date information to members. Therefore, membership to cooperative is hypothesized to influence wheat market supply, market outlet choice and the participation in value addition.

***Distance from nearest market**:* This is a continuous variable, measured in km from the nearest market the household used to sell their produce. The farther away a household is from the market, the more difficult and costly it would be to get involved. Hence, distance from the nearest market is hypothesized to affect the likelihood of wheat market supply, market outlet choice and the participation in value addition negatively.

Access to credit: This is a dummy variable which takes a value 1 if the farmer obtains credit from financing institution operating in the area, 0 otherwise. Access to credit is hypothesized to influence wheat market supply, market outlet choice and the participation in value addition.

Amount of wheat produced: This is a continuous variable measured in terms kilogram of wheat production by the household. It is hypothesized that amount of wheat produced was expected to influence wheat market supply, market outlet choice and the participation in value addition.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

Under this chapter, the major findings of the study were presented. Hence, both descriptive statistics and econometric methods were used to analyze the primary data. The descriptive statistics were hired to describe the demographic characteristics of sample farmers and traders. And also the Econometric models were used to detect factors affecting volume of wheat supplied to market and factors affecting wheat market outlet choices in the selected study area.

4.1. Descriptive Statistics

4.1.1. Demographics and Socioeconomics Characteristics of Households

There are a number of Variables used to describe demographic characteristics of sample farmers. These demographic characteristics of the households have the impacts on the wheat chain value. These variables used to describe demographic characteristics of sample farmers were Age, Sex, Educational level, marital status, and family size. The results presented in Table 2. depicts that 86.51% and 13.49% of the respondents were Male and Female Households respectively. With regard to marital status of the sample households, the results of the study indicated that 1.27% of them were single, 93.64% of them were married, 3.31% widowed and 1.78 % was divorced.

Table 2: Demographic and socioeconomic characteristics of respondents

Variables		Frequency N=393	Percent N=393
Sex	Male	340	86.51
	Female	53	13.49
Education Level	Illeterate	28	7.12
	Read and Write	59	15.01
	Primary(1-4)	147	37.40
	Junior(5-8)	103	26.21
	Secondary(9-10)	51	12.98
	Preparatory(11-12)	5	1.27
Marital Status	Single	5	1.27
	Married	368	93.64
	Widowed	13	3.31
	Divorced	7	1.78
Age	Mean	47.59 (12.82).	
Family Size	Mean	6.38 (3.02).	

Stata Outputs from the survey Data

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Sex HH	393	1.13	0.32	1	2
Edu HH	393	2.95	1.39	1	7
Marital Status	393	1.08	0.37	1	4
Age	393	47.59	12.82	24	86
Family Size	393	6.38	3.02	0	13

Source: Own computation, 2022

Age is the main factor on wheat value chain analysis. Hence Age is one of the important characteristics of the community. It can affect the value chain analysis of wheat. It imitates on the productivity of the population as it has an attitude on the overall health situation within the community. When we see in developing countries, aged members are more disposed toto diseases and thus are less productive. It has a way on the employment pattern, spatial mobility and quality of work done. To conclude, Age plays a significant role in any kind of business, particularly in agriculture, because the use of child labor on the farms is quite high. In this study, the maximum and minimum age of the respondent was 24 and 86 years respectively with mean age of 47.59 years and standard Deviation 12.82.The result showed that wheat production and marketing performed by economically active group. The age group between 15 and 60 years are considered as economically active age group in many findings (Melaku, 2005).

Education is very important instrument in influencing farmer's productivity in many ways. The educational level of the household head can influence how he or she outlooks the new

technologies and new ways of doing business. So, Educational level can affect technology adoption decision in the society. Education can also contribute to decision-making processes that alter the paths people take in life. Under this study, Educational level of the sample household heads in the study area ranges from illiteracy to tertiary levels.

Better educational background of farmers is believed to have positive impact on their readiness to accept new ideas, innovations and technology than uneducated ones. In this regard from the sampled households, 7.12%, those who can read and write were 15.01%, those who were at primary, junior, secondary and preparatory educational levels were 37.40%, 26.21%, 12.98% and 1.27% respectively.

There were different living styles of the society living in the rural areas of the studied Districts. These societies are exercising mainly different Agricultural activities. The rural household living relies on agriculture. Hence, the livelihood of rural farm households mainly relies on agriculture which requires more labor for various activities like land preparation, planting, weeding, cultivation, harvesting, threshing, animal keeping, fetching water and fire wood collection and so on. The family size with age composition is important to carry out different agricultural activities. The average family size in the study area was 6.38 with standard deviation of 3.02.

4.1.2 Farming Experience of the Farmers Households

The farming experience in the District varies among respondents. The average year of farming experience for total sample households were 23.60years with a standard deviation of 12.63 and minimum of 1 and maximum 58 years.

4.1.3. Land Using of the Farmer Households

Land is the natural resource that the life of all living things relies on. Land is the most important asset for the farmers. And also Land is perhaps the single most important factor of production and measure of wealth in the selected study area. It is the main source of income and increases the status of people in the community. From the undertaken study, the average land size of respondents was 3.87hectares (Table 3). And also the average rented in and out land for household was 0.19and 0.16hectare respectively. Both the minimum and maximum size of landholding of the respondent farmers was 0.8 and 10.0 hectares respectively. From it out of the total land, the respondents allocated most of their plots for wheat production, which was an average of 2.98 hectare on average out of total holding, since the area is known as

wheat belt of the country. All of the sample respondents indicated that they are participating in wheat production activity.

In Sinana District, in addition of wheat cultivation different crops were grown by farmers. For example Crops like barley, teff, maize, faba bean, field pea, emmer wheat and potato are the major ones.

Table 3. Land holding

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Total Area of Land of Household	393	3.89	1.27	0.8	10
Total Area Rented in Land	393	0.19	0.51	0	2.8
Total Area Rented Out Land	393	0.16	0.47	0	2.5
Total Area Sherd In Land	393	0.28	0.68	0	3
Total Area Sharedout Land	393	0.20	0.58	0	3
Total Area Allocated land in 2021	393	2.98	1.02	0.5	8
Grazing Land	393	1.87	0.34	1	2
Size of Grazing Land	393	0.14	0.38	0	2

Source: Own computation, 2022

4.1.4. Access to services of the farmers Households

Access to improved input would help to increase production and productivity of wheat and other crops. In the study District, farmers stated that they are using inputs like commercial fertilizers (DAP and Urea), improved and local seeds.

Institutional services are required and vital to increase agricultural productivity and enable farmers adopt new technology, increase production and provide timely information. Extension services, input availability and access to credit are among the institutional services which support farmers in boosting productivity and production. Rural Community requires different services to address their living activities. The government also prepared different strategies to provide these services to the rural communities to transform their living standards. Provision of adequate services for the communities improves the communities' socioeconomic development in general and the well-being of individuals in particular. It has important contribution in improving production and productivity and thereby increasing marketable surplus and ultimately for increasing the income of smallholder farmers.

There are a number of services the government is providing to the society. Among these, the most important services that are expected to encourage production and marketing of wheat in the study area include access to extension service, access to credit and access to market information.

4.1.4.1. Access to extension services

In the Recent two Decades, Extension service program have been emerged in our country to support farmers. This is the most valuable programs for the farmers to increase production and productivity. So, Extension service in agriculture is vital and it provides assistance for farmers in improvement of production and productivity. It also enables flow of information and transfer of knowledge and scientific findings to practice. Access to agricultural information services makes farmers to be aware of and get better understanding and eventually leads to decision to take risk for improved agricultural practices. It helps in spreading new innovations and ideas that emerges from research findings and improves better understanding of technologies that benefit farmer's production and productivity. In addition, access to agricultural extension services helps to facilitate spreading and adoption of improved technologies and ensure the local availability of these technologies for the majority of smallholders.

Recently, in Ethiopia the government has been trying to fill the required knowledge and achieve food self-sufficiency in the country by placing in each Kebele administration three development agents (DAs) and building a farmer training center (FTC). These Development agents are assigned as better source of extension services for farmers at kebele level that strengthens severe method of extension work. However, some development agents exposed that district level managers from different streams influenced them to do different activities out of agricultural extension professionally. Hence, the key informant discussions pointed out that some development agents have no time to deliver technical advice to farmers sufficiently. The result in Table 4 below indicated that 93.64% of respondent farmers have access to agricultural extension services.

Table 4: Access to agricultural extension services

Name of Kebeles	Total Number Of Households/kebeles	Who have access to Agricultural Extension Service (N=393)	Percent
Ilu Sambitu	106.00	98	92.45
Obera	139.00	132	94.96
Besaso	60.00	56	93.33
Shallo	88.00	82	93.18
Total	**393.00**	**368**	**93.64**

Source: Own computation, 2022

4.1.4.2. Access to Market and Market Information

Information is a vital resource for the farmers to address their goals. This information requires the availability of some sources. Market information is mostly said to be more perishable than the commodity itself. Access to timely and accurate market information is the basic element not only in sesame but also other commodity marketing (Kindie, 2007). The amount of marketed surplus primarily depends on access to market information and the willingness and ability of farmers to use the information. The role of market information in decision making process is to reduce risks and uncertainties related to market and enable farm households to make the right decision in sales and price of the product produced and inputs used in the production process.

Access to market information is extremely limited in the Ethiopian grain market. At the producer level, farmers have very limited information on price prevailing even in nearby markets (Wolday, 1994). It is assumed that producers and traders with access to market information can make better decision on how much to produce and sold to the market.

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

From this study, access to price information and source information of respondents in Table 5 showed that the major source of information was friends/neighbour farmers, which is 37.15%. About 61.83% and 31.55% of the respondents can get market information from radio and traders respectively.

