

**VALUE CHAIN ANALYSIS OF MALT BARLEY (*Hordeum vulgare*L.):  
THE CASE OF LEMU BILBILO WOREDA, EAST ARSI ZONE,  
OROMIA NATIONAL REGIONAL STATE OF ETHIOPIA**

**M.Sc. THESIS**

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JIMMA, ETHIOPIA**

**VALUE CHAIN ANALYSIS OF MALT BARLEY (*Hordeum vulgare*L.): THE CASE  
OF LEMU BILBILO WOREDA, EAST ARSI ZONE, OROMIA NATIONAL  
REGIONAL STATE OF ETHIOPIA**

**MSc. Thesis**

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*Submitted to the School of Graduate Studies, Jimma University, College of Agriculture and Veterinary Medicine, Department of Agricultural Economics and Extension in Partial Fulfillment of the Requirements for the Degree of Master of Science (MSc.) in Agribusiness and Value Chain Management.*

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## **DEDICATION**

I dedicated this thesis to my beloved sister TezerawerkWeldeyohanis separated from me due to death and to my generous mom and dad whose eyes didn't see this world, for their love and their dedicated partnership for success in my life.

## **STATEMENT OF THE AUTHOR**

First, I declare that this thesis is my own work under the guidance of my advisors and that all sources of materials used for this thesis have been appropriately acknowledged. This thesis has been submitted in partial fulfillment of the requirements for M.Sc. degree in Agribusiness and Value Chain Management at Jimma University and is deposited at the University Library to be made available to borrowers under rules of the library. I seriously declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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## LIST OF ACRONYMS AND ABBREVIATIONS

AMF	Asella Malt Factory
AZoARD	Arsi Zone Office of Agriculture and Rural Development
AZoTMD	Arsi Zone Office of Trade and Market Development
BDS	Business Development Service
BoARD	Bureau of Agriculture and Rural Development
CBO	Cooperative Bank of Oromia
CC	Contingency Coefficients
CDF	Cumulative Distribution Function
CSA	Central Statistics Agency
DA	Development Agents
DBoA	District Biro of Agriculture
EGFAR	Ethiopian Grain Food and Agricultural Report
ESE	Ethiopia Seed Enterprise
ETB	Ethiopian Birr
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
GDP	Growth Domestic Product
GTP	Growth Transformation Plan
GTZ	German Technical Cooperation
ILO	International Labor Organization
ILRI	International Livestock Research Institute
KARC	Kulumsa Agricultural Research Center
MBMI	Malt Barley Marketability Index
MLE	Maximum Likelihood Estimation
MoARD	Ministry of Agriculture and Rural Development
MoFED	Ministry of Finance and Economy Development
MOI	Market Orientation Index
NGO	Non- Governmental Organization
OCSI	Oromia Credit and Saving Institution
OLS	Ordinary Least Square
OSE	Oromia Seed Enterprise
PFC	Primary Farmers` Cooperatives
PHCE	Population and Housing Census of Ethiopia
PRA	Participatory Rural Appraisal
SNV	Netherlands Development Organization
UNIDO	United Nations Industrial Development Organization
USAID	United States Aid for International Development
VCA	Value Chain Analysis
VIF	Variance Inflation Factor
WB	World Bank
WoARD	Woreda Office of Agriculture and Rural Development
WoRT	Woreda Office of Road and Transportation
WoTMD	Woreda Office of Trade and Market Development

## **BIOGRAPHICAL SKETCH**

The author, Samuel was born on March 12/1989 at Aseko, East Arsi zone of Oromia National Regional State to his father Weldeyohanis Kifle and to his mother W/ro Sahliye Kestela. He attended his elementary and high school education at Aseko elementary and secondary school respectively starting from 1997 to 2006. He attended his preparatory school at Abomsa Arbegnoch Preparatory School Merti Woreda of East Arsi zone from 2007 to 2008 and joined Hawassa University in 2009. He graduated with BSc. degree in Rural Development and Family Science (RDFS) in 2011. Then after, he was employed at Dawro zone Agricultural office and served for three consecutive years from end of August 2011 as subject matter specialist (expert) and joined Jimma University to pursue his MSc. study in Agribusiness and Value Chain Management in October 2014.

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## VALUE CHAIN ANALYSIS OF MALT BARLEY (*HORDEUM VULGARE L*): THE CASE OF LEMU BILBILO WOREDA, EAST ARSI ZONE OF OROMIA REGION.

### ABSTRACT

*This study was conducted at Lemu Bilbilo district of Oromia region with the aim of analyzing malt barley value chain with specific objectives of identifying value chain actors and drawing its map, analyzing the performance of actors, analyzing the market orientation determinants of malt barley producers and identifying the challenges and opportunities of malt barley value chain. The data were collected from both primary and secondary sources. Primary data were collected from 150 randomly selected producers, 15 collectors, 9 grain whole sellers, 2 brokers, 4 primary cooperatives; one union, one malt factory, one beer factory, three beer distributors, 12 retailers and 10 consumers while secondary data were collected from published and unpublished documents. Descriptive statistics and econometric model of ordinary least square (OLS) method was used to analyze the data using STATA software. Market orientation index was used as dependent variables to investigate producers' market orientation determinants in malt barley production. The findings of the study revealed that, input suppliers, malt barley producers, cooperatives, union, collectors, grain wholesalers, processors, beer distributors, retailers and consumers are main actors of malt barley value chain. The performance of actors in malt barley value chain revealed that, about 42.33% and 29.84% of the margin is shared by malt factory and producers respectively while local collectors, grain wholesalers, cooperatives and union shared 5.87%, 7.96%, 5.87% and 8.13% of the total margin respectively. About 50.98% of the net marketing margin is shared by producers followed by malt factory (22.15%), Union (9.49%), grain wholesaler (9.45%), rural collectors (5.21%) and cooperatives (4.72%). The chain is governed by malt factory and Brewery Company who have capital advantage over the other chain actors. The econometric result revealed that, literacy of household head, family size, land size allocated, farming experience, oxen owned, access to improved seed, access to credit service, productivity of wheat and agricultural input cost significantly affects market orientation of malt barley producers. Shortage of good and improved malt barley seed, shortage of chemicals for emergency disease occurrence, high cost of inputs and high interest rate, mixed seed with other varieties, poor linkage with value chain actors, lack of capital to purchase inputs, diseases and pest attacks, presence of unlicensed traders, limited function of cooperatives, lack of appropriate storage facility, unequal dissemination of market information, shortage of malt barley and lack of laboratory sampling test are the constraints whereas high demand for malt barley production, high demand for malt barley by different factories, availability of different buyers and or users of the product, its potential for value addition, favorable land and climatic condition in the area of production, presence of value chain supporters and enabling policy environment; and high productivity potential are the major opportunities of malt barley value chain in the study area. Therefore, policy aiming at increasing farmers' access to credit, access to improved seed, developing and improving infrastructure, facilitating adult education, improving cooperative development and strengthening linkages of actors are recommended to enhance the development of malt barley value chain and farmers' market orientation in malt barley producers at Lemu Bilbilo district of east Arsi zone in Oromia National regional state of Ethiopia.*

**Key Words:** Lemu Bilbilo, Malt Barley, Margin Distribution, Market Orientation, Ordinary Least Square, Value Chain

# 1. INTRODUCTION

## 1.1. Back Ground of the Study

Barley (*Hordeum vulgare* L.) is the most widely grown cereal crop over broad environmental conditions and is the world's fourth important cereal crop after wheat maize and rice. Globally, the European Union, Russian Federation, Ukraine, Turkey and Canada were the largest world barley producers while Ethiopia, Morocco, Algeria, Tunisia and South Africa were the top five largest barley producers in Africa (USAID, 2014). Ethiopia is ranked twenty-first in the world's barley production with a share of 1.2%) and second in Africa next to Morocco with a share of 26% of the total barley production of the continent (FAO, 2014).

Barley is an important cereal crop grown by subsistence farmers on small-scale farms accounting for over 60% of the food of the people in the high lands of Ethiopia (Ejigu, 2012). It is the fifth important grain crops grown next to Teff, Maize, Sorghum and Wheat with percentage share of 7.56% of the land covered in the production year (CSA, 2015). In the highland of the country barley can be grown in Oromia, Amhara, Tigray Regional States and part of SNNP in the altitude range of 1500 and 3500 m, but it is predominantly cultivated between 2000 and 3000m above sea level (Berhaneet *al.*, 1996).

In Ethiopia, barley types are predominantly categorized as food and malting barley based on their uses while the highest proportion of barley production area is allocated for food barley (Asfaw (2000)). Food barley is principally cultivated in the highland where the highest consumption in the form of various traditional foods and local beverages from different barley types. Ceccarelli *et al.* (1999) indicated that barley grain accounts for over 60% of food for the highland in Ethiopia. According to Birhanu *et al.* (2005), barley is used in diversity of recipes and deep rooted in the culture of people's diets.

Malt barley, due to its limited usage and high-quality requirements, is a unique niche product in the international grain market representing only about 1.5% of the total world grain production (USAID, 2014). It is particularly interesting in the context of smallholder commercialization and food security since it has high value as both cash and a food crop. It is also the major raw material (about 90% of the total raw material cost) used in beer

production and mainly produced in south eastern parts of Ethiopia particularly in east and west Arsi, west Shewa and Bale administrative zones of Oromia region (Legesse *et al.*, 2007). Ethiopia has a shortage of malt barley to meet the demand of the local breweries due to problems in resource allocation for the crop and its demand is being met through imports (that accounts for about 69%) and partially through domestic production (Gemed, 2016).

Barley is the third important cereal crop and was grown on 15.45% of the land next to wheat (33.7%) and Teff (16% and followed by maize (12.61%) and sorghum (8.68%) in area of production respectively (CSA, 2015) in Arsi zone. Malt barley is a crop with a sustainable market for farmers in Arsi including the study area of Lemu Bilbilo and for others like Tijo-Digalu, Sagure and Tiyo districts (Taddese, 2006).

Lemu Bilbilo district has a suitable agronomic conditions and high potential of cultivated land for growing malt barley. The total land used for crop production (annual crop like cereals, pulses, oilseed and vegetables) were about 55,245 hectares while the total number of farmers were 21450 production year and the total land used for malt barley was about 7937 hectares (WoARD, 2015) which was nearly 30% as compared to 70% of food barley. There are also different market opportunities for smallholder farmers for selling their produce including traders, cooperatives, and private enterprises which leads to obtain different welfare benefits.

## **1.2. Statement of the problem**

Agriculture is central to Africa's agenda, and efforts have made to link production with agribusiness for better growth in the sector. However, the crops value chains are affected by constraints such as poor infrastructure; fragmented and risky markets; poorly functioning input markets; difficulties accessing land, water, and finance; and inadequate skills and technology (World Bank, 2013).

Value chain analysis is a significant concept in strategies to reduce rural poverty in developing countries which offer the farmer the possibility to acquire new knowledge in production and all value chain actors (Humphrey and Schmitz, 2000). However, little attention has been paid to the value chains of commodities (including malt barley) by which

agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities (UNIDO, 2009).