Additionally development agents and television helped as sources of information by serving about 30.03% and 31.3% respondents respectively. Market bulletins and message blackboards was source for only 6.11% and 0.76% of respondents respectively.

Table 5: Sources of market information for respondents

Source Category	Sources of information	Number of Respondents	Percent(%)
Personal/professional Networks	Friends/Neighbor	146	37.15
	Traders	124	31.55
	Development Agent	118	30.03
	Others	5	1.27
Public information System	From market bulletins	24	6.11
	Radio	243	61.83
	Television	123	31.30
	Message blackboards at mraket Places/EXC Board	3	0.76

Source: Own computation from survey data, 2022

4.1.4.3. Access to credit

Providing credit services to farmers will support to increase their product and productivity. The access of credit is available differently in different places. The availability of financial sources for credit is important for farmers. Farmers use this credits for different fulfilling different gaps in agricultural activities. Some farmers are using as an important input for agricultural activities. In this study, the result shows that 90.59% of respondents have access to credit (See Table 6). However, only 13.23 % of the respondents have taken credit from the available sources in the study area. Some factors that obstruct farmers from taking credit in study area were high price interest rate, fear if inability to repay, lack of collateral, Religion, No Services and self-sufficiency. The credit source for these farmers was Banks, Saving and credit Association, cooperatives, local money lenders and NGOs. Mostly, the credit provision is based on group collateral but farmers are not much interested in this approach in order not to pay for defaulters in their group. This the main obstacle to farmers in receiving credit.

Table 6: Credit Services

Name of Kebeles	Total Number Of Households/kebele	Cooperative	Bank	NGOs	Local money Lender	Saving and credit Association	Others	Total %
Ilu Sambitu	106.00	10.38	24.53	4.72	1.89	46.23	0	87.74
Obera	139.00	12.23	25.90	2.16	3.60	48.20	1.44	93.53
Besaso	60.00	8.33	23.33	5.00	1.67	50.00	0	88.33
Shallo	88.00	6.82	19.32	6.82	2.27	54.55	1.14	90.91
Total	**393.00**	**9.92**	**23.66**	**4.33**	**2.54**	**49.36**	**0.76**	**90.59**

Source: Own computation, 2022

4.1.5. Agriculture Input utilization

There are different inputs used by farmers to increase product and productivity. The most common Inputs used by farmers of the study area are fertilizer, seed, Fungicide, Insecticides, herbicides and pesticides. Mostly, these inputs are supplied to farmers either by cooperative/unions and private traders. Cooperatives and unions are major suppliers of fertilizer for producers in the study area. Government (National Input Supply Enterprise) supplies to the unions with DAP and Urea fertilizers and then the unions can either sell to primary cooperatives, state farm, university, national and international research institutions or sell directly to investors who are engaged agricultural activities. Fertilizer application is one of the most important agricultural practices that are used by wheat growers in the study area. Moreover, proper application of the recommended fertilizer rate is important to obtain the required production and marketable supply. However, farmers in the study area apply varying fertilizer rate, which is below the recommendation rate given by Sinana Agricultural Research Centre.

The recommendation rate given by Sinana Agricultural Research Centre is to apply 100kg of DAP and 50kg of UREA per hectare.

In this study, the survey result indicated that all sample respondents 100% applied DAP (Di Ammonium Phosphate) and only 73.03 % of them used UREA fertilizer on their wheat field. The rate of application was 146.90 and 70.36 kg's on average for DAP and UREA respectively as indicated in table 7 below.

Table 7: Amount of seed and fertilizers used per hectare by the respondents in kilogram

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Improved Seed(Kg/Ha)	393	203.63	43.28	150	350
DAP (Kg/Ha)	393	146.90	26.38	100	200
UREA (Kg/Ha)	393	70.36	26.89	25	150

Source: Own Computation, 2022

The Major pesticides used by respondents of the study area were Natura, Pallas 45-OD, Topic, 2-4D, Tilt, Rexoudo, Mankozeb, Helarate and Bumper. Herbicides and insecticides used by farmers of the study area are supplied by sole proprietors, unions and primary cooperatives.

Unions mostly deal with herbicides and fungicides while sole proprietor and primary cooperative trade in herbicides, fungicides and pesticides. Herbicides are supplied by private companies and unions to sole proprietors and primary cooperatives. They are bought from

within the district, and from importers in Addis Ababa. Unions supply chemicals like 2, 4-D, Pallas, Topic and Tilt from private companies for users in the study area. Primary cooperatives also supply Pallas 45-OD and Topic chemicals for farmers at their kebele level.

Yerosan Pest control, Batu Agro chemical, and Biyolesa private shops which supply different chemicals in the zone were also interviewed. Among these, Batu Agro chemical was a wholesaler in Robe. They were supplying Pallas, 2, 4-D, Topic, Tilt, Rexoudo, Mankozeb, Helarate, Malathine, Bumper and Novofil. Their major suppliers of these chemicals (100%)were private companies in Addis Ababa. The average quantity purchased per year varied among the private shops depending on their capital and availability of the market. Besides selling chemicals, chemical suppliers do other services such as supplying farm implements, vegetable seeds, and advices on chemical application to farmers.

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

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

During the survey respondents were also asked the amount of seed they used per hectare. The result in table 7 depicted that respondent's maximum and minimum use of seed per hectare was 150 and 350kg's per hectare with an average of 203.63 kg. This is almost 1.82 % higher than the recommended rate (blanket) of seed per hectare which is 200kg per hectare for the area. The area calls for further attention and trainings that will save farmers cost and again improve productivity in the area.

4.1.6. Wheat production

Wheat is a cereal crop which is the most important kind grown in temperate countries, the grain of which is ground to make flour for bread, pasta, pastry, etc.Wheat is also a cereal *grain* that yields a fine white flour used chiefly in breads, baked goods (such as cakes and crackers), and pastas (such as macaroni. Wheat is a cereal crop grown for food. Wheat is also used to refer to the grain of this crop, which is usually ground into flour and used to make bread.

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

The result of study indicates that on average respondents allocated 2.98ha for wheat which is 76.71 % of their total average land holding. On average, a farmer household produced 126.39qt and 68.71qt of wheat in Bona and Ganna season respectively. The average productivities of the crop were 42.38qt/ha and 23.04qt/ha in Bona and Ganna seasons respectively.

4.1.7 Nonfarm Participation and Income

In addition to the income incurred from farming activities, there is high supplementary cash demand from nonfarm activities to cover household expenses such as education, clothing, social contributions (EDIR), tax, Tractor rental expenses, purchasing of cattle, cost of health service, and other emergency needs. To spend for these expenses, the households residing in the District participated in nonfarm activities like petty trading, grain trade, Land trading, animal trade and other handicrafts.

Out of the total sample households 81(20.61 %) were involved in nonfarm activities. The average annual income earned from the respondents who participated in nonfarm activities was 10250 Birr. The minimum annual income earned from nonfarm activities was Birr 2000 and the maximum was Birr 17500.

4.1.8. Demographic Characteristics of Traders

Age is one of the demographic factors which are useful to describe traders experience and networking. The average age of all sample traders was 43.36 years. With respect to the sex, twenty traders were male and five traders were female. The marital status of traders also shows that all traders interviewed were married. In terms of education most of traders were educated. No one of them was illiterate.

Table 8: Demographic characteristics of trader's respondents

Variables		Frequency N=25	Percent N=25
Sex	Male	20	80.00
	Female	5	20.00
Education	Illeterate	0	-
	Read and Write	0	-
	Primary(1-4)	0	-
	Junior(5-8)	8	32.00
	Secondary(9-10)	12	48.00
	Preparatory(11-12)	5	20.00
Marital St	Single	0	-
	Married	25	100.00
	Widowed	0	-
	Divorced	0	-
Age	Mean	43.36 (7.41).	
Family Siz	Mean	3.56 (1.58).	

Source: Own Computation, 2022

4.2. Analysis of Value Chains

Value chain analysis is a means of evaluating each of the activities in a company's value chain to understand where opportunities for improvement lie. Conducting a value chain analysis prompts you to consider how each step adds or subtracts value from your final product or service.

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

4.2.1. Value Chain Actors and Their Roles

Value chain actors those who participated directly or indirectly in the value chain development of wheat. These actors may participated in either of input provision, production, marketing, processing, consuming or involved the one who involved in participating to the above listed activities. In this study, value chain actors of wheat include direct actors (input suppliers, producers, traders, consumers) and indirect actors are those that provide financial or non-financial support services, such as credit agencies, business service providers, government, cooperatives, researchers and extension agents.

Wheat input suppliers: Input application is one of the most important farming activities that are used by wheat producing farmers to produce wheat and market in the study area. Among other input; seeds, fertilizer, chemicals and farm implements are the major ones that wheat producers used to produce. These inputs were provided by different wheat value actors. Primary cooperatives, agricultural developments office and individuals and private shops are the major input sources in the study area. Cooperative unions of the zone indirectly participated input provision through its branch at district level.

Wheat producers: They are smallholder farmers in the study area who produce wheat for market and/or consumption. Wheat producers are important 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. They are the main actors of the chain by participating both in the product market to supply their output and factor market in purchase basic inputs from input suppliers. Among others activities ploughing, sowing, fertilization; weeding, pest/disease controlling, harvesting, post-harvest handling and marketing are mainly undertaken by wheat farmers.

Collectors: These are actors in the wheat value chain who collects wheat from smallholder farmers in village markets or at the farm gate and reselling it to wholesalers and retailers. Collectors facilitate transaction by serving as an intermediary among wheat producers, wholesalers and retailers. Buying, assembling, transporting, packing and selling to wholesalers and retailers are some of the important activities done by them.

Wheat wholesalers: They are key actors in wheat value chain and participated in buying relatively large volume of wheat from collector or producers and selling it to retailers and consumers and processors. Wholesalers have relatively strong working capital, better storage house, and communication access than any other traders of the study area. They govern the

value chain of wheat in the study area as most of the time they determine quantity, price, and quality of wheat that the upstream and downstream actors are selling or buying from them.

Wheat retailers: Retailers delivers wheat to consumers. They own and handle wheat for a short period and incur relatively small marketing cost to the product. They purchase from collectors and wholesalers at district market and resale it to consumers. They have limited working capital and operate in small scale compared to other wheat traders of the district.

Cooperatives/unions: They play significant role for wheat value chain development by promoting producers to produce more by providing input and buying output at relatively good price. Most cooperatives in the study area located near the market and this helps wheat farmers to become more informative on production and marketing strategy.

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

Wheat processor's: Millers/flour factory are also another wheat value chain actors that process wheat purchased from district cooperatives, and wholesalers and distribute the processed flour to flour wholesalers, retailers, hotels/restaurants, bakers, and also directly to consumers.

Consumers: They are the end actors in wheat value chain. The marketed wheat reaches consumers through direct purchasing from farmers or from wholesalers, retailers, hotels and restaurants as food. Residents of the rural and urban, peoples visiting markets, travelers, etc. are the major consumers of wheat and wheat product in the study area.

Wheat marketing channels

According to Mendoza (1995), marketing channel is the sequence of intermediaries through which whole wheat passes from farmers to consumers. The analysis of marketing channels is intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to the final destination (consumer).

The wheat market channels collected from three markets revealed that there are 11 major marketing channels for wheat marketing which obtained from traders' survey. The estimated volume of production of wheat was 312,675.00 quintals in the year 2021/22 from which about 171,971 quintals of wheat was sold.

The major 11 identified channels are explained below:

Producer – consumer

Producer – retailer – consumer

Producer – collector – retailer – consumer

Producer – collector - wholesaler – retailer – consumer

Producer - commission agents- processor – consumer

Producer - processor – consumer

Producer – collector - wholesaler – processor – consumer

Producer – wholesaler – commission agents- processor – consumer

Producer – wholesaler – processor – consumer

Producer – cooperatives – wholesaler – processor – consumer

Producer – cooperatives – processor – consumer

Structure of the market

The structure 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 characterized using the following indicators: market concentration, the degree of transparency (market information) and entry conditions (licensing procedure, lack of capital and know how).

Degree of market concentration

Wheat market shows concentrated buyers. The analysis of the degree of market concentration was carried in selected three sample markets. Concentration was calculated by taking annual volume of purchased wheat in 2021/22 from sample traders' survey at three markets. The result shows that in three markets wheat traders were relatively concentrated in the hands of few traders (Table 9).

Table 9: Concentration ratio for sample markets

Sample markets	Market share (%)
I	87.41
II	76.2
III	65.4

Source: Own, survey result, 2022

In market I, the four largest traders handled 87.41% of the total volume of purchased wheat. In market II, and market III the four largest traders handled 76% and 65% from the total volume of purchased, respectively. Applying the market structure criteria suggested by Kohls and Uhl (1985), the wheat market shows that strongly oligopolyistic market in all the three sample markets. This suggests that there is market imperfection because a few traders seem to have monopolized the wheat market.

Degree of market transparency

It is widely accepted that, accurate and timely market information enhances market performance by improving the knowledge of buyers and sellers concerning supply and demand. Exclusive access to market information or the control or concentration of information asymmetry and concentration of capital at the disposal of very few traders is important sources of monopoly which affects the nature of horizontal and vertical relations. More balanced knowledge of the markets provides a fair distribution of the gains from efficient market price formation (Timmer *et al,* 1983).

There is system of dissemination of market information. However it is not transparent among wheat traders in sample markets and farmers. In the sample markets, all traders had information through different sources. Wheat traders rely on contact with brokers and other traders to obtain market information regarding price. Moreover, information on price in the nearby market is unevenly distributed among all sample traders indicating that they have access to their information.

Survey result indicated that 34% of the sample traders got price information through the combination of telephone, personal observation and other traders and brokers. About 23% and 19 % of the traders knew price by personal observation and from other traders, respectively. The rest of traders had information through telephone only and through apparent acts of traders interested to buy large quantity of wheat at higher price.

Barriers to entry

Licensing procedure: According to the survey result more than 60 percent of the traders responded that it is easy to get wheat trade license if they fulfill the requirement. In practice, however, this is not the case, as most of the traders operating in the study areas had no trade license; therefore it seems that, there was no restriction to enter in the wheat markets with relation to wheat/grain trading license. In the study area, 83%, and 57% of the retailers and

rural assemblers had license respectively. Wholesalers involved in wheat buying and selling activity were also all licensed. Wholesalers buy wheat and transport to different marketing routes such as Addis Abeba, Shashamane and Adama. However, retailers and assemblers indicated shortage of capital limited them from expanding their business venture.

Traders explained that informal rural collector (which do not own license) were involved in buying and selling of wheat especially during peak production season and high demand time. There is no strong regulatory action that controls non licensed market participant at kebele level and small towns in the district.

Capital: Some of the traders were constrained from receiving credit from micro finance for lack of guarantor and complicated process to get credit. In the survey about 87% (Table 20) of the sample traders respond that major problem to run their business was lack of capital. In interviews, they stated that their greatest constraint is access to finance, which they view as a constraining factor in expanding their scale of operations, achieving greater efficiency, and engaging in the long-term storage needed. In these cases, capital requirement discourage entry into wheat trading.

Even though availability of credit providers was admitted, there was no simplified credit system to solve capital limitation systems faced by retailers. Previously some of them explained that religious beliefs limited them from taking credit but now with the new banking package they are able to take from the interest free baking.

Lack of experience: From survey result more than 50% had been in wheat/grain trading business for more than 5 years. Survey result reveals that, 43%, 35%, 13% and 9% of traders had 1-5, 6-10, and 11-15 and 16-20 years of experience, respectively (Table 10).

The majority of traders found in over all markets that had 1-5 and 6-10 years of experience. There appears relatively high variation within a sample that it is from 2 to 20 years of experience. This may explain that there is no barrier to entry in wheat trade with respect to years of experience.

Table 10: Experience in wheat/grain trading

Years of experience	%
1-5	43.5
6-10	34.8
11-16	13.0
16-20	8.7

Source: survey result, 2022

Conduct of Wheat Market

Market conduct refers to the patterns of behavior that firms follow in adopting or adjusting to the markets in which they sell or buy (Bain, 1968). In thesis conduct of the wheat market is analyzed in terms of the traders' price setting, purchasing and selling strategies.

Trader's price setting strategy

The method of price formation is critical in wheat trading. About 57.5% of the sampled traders set purchase price themselves, 15% of them reported that their price is set by market, 12% of the traders set price by negotiation, and the rest reported that the price is set by traders from other market, wholesalers, and brokers. This indicates that the wheat traders had significant role in price setting.

The informal survey result on price setting practice in the three markets shows that small trader especially urban collector collects wheat from small markets and sale to wholesalers. On the market day, in the daytime, wholesalers collect wheat from farmers directly or through their commission agents. Sometimes farmers are forced to sell at whatever price that is set. But collectors have information about current price from wholesalers before they collect wheat from farmers on every market day.

Salling and Purchasing Strategy

Out of the interviewed farmers, majority of them (68.7%) decide to sell their product by assessing market price. The remaining 42.4% of respondents supply to market when they need money for different purposes. All of the respondents confirmed that price was the determining factor which influences them for whom to sell among the buyer outlet choices.

Traders are highly mobile and they purchase from different markets in a week. On average one trader visited more than one market per week (Table 11).

Table 11: Average number of markets visit in a week

Agent	Mean
Commission agent	2.4
Collectors	2.33
Retailer	2.13
Wholesalers	2.00

Source: own survey result, 2022

Performance of wheat market

Marketing margin

Table 12: Marketing margin (birr/kg)

	Marketing channels										
Marketing Margins	I	II	III	IV	V	VI	VII	VII	IX	X	XI
GMMp	100.00	80.7	83.3	87.4	84.16	82.18	77.14	83.85	72.19	77.45	88.17
GMMr	-	1.4	0.9	0.8	-	-	-	-	-	-	-
GMMcol	-	-	0.5	0.4	-	-	0.4	-	-	-	-
GMMcop	-	-	-	-	-	-	-	-	-	0.5	0.6
GMMpro	-	-	-	-	2.0	2.0	1.9	1.8	2.0	1.8	2.0
GMMw	-	-	-	0.5	-	-	0.8	0.7	0.5	0.8	-
GMMca	-	-	-	-	0.3	-	-	0.4	-	-	-
TGMM	0.00	19.3	16.7	12.6	15.84	17.82	22.86	16.15	27.81	22.55	11.83

NOTE: TGMM, GMMp, GMMr, GMMcol, GMMcop, GMMpro, GMMw and GMMca means total gross marketing margin, gross marketing margins for producers, retailers, collector, cooperatives, processors, wholesalers and commission agents respectively.

Table 12 gives an overview of the marketing margin among different actors in different channels. The total gross marketing margin (TGMM) is highest in Channel IX and followed by channel VII which accounts for 27.81% and 22.86% of the consumer's price, respectively. TGMM is lowest in channels XI which accounts 11.83% of the consumer's price and producer's share (GMMp) is highest (88.17%) in consumers' price.