Even though the concept of value chains has been extended to the analysis of globalization (Gereffiet *al.*, 2001), however, malt barley value chain analysis in Ethiopia is scanty. The barley value chain research conducted by Rashid *et al.* (2014) in Ethiopia focused on production and productivity, quantity supplied determinants and some of value chain aspects of barley in general on selected zone using focus group discussion and key informant interview. However, this study was not concentrated on malt barley and was more general approach as well as it did not touch the current study area of Lemu Bilbilo district.

Moreover, the research performed on seed value chain analysis' case of farmers based seed production and marketing in Arsi Zone of selected districts including Lemu Bilbilo, mainly focused on seed production and mapping the seed value chain of selected crops (Mulugeta *et al.*, 2010). However, the value chain analysis of malt barley has not seen separately in each of the districts including the current study area.

Value chain development of agricultural crops is faced with different challenges in developing countries. According to (Daviron and Gibbon, 2002) cited in (Trienekens, 2011), lack of efficient and effective coordination in value chains, lack of market orientation, lack of market access are serious barriers for smallholder farmers in developing countries including Ethiopia. Moreover, according to Ababa (2010), lack of skill in modern agricultural practices; low productivity and production; lack of market information system; lack of access to credit are the constraints hindering value chain analysis. Furthermore, the challenge of meeting ever increasing demand for malt barley and its value-added products (malt and beverages) will not be an easy task. It requires improving the resource allocation to the crop and enhancing linkages among relevant actors as well as designing the upgrading strategy is imperative.

Similarly, despite the available potentials and opportunities for malt barley production and marketing, there are different challenges affecting its value chain development in the study area of Lemu Bilbilo district. Yet, producers are still facing different problems such as, limited improved seed supply, high cost of seed and fertilizer, lack of credit, low market



orientation in resource allocation, poor linkage with local malt barley processors and fail to meet the quantity requirement for different factories in the country level. Therefore, this entails a need for more comprehensive study which thoroughly analyzes the malt barley value chain in the study area.

Farmers in east Africa including Ethiopia concentrated on subsistence food production and traditional activities that did not fully employ available land and labor that contributed for low market orientation (Leykun and Jemma, 2014). In agriculture, market orientation is basically a production decision issue as influenced both by production conditions and market signals (Gebremedhinet *al.*, 2010). It is also the degree of allocation of resources (land, labor and capital) to the production of agricultural produce that are meant for exchange or sale (Jaleta *et al.*, 2010). Market oriented production allows households to increase their income by producing output from land and labor and using the income generated from sales to purchase goods for consumption (Schneider and Gugerty, 2010).

However, researches regarding market orientation in Ethiopia were mainly focused on cereals and pulse crops and influenced by different factors. According to Gebremedhin and Jaleta (2012) household subsistence requirements, market access and production factors (land, labor and capital) affect market orientation of smallholder farmers in Ethiopia. Landholding size and land slope, number of oxen owned and membership in extension package program have positive and significant associations with market orientation (Abera, 2009). Moreover, According to Tefera (2014), sex of the household head, education level, access to credit and land per capita influenced chickpea market orientation. However, the above mentioned scholars have not seen the market orientation of cereal crops including malt barley independently.

The market orientation of malt barley producers in Ethiopia particularly the study area is affected by several factors by affecting the demand and supply of the commodity which was resulted from low resource allocation (land) to malt barley in the study area. Ethiopia produces mostly food barley, with its share estimated to be 90% (Alemu *et al.*, 2014), and remains significantly deficient (a shortage) in malt barley production due to problems of resource allocation to the commodity (Mohammed, 2003). According to Mulatu and

Grando(2011), the malt barley supplied to the malt factory in Ethiopia is produced by farmers having small plots of land; as a result, the quantity requirements for malt barley are not being met in the country level.

Similarly, the study area produces mostly food barley with its share estimated to be 70% while malt barley is 30% in 2015 production year (WoARD, 2015). Moreover, the study area is the bulk supplier of malt barley to different buyers as compared to other districts in the Arsi zone, but only 60% of the quantity demanded by AMF was met by domestic production (AMF, 2015). However, a research verifying the determinants affecting market orientation of malt barley producers particularly in the study area of LemuBilbilo district is limited as far as the researchers` knowledge concerned and reviewed published documents..

Even though some related studies were carried out in different districts of Arsi zone, such study that provides empirical evidence on malt barley value chain and its market orientation for improving the production through resource allocation and marketing has not been undertaken in the study area. Therefore, there is a strong need to make value chain analysis to identify the major malt barley value chain actors and their roles, to identify constraints and opportunities along malt barley value chain, factors that affect market orientation of malt barley producers, to estimate marketing costs and margins at different market channel at the study area of LemuBilbilo district, east Arsi Zone of Oromia National Regional State.

### **1.3. Research Questions**

The study conducted on malt barley value chain in the study area tried to answer the following questions for the research gaps identified in the statement of the problem.

1. What does the malt barley valuechain and its market channels looks like in the study area?
2. Who does what and how the benefit shared among actors of malt barley value chain?
3. What are the factors affecting the market orientation of malt barley producers?
4. What are the challenges and opportunities for malt barley value chain?

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

### 1.4.1. General objective of the study

The general objective of this study is to analyze malt barley value chain in Lemu-Bilbilo Woreda.

### 1.4.2. Specific objectives of the study

- To identify actors and to draw up value chain map of malt barley value chain in the area
- To analyze the performance of malt barley value chain actors at the study area
- To analyze determinants of market orientation for malt barley producers at study area
- To identify challenges and opportunities of malt barley value chain at the study area

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

This study was conducted in East Arsi zone Lemu-Bilbilo Woreda. Important information was collected from malt barley producers and marketing actors starting from local collectors to the end market and finally to consumers involved in the subsector in the study area and outside the study area. The study had focused on identifying major actors of malt barley value chain, estimating the value distribution and margins of actors, mapping malt barley value chain, analyzing the determinants of market orientation for malt barley producers and the existing challenges and opportunities with possible interventions in the study area.

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

The study was conducted to understand the malt barley value chain from input supplier to the consumer and the major determinants affecting malt barley producer's market orientation of malt barley producers, the performance of actors in the value chain and the market channel of the commodity with its visual map. In addition to this, verifying the factors affecting market orientation of malt barley producers and how the bottlenecks associated with these factors can be alleviated is also fundamental in improving the wellbeing of emerging and small holder livelihood in the study.

Moreover, identifying the different actors and calculating the margin distribution along the value chain of malt barley was also used to identify the benefit shared among the different value chain actors of the commodity and sort out the actors who needs quick upgrading in the chain. By mapping the value chain of the selected product, farmers are better able to visualize the relative position of different markets, both for accessing inputs and services as well as for selling the final out-put. They also visualize different players in the market system and the function they perform, as in the type of value they add to the product. The information of the findings obtained from this study is more worthy for the farmers in general and the malt factories and beverages as well as for government institutions like cooperatives and unions.

This study was also aimed at reducing the knowledge gaps that affect market orientation and increases linkage with malt factories and for other organizations like : research and development organizations may initiate for producing new varieties to increase the production, agricultural input suppliers, traders, policy makers, government and non-governmental organizations to assess their activities and redesign their mode of operations and ultimately influence the design and implementation of policies and strategies.

### **1.7. Limitations of the Study**

This study was limited in the study area and lack many detail investigations which could have reinforced understanding of the whole system especially in relation to production and consumption studies. Furthermore, there were more challenges while collecting the data from the respondents specially Brewery factory were not responsible to give relevant data which was a serious challenge in this study. Thus, it restricted to perform all actors` performance in the value chain like beer distributors and retailers. Moreover, getting data from traders as well as cooperatives were difficult but not that much challenge as that of breweries. Again, shortage of finance, logistics and inaccessibility of some of the respondents from producers were additional challenge during survey

### **1.8.Organization of the Study**

The first section represents introduction, the second section represents review of literature on value chain analysis from different sources which are in line with the current study.

Description of the study area and methodologies are presented in section three with the research describing methodology. The fourth section, explains the results of the main findings and discussion on the results of the research paper. The final sub-section clearly summarizes and concludes the main results of the study together with recommendations.

## **2. LITERATURE REVIEW OF THE STUDY**

This chapter tries to present important definitions and concepts, related literature including conceptual issues regarding value chain concept and histories, value chain mapping, governance and upgrading, and various relevant topics which is in line with the current study. It also attempts to explore results of relevant empirical studies which were conducted in different parts of the country which are nearly related with the topic of the research.

### **2.1. History and Concepts of Value Chain**

The concept of the Value Chain was made popular by Harvard University's Professor Michael Porter. Porter (1985) defines VC as "a systematic approach to examining the development competitive advantage. The chain consists of a series of activities that create and build value, including core activities (input supply, processing, marketing, retailing, warehousing) and service activities (accounting, organizational management, human resource training and management, inter-firm relations, etc.) that support the core activities.

Agricultural value chain analyses are systematically maps chain actors and their functions in production, processing, transporting and distribution and sales of a product or products. Through this mapping exercise, structural aspects of the value chain such as characteristics of actors, profit and cost structures, product flows and their destinations, and entry and exit conditions are assessed. As such, value chain analysis is a descriptive construct providing empirical framework for the generation of data. However, value chain analysis also provides an analytical structure to gain insights into the organization, operation and performance of the chain (Kaplinsky and Morris, 2001).

According to Grunert *et al.* (2005), a value chain is the disaggregating of a firm into its strategically relevant activities for understanding the behavior of costs as well as the existing and potential sources of differentiation where its main aim 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

According to Kaplinsky and Morris (2001), a value chain is defined as “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), to delivery to final consumers, and final disposal after use. As such, value chains include all the vertically linked, interdependent processes that generate value for the consumer, as well as horizontal linkages to other value chains that provide intermediate goods and services. Value chains focus on value creation typically via innovation in products or processes, as well as marketing and on the allocation of the incremental value

The concept of a value chain is increasingly being applied in the design and implementation of development programs aimed at poverty reduction. As an analytical tool, it provides a useful framework for understanding key activities, relationships, and mechanisms that allow producers, processors, buyers, sellers, and consumers separated by time and space to gradually add value to products and services as they pass from one link of the chain to another, making it a “value chain” (UNIDO, 2009).

According to Dempsey *et al.* (2006), “A value chain is a supply chain consisting of the input suppliers, producers, processors and buyers that bring a product from its conception to its end use. A value-chain approach to development seeks to address the major constraints at each level of the supply chain rather than concentrating on just one group (e.g. producers) or on one geographical location. Constraints often include a lack of information about or weak connections to end markets, and or inadequate coordination between actors. Taking a value chain approach is often essential to successful economic development since micro and small enterprises and smallholder farmers will only benefit over the long term if the industry as a whole is competitive”.



Source: Adapted from Anandajayasekaram and Berhanu (2009) cited in Tegegn (2013)

**Figure 1:** Typical agricultural value chain and associated business development services.

The value chain concept entails the addition of value as the product progresses from input suppliers to producers to consumers. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekaram and Berhanu, 2009).

### 2.1.1. Value chain map for agricultural commodities

Mapping a value chain facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. It is the process of developing a visual depiction of the basic structure of the value chain. This exercise is carried out in qualitative and quantitative terms through graphs presenting the various actors of the chain, their linkages and all operations of the chain from pre-production (supply of inputs) to industrial processing and marketing (UNIDO, 2009).