4.2.2 Value chain map of Wheat in Sinana District, Bale Zone

According to McCormick and Schmitz (2002), 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. Consequently, the current value chain map of Wheat in Sinana District, Bale Zone is depicted in (Figure below 5).

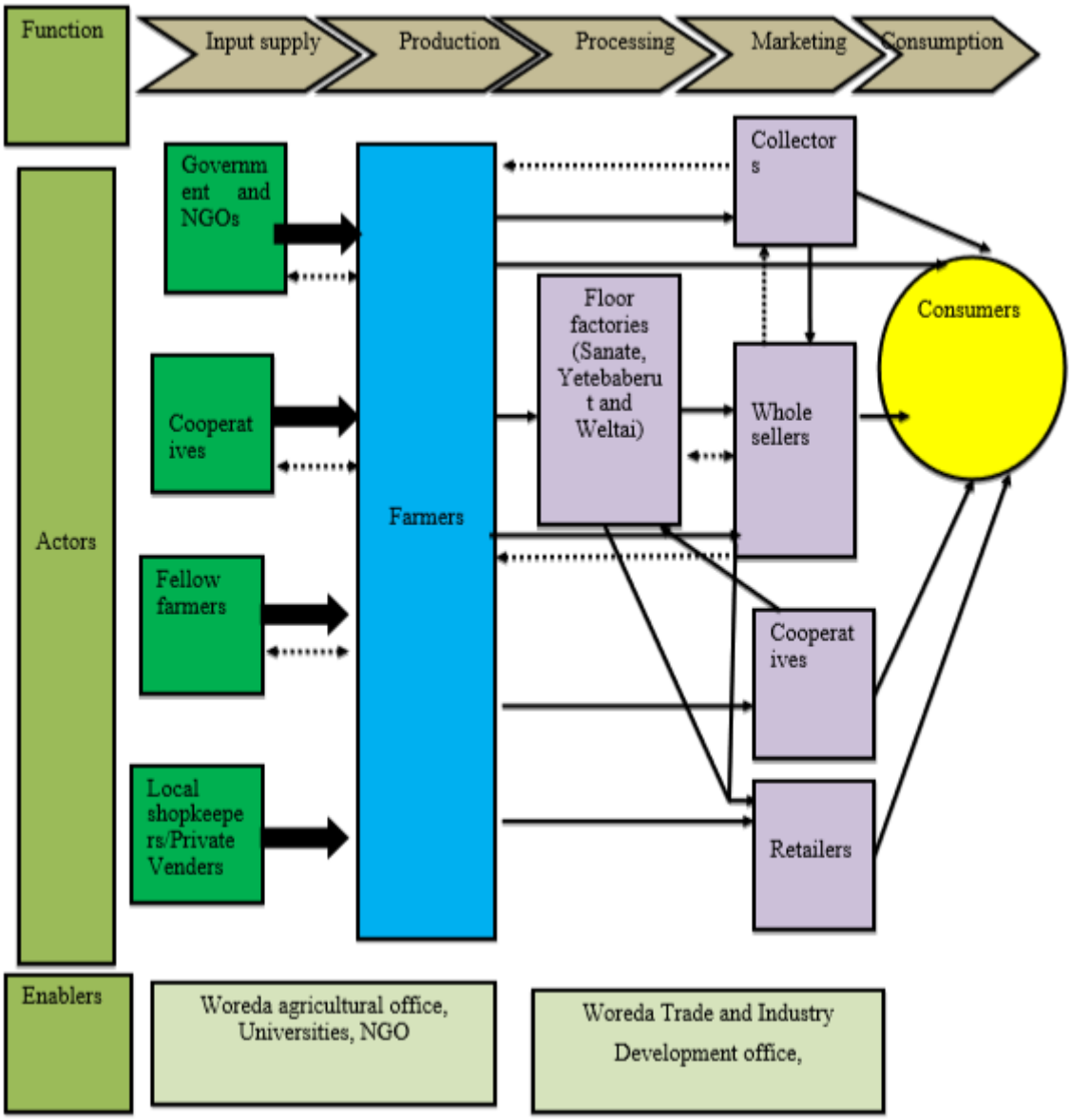

Figure 5: Wheat Value Chain Map of Sinana Woreda

4.3. Major Production and Marketing Constraints

The objective of this section is to highlight some of the more critical problems facing the farmers and traders and to better understand the relative importance of the problems. The major production and marketing problems highlighted by the respondents were shortage of land, fertilizer supply, chemical and seed supply, occurrence of diseases, credit shortage, transport, infrastructure, absence of store and absence of trust between traders.

4.3.1 Major constraints for wheat production

Farmers in study area face numerous challenges in wheat production and other agricultural activities. Among the number of problems, problem related to nature, market, poor quality extension, poor infrastructure, availability of input at time and others. Among these constraints Fungus accounts 46.56%, Weed accounts 9.67%, Shortage of Other inputs accounts 8.91%, Shortage of Improved Variety Seed accounts 8.40%, unavailability of improved Variety Seeds 5.34%, Mono cropping 5.09%, Low yield of wheat 4.33%, High price of inputs 3.56 % and others 1.02%. Among the natural challenges as table 13 below show that shortage of rainfall distribution problem associated drought, Low Soil Fertility and High Rain fall percent of respondent 2.54%, 2.80%, 1.78% respectively were the serious production problems they faced in the 2021/22 crop production season. As the result the land of sampled household face a little soil erosion problem and finally the soil becomes infertile.

Table 13: Major constraints for wheatproduction

No.	Variables	Constraints N=393	percentage of Constraints
1	Fungus	183	46.56
2	weed	38	9.67
3	Monocropping3	20	5.09
4	Sortage of Improved Variety Seed	33	8.40
5	Low Soil Fertility	11	2.80
6	Shortage of Other inputs	35	8.91
7	unavalablity of improved Variety Seeds	21	5.34
8	High price of inputs	14	3.56
9	Low yield of wheat	17	4.33
10	Shortage of Rain	10	2.54
11	High Rain fall	7	1.78
12	Others	4	1.02
	Total	**393**	**100.00**

Source: Own computation, 2022

Addition to the natural problem farmers also struggle with market problem related to low price, Price fluctuation and lack of market information. Therefore from total sampled respondent 74.05 percent, 15.01 percent and 10.94 percent were challenged with low price of wheat product, price fluctuation and market information related to input and output price respectively. Due, to lack of market information most of the farmer have not good barging power of wheat production rather than they simply sell for traders.

Addition to above constraints for wheat production there was number of pests and disease constraints in for wheat production in study area during 2021/22 production season.

Table 14: Market Problem

Variable	No. Of Respondent	percent
Challenged with low price of wheat product	291	74.05
Price fluctuation	59	15.01
Market information	43	10.94
Total	393	100.00

Source: Own Computation, 2022

Higher fertilizer price and delayed delivery: Application of fertilizer plays an important role for farmers to increase production and productivity. However, price escalation of fertilizer together with limited access to credit has forced farmers to use lower quantity of fertilizer. Besides, untimely delivery of fertilizer by multipurpose cooperatives was also causing a serious challenge to the farmers. This resulted in lowering yield and marketed surplus. About 40.97 % of the respondents stated their major production problem was high fertilizer price and delayed delivery. In addition to this, shortage of fertilizer, shortage of chemicals and shortage of improved seed was 21.63%, 31.30% and 6.11% respectively.

Table 15: Production Constraints

Variables	No. of Respendent N=393	Percentage
High fertilizer price and delayed delivery	161	40.97
Shortage of supply of Fertilizer	85	21.63
Shortage of supply of improved seed	24	6.11
Shortage of supply of chemicals	123	31.30
Total	393	100.00

Source: Own Computation, 2022

Limited credit access: Availability of credit is the major source of cash for farmers to finance for agricultural inputs needed to increase production and marketed surplus of wheat. However, only few of the respondents stated they had accessed to credit from formal sources. Because of financial constraint, farmers were forced to use input below the recommended rate that would impact the amount produced and marketed surplus.

Prevalence of crop diseases: Prevalence of disease was one of the production problems encountered by farmers in the study area. Occurrence of rust was the major problem stated in the study area because of prolonged rain. About 46.56 % of the respondents stated their major production problem was occurrence of diseases specially wheat rust.

Seed supply: Farmers in the study area access local wheat seed from their own source and through exchange from other farmers. Improved wheat seeds like Dekeba, Hidasie by east Africa agricultural productivity program, Kingbird, Ogolcho, Dendea, Huluka and Digalu by Oromia region research institute were supplied to wheat producers in the *Woreda.*

During the discussion with farmers they complain that there was delay in time of delivery for improved wheat seeds by the *District*. About 8.4 % of the respondents stated that their major production constraint was related to improved seed supply.

Shortage of farm land: Access to sufficient land is very crucial for more wheat production and marketed surplus. During the discussion with respondents, they stated that they were constraining with shortage of land. They produce wheat through renting extra land from other farmers which is called "Yeguto" in which the producer and the land renter shared the produce equally. About 37.66 % of the respondents in the *District* stated that their major production constraint was shortage of farm land.

4.3.2 Marketing Constraints

Transport problem: Access to transport is an important factor for marketed surplus. In the study *District* farmers took their produce to the market by using Cart, Back animals and their backs using *Zembil* particularly for females. Absence of back animals constraints the amount of bread wheat supplied to the market. About 70.23 % of the respondents stated that the major marketing problem was absence of transport facilities from their home to the market.

Scaling problem: Farmers in the *District* practiced selling of their produce using a local scaling material called *Tono*. Traders especially collectors used to buy and sell grain by using such local scaling material. They had two types of local scaling material one is bigger and the other is the smaller and the usually bought with the bigger one from farmers and sold it to the consumer or other traders with the smaller one. The Other form of scaling is called *Mizan* which is the modern measurement instruments. Using this also has some cheating during measurement. So, the sampled respondents stated that their major marketing problem was related to scaling.

4.3.3 Traders' Marketing Constraints

The major marketing problems sample traders faced in the study area were infrastructure, storage problem, theft and access to credit. As depicted in the table 16, about 61.32% of the traders reported that their major marketing problem was infrastructure problem specially road, 9.92% of the traders stated that absence of storage in towns constraints to get license from the *District* to expand their business, about 2.29% of the respondents stated that theft was their major problem, about 5.60% of the respondents stated that absence of trust was the challenges to Trade wheat and 20.87% of the respondents stated that getting credit to implement wheat trading was a challenge. Banks demand collateral in fixed assets to lend money for the traders.

Table 16: Rank of wheat marketing constraints for traders

Variable	No. of Respondents N=393	Percentage
Infrastructure	241	61.32
Access to Credit	82	20.87
Storage problem	39	9.92
Absence of trust	22	5.60
Theft	9	2.29
Total	393	100.00

Source: Own Computation, 2022

4.4 Econometrics Model Results

4.4.1. Factors Affecting Market Supply of Wheat in Sinana Woreda

Prior to running the OLS regression model, all the hypothesized explanatory variables were checked for the existence of multi-co linearity problem. The study used Variance inflation factor (VIF) to investigate the degree of multi-collinearity among continuous explanatory variables and contingency coefficient (CC) among discrete (dummy) variables. All VIF values are less than 10. This indicates absence of serious multi-collinearity problem among continuous independent variables (Table 17).

Table 17: Variance inflation factor for continuous independent explanatory variables

Variables	VIF $(1-R^2)^{-1}$	Tolerance
Age	1.116	0.896
Family Size	1.160	0.862
Farming Experience	1.192	0.839
Frequency of extension contact	1.781	0.561
Distance from nearest market	1.263	0.792
Amount of Wheat produced	1.158	0.864

Source: own computation, 2022

Contingency coefficient results indicated absence of serious multicollinearity problem among the independent dummy variables (Table 18).

Table 18: Contingency coefficients for dummy variables

	Sex	Education	Acss. Market information	Membership to coopert.	Acss. to credit
Sex	1				
Education	.327	1			
Acss. Market information	.093	.189	1		
Membership to cooperatives	.090	.152	.140	1	
Acss. to credit	.171	.235	.003	.061	1

Source: own computation, 2022

Since there is heteroscedasticity problem in the data set, the parameter estimates of the coefficients of the independent variables cannot be BLUE. Therefore, to overcome the problem, Robust OLS analysis with heteroscedasticity consistent covariance matrix was estimated. The overall goodness of fit of the regression model is measured by the coefficient of determination (R^2). It tells what proportion of the variation in the dependent variable, or regress and, is explained by the explanatory variable. R^2 lies between 0 and 1, the closer it is to 1, and the better is the fit. Hence, the independent variables included for analysis explained 93.03% of the variation in dependent variable.

Table 19: OLS results of factors affecting wheat market Supply

Variables	Coefficient	Robust SE
Age of household head	0.14	0.12
Sex of household heads	0.05	0.32
Educational level	0.06***	0.02
Family size	0.14	0.11
Farming experience	0.25***	0.07
Frequency of extension contact	0.3***	0.8
Access to market information	0.034***	0.01
Membership to Cooperatives	0.03	0.02
Distance from nearest market	-0.04	0.03
Access to credit	4.466**	1.766
Amount of wheat produced	0.14***	0.03
Constant	6.51***	2.3

Note: ***, ** and * are significant at 1%, 5% and 10% level of probability, respectively.

Source: Own survey data (2022)

Education level: Education has a positive relationship with the amount of wheat delivered to market at a 1% significance level. Table 19 shows that as the level of educational grade attended by the household's increases, the market supply of wheat produce increases. Higher education levels can enhance the ability of an individual to upgrade and synchronize high input grain supplies with the appropriate market place and time, thus increasing total market supply.

Farming experience: This variable influenced wheat market supply in a significant and positive way. The result showed that as farmers' experience increased by a year, the amount of wheat supplied to the market increased by 0.25 quintals, while all other factors remained constant. This means that farmers with more wheat production and marketing experience are better able to sell more wheat products in the market than farmers with less experience because they have a larger marketing network and more information.

Frequency of extension contacts: The result showed that wheat frequency of extension contacts has significance effect at 1% significant level for wheat quantity supplied to market. Positive sign of the coefficient indicates that farmers who are visited frequently increase quantity of marketed supply. Visits by extension agent improve participation and increase the quantity of wheat supply to market. This is in line with previous study conducted by Mohammed et al. (2018) who found that found that frequency of extension contact on volume of wheat supply had significant and positive effect.

Access to Market Information: This result showed that market information has a significant effect on wheat supplied to market at a 1% significance level. As a result, as the farmer's market information increased, the amount of wheat supplied to market increased by 0.034 quintal.

Access to credit: As the multiple regression model result indicates, the variable access to credit had positive and significant influence on volume of wheat supply at 5% significance level. From this result it can be stated that those farmers who have access to formal credit, are more probable to supply marketable wheat than those who have no access to formal credit. In the study area, access to credit is determined by availability of cash on hand. The cooperatives and agricultural Office that distributes improved seed and fertilizer on credit requires a down payment to provide credit. 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.

Amount of wheat produced: The model result in Table 19 showed that amount of wheat produced has significant effect at 1% significance level for wheat supplied to market with expected positive sign. Positive signs of coefficients indicate that as farmers' wheat production increase the probability of market supply increases. Thus, the result implied that, as wheat production increases by one kilogram, the amount of wheat supplied to market is increased by 0.14 kilogram, keeping others factors constant.

4.4.2. Factors Affecting Wheat Market Outlet Choice

Wheat producers in the study had four major types of market outlets via which to sell their wheat. A multivariate probit model was used to analyze producers' channel choice. The p-value of Wald $\chi 2$ (6) = 117.23, Prob> $\chi 2$= 0.0000*** is significant at 1% significance level and indicated that the coefficients of regressors are jointly significant. The value of $\chi 2$ (6) = 29.64, Prob> $\chi 2$ = 0.0001*** implies that the null hypothesis which states the choice of available market channels are independent is rejected and therefore, wheat producers market outlet decisions are interdependent. The likelihood ratio test of the null hypothesis of independency between the market outlet decision $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{32} = \rho_{42} = \rho_{43} = 0$ is significant at 1%. Therefore, the null hypothesis that all the ρ (Rho) values are jointly equal to 0 is rejected, indicating the goodness-of-fit of the model. Hence, there are differences in market selection behavior among farmers, which are reflected in the likelihood ratio statistics.

Separately considered, the ρ values (ρ_{ij}) indicate the degree of correlation between each pair of dependent variables. The ρ_{21} (correlation between the choice for wholesaler and cooperative), and ρ_{31} (correlation between the choice for wholesaler and rural collector), $_{41}$ (correlation between the choice for wholesaler and consumer), ρ_{32} (correlation between the choice for local collector and cooperative markets) are negative and statistically significant at 1% and 5% level respectively and (Table 20).

It can be concluded that farmer that farmers delivering to the wholesaler market are less likely to deliver to cooperative market channel (ρ21). Equally, those involved local collector market outlet are less likely to send their wheat to the wholesaler (ρ31). The likelihood of choosing consumer outlet is relatively low (17%) as compared to the probability of choosing local collector outlet (24%), cooperative outlet (38%) and wholesalers' outlet (49%). The joint probabilities of success or failure of choosing four outlets suggest that households are more likely to choose jointly the four outlets. The likelihood of households to jointly choose the four outlets was 2% which is relatively higher compared to their failure to jointly choose them was (0.37%).

Table 20: Overall model fitness, probabilities, and correlation matrix of market outlet choices from the MVP model

Variables	**Wholesaler**	**Cooperative**	**Local Collector**	**Consumer**
Predicted probability	0.49	0.38	0.24	0.17
Joint probability success	0.02			
Joint probability of failure	0.0037			
Numbers of draws (SML,#draws)	5			
Observation	393			
Log Likelihood	-154.32			
Wald (chi^2 49)	117.23			
Prob>chi^2	0.000***			
	correlation matrix			
	$\rho_1(Y_1)$	$\rho_2(Y_2)$	$\rho_3(Y_3)$	$\rho_4(Y_4)$
$\rho_1(Y_1)$	1.00			
$\rho_2(Y_2)$	-0.369(0.126)***	1.00		
$\rho_3(Y_3)$	-0.485(0.241)**	-0.103(0.041)**	1.00	
$\rho_4(Y_4)$	-0.507(0.233)**	-		1.00

Likelihood ratio test of $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{32} = \rho_{42} = \rho_{43} = 0$; $\chi^2(6) = 29.64$ Prob> χ^2 0.0001;
Values in parenthesis are the standard errors

Sex of the household heads: Sex of the household head had positively influenced the likelihood of choosing a wholesaler and negatively influenced the choice of cooperatives at 1% and 5% levels of significance, respectively. Males most likely have more time to sell and also hold large amount of wheat to sell, and consequently search for wholesalers. However, female households were more likely to choose cooperatives. Finding by Diro et al. (2017) also discussed that male farmers have more resources available for transportation and time to sell their product to far away markets.