According to Kaplinsky and Morris (2000) mapping the chain means giving a visual representation of the connections between actors and tracing a product flow through an entire



channel from the point of product concept to the point of consumption. It is an ideal tool for measuring and quantifying the cost of administrative distortions that hinder competitiveness of products and industries. In its simplest form, the value chain is merely a flow diagram. Value chain can be complex and contain a big number of actors. Each actor can also be connected to more than one value chain. Therefore, it is important to know the aim of the study and the point of interest. Thereafter decision can be made on where in the chain to start and what to include in the chain analysis. The first step in a value chain study is to identify the actors and the connections between them to get the chain mapped out. This can be done with a qualitative study, followed by a quantitative study when the map of the chain is completed. The quantitative study gives more information about activities and relations in the chain and makes the study more certain (Hellin and Meijer, 2006).

#### 2.1.2. Value chain governance

Value chain governance refers to the relationships among the buyers, sellers, service providers and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use. It shows the role of coordination and associated roles of identifying dynamic profitable opportunities and distributing roles to key players (Kaplinsky and Morris, 2000). Governance is a central concept to value chain analysis can be defined as non- market coordination of economic activity and ensures that interaction between firms along a value chain exhibit some reflection of organization rather than being simply random (Roduner, 2004). Value chains imply repetitiveness of linkage interactions.

Governance ensures that interactions between actors along a value chain reflect organization, rather than randomness. The governance of value chains emanates from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in activities, roles and functions. Humphrey and Schmitz (2000) argue that the issue of governance in value chain is important for market access, fast track to acquisition of production possibilities, distribution of gains, leverage points for policy initiatives, and channel for technical assistance.

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

### 2.1.3. Value chain upgrading

Upgrading refers to the acquisition of technological capabilities and market linkages that enable firms to improve their competitiveness and move into higher-value activities (Kaplinsky and Morris, 2000). Value chain analysis helps to find those segments of the value chains which need to be improved or upgraded (Redunko, 2008). According to Kaplinsky and Morris (2002), upgrading is a process of adopting innovation a process which recognizes relative endowments and the existence of rents.

Moreover, Kaplinsky and Morris (2000) gives four directions in which economic actors can upgrade: increasing the efficiency of internal operations, enhancing inter-firm linkages, introducing new products and changing the mix of activities conducted within the firm. In most cases upgrading of value chains is achieved through attention to multiple business aspects, such as combined attention to product and process upgrading or collaborative product upgrading in combination with contractual arrangements.

The concept of upgrading to understand the three different shifts that firms might undertake in the global chain. Firstly, a firm can upgrade through transformation of inputs into outputs more efficiently by reorganizing the production system or by introducing superior technology

which is often referred as process upgrading. Secondly, product upgrading through which a firm can upgrade from moving into more sophisticated product lines. Thirdly, upgrading by value addition referred as functional upgrading. Fourthly, moving to a new value chain referred to chain upgrading.

Process upgrading: Is increasing the nature of internal processes such that these are significantly better (differentiated) or more cost-efficient than those of rivals, both within individual links in the chain (for example, increased inventory turns, lower scrap), and between the links in the chain (for example, more frequent, smaller and on-time deliveries (USAID, 2008). KIT *et al.* (2006) indicated that process upgrading means producing the same product more efficiently perhaps by using new technologies or management methods.

Product upgrading: Is introducing new products or improving old products faster than rivals. This involves changing new product development processes both within individual links in the value chain and in the relationship between different chain links. Farmers can improve their product in various ways. For example, they may plant a new variety that has desirable characteristics; or they stop using agrochemicals and apply for certification so they sell their produce as “organic” (Kaplinsky and Morris, 2002)

Functional upgrading: Is increasing value added by changing the mix of activities conducted within the firm (for example, taking responsibility for, or outsourcing accounting, logistics and quality functions) or moving the locus of activities to different links in the value chain for example from manufacturing to design (Rudenko, 2008).

Chain or inter-sectorial upgrading: where firms move into new but often related industries. This occurs when firms apply the competence acquired in a particular function of a chain (e.g., competence in producing inputs, or in export marketing) to a new sector. For example, a company or a cluster of companies that specialize in graphite materials could move from making golf clubs and tennis rackets to racing bikes, fishing rods, and even airplane components (Gereffiet *al.*, 2001).

## **2.2. The Agricultural Value Chain Analysis Approach and Purpose**

Agricultural value chain analysis can be viewed as an empirical device or analytical tool (Kaplinsky and Morris, 2001). The research can be descriptive, prescriptive and designed to provide operational guidelines to improve efficiency of vertical coordination. Agricultural value chain analysis systematically maps chain actors and their functions in production, processing, transporting and distribution and sales of a product or products. Through this mapping exercise, structural aspects of the value chain such as characteristics of actors, profit and cost structures, product flows and their destinations, and entry and exit conditions are assessed (KIT *et al.*, 2006; Kaplinsky and Morris, 2001). Value chain approaches have been utilized by development practitioners and researchers alike to capture the interactions of increasingly dynamic markets in developing countries and to examine the inter-relationships between diverse actors involved in all stages of the marketing channel (Giuliani *et al.*, 2005; Pietrobelli and Saliola, 2008).

Agricultural value chain analysis is a dynamic approach that examines how markets and industries respond to changes in the domestic and international demand and supply for a commodity, technological change in production and marketing, and developments in organizational models, institutional arrangements or management techniques. The analysis should look at the value chain as a set of institutions and rules; as a set of activities involved in producing, processing, and distributing commodities; and as a set of actors involved in performing the value adding activities.

Agricultural value chain analysis focuses on chain governance and the power relationships which determine how value is distributed at the different levels. Through the analysis of systems and power relations at different levels, value chain analysis enables a more comprehensive modeling of the effects of interventions at different levels. Such an approach can enable a better targeting of interventions aimed at poverty reduction. The agricultural value chain approach concurrences due attention to the roles of business development services in enhancing the performance of value chains. Kaplinsky and Morris (2001) showed that a strategy to improve the competitiveness of a value chain should consider the nature of products in relation to the type of markets where the product is sold for final usage.

### **2.3. The Need for Value Chain Analysis in Agriculture**

In agriculture, the concept of value chain is very important as increasingly agricultural products are hardly consumed in the place where they are produced but are transformed, combined with other products, and transported from one actor (owner) to the other with value addition to the product, packaged and displayed until it gets to the final consumer (Roduner, 2007). Value chain was used by many organizations across the globe. Following the pioneering contributions of Porter (1985) who focused on how individual firms can create value and build up their competitive advantage, different institutions and individuals applied value chain approach. Moreover, Ponte (2002) used a value chain analysis for the coffee exporting countries in the developing world. The study concluded that the coffee chain was increasingly becoming buyer-driven and the coffee farmers and the producing countries were facing a crisis relating to changes in the governance structure and the institutional frame work of the coffee value chain.

The value chain approach analyzes the firms in the market chain from input suppliers to final consumers and the relationship among them. It analyzes the factors influencing industry performance, including access to and the requirement of the end market; the legal, regulatory and policy environment; coordination between firms in the industry; and the level and quality of support services. Relationships among firms in an industry can facilitate production and marketing efficiencies and enable the flow of information, learning, resources and benefits (SNV, 2007).

Kaplinsky and Morris (2001) argue that there are three main sets of reasons why value chain analysis is important in this era of rapid globalization. The first reason they raise is that with the growing division of labor and the global dispersion of the production of components, systemic competitiveness has become increasingly important. Second efficiency in production is only a necessary condition for successfully penetrating global markets. Third, entry in to global markets which allows for sustained income growth requires an understanding of dynamic factors within the whole value chain.

## **2.4. Methodology of Value Chain Analysis**

An approach used in value-chain analysis depends on the research question (Kaplinsky and Morris, 2001) cited in Emanu and Nigussie (2011), accordingly, four aspects of value-chain analysis have been applied in agriculture:

**Value chain mapping:** a value-chain analysis systematically maps the actors participating in the production, distribution, processing, marketing and consumption of a particular product (or products). This mapping assesses the characteristics of actors, profit and cost structures, and flows of goods throughout the chain, employment characteristics, and the destination and volumes of domestic and foreign sales. The map shows existing relationships between different actors in the value chain. It also shows potential or weak links that could be explored and strengthened in future.

**Identifying the distribution of benefits of actors in the chain:** Through the analysis of margins and profits within the chain, one can determine who benefits from participation in the chain and which actors could benefit from increased support or organization. This is particularly important in the context of developing countries (and agriculture in particular), given concerns that the poor in particular are vulnerable to the process of globalization.

**Examining the role of upgrading within the chain:** Upgrading can involve improvements in quality and product design that enable producers to gain higher-value or through diversification in the product lines served. An analysis of the upgrading process includes an assessment of the profitability of actors within the chain as well as information on constraints that are currently present. Governance issues play a key role in defining how such upgrading occurs. In addition, the structure of regulations, entry barriers, trade restrictions, and standards can further shape and influence the environment in which upgrading can take place. Possible forms of upgrading include: process upgrading, product upgrading and function upgrading.

**Role of governance in the value-chain:** Governance in a value-chain refers to the structure of relationships and coordination mechanisms that exist between actors in the value-chain. Governance is important from a policy perspective by identifying the institutional

arrangements that may need to be targeted to improve capabilities in the value-chain, remedy distributional distortions, and increase value-added in the sector. By systematically understanding these linkages within a network, one can better prescribe policy recommendations and, moreover, further understand their reverberations throughout the chain.

## **2.5. Marketing Performance Analysis**

Marketing performance can be evaluated by analyzing costs and margins of actors in different channels. A commonly used measure of system performance is the marketing margin or price spread (Getachew, 2002). Margin or spread can be useful descriptive statistics if it used to show how the consumer's price is divided among participants at different levels of marketing system (Mendoza, 1995). 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). Market performance can be evaluated by analysis of costs and margins of marketing agents in different channels.

### **2.5.1. Marketing cost**

Marketing cost is the embodiment of barriers to access to market participation by resource poor smallholders. It refers to those costs, which are incurred to perform various processes along different channels. Further, marketing costs like handling cost (labor, loading and unloading, costs of damage, transportation and etc.) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway *et al.*, 2002).

### **2.5.2. Marketing margin**

Marketing margin is defined as the difference price between the price the consumer pays and the price that is obtained by producers, or as the price of a collection of marketing services, which is the outcome of the demand for and supply of such services (William and Robinson, 1990 and Holt, 1993) as cited in Gebre and Bekele (2015). The size of marketing margin is

largely dependent upon a combination of the quality and quantity of marketing services provided the cost of providing such services, and the efficiency with which they are undertaken and priced. Analyzing market margins is an important means of assessing the efficiency of price formation in and transmission through the system.

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). The marketing margin in an imperfect market is likely to be higher than that in a competitive market because of the expected abnormal profit (Wolday, 1994).

Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain, for example between producer and wholesale, wholesale and retail prices (Scarborough and kydd, 1992).

## **2.6. Empirical Reviews**

### **2.6.1. Value chain analysis of commodities in different area**

The value chain concept has been applied in both the crop and livestock sectors (Rich K.M. *et al.*, 2010) and goes beyond supply chain analysis to make a more critical assessment of performance and competitive advantage in a dynamic context. A value chain is the full range of activities required to bring a product from conception, through the different phases of production and transformation. According to Kaplinsky and Morris (2001), a value chain is made up of a series of actors (or stakeholders) from input suppliers, producers and processors, to exporters and buyers engaged in the activities required to bring agricultural product from its conception to its end use. Development practitioners make extensive use of the value chain concept for the design of market-driven rural development projects and strategies. It is also widely used by researchers, as shown by the increasing number of publications (Fasseet *al.*, 2009). There are a number of studies that have employed the value chain approach to agricultural commodities in Ethiopia.