Education Level of Households: Education level of households has positive and significant effect at 5% probability level in choosing wholesaler and cooperatives, outlet. The positive relationship between education level and selling to private trader can be explained by the fact that being educated enhances the capability of farmers in making informed decisions with regard to the choice of marketing outlet to sell their farm produce based on the marketing margin and marketing cost. These results concur with the findings of Rizik*iet al.* (2015)

which revealed that education level enhances the capability of farmers in making informed decisions with regard to the choice of marketing outlets to sell their farm produce.

Frequency of extension contact: Frequency of extension contact is positively and significantly associated with the likelihood of choosing wholesaler and cooperatives outlet at 10% level of significance. Farmer's access to extension service increased the ability of farmers to acquire important market information as well as other related agricultural information which in turn increases farmer's ability to choose the best market outlet for their product. This is in line with the finding of Asefa *et al.* (2016) who found that frequency of extension contact had a positive and significant effect on cooperatives.

Access to market information: A positive relationship was found between access to market information and choice of wholesalers' and local collectors' market outlet at a 5% significance level. The rationale behind this could be that access to market information might encourage farmers to sell to a better market and thereby increase their profit. Diro *et al.* (2017) in his study found that farmers who had no information preferred brokers over urban traders.

Membership to cooperatives: Membership to cooperative by wheat producers was found to have a negative and significant relationship with the likelihood of choosing local collectors' market outlet at 1% significance level and positive relationship with likelihood to choosing cooperatives at 5% significance level. This implies that the households will sell fewer amounts of wheat in the wholesale, local collector and consumer as compared to cooperative. This is mostly related to the reality that those multipurpose cooperatives passing down production and market information they accessed directly or indirectly to their members. This result is in line with finding of (Woldesenbet, 2013; Tefera 2014), who found that households that were a members of any cooperatives negatively influence the probability of choosing wholesale, collector and consumer market outlet.

Distance from the nearest market: Distance from the nearest market was found to have negative and significance relationship with the likelihood of choosing wholesaler outlet while positive and significance relationship with the likelihood of choosing local collector market outlet at 5% and 1% significant level respectively. The implication is that household located far away from nearest market center faces difficulty in delivering the product to wholesaler rather than selling to local collector market outlet, because of lack of market price information and lack of transport accessibility. This result was also supported by the result of

Djalalou*et al.* (2015) who found that market distance has positive relationship with rural market and negative relationship with urban markets.

Amount of Wheat produced: The likelihood of choosing wholesaler and cooperative market outlet was positively and significantly affected by amount of wheat produced at 10% and 1% levels of significance, respectively. The survey result indicated that those households who produced more wheat would get output and more likely to sell to wholesaler and cooperative outlet, compared to farmers with small wheat produced.

Table 21: Multivariate probit estimation for determinants of wheat producer market outlet choice

Variables	**Wholesaler (1)**		**Cooperative (2)**		**Local Collector (3)**		**Consumer (4)**	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Age of household head	0.105	0.065	0.031	0.0089	0.009	0.337	0.121	0..43
Sex of household heads	1.486***	0.378	-0.705**	0.333	0.554	0.527	0.565	0.516
Educational level	0.14**	0.063	0.189**	0.08	0.089	0.084	0.069	0.064
Family size	0.016	0.065	0.69	0.064	0.93	0.078	0.004	0.057
Farming experience	-0.026	0.019	0.004	0.012	0.059	0.062	-0.009	0.014
Frequency of extension contact	0.104*	0.06	0.898*	0.363	0.03	0.036	0.065	0.087
Access to market information	0.427**	0.239	0.749	0.766	0.886**	0.485	-0.1	0.188
Membership to Cooperatives	0.01	0.012	0.042**	0.027	-0.631***	0.236	0.003	0.145
Distance from nearest market	-0.408**	0.255	0.139	0.306	0.674***	0.247	0.198*	0.028
Access to credit	0.095	0.092	0.069	0.064	0.141	0.098	0.001	0.232
Amount of wheat produced	0.105*	0.063	0.675***	0.247	-0.417	0.3	0.011	0.031

***, ** and * indicate statistical significance at 1, 5 and 10%, respectively
Source: Own survey data (2022)

4.4.3. Factors Affecting Participation in Value Addition

A binary discrete choice regression model (logit or probit) can be used for estimation of the decision of value addition in wheat production. Both logit and probit regression models were compared. Given the two models, the one with the smaller Akaike information criterion (AIC) and the Bayesian information criterion (BIC) fits the data better than the one with the larger AIC and BIC. Accordingly, logit model was preferred over probit model in estimating the propensity score (Table 22).

Table 22: AIC and BIC test of value addition estimates

Model	Obs	Log likelihood for the model	AIC	BIC
Logit	393	-142.66	308.533	385.566
Probit	393	-143.280	309.541	3386.856

Source: Own survey data (2022)

Thus, logit model was used for estimation of factors affecting the probabilities of the farmer households to add values to wheat and the marginal effect measured at the means are given in Table 23. Pseudo R^2 indicated that the independent variables included in the logit regression explain significant proportion of the variations in the wheat producer farmers' likelihood to add values to wheat. The logit model explains 51.29% of the variations in the likelihood of wheat producer farmers to add values to their product.

Table 23: Logit result for factors influencing wheat value addition

Variables	Coefficient	Robust SE	Marginal Effect
Age of household head	0.2282	0.4083	0.328
Sex of household heads	0.5544	0.361	0.061
Educational level	0.0426***	0.0138	0.037
Family size	-0.6761	0.5422	-0.1269
Farming experience	0.832**	0.332	0.041
Frequency of extension contact	1.1505**	0.5411	0.054
Access to market information	0.162***	0.054	0.051
Membership to Cooperatives	-0.003	0.018	-0.187
Distance from nearest market	-0.005	0.059	-0.106
Access to credit	2.0466***	0.6948	0.092
Amount of wheat produced	-0.053*	0.0304	-0.00034
Constant	-7.2873***	2.4933	-

No. of obs. 393

Log likelihood -142.66

Pseudo R^2=0.5129

Chi-square 214.68

Prob > chi2 0.000

Akaike crit. (AIC) 308.533 Bayesian crit. (BIC) 385.566

***, ** and * indicate statistical significance at 1, 5 and 10%, respectively
Source: Own survey data (2022)

Educational level: education is one of the most important factors which influencing the value addition of wheat production. This variable is a positive relationship with value addition and significant at 1% probability level. The marginal effect result of the variable shows that as the year of schooling of household heads increased by one year the probability of value addition increases by 0.037 marginal effects. Therefore, educated household head can access information and will have higher tendency for value addition than illiterate household heads.

Farming experience: farm experience is one of the factors that influence the value addition in wheat production. Farming experience affects decision of value addition positively and statistically significant at 5% significance level. The marginal implies that; as the farm experience increase by one year the probability of household wheat value addition increase by 0.041.

Frequency of extension contact: The frequency of extension contact is positively related with decision of value addition on wheat production. This variable is significant at 5% probability level. The marginal effect result implies that household heads who get extension services are about 5.4% more likely to participate in value addition as compared to household heads that were not get extension services. Therefore, farmers' who frequently contact extension agents are believed to be exposed to different, new, and update information that help them to participate in value addition.

Access to market information: Accesses to market information positively affect the value addition on wheat production. It is statistically significant at 1% probability level of significance. From the analysis of marginal effect a unit increase of access to market information increase the probability of decision of value addition by 5.1%. This implies that access to market information value added wheat demand and price will motivate them to take part in the value addition in the wheat production.

Access to credit: Access to credit has a positively and significantly affected the probability of farmer's to participate in value addition to wheat produce at 1% level of significance. The result indicated that farmers access to credit services increase the probability of adding values to wheat produce by 9.2%.

Amount of Wheat Produced: Amount of wheat produced in kilogram by farmers affects decision of value addition negatively and statistically significant at 5% significance level. As yield of wheat increase by one kilogram the probability of farmers to add value decreased by 0.034%. This could be attributed to the fact that farmers who produce larger amount of wheat get better income. Farmers who produced smaller amount of wheat adds value to get better price from the smaller amount produced.

CHAPTER FIVE

5.1 Summary and Conclusion

The study was conducted in Sinana woreda known for its surplus production of wheat commodities. However, the analyses of value add of agricultural crops in general and wheat in particular is not well understood. The study attempted to investigate value chain of wheat in the area. Selection of the wheat crop was mainly based on the relative importance and marketability. The study was conducted in order to identify production and marketing support services, structure-conduct-performance of the market, determinants of supply and value addition and the choice of market outlet in the area. Production of wheat in the study area is mainly for market. Hence, the commodities are important source of cash for farmers. Nationally, the area is known for its surplus production. In the area, the average land allocated for the production of wheat per household was 2.98 hectares.

Regarding structure of the market, the result shows that in three markets wheat traders were relatively concentrated in the hands of few traders. In market I, the four largest traders handled 87.41% of the total volume of purchased wheat. In market II, and market III the four largest traders handled 76% and 65% from the total volume of purchased, respectively.

Regarding market transparency survey result indicated that 34% of the sample traders got price information through the combination of telephone, personal observation and other traders and brokers. About 23% and 19 % of the traders knew price by personal observation and from other traders, respectively. The rest of traders had information through telephone only and through apparent acts of traders interested to buy large quantity of wheat at higher price. Barrier to entry in terms of licensing and years of trade experience did not hinder entry into wheat market, but capital requirement did. Concerning conduct of wheat market, generally, trading is mainly on eye-appraisal and exchange takes place on bargaining. Traders are highly mobile and purchased from different market per week.