McCarthy *et al.* (2008) conducted a research on rice and wheat value chain in India and stated that, input suppliers (including manufacturers, wholesalers and retailers); producers; a large number of intermediaries (including collectors, traders, commission agents, and brokers); wholesalers; processors (including rice and flour millers); and retailers are the major actors in the rice and wheat value chains.

The study by Tegegn (2013) on Value chain analysis of vegetables in Oromia regional states of Habro and Kombolcha districts was aimed at identifying vegetable value chain actors and examining the performance of actors in the chain and he identified the challenges and opportunities of the commodity in the area. He also used multiple regression models for determinants of market supply using multiple regression model and found that, access to extension service, access to market information, vegetable farming experience, non/off-farm activities, distance to the nearest market and quantity of vegetable produced, marketed supply is significantly affected by access to market information and quantity produced in the case of tomato

Consecutively, McCormick and Schmitz (2001) have indicated even though firms in a system are formally independent of one another, an increasing network through personal relations and repeated transactions has assisted to inspect and alleviate the chain's core problems by developing their capacity and reducing the cost of the actors. Moreover, the study on pulse value chain in Ethiopia attempts to identify the various impediments in order to develop possible interventions that can improve the performance of the value chain and indicated that, aggregation from producers often takes substantial effort as production is from about 11 million households that are spread over large and hard to reach areas.

Many actors are involved in aggregation and trading - the number of actors and their economic performance is unknown. Some estimate that there are thousands of aggregators (including assemblers, retailers, wholesalers, farmers' union, processors and exporters) operating at different levels in the value chain (Rashid *et al.*, 2010).

### 2.6.2. Actors and their role in the value chain

According to McCarthy *et al.* (2008), a study conducted on value chain analysis of wheat and rice in India find that, the major actors in the rice and wheat value chains are input suppliers (including manufacturers, wholesalers and retailers); producers; a large number of intermediaries (including collectors, traders, commission agents, and brokers); wholesalers; processors (including rice and flour millers); and retailers. Input suppliers include major chemical companies, government distributors, small wholesaler/retailers, and even smaller retail shops that sell small quantities of seed, fertilizer and pesticide to farmers at the village level. Producers are actors who grow wheat and rice and sell to local collectors or traders. Local collectors come to the villages and pick up small amount of grain, which they sell to larger traders and finally retailers received for retailing.

According to Rashid *et al.* (2010), the maize value chain in Ethiopia involves multiple actors, including: input suppliers, producers, traders (local assemblers and wholesalers), retailers and processors, and consumer. The role of input suppliers is supplying agricultural inputs for producers while the producers' major role is production. They produce at a small scale and sells only around 20% of produce, most immediately at harvest. Local trader/ assembler/co-operative (Individuals in towns close to producing farms) Assembles from farmers and sells to larger buyers typically transport grain on donkeys to nearest town. Wholesaler/unions (primary private individuals) Own or rent storage but usually do not store for more than one month. Use a broker to find buyers in Addis Ababa (main market) or other deficit areas. Retailer / processor (retail shops or processors in major markets directly (or through brokers), source grain from wholesalers. They Clean grains and sell to end consumers.

According to Kelemu *et al.* (2014) study on Innovation platforms for improving productivity in mixed farming systems in Ethiopia: Institutions and modalities, farmers, Collectors, traders, processors and consumers were the major Barley value chain actor. Farmers were classified in to malt barley and food barley producing farmers. Malt barley producers are those that have entered agreement with malt factories and premium prices are granted. This type of arrangement encourages farmers to engage in malt barley production. Such arrangement also provides good opportunities for factories to substitute imported malt barley and reduce their

transaction costs. Barley producers include smallholders and commercial farms. There are some 4.2 million smallholders, two state farms and several private commercial farms that produce and supply the domestic market with wheat. The major producers and suppliers, however, are the smallholders, accounting for more than 89% of the market supply.

According to these authors` food barley collectors are the same traders that come to the village to collect many other types of grains. These traders are not specialized for barley only. As a result, malt and food barley collectors usually collect the grain at times of harvest and also during slack season from village markets. Collectors are agents for traders at Woreda, and other traders coming from major towns. Traders were classified in to two: Traders at Woreda town and traders from major towns. Traders at Woreda town are one of the actors in the malt barley and have direct link with collectors. They buy all produces from collectors. Together with collectors they determine the price of produce at a given season. *Traders from major towns* are traders those who have direct link with both collectors and traders at Woreda town. These traders are powerful in the value chain, who determines the ultimate price of produce.

According to the study by Kelemuet *al.* (2014), the processors are the malt factories where the factory has established a scheme to buy malt barley from surrounding farmers. The factory pay premium price for malt barley producers to encourage them produces quality grain. The consumers are one of the actors involved in barley value chain particularly food barley and they are the rural residents. The consumption of food barley in towns is low compared to rural areas. According to Fantahun and Admasu (2010), the actors involved in the malt barley marketing system are producers, farmerscooperatives (primary and union), wholesalers, retailers, malt factories, breweries and consumers.

Moreover, there are also the chain supporters (Support giving actors) to barley value chain who are enormous like Wheat value chain. According to the study by Kelemuet*al.* (2014) the support actors that are currently providing support to the value chain are agriculture office of the Woreda through supply of technical support through extension system; seed enterprises both the federal and regional enterprises that are providing seed to the farming communities

through cooperatives, Woreda administration, store service providers, transporters, universities and private chemical traders.

Moreover, the study on vegetable value chain at Habro and Kombolcha Woreda indicated that, input suppliers, farmers, traders and consumers and exporters were the primary actors in and each of them adds value in the process of changing product title (Tegegn, 2013). He stated that, input suppliers are responsible to supply agricultural inputs like improved seed varieties, fertilizers, herbicides, pesticides and farm implements which are essential inputs at the production stage while producers are the major actors who perform most of the value chain functions from farm inputs preparation on their farms or procurement of the inputs from other sources to post harvest handling and marketing.

### 2.6.3. Performance of Actors in the Value Chain

The study conducted by Mintenet *al.* (2013) on Teff value chains in Ethiopia showed that, the share of the producer in the final retail prices increased from a level of between 74 and 78 percent in 2001 to between 76 and 86 percent in 2011. The shares of urban–rural marketing, urban distribution, and milling in final retail prices have declined significantly during this period. The results also showed that 85% of Teff was supplied directly from farmers to rural grain traders and urban retailers obtained 32% of supply directly from farmers, which make market channels shorter. Mill owners and cereal shops obtained 77% of Teff supply from rural grain traders/brokers.

Assefa (2009) used marketing margin analysis on market chain analysis of honey production in Eastern Tigray of Ethiopia and found that 17% of total gross marketing margin was added to honey price when it reaches the final consumer at the regional capital of Mekelle. Out of the total gross marketing margin 5.89% was gross margin of honey collectors, while 11.11% was that of retailers. Moreover, Musema (2006) used marketing margin analysis on pepper marketing chains in Alaba and Siltie Zones in southern Ethiopia and found that the gross marketing margin was 43.08% of the consumer price. Producers share by retailers was 50.7% of the consumers' price.

According to Rashid *et al.* (2014), on Ethiopia barley value chain, there are wide variations across the regions when determining which farmers sell their barley. However, at the national level, traders are the single largest actor in barley marketing, handling over 70percent of the marketed surplus. Next in line are consumers and farmers, accounting for 17.1 and 10.4percent, respectively. Most of the sales to farmers consisted of seed, and the consumers are the deficit households in the community as shown in the table below.

According Rashid, *et al.* (2014), there is wide variations across the regions when determining which farmers sell their barley. However, at the national level, traders are the single largest actor in barley marketing, handling over 70percent of the marketed surplus. Next in line are consumers and farmers, accounting for 17.1 and 10.4percent, respectively. Most of the sales to farmers consisted of seed, and the consumers are the deficit households in the community as shown in the table below. According to the study on barley value chain in Ethiopia, the value chain actors of Barley commodity perform an important market function, namely product aggregation. The majority of these traders are also smallholders who conduct commodity trade as a secondary business and operate very competitively with low margins.

Moreover, review literatures on barley value chain management indicated that, barley sales by the state and commercial farms are normally conducted on tender basis or by negotiating with buyers and delivery is at farm-gate. Depending on their proximity to the market and prevailing market and price conditions, they directly sell to rural consumers or to rural assemblers or to cooperative unions or to grain wholesalers. It is estimated that about 30% of farmers' produce is directly sold to consumers, 25% to assemblers, 20% to cooperative unions and 25% to grain wholesalers (Kaso and Guben, 2014).

Despite heavy public emphasis on farmers' organizations, the cooperatives appear to play a minimal role in the barley value chain. Less than half a percentage of marketed barley passes through cooperatives, which have little influence on the cooperatives revenues. As it was reported in 2014 marketing year, about 230,000 tons of barley were marketed; and only 920 tons were marketed through a cooperative, the majority of which was malt barley. Assuming a margin of 10percent and a unit price of 10,000Birr per ton, cooperatives made about 920,000 Birr or US\$46,000, which is miniscule given the size of the market.

According to Bernard *et al.* (2008) reported that, cooperatives accounted for 5-10 percent of all grain marketing. Another study that focused on malt barley found that cooperatives marketed 6 percent of the surplus (Alemu *et al.*, 2014). Finally, about 10 percent of the marketed barley, equivalent to 23,000 tons in 2014, changed hands through farmer-to-farmer transactions.

The result of marketing costs, margins, and profitability analysis of Teff and wheat market chain analysis by Urgessa (2011) indicated that, farmer traders incurred the smallest transaction cost per quintal. This was due to absence of costs related to transportation since they sell the product in their village market. The average transaction cost per quintal incurred by wholesalers of Teff (29.94 ETB) and wheat (23.6 ETB) was higher than any other traders. This could be due to higher costs associated with transportation of the product and storage loss during product preparation. With respect to profitability, urban retailers received the highest net profit rate per quintal 20.35 ETB for Teff and 28 ETB for wheat. Wheat urban assemblers and Teff regional wholesalers obtained lowest net profit per quintal respectively due to higher transaction cost for the latter associated with product preparation and transportation. However, wholesalers' lower net profit per quintal could be compensated through transaction of higher volume of the commodities.

Moreover, the study by Amare (2010), on the analysis of Grain Marketing in Southern Zone of Tigray Region, Ethiopia clearly showed that, the net earnings of assemblers are greater than the earnings of wholesalers and retailers. The net benefit calculated for wholesalers, assemblers and retailers were Birr 37.9/quintal, 49.25/quintal and 16/quintal, respectively. Transport cost was identified as the major cost component of marketing costs which accounted 44.19 per cent and 45.13 per cent, for wholesalers and assemblers respectively.

#### 2.6.4. Market orientation determinants among smallholder farmers

Market orientation is a production philosophy which focuses on consumers' taste, preferences and satisfaction as its basic production and marketing objectives. This is a situation where the production is aimed at satisfying dispersed population instead of just the household doing the production (Onubuogu and Onyeneke, 2012). Examining the trend of market orientation is a method of accessing the smallholder farmers' participation in the output market so that the objective of small-holders' agricultural commercialization and market orientation can be justified.

Tefera (2014) on determinants of haricot bean market orientation using tobit model found that, household head education level, access to credit and land per capita positively influenced chickpea market orientation while being male head of a household and accesses to credit increased the predicted value of haricot bean market orientation. Additionally, Tefera (2014) found that, the average level of market orientation index for haricot bean 0.4 and for chickpea 0.53 and concluded the household market orientation as moderate level.

Gebremedhin and Jaleta (2012) studies on Market Orientation and Market Participation of Smallholders in Ethiopia and found that, Household size, labor supply of household, ownership of equine, involvement in Extension the previous year, rainfall, and altitude, are significant correlates with market Orientation. Improving market orientation of smallholders at production level, and facilitation of market entry and participation of households in output markets. They specified that, the market orientation index of the crop in the study area was 0.29 and the farmers were found at moderate level of market orientation in the study area (Bure, Gomma and Mieso) in Ethiopia

Moreover, Kemisola *et al.* (2013) Study on determinants of market orientation using econometric model of probit model indicated that, age, gender, and distance significantly influenced market orientation. There is a strong significant and; negative relationship between age of farmers and market orientation and positive relationship between gender and distance in the study area. Policy that would promote formation of rural information bureaus alongside

the mobile-telephony systems that are already being piloted by some institutions should be pursued.

According to Jaleta *et al.* (2009), the study on Improving Productivity and Market Success of Ethiopian Farmers, Improving Market Opportunities, household crop market participation was determined by literacy of the head of household, nearness to the market place and household's market orientation, which is the making of production decisions based on market signals.

Eskola (2005) found that transaction cost-related factors such as geographical location, market information sources, and travel time to the nearest market, labor availability, farming experience, gender of household head, off-farm income and household asset base affect smallholders' likelihood and intensity of participation in markets which is the direct implication for market orientation of smallholder producers.

#### 2.6.5. Challenges for value chain development in Ethiopia

As it was reported by (Dereje, 2007; Kaleb, 2008; as cited in Tegegn ,2013), a review of literature in agro-industry value chain in Ethiopia indicates that the sector faces many challenges due to limited market orientation, limited efforts in market linkage activities and poor market information among actors.

According to the study conducted by Ababa (2010) in BenishangulGumuz Regional State, on market assessment and value chain analysis found out challenges that need to be addressed to realize the objectives of the food security and income generation activities include poor working culture and agricultural practice in the area; lack of skill in modern agricultural practices; poor quality of products and low prices; low productivity and production; no market information system for effective agricultural marketing; limited access to market especially between kebeles and woreda; lack of processing, preservation and transportation facilities for the products; capital shortage and lack of access to credit; water shortage during dry season; wild fire, and pests and diseases.



According to Tegegn (2013) investigation on vegetable value chain analysis, assessed Constraints hindering the development of vegetable value chain found in all the stages of the chain and found that at the farm-level, vegetable producers are faced with lack of modern input supply and high postharvest losses. On marketing side, limited access to market, low price of product, lack of storage, lack of transport, low quality of product and lack of policy framework to control the illegal Ethio-Somalia trade route are the major problems. Similarly, the study by Gebre and Bekele (2015) on potato value chain analysis, the case of Hadiya zone in Ethiopia, identified the challenges and opportunities deterring the value chain stages and found that:

Moreover, some studies suggest that there are other factors that affect barley value chain by limiting barley productivity. According to Sinebo and Yirga, (2002), biotic stresses like disease, insect pests, and weed infestations contribute to lower rates of yields in Ethiopia. Diseases (such as scald, net blotch, spot blotch, and rusts) and insect pests (such as aphids and barley shoot fly) reportedly can cause yield losses of up to 67 and 79 percent, respectively. Yield gains from weed control, on the other hand, ranges from 14-60 percent depending on the location and type of weed (Negewoet *al.*, 2011).

According to the study on barley value chain in Ethiopia, studied by Rashid *et al.* (2014), suggest that storage is a pervasive and systemic problem at all levels of the value chain. Storage is a serious constraint in Ethiopia's grain markets in general and malt barley in particular. According to the study by Kalebet *al.* (2014), the following are major constraints identified as factors that affect Barley Value Chain. These includes: Shortage of supply of disease resistant and high yield varieties, Weed and pest occurrence, Low soil fertility and low soil pH, Poor soil drainage, Frost and drought, Diseases, such as scald, net blotch, spot blotch and rusts, Rising costs of transport, Market price fluctuation and others.

Fantahun and Admasu (2010) identified some of the major production and market constraints including shortage of input supply, price setting, lack of extension services, lack of finance, inadequate malt barley supplied, poor market information and dissemination, poor storage and transportation on their investigation of malt barley market chain analysis in Amhara regional state. The findings of (Yadeta 2012) finds that, insufficient Agricultural input suppliers in

local market, Skill gap (shortage) for OSE staff and stake holder, Integration with supplier's system, Hidden costs or wastages, Accessibility to customers by OSE & AMF, are highly identified problems.

Beyene and Phillips (2007) has designated that, absences of research and market information in Ethiopian honey value chain have wasted the nation's countless benefits. This study was further showed by Belay (2003) who stated that, lack of government support such as: inadequate research and training, policies and strategies, have increased knowledge gap among the Ethiopian small scale farmers. Moreover, a research conducted on green beans by Lusby (2007) has discovered that, lack of crop husbandry skills and partial extension services has constrained the productivity of the sector.

The study on upgrading wheat grain quality along the value chain in Ethiopia by Birachiet *al*, (2015) indicated that, despite the importance of wheat for consumption and as a source of income, value chain actors are constrained by various challenges. Failure to produce the desired wheat grain reduces the prices received by producers and affects the quality of products purchased by consumers. Generally, grain quality is negatively affected by poor agronomic practices of farmers who lack training on post-harvest management and storage of wheat grain. Adequate storage facilities are missing along the value chain.

## **2.7. Conceptual Framework of Malt Barley Value Chain**

According to Anandajayasekeram and Berhanu (2009), the focus of value chain framework is developing an effective way of coordinating the hierarchical stages in the value chain to meet consumer demand in an efficient manner and enables to think about development from a systems perspective. The main idea of value chain is to highlight and map out specific physical commodity flows within a sector, including key stakeholders, through usually narrowing the analysis to domestic markets and ignoring dynamic adjustments to sector characteristics and relationships (Kaplinsky and Morris, 2001).

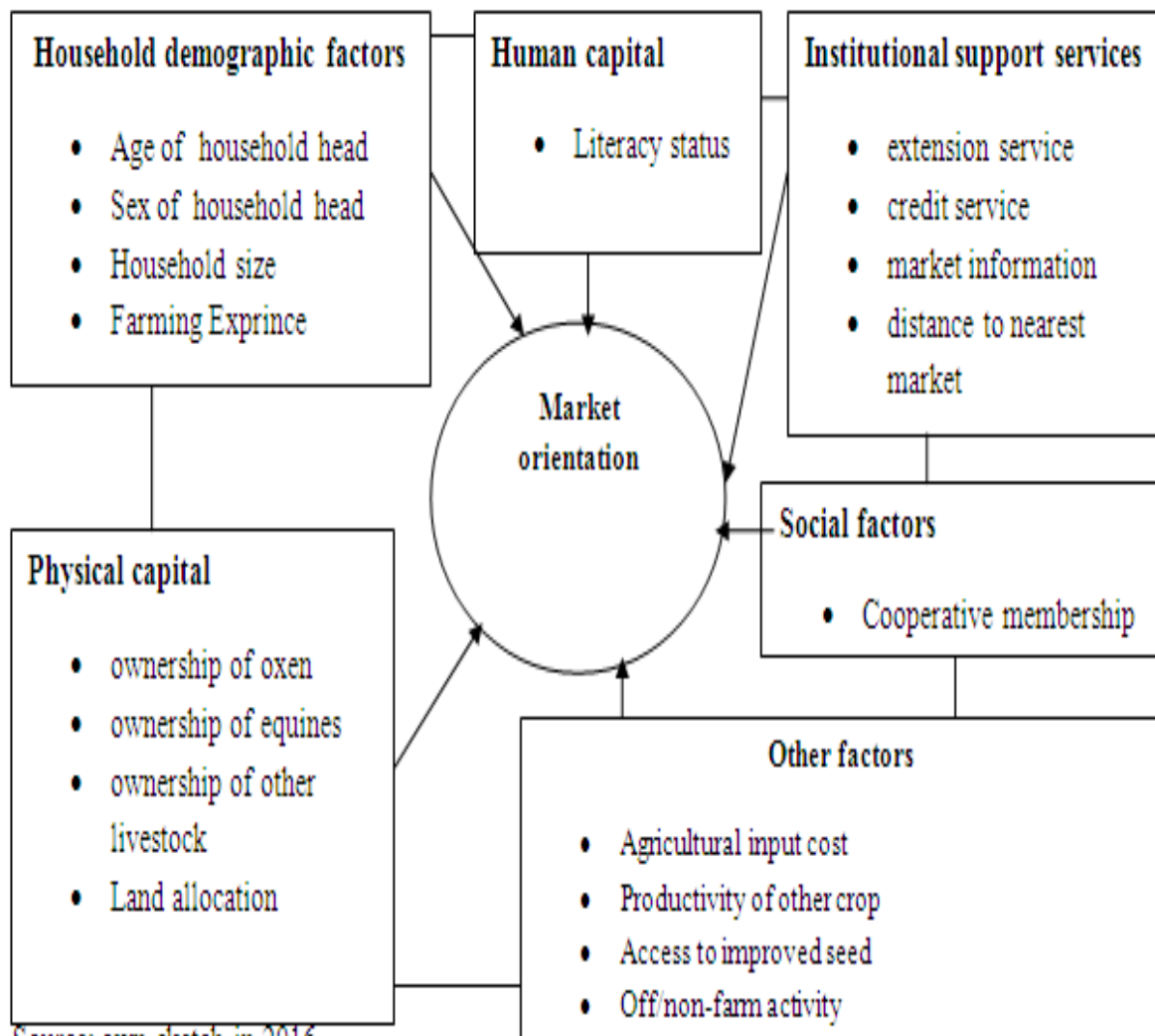
The main possible actors of Malt barley value chain in the study areas are input suppliers, Malt barley producers, Malt barley traders, malt barley processors (malt factory and breweries), distributors, retailers (hotels/restaurants) and consumers and also supporting

service providers. Therefore, the main focus of this study was to indicate some preliminary points on the value chain analysis of malt barley in order to empower producers by using their land efficiently and creating and strong integration for value chain development for the commodity among the actors who participate from production to final consumption at different stages. This also shown through mapping the malt barley value chain actors and their functions and also support service providers, identifying value chain actors of the commodity, performing value addition activities and value share of each actor along the chain, by assessing challenges affect the value chain and also identifying who governs the malt barley value chain more as compared to their contribution and share in the study area.

## **2.8. Conceptual Framework of Malt Barley Producers` Market Orientation**

Analysis of the variation in market orientation of households of malt barley in the study areas where the crops are important source of income offers a unique opportunity to gain understanding into the determinants of market orientation of malt barley production.