Results of econometric model regarding factors affecting wheat market supply indicated the relative influence of determinants of different variables on marketable supply of wheat in the study area. A total of eleven explanatory variables were included in the model of which six variables had shown significant relationship with marketable supply of wheat. Accordingly, education level, farming experience, frequency of extension contact, access to market

information, access to credit and amount of wheat produced were found to have positive and significant influence on marketable supply of wheat.

The multivariate probit model output indicated that the probability of choosing wholesaler market outlet was significantly affected by sex of household head, education level, frequency of extension contact, access to market information, distance from nearest market and amount of wheat produced. The probability of choosing cooperative market outlet was significantly affected by sex of household head, education level, frequency of extension contact, membership to cooperatives and amount of wheat produced. The probability of choosing collectors market outlet was significantly affected by access to market information and distance from nearest market whereas consumer market outlet was affect by distance from nearest market. In the analysis of determinants of value addition in wheat production, the result of logit model indicated that education level, farming experience, frequency of extension contact, access to market information, access to credit and amount of wheat produced significantly affected farmer's decision to be engaged in value addition.

5.2. Recommendation

The enhancement of wheat producers' bargaining power through cooperatives is the best measure that should target at reducing the oligopolistic market structure in the wheat market. The measure also favours the sustainable supply of wheat at reasonable price to consumers. Quantity of wheat produced is one of the determinant factors that affect volume of wheat supplied to the market positively. Therefore, policy proposed should focus on increasing production and productivity of the sector. This could be partly achieved through identifying new technologies and management systems that would improve the production and productivity of the crops. Creating stable demand for surplus production would also enhance farmers' decision on wheat production consistently. The result of this study has shown that access to market information affected the quantity of supplied positively and significantly. Farmers in the study area do not get timely market information up on which to base their marketing decision. They depend on traders and other farmer friends for price information. Therefore, there has to be an institution that can convey reliable and timely market information required by all stakeholders simultaneously. This would make the marketing system to operate efficiently and harmoniously. The availability of timely and precise market information increases producers' bargaining capacity to negotiate with buyers of their produce. In order to obtain this advantage there is a need to improve extension system which

focused on market extension and linkage of farmers with markets is necessary to ensure a reliable market outlet for producers of the study area.

The econometric finding of multivariate probit suggests that an adjustment in each one of the significant variables can significantly influence the probability of choice of market outlet. Therefore, this study recommends that an improvement of existing road facilities would reduce the time spent to reach the market and lower transportation costs would enhance farmers to sell their produce to the outlet that results higher returns. The need for improvement of the extension services to aware farmers to choose formal markets such as cooperatives and legal traders' outlet with higher returns resulting from quantity sold not from unit price. Furthermore, the concerned authority should be able to increase the awareness of households about the importance of adult education to choice appropriate market outlet and finally government should increase the number of cooperatives which increases wheat farmers' income from fair market at minimum marketing cost.

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

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

The other variable that affects the farmer's decision to participate in value addition is Access to credit. The provision credit to smallholder farmers may enable them to invest in agricultural upgrading by resolving the shortages of working capital. Therefore, it is important to create credit access and simplify way of provision for farmers because it will help farmers to participate in value addition activities which will increase their income.

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APPENDICES

APPENDIX I: TABLES

Table 24: Means of transport used by sampled producers

Means of transport	Frequency N=393	Percentage
Vehicles	161	40.97
Back of animals	84	21.37
Cart	125	31.81
Others	23	5.85
Total	393	100.00

Source: Own computation from survey result, 2022

Table 25**:** Area allocated and productivity of wheat per hectare

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Total Area of Land of Hous	393	3.89	1.27	0.8	10
Total Area Allocated land ir	393	2.98	1.02	0.5	8
Production of Wheat in Bona (quintal)	393	42.38	5.61	33	55
Production of Wheat in Gannaa (quintal)	393	23.04	5.91	10	39
Average Wheat productioon per Hectare	393	32.71	3.29	23	40

Source: Own computation, 2022

APPENDIX II: Questionnaire to be filled by Sinana Household Heads

MADDA WALABU UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

Questionnaire for thesis Research

The main objective of this questionnaire is to collect information for an **MSc** thesis entitled '**Analysis of Wheat Value Chain: The case of Sinana district, Bale zone, Oromia region'** Your help in answering these questions is highly appreciated. Your responses will be confidential. It will be pooled together with responses of many other smallholder farmers and analyzed. The study will be conducted for academic purpose only. Hence, I request your honest and valuable responses to fill up this questionnaire.

Name of District _____

Name of Peasant Association _____

Code of household head _____

Enumerator name _____

Signature _____

Date of Interview _____

Part I: Socio Demographic Characteristics

1	Sex of house hold head	1= Male 0= Female
2	Age of household head in years	
3	Educational level of the household head	1= None (illiterate) 2= Read and write 3= primary (1-4) 4= Junior (5-8) 5= Secondary (9-10) 6= Preparatory (11-12) 7=Above
4	Marital status	1= Married 2= Single 3= Widowed 4= Divorced

Family size_____

Sex category	< 15 yrs.	15 to 65 yrs.	> 65 yrs.
Male			
Female			
Total			

Part II. Resource ownership

Land holding and Farming characteristics

1. What is the area of your total land _____ ha
2. What is total area of rented in land_____ ha , rented out land_____ha
3. What is the area of shared in land _____ ha , Shared out land_____ha
4. Total area allocated for wheat in 2021/2022 production year_____ha
5. Have you grazing land? 1. Yes 0. No
6. If your answer for #5 is 'yes' what is the size of grazing land? _____ha
7. When did you started farming (farming experience) _____(years)

III. Source of Income

Farm income

1. What are your major sources of income? Sale of crops =1 Sale of livestock and/or products =2 Off-farm income =3 Others = 4 (specify) _____
2. Estimate of annual cash income from a) Sale of crops ____Birr/year b) Sale of livestock _____Birr/year c) Sale of livestock products (milk, butter, egg,…)_____Birr/year d) Off-farm income ___Birr/year e) Other sources __Birr /year(specify)___
3. Which crops did you sale most of the time? _____ (Put in their order of importance by selecting from the following) Wheat =1 Barley =2 Linseed =3 Field pea =4 F.bean =5 Others =6(specify)_____

Off/non farm income

4. Do you have off/nonfarm income? 1. Yes 0. No (if yes proceed to the following table)

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

*1=Husband 2=Wife 3= Son 4=Daughter

IV. Wheat production

Input Supply

1. Have you used agricultural inputs (fertilizer, chemicals, improved seeds etc.) for the Production of wheat? (√) 1. Yes 0. No

Type of input		Did you used for wheat? 0. No 1. Yes	Price per (Qt/Lit)	Amount used per Hectare	**Source:** 1. Own 2.Government, 3.Cooperative/Union 4. Private Traders
Improved seed					
Fertilizer	DAP				
	UREA				
Herbicide					
Fungicide					
Insecticide					
Others (specify)					

2. How many Quintals you have got wheat production last year 2021/2022 per Hectare? _____

Part V: Credit services

1. Do you have access to credit? Yes=1 No=0

2. If yes, have you received credit in cash last year? Yes=1 No=0

3. If your answer under Question #2 is yes, how much it was?_____ Birr

4. If your answer under Question #2 is yes, for what purpose you used? Farm inputs

purchase=1 Livestock purchase=2 HH consumption=3 Land rent=4 Others =5 Specify____

5. From where did you get the credit service? Cooperative=1 Bank= 2 NGOs=3 Local money Lender=4 Saving and credit Association=5 Others=6 (specify)_____

6. If your answer for #2 is no, why? High interest rate=1 No need=2 Lack of Collateral=3 Fear of inability to repay=4 No service= Others =6/specify_____

7. What was the precondition to get credit? 1. Membership 2. Personal guarantee 3. Land holding 4. Collateral 5. Partial payment 6. Others (specify)_____

8. Do you have any problems in getting credit? Yes =1 No =0

9. If yes, what is the nature of your credit problem(s)? 1. Few supply 2. Inadequacy of credit 3. No diversification 4. Absence of informal sources 5. Unfavorable repayment time 6. High interest rates 7. Restrictive procedures 8. Others (specify**)**_____

Part VI: Extension and Information Services

1. Did you have an extension contact? Yes =1 No =0

2. If yes how frequently do you meet extension agent? 1. Daily 2.Weekly 3.Monthly 4. Rarely

No	Type of training	1. Yes 0. No	By whom	How many
1	Crop management			
2	use of input			
3	Use of cooperative			
4	Use of credit			
5	Natural resource conservation			
6	Pre and post-harvest management			
7	Seed production			
8	Field days/demonstration			

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

Part VII: Farming activities and associated costs

1. What do you use to plough your land? 1. Own Oxen 2. Own Tractor 3. Rented Tractor 4. Rented oxen

2. If rented tractor how much it costs you per hectare _____birr , how about if rented oxen _____birr/hectare

3. Do you weed wheat manually? 1. Yes 0. No

4. If Q3 is yes, from where do you get labour for weeding? 1. Family 2. Casual labourer 3. Daily labourer

5. If Q4 is causal labourer, how much do you pay him/her per month .....birr

6. If Q4 is daily labourer, how much do you pay per man day .....birr

7. If you employ daily labourer to spray chemical for you, how much it costs you per hectare_____birr

8. What do you use to harvest your wheat? 1. Manually harvested 2. Combine harvester

9. If you used combiner for harvesting how much you paid per quintal in 2021/22 harvesting time? _____birr, how if manually _____birr/man day.

10. What are the major wheat production constraints?

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

Part VIII: Marketing

1. Did you sell wheat last year (2021/22)? 1. Yes 0. No

2. If your answer for question #1 no is why didn't you sell? _____

3. If your answer for Question #1 is yes, which type of wheat is sold? 1. Bread wheat 2. Durum wheat 3. Both

4. If your answer for question #1is yes, to whom did you sell? (More than one answer is possible) 1=consumer 2=Retailer 3=Wholesaler 4=Cooperatives/Unions 5=brokers 6=millers/processors 7= commission agents 8= speculators 9 = Assemblers

5. To whom do you usually want to sell? _____ (choose from the above Question #4)

6. What is your Reason for selling to the selected actor for Question #5? 1. Price difference from others 2. Closeness in distance 3. Transport availability 4. Others(Specify)_____

7. If you sold to more than one actors in Question #4, please estimate volume sale to each of them from 2021/22 production years sale (percentage) _____

8. For how many months you store wheat for sale (on average months) _____months

9. What was the price of wheat immediate after harvest in 2021/22? _____birr/100kg

10. Where do you sale/market place? 1. Within village 2. Outside village 3. Within district 4. Outside district

11. Is there a difference in price due to differences in place of sale and the type of buyer? 1. Yes 0. No

12. If your answer for Question #11 is yes, indicate the price when the product is sold to different actors and in different places.

Place of Sale	Price when the product is sold to						
	Consumer	Retailers	Wholesalers	Cooperative Union	Processor	Agent	speculator
On the Farm /Farm Gate							
Village market							
Woreda market							
Collection points							

13. Means of transportation used to take wheat to the market? 1. Cart 2. Back animal 3. Vehicle 4. Others (specify)_____

14. Do you owned the type of transportation you used to supply to market place? 1. Yes 0. No

15. If your answer for Question #14 is no, how much it costs you to reach market place per 100kg? _____birr

Part IX: Marketing Association

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

2. Do you have long standing customer (buyer)? 1. Yes 0. No

3. Do farmers sell their wheat product on credit basis? 1. Yes 0. No

4. If your answer for question #3 is yes, how long does you wait for the payment? _____

5. In deciding to whom to sell, what factors do you consider?_____

Part X: Price information

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

Years	Average Price per 100kg in Birr	Remark
2009		
2010		
2011		
2012		
2013		

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

XI. Supply information

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

Value addition

4. Is there product quality required by buyers? 1. Yes 0. No
5. If your answer for Question # 4 is yes, do you keep quality that is required by buyers? 1. Yes 0. No
6. If your answer for Question # 5 is yes, what value adding activities you made? 1. Cleaning, cost per quintal _____ 2. Storage, cost per quintal for storage _____ 3. Transportation, cost per quintal to reach sale outlet _____ 4. Others (specify, cost)___
7. Is there price difference due to value addition? 1. Yes 0. No
8. If your answer for Question # 7 is yes, do you estimate price difference due to value addition? _____birr/kg

XII. Source of Market Information

1. Do you get market information before supplying your product to market? 1. Yes 0. No

Source Category	Source List	1. Yes 2. No
Personal/professional Networks	Traders	
	Friends/Neighbor	
	Development Agent	
	Others (specify_____	
Public information System	From market bulletins	
	Radio	
	Television	
	Message blackboards at market places/ECX board	

XIII. Average Return of Wheat

Type of Wheat	Selling Price	Total costs birr/Quintal							
		Packing Materials	Loading	transport ation	Broker	Weight	Store Rent	Revenue	Revenue Tax
Bread wheat									
Durum wheat									

XIV. Membership in Cooperatives;

1. Are you a member of farmers' Cooperative? 1. Yes 0. No

2. If your answer for Question #1 is yes, what is the name of cooperative? _____

3. Why you joined the cooperative? 1. The cooperative provide better price

2. The cooperative try to hold the cost down 3. Provide guaranteed outlet (market)

4. Give field service or technical assistance 5. The scaling is fair 6. It makes timely Payment 7. Others (specify)_____

Gender

1. During allocating lands to wheat crop planting, who will decide? 1. Only husband

2. Only wife 3. Both husband and wife through discussion 4. Others (specify) _____

2. Who controls the overall crop products you got during storage? 1. Husband 2. Wife

3. Both 4. Others (specify)_____

3. Who decides on sell of wheat produces owned by household? 1. Husband 2.wife

3. Both husband and wife 4. Others (specify)_____

4. Who will manage the finance after selling your products? 1. Husband 2. Wife 3. Others

5. Who is the member of cooperative from your family? 1. Husband 2. Wife

XV. Marketing constraints

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

XVI. Livestock ownership

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

Thank you for your cooperation in advance!!!

Checklist for Wheat Value Chains in Sinana District for traders (wholesalers, Assemblers/collectors, retailers)

1. General Characteristics

1. Name of trader _____ Tel: _____

2. Age _____ Sex _____ 1. Male 2. Female

3. Marital status 1. Married 2. Single 3. Divorced 4. Widowed

4. Family size _____: Male _____ Female _____

5. Country---------- Region ---------- District---------- Kebele ----------

6. Type of business: 1) Wholesaler 2) Retailer 3) Processor

7. Level of education of respondent _____

8. Position of respondent on the business: 1. Owner 2. Spouse of owner 3. Employed manager 4. Relative of business owner 5. Others (Specify) _____

9. How long have you been operating the business? _____ years

10. Did you trade alone or in partnership? (√); 1. [ ] Alone 2. [ ] Partnership 3.[ ] Other (specify) 11. If your answer for Question # 10 is partnership, how many are you in the joint venture?_____

12. Total number of peoples employed in your business: _____

2. Buying

2.1 What products do you purchase in your trading center? 1. Bread wheat 2. Durum wheat 3. Both 4. Pulse crops (specify_____) 4. Other cereal crops (specify _____)

2.2 If you are involved in more than single commodity trade which one is larger in volume? 1. Wheat 2. Durum wheat 3. Pulse crops

2.3 Who are the major suppliers of bread wheat to you? 1. Farmers 2. Retailers 3. Brokers 4. Other wholesalers 5.Investors 6.Cooperatives/Unions 7. State farm

2.4 If your answer for Question # 2.3 is farmers are the major suppliers, where does the transaction take place? 1. Farm gate 2. Farmers bring their products up to our business center 3. Market place

2.5 If farmers bring products up to your trading center, do you help them in terms of Transportation? 1. Yes 0. No

2.6 If your answer for Question # 2.5 is yes, how do you help them? 1. Share part transportation cost 2. Send for them track 3. Cover the whole cost of transportation 4. Others (Specify)_____

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

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
High demand												
Low demand												
High supply												
Low supply												

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

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

2.9 Average buying prices for products per 100kg in 2021/22 production season

_____birr (Average of Bona and Ganna season)

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

2.11 Do traders transfer information on quality considerations to their suppliers? 1. Yes 0. No

2.12 Is there long standing relationship between traders and suppliers? 1. Yes 0. No

2.13 Do traders provide premium prices for their permanent suppliers? 1. Yes 0. No

2.14 If your answer for Question # 2.13 is yes, how much (what percent of the price)? ---------

2.15 If your answer for Question # 2.13 is yes, based on what do traders add premium price for producers or suppliers? _____

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

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

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

3. Selling

3.1 To whom do traders sell wheat grain? ----------

3.2 Where do traders sell (place/s)? ----------

3.3 Average price per kg when reselling _____birr

3.4 Do traders have longstanding customers for selling wheat they bought?

3.5 Do you sell on credit? 1. Yes 0. No

3.6 If your answer for Question # 3.5 is yes, for how long do you wait the payment? ----------

3.7 Are you/traders in your area supply to flour factory? 1.Yes 0.No

3.8 If your answer for Question # 3.7 is yes, to which area processors? _____

3.9 Do they (processors) have specific criteria for your products? 1. Yes 0. No

3.10 What are the requirements of buyers in terms of quality? ----------

3.11 Do traders know the different grades of wheat that processors want? 1. Yes 0. No

3.12 If your answer for question # 3.11 is yes, are they using them? 1. Yes 0. No If no, why?

3.13 How do you consider the trend in availability of wheat grain/volume of marketed of grain in the market you operated (Increased, decreased, the same)? ----------

Reason for such a trend? ----------

3.14 Who is the price maker in the wheat market? ----------

3.15 Factors affecting the price of products and services in the area----------

3.16 Do traders (of wheat) usually have any legally binding contract agreement with their Suppliers and buyers? 1.yes 0.No

3.17 If your answer for Question # 3.16 is yes, is there any problem with enforcement of contracts? 1. Yes 0. No

3.18 Which market regulations affect your business? ----------major Problems in selling your products? ----------

4. Transportation

4.1. How do traders transport wheat? ----------

4.2. If traders are transporting using Isuzu trucks, how many quintals can they transport in one load?---------- quintals

4.3. What are the major problems in transporting? ----------

5. Market information

5.1. How do traders get market information (source)? ----------

5.2. To whom do they transfer this information? ----------

5.3. How often do traders get market information? ----------

6. Credit

6.1. How often working capital is a problem for traders?_____

6.2. Traders cash sources (own, credit from bank, credit from informal market…)_____

6.3. Any problem related to credit? ----------

7. Storage

7.1. Do you own your own storage? 1. Yes 0. No

7.2. If your answer for Question # 7.1 is yes capacity of your storage? --------quintal at a time

7.3. If your answer for question #7.1 is 'no' where do you store? 1. Renting 2. Friends store 3. Others (specify) _____

7.4. If your answer for question #7.3 is renting, rental cost per month? ----------birr/month

7.5. For how many months do you store products you bought? ----------months

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

Topics	Ratings				
	1	2	3	4	5
General Marketing					
Awareness of his market position and role					
Storage techniques and post- harvest management					
Distribution and transport logistics					

Thank you for your patience and time allocation to respond!!!