In this study, market orientation of malt barley producers is modeled (Figure 2) as a function of household demographic factors (age and sex of head, household size, farming experience ), human capital (education level of household head), physical capital (land, oxen ownership, ownership of other livestock and ownership of equines ),institutional support services (frequency extension contact, credit, and market information), market access (distance to nearest market) ,Access to improved seed, Agricultural input cost, productivity (yield) of other crop, off farm activity and social capital (membership of agricultural cooperatives).



**Figure 2.** Conceptual framework of malt barley market orientation at the study area

### **3. RESEARCH METHODOLOGY**

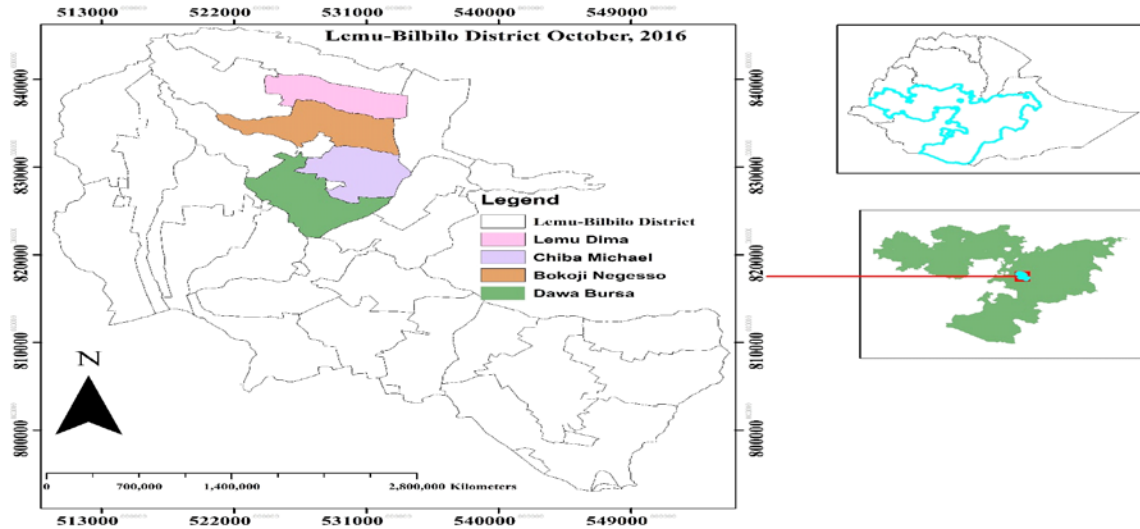
#### **3.1. Description of the Study Area**

LemuBilbilo is one of the districts found in Arsi Zone of Oromia Region. It is part of the former Bekoji Woreda in East Arsi zone which was divided for EnkoloWabeandLemuBilbilo Woredawhich is located about 235 km southeast of Addis Ababa, 56 kilometers south of Asella (Arsi Zone office of Road and Transport, 2016).

Topographically, the area lies within an elevation range of 1800 to 41800 meters above sea level with 800-1400 mean annual rain and temperature of 6<sup>0</sup>c to 20<sup>0</sup>c (Woreda communication office, 2016). The total population for this Woreda was 180,695, of whom 89,352 were men and 91,343 were women; 23,340 or 12.92% of its population were urban dwellers (PHCE, 2007).

The district is characterized by crop-livestock mixed farming system where crop production is dominant in the area. The farmer in the Woreda produces different varieties of agricultural crops ranging from cereals to pulses, vegetables, fruit, oilseeds and spices. Crop production by area is predominantly cereals followed by pulses, vegetables, oilseeds and fruit crops. The major crops grown in the area are malt and food barley, faba bean, field pea and wheat. Most land is allocated to food crop production and hence the major share of livestock feed is obtained from crop residues (WoARD, 2015).

The LemuBilbilo district consists of 24 kebeles where 83% of them are the most known malt barley producers while the rest four kebeles are the non-Producers of barley in general. The total study area of the Lemu Bilbilo district is estimated at 81,400 hectares. Out of this crop area, grazing and forest accounts for 86.2%, 8.28% and 4.71%, respectively. Bushes and shrubs which are seasonal browsing area occupy 0.32% of the total. The other 0.49% is occupied with swamps and buildings thus have very low agricultural value (FAO, 2010). As typical Ethiopian smallholder agriculture, the major economic activity is mixed farming, where crop production and livestock husbandry are practiced side by side.



Source: GIS output of 2016

Figure 3: Location of the study area

### 3.2.Data Types, Source and Collection Methods

Both quantitative and qualitative data types were used and collected both from secondary and primary sources. Secondary data were collected from published and unpublished documents, reports, from different governmental offices found in the district like Agricultural and rural development office, Trade and Market Development office and zonal offices (Arsi zone Agriculture and rural development office, trade and Market Development office, Road and Transportation office,).

Primary data was collected from 150 producers through household survey methods. The household survey focused on collecting quantitative data on production, land allocation, and marketing of farm produce, as well as demographics, resource ownership, and non/off-farm activities using pre-tested questionnaire while the qualitative fieldwork was done through focus group discussion and key informant interview methods. About four group discussions was planned and accomplished accordingly the study kebeles consisting of 5 peoples and 8 key informant interviewees was also taken place at in the study area using the checklist prepared where cooperatives leader and Development agents of the woreda participants in the interview for key informants.

A semi-structured questionnaire was employed to collect primary data for the cropping season of 20015/2016 from the sample respondents and a total of 150 malt barley producers were interviewed. Before conducting the actual interview, the questionnaire was pre-tested and overseen on six malt barley producers (farmers) who were not included in the sample respondents. Four enumerators where three of them were diploma holders in plant science and with a degree in animal science that had experience in data collection was recruited and trained on the details of the interviewing techniques and the contents of the questionnaire. The data collection activities were held for two month from April 30-June30, 2016 with time schedule of the field work at different level of the value chain actors.

### 3.3.Sampling Techniques of Producers

For this study, a two-stage sampling technique was implemented to select sample households from malt barley producer kebeles. In the first stage, with the help of district agricultural experts and development agents, out of 24 kebelesof Lemu Bilbilo district, four malt barley producer kebeleswere selected purposively based on the level of malt barley production. In the second stage, from the selected rural kebeles, 150 sample households were selected randomly based on proportional to the population size of malt barley producers of respective kebeles taking the list of malt barley producers from each of selected kebeles for the study using Cochran sample size determination formula in collaboration with experts in the department of crop production. The sample size determination formula was specified in the equation (1) given below:

$$n = \frac{Z^2 * p(1 - p)}{e^2} \text{----- (1)}$$

Where  $n$ = sample size, $Z^2$  =the abscissa of the normal curve that cuts off an area $\alpha$  at the tails  $(1 - \alpha)$  equals the desired confidence level of 95%, the area under the normal curve i.e.  $z= 1.96$ ,  $P$  = expected prevalence or proportion.  $e$  -the acceptable sampling error, hence 5%in this study;  $P=11\%$ ,  $N=1509$ ,  $Z=1.96$  with 95% confidence interval and  $e=5\%$

$$n = \frac{(1.96)^2 * (0.11 * 0.89)}{(0.05)^2} = 150 \text{----- (2)}$$

**Table 1: Sample size of producers from selected kebeles**

<b>No.</b>	<b>Name of kebeles</b>	<b>Total producers</b>	<b>Proportions</b>	<b>Sample</b>
1	BekojiNegesso	438	0.29	44
2	Chiba Michael	389	0.26	39
3	LemuDima	295	0.19	28
4	Dawa Bursa	387	0.26	39
<b>Total</b>		<b>1509</b>	<b>1.00</b>	<b>150</b>

Source: survey result of 2016

In addition to producers, samples were taken from traders, cooperatives, union and processors based on the response given by the farmers. Since there were no traders who were licensed for malt barley only, traders` sample were taken from grain traders in of the district. The sites for the trader surveys were in the district in which a good sample of malt barley traders existed. The lists of Grain wholesalers were obtained from the District Bureau of Trade and Industry (DBoTI) and for other traders (Rural collectors) there is no recorded list in the district. The data also taken from primary cooperatives of the district from each selected kebeles and union of the district. Furthermore, for this study data from processors, Distributors (wholesalers), retailers (hotels, cafe or grocery) and consumers were also collected based on flow of malt barley and further value added.

Accordingly, 15 rural collectors and 9 grain wholesalers were selected randomly from selected kebeles and from the study district respectively. Moreover, four primary cooperatives and one union were selected from the study kebeles and study district purposively and respectively. Furthermore, one malt factory (AMF) and one beer factory (Meta Diageo) were included in the sample purposively due to one main reason. It is because of, about 82% of malt barley produced in area was purchased by AMF and Meta Diageo is one of the main purchasers of malt barley through techno serve in the form of contact farming in the area.

Moreover, three beer distributors were included in the sample from Asella town randomly, 12 retailers (Hotels, grocery and cafes) randomly per the transaction in buying and selling of the product specified for this study both at the study area and out of the study area. Moreover, 10 consumers and 2 commission agents were also included in the sample.



**Table 2:** Sample size of traders, institutions and processors of malt barley

Traders	Place of samples and size							
	BekojiN egesso	Lemu Dima	Dawa bursa	Chiba Michael	Bekoji town	Asella town	Seb eta	Total
Rural collectors	5	3	3	4	0	0	0	15
Grain wholesalers	0	0	0	0	9	0	0	9
Cooperatives	1	1	1	1	0	0	0	4
Unions	0	0	0	0	1	0	0	1
Processors	0	0	0	0	0	1	1	2
Distributors	0	0	0	0	0	3	0	3
Retailers	0	0	0	0	5	7	0	12
Commission agents	0	0	0	0	2	0	0	2
Consumers	0	0	0	0	5	5	0	10
Total	6	4	4	5	22	16	1	58

Source: survey result of 2016

### 3.4. Methods of Data Processing and Analysis of the Study

The data generated was subjected to different forms of analysis: Descriptive analysis involved the use of statistical tools like frequency tables, percentages and ratios to describe socio-economic characteristics that affect market orientation of producers. Socio economic characteristics such as: sex, household size, education, household resource endowment such as land, labor, capital and transport facilities and institutional services such as credit, extension and access to market and non-farm activities were considered in the analysis to see how they affect market orientation. Ordinary least Square (OLS) technique of multiple regression model analysis was also used for determinants of market orientation of malt barley producers. Descriptive statistics, econometric estimation, value chain analysis, actor's performance analysis and analytical Indexes like crop marketability index and market orientation indexes were used for data analysis in order to meet the specific objectives of this study. The data collected from different sample respondents were coded and entered using SPSS then transferred and analyzed using STATA version 13. Moreover, SWOT analysis methods were used to identify challenges and opportunities from different stakeholders of malt barley value chain at the study area.

### 3.4.1. Value chain analysis of malt barley

According to Kaplinsky and Morris, (2000), value chain as a full range of activities required to bring a product or service through the different phases of production, including physical transformation, the input of various producer services, and response to consumer demand. Following this basic assumption of value chain, in the study area malt barley value chain encompasses the complete sequence of operations which, starting from the raw material, or an intermediate product, finishes downstream, after several stages of transformation or increases in value, at one or several final products at the level of the consumer. Since products move successively through the different stages and transactions take place between multiple chain actors, money and information are exchanged and value was progressively added.

Following the four value chain approaches, the Current malt barley value chain map was drawn, malt barley value chain actors` functions and characteristics as well as market channel for malt barley were identified, and explained. Furthermore, margin and financial profit share of actors were assessed and finally, chains which need upgrading and governance role were identified and the intervention needed were drawn as recommendation.

The process of value chain map for malt barley was done by identifying the value chain actors with their respective function using arrows for product flow, money flow and information flow from one actor to the other in qualitative and quantitative terms through graphs presenting the various actors of the chain, their linkages and all operations of the chain from pre-production (supply of inputs) to consumption. After having developed the general conceptual map of the value chain, analyzing the chain`s market performance and benefit share of actors is the next steps in the whole value chain.

To understand the characteristics of the chain actors of Malt barley and the relationships exists between them, including the identification of all actors in the chain; the flow of product through the chain; the work features and the destination; information was obtained by conducting interviews, focus group discussion and by collecting secondary data from various sources. This could be captured through mapping the value chain. Mapping the chain

facilitates understanding of sequence of activities, key actors and relationship involved in the value chain. This analysis was undertaken in qualitative terms.

### 3.4.2. Performance analysis of actors in malt barley value chain

To analyze marketing performance of the actors involved in the value chain of malt barley, similar steps was used followed by Tegegn (2013). Marketing margin was calculated by taking the difference between malt barley producers and retail prices. This can be calculated mathematically as, the ratio of producers' price to consumers' price and can be expressed as,

$$\text{producers' share} = \frac{\text{producers' price}}{\text{consumers' price}} = 1 - \frac{\text{Marketingmargin}}{\text{consumers' price}} \text{ --- (2)}$$

Gross Marketing margin (GMM):- According to Mendoza (1995), “marketing margins” should be understood as the gross marketing margins. He advises marketing researchers to emphasize on gross marketing margins in reporting their findings and considered in this study.

$$GMM = \frac{\text{Retailprice} - \text{farmgateprice}}{\text{Retailprice}} * 100 \text{ --- (3)}$$

Where GMM=Growth marketing Margin

Total Gross Marketing Margin (TGMM): - In analyzing margins, first the Total Gross Marketing Margin (TGMM) was calculated. This is the difference between producer's (farmer's) price and consumer's price (price paid by final consumer) and was calculated as follows;

$$TGMM = \frac{\text{Consumerprice} - \text{Produceprice}}{\text{Consumerprice}} * 100 \text{ --- (4)}$$

Gross Market Margin of individual actors ( $j^{\text{th}}$ ): - To find the benefit share of each actor similar procedure was applied with some adjustments, hence, the marketing margin was calculated at a given stage “j” and given by:

$$GMM_j = \frac{SP_j - PP_j}{TGMM_j} \times 100 \text{-----(5)}$$

Where, SP<sub>j</sub> is selling price at j<sup>th</sup> stage and PP<sub>j</sub> is purchase price at j<sup>th</sup> stage.

Net Marketing Margin (NMM): - is the percentage over the final price earned by the intermediary by deducting the marketing costs and is calculated as follows:

$$NMM = \frac{GrossMarketingmargin - MarketingCost}{Consumerprice} * 100 \text{-----(6)}$$

From higher NMM or profit of the marketing intermediaries reflects reduced downward and unfair income distribution, which depresses market participation of smallholders

### 3.4.3. Analysis of values added among the actors in the value chain

To determine the benefit shared among each actor along the malt barley value chain, descriptive statistics i.e. percentage was employed. In order to analyze the value added and distributed among each actor in the malt barley value chain, the money that an actor in the Malt barley value chain incurs (cost) and receives (margin) was identified. To do this, the operational costs and the required initial investment cost of the actors were identified during survey data collection. In the second step, Average cost was identified to calculate, the total sales (revenues) by multiplying the number of malt barley (malt barley product) sold (Q) with the selling price (P).

$$R = (Q * P) + othersourcesofIncome \text{-----(7)}$$

Where, R-total revenues, Q-Total number of Malt barley (malt barley product) sold and P-selling price. Moreover, Value addition of the actors in the value chain was calculated by subtracting the revenues of consecutive actors and the following the formula in order to compare the value added among the actors in malt barley value chain.

$$Value\ share = \left( \frac{Added\ Value}{Retail\ price\ (total\ added\ value)} \right) * 100 \text{ --- (8)}$$

#### 3.4.4. Market orientation analysis of malt barley producers

To analyze market orientation of malt barley producers, market orientation index was calculated for each sampled household heads during the study based on the resource they allocate for malt barley since market orientation is also the decision farmers in resource (land) allocation for production of a crop (Gebremedhin and Jaleta, 2012). When crops are grown for dual purpose both for commercial and consumption due to proportion of land operated by a farmer, farmers have different market orientation index depending on their resource allocation (land, labor and capital) for the commodity they produce. Based on the proportion of total amount sold to total production at farming system level, a crop specific marketability index ( $\alpha_k$ ) was computed for malt barley produced at farmer level system as follows.

$$MBMI_i = \left[ \frac{gross\ value\ of\ Malt\ barleys\ sold\ by\ individual\ farmer\ /yera}{Total\ value\ of\ malt\ barley\ produced\ by\ individual\ farmer} \right] \text{ --- (9)}$$

Where  $MBMI_i$  refers to malt barley marketability index for individual farmer in 2015/2016 production year.

$$\alpha_k = \frac{\sum_{i=1}^N S_{ki}}{\sum_{i=1}^N Q_{ki}} Q_{ki} \geq S_{ki} \text{ and } 0 \leq \alpha_k \leq 1 \text{ --- (10)}$$

Where  $\alpha_k$  is the proportion of malt barley sold ( $S_{ki}$ ) to the total amount of malt barley produced ( $Q_{ki}$ ) aggregated over the total sample households in a farming system.  $\alpha_k$  Takes a value between 0 and 1, inclusive of the value between 0 and 100% if it is converted into percentage. A value of zero would signify a totally subsistence level of market orientation in production and the closer the index is to 100, the higher the market orientation in production.

After the crop, specific marketability index calculated, household's market orientation index in land allocation ( $MOI_i$ ) was computed from the land allocation pattern of the household weighted by the marketability index of the crop ( $\alpha_k$ ) derived from equation 10

$$MOI_i = \frac{\sum_{k=1}^k \alpha_k L_{ik}}{L_i^T} L_i^T \geq 0 \text{ and } 0 < MOI_i \leq 1 \text{ --- (11)}$$

Where  $MOI_i$  is market orientation index of farmer,  $L_{ki}$  is amount of land allocated for malt barely barley in hectare, and  $L_i^T$  is the total crop land operated by farmer measured in hectare.

### 3.4.5. Econometric Analysis

The dependent variable analyzed in this paper is market orientation index of malt barley producers. The econometric model used depends on the nature of the dependent variable. For the determinants of household market orientation, we use ordinary least squares (OLS) model by following Gebremedhin and Jaleta (2012). This was because the dependent variable (market orientation index) is continuous as well as all the producers were involved both in production and marketing of malt barley and had an index greater than zero. Therefore, multiple regression model was applicable for analysis using the producers' market orientation index as dependent variables and indicated below.

$$Y_i = \beta_0 + \beta_i X_i + \varepsilon_i \text{-----}(12)$$

Where:  $Y_i$  = Market orientation index for  $i^{\text{th}}$  farmer,  $\beta_0 = \text{constant term}$ ,  $\beta_i$  = estimated parameters,  $X_i$  = the explanatory variables influencing market orientation of  $i^{\text{th}}$  farmer

#### 3.4.5.1. Test for Multicollinearity and Heteroscedasticity Problems

It is important to check variables used in the model for Multicollinearity and heteroscedasticity problems before running the model. Multicollinearity problem arises due to a linear relationship among explanatory variables; and becomes difficult to identify the separate effect of independent variables on the dependent variable because of existence of strong relationship among them (Gujarati, 2003). Variance inflation factors (VIF) technique (Appendix Table 9) and correlation among explanatory variables (Appendix table 12) were employed to detect Multicollinearity in explanatory variable. According to Gujarati (2003),  $VIF(X_j)$  can be defined as:

$$VIF(X_j) = \frac{1}{(1 - R_j^2)} \text{-----}(13)$$

Where,  $R_j$  is the multiple correlation coefficients between  $X_j$  and other explanatory variables. If the value of variance inflation factor (VIF) is 10 and above the variables are

collinear. If there is Heteroscedasticity problem in the data set, the parameter estimates of the coefficients of the independent variables cannot be BLUE. Breusch-Pagan test of Heteroscedasticity was employed for detecting Heteroscedasticity and Contingency Coefficients (CC) was used for dummy variables (Appendix Table 10)

Thus, before the execution of the econometric analysis the hypothesized independent variables were tested for the presence of Multicollinearity problem. The variance inflation factor and contingency coefficient were computed to check association among continuous variables and dummy variables, respectively. Both the VIF values and the contingency coefficients show that Multicollinearity was not a serious problem. The values of VIF for continuous explanatory variables were 2.15 or less than 10; accordingly, the contingency coefficients for dummy explanatory variables were 0.45 or less than 0.75, indicated that both sets of continuous and dummy variables have no serious Multicollinearity problem (Appendix Tables 9 and 10).

Thus, all hypothesized explanatory variables were included in the econometric analysis. In addition, Breusch-Pagan/Cook-Weisberg test was also employed to detect Heteroscedasticity Gujarati (2004). Accordingly, a large chi-square would indicate that Heteroscedasticity is present. In the present study, the test result shows the chi-square value was not that much big (about 60.55) indicating Heteroscedasticity was a problem but not serious and it was solved by Robusting the standard error (Appendix Table 11).

### **3.5. Hypothesis, Variable Selection and Definition**

In this part of study, the main interest of the researcher is to analyze the determinants of market orientation of malt barley producers with respect to resource allocation and market signals of the commodity. The hypothesis was presented with the effect of key explanatory variables that might influence, market orientation of smallholder malt barley producers in the study area. To deal with malt barley producers' market orientation, which is the main issue explained in the present study, the market orientation index was used as a dependent variable to measure market orientation of malt barley production.

#### 3.4.6. Independent (Explanatory) variables

These are variables explaining the dependent variables which can be continuous, dummy or categorical dummy variables taking different values in the analysis and are explained below.

**Age of Household Head (AHHH):** It is a continuous variable and measured in years and may have a negative or positive impact on producer's market orientation. The positive impact resulting from the fact that older farmers may take their decision more easily than the young farmers, because the older people might have preferential access to credit due to their age, availability of land, or family size, (Adegbola and Gardebroek, 2007). Moreover, Onubuogu (2012) found a direct relationship on the market orientation of farmers at 5% significant level and stated that, the more aged farmers are selling more of their produce and products, hence having higher market orientation compared to the younger farmers. The negative impact of age to market orientation is that, young people might have a longer planning horizon and might be willing to take risks (Zegeye *et al.*, 2001).

**Sex of Household Head (SHHH):** This is a dummy variable and takes a value of zero if the respondent is female and one if the respondent is male for variable to be considered. Male headed households, due to their potential crop production efficiency and decisions to produce are more advantages over female headed households and are expected to be more market oriented. The finding by Tefera (2014) on determinants of smallholder pulse producer's market orientation in southern Ethiopia indicates that, female head of households have a reduction by 0.331 in the chickpea market orientation compared to their male head of a household counterpart. Therefore, being male headed household is expected to affects market orientation of malt barley producers positively.

**Education of Household Head (EHHH):** This is a categorical variable and takes 1 if no education, 2 if grade 1-4 attended, 3 if grade 5-8 attended, 4 if high Scholl attended, 5 if preparatory attended and 6 if certificate and above. Randelaet *al.* (2008) reveled that, level of education gives an indication of the household ability to process information and causes some farmers to have better access to understanding and interpretation of information than others. Moreover, Onubuogu and Onyeneke, (2012) showed that, higher level of education is



associated with access to information on better market orientation strategies and higher productivity. Therefore, education level of the household was hypothesized to affect positively market orientations of malt barley in the study area.

**Family Size of Household Head (FHHH):** It is a continuous variable measured in the availability of all family members in the household, which was associated with market orientation either positively or negatively. According to Gebremedhin and Jaleta (2010), large household sizes diminish households from market orientation due to its effect on increasing household domestic consumption requirements. Moreover, it may have positive impact on market orientation since higher family size may have more active labor force used to produce more. According to Onubuogu and Onyeneke, (2012), the coefficient of household is positive and also significant at 5% level. It has direct relationship with market orientation and is an important determinant of market orientation of root and tuber crops production. From these contexts, family size is expected to have either negative or positive impact on market orientation malt barley producers in the study area.

**Distance to Nearest Market (DMRKT):** It is considered as a continuous variable which is the distance of the malt barley producers from production area to the nearest market and measured in walking hours. According to Berhanu and Dirka (2008), distance to market was explained as an important determinant factor for market-oriented chickpea production because of its impact on marketing costs and revealed that, farm households have hindrance to produce more as the price they receive for their produce will lower due to high transportation costs caused by long distance. If the market is far from the production area, the farmers' fails to get more information and they also fear the transport cost for the produce and may allocate small proportion of land to malt barley production and affects their market orientation negatively.

**Land Allocated for Malt Barley (LNDALCTD):** This is a continuous variable measured in hectare indicating the land allocated for malt barley from total land owned by a farmer used to produce any types of crop in a year. Land is an important factor in production and ownership of land is crucial for households to engage in production. The more land owned the more will

be the probability to participate in the decision (Abay, 2007). In this study land size allocated for malt barley is expected to affect the market orientation of producers positively.

**Farming Experience (FRMXP):** This is also a continuous variable measured in year of production which is the total number of years a farmer stays in production of malt barley. Farmers with longer farming experience are expected to be more knowledgeable and skillful (Taddese, 2011). A household with better experience in malt barley farming is expected to allocate more of his land to produce more amounts of malt barley. Therefore, this variable was hypothesized to positively influence farmers` market orientation in the study area.

**Productivity of Other Crop (PRDCTVTY):** This is a continuous variable which is productivity of any other crop other than malt barley measured in quintal per hectare. The crop whose yield is higher than malt barley is expected to have negative impact on malt barley producers` market orientation since farmers need a crop that yield high productivity.

**Livestock Ownership (TLSTKN):** It is a continuous variable measured in terms of TLU. As the number of animals increase, the probability of market orientation towards market oriented crop production is expected to decrease since the alternative income as well as food could be found from animals. In line to this Tegegn (2013) found that, farmers who have a number of livestock were specializing in livestock production so that they allocated large share of their land for pasture. On the other hand, Aysheshm (2007) found that household with larger TLU had better economic strength and financial position to purchase sufficient amount of input which initiates the farmers to allocate more of his land for livestock production. So, in the study area also, it was expected to affect market orientation of malt barley producers negatively.

**Equines Ownership (EQN\_SHIP):** This variable is used in the model as continuous variables and measured in number. Ownership of equines encourages market orientation due to their effect of reducing marketing costs, and improves the farmer`s profitability. They are the most important components of the farming system in line with crop marketing process serving as a source of transportation and reduce the transaction cost in the household. In this study,

equines ownership is expected to have positive impact on malt barley producers' market orientation.

**Access to Market Information (ACCMrkt):** It is a dummy variable with a value of one if a household head has access to market information and zero otherwise. The decisions of farmers towards the market are based on market price information, and poorly combined markets may deliver incorrect price information, leading to incompetent product movement. According to CIAT, (2004) cited in Tegegn, (2013), business decisions are based on dynamic information such as consumer needs and market trends implying that, farmers those who have access to dynamic information may produce more malt barley by allocating more of their land and hypothesized to have positive effect to market orientation of malt barley producers.

**Oxen Owned by Farmer (OXOWN):** This is also taken as a continuous variable measured in number of oxen owned by a farmer used for draft power for the production of malt barley. The aim of this variable is to know impact of number of oxen on households' market orientation through their impact on the producers towards malt barley production. Studies conducted (Samuel and Sharp, 2007; Abera, 2009; Gebremedhin and Jaleta, 2010) showed significant positive effect this variable on commercialization of cereals which an indicator for market orientation of specific crop grown by households. Similarly, in the present study, it was hypothesized to affect farmer's market orientation positively through increasing the production.

**Access to Credit Service (ACCRDT):** This is a dummy variable which represents whether the farmer has obtained formal credit or not during the production season. If the farmer has access to credit facility, the variable takes a value of one and zero, otherwise. Credits are expected to enhance farmer skills and knowledge, link farmers with modern technology through the purchase of inputs, to smooth consumption as well as markets, ease liquidity and input supply constraints, thus are expected to increase agricultural productivity, induce market orientation (Lerman, 2004; Martey *et al*, 2012). Similarly, in the present study access to credit is expected to have positive influence on market orientation of malt barley producers through improving the financial capacity of farmers to buy modern inputs, thereby increasing production of malt barley.

**Access to improved seed (ACMBS):** This is a dummy variable that takes values of 1, if the farmer uses improved seed and zero otherwise. It is expected to take positive sign, because improved seed is one of the most important inputs that increase production and productivity of malt barley which helps the farmers to produce more. The use of improved seeds aids in higher produce for the market and in turn increases in revenue for the farmers (Onubuogu and Onyeneke, 2012). If there is access for improved seed for farmers, they may allocate more of their land for malt barley since the crop is highly demanded and expected to affect market orientation of producers positively associated with, market orientation of smallholder farmers. According to the use of improved seeds aids in higher produce for the market and in turn increases in revenue for the farmers

**Extension Contact Frequency (FRQCY):** This is continuous variable which is the number of days that farmer had contact with extension agent for agricultural work supervision in a year. The objective of the extension service is introducing farmers to improved agricultural inputs and to better methods of production. In this regard, extension is assumed to have positive contribution to market orientation of malt barley producers. Farmers that have frequent contact with extension agent have better access to information and could adopt better technology such as better seed varieties and other better production practices, as well as they are more likely to know the advantage of market oriented production which increases their likelihood to produce more. According to Gebremedhin *et al.* (2006), extension service was found to enhance farmer skills and knowledge and develops their production. Hence, in the present study, it was expected to have positive impact on market orientation through its stimulation of production for malt barley producers.

**Off /Non-Farming Activities (OFFRM):** This is a dummy explanatory variable taking value of 1 if the household head involved in off/non-farm activity otherwise zero. This variable was expected either positive or negative effect on malt barley market orientation. The income obtained from this activity may weaken the farmers not to produce more by serving as an alternative income or it may strength the attitude towards production through purchasing inputs for production.

**Membership to Cooperative (COPMB):** This is a dummy variable and takes the value of one if the household is membership of any agricultural cooperatives engaged in any business, otherwise zero. Membership to cooperative societies which is a social capital had a positive coefficient with market orientation of root and tuber crop production indicating that root and tuber crop farmers that are members of cooperative societies had higher market orientation than their counterparts who are not members of cooperative societies (Onubuogu and Onyeneke, 2012). It is expected to be associated with market orientation decision of malt barley producers positively.

**Agricultural Input Cost (INPT\_CST):** This is a continuous variable which is the amount of cost incurred for fertilizers and seed used for malt barley production in year of 2015 and measured in birr per hectare. This variable was expected to have negative impact on market orientation of the producers since farmers are risk averse during production year.

## 4. RESULT AND DISCUSSION

This chapter presents the results and discussion of the study. Descriptive statistics and indexes were used to analyze the data to have a clear understanding of the socio- demographic, institutional, economic and other characteristics of the households in addition to the econometric model.

### 4.1. Demographic Characteristic of Malt Barley Value Chain Respondents

In this part, showed the brief descriptions of sample producers sample traders (collectors, wholesalers), distributors and retailers found in the malt barley value chain were shown.

**Table 3:** Demographic characteristics of sample malt barley value chain actors

Characteristics	Statistical measures	Producers (N=150)	Collectors (N=15)	Wholesalers (N=9)	Distributes (N=3)	Retailers (N=12)
Education	Mean	0.72	1.00	1.00	1.00	1.00
	Std.Dev	-	-	-	-	-
Sex	Mean	0.89	0.73	0.78	1.00	0.58
	Std.Dev	-	-	-	-	-
Age	Mean	49.37	42.93	44.67	38.67	52.00
	Std.Dev	8.33	4.39	6.75	2.52	10.13
	Max.	68.00	48.00	56.00	41.00	67.00
	Min	36.00	33.00	37.00	36.00	39.00
Family size	Mean	6.67	4.20	7.00	4.67	6.125
	Std.Dev	1.81	0.77	1.32	6.00	0.83
	Max.	12.00	6.00	9.00	4.00	7.00
	Min	2.00	3.00	5.00	3.00	3.00
Experience	Mean	9.13	6.47	11.11	2.67	15.92
	Std.Dev	2.14	1.96	3.02	2.08	4.27
	Max.	17.00	9.00	14.00	5.00	21.00
	Min	3.00	4.00	6.00	1.00	9.00

N=Number of respondents; **Source:** Own computation from survey result, 2016

Table3 above summarizes the demographic characteristics of producers and traders in terms of sex, age, family size, experience and education. The analysis illustrated that, about 89% of the sample producers were male headed while the rest 11% were female headed households. About 73, 78 and 51% of the sample from collectors, grain wholesalers and retailers were male headed households while 27, 22, and 49% of them were female headed household respectively. These indicate that both males and females are participant in production and

trading as well as consumption of malt barley and its products. However, the entire sample included in distributors was a male headed household.

From total of the respondents included in the producers` sample, about 72% of them had formal education in different category. specifically, about 36% of the sample household heads have attended their education from grade 1 -4, about 30% of them attended from grade 5-8 Education while the rest 4.67% and 2% of the sample producers got high school and preparatory education respectively (Appendix Table 1).The entire sample from traders, distributors and retailers had formal education in different grade level. The average age of the sample producers, collectors, grain wholesalers, distributors and retailers were 49.37, 42.93, 44.67, 38.67 and 52.00 years with 8.33, 4.39, 6.75, 2.52, 10.13 and 9.53 standard deviation respectively.

Farming experience is taken to be the number of years that an individual was continuously engaged in Malt barley production and trading ranging from collecting up to retailing. The average years of malt barley farming experience of the farmers found to be 9.13 years with 3 and 17 years of minimum and maximum respectively. The collectors and grain wholesalers have an average of experience in raw malt barley trading 6.47 and 11.11 years ranging from 9 to 4 and 6 to 14 years respectively while distributors and retailers have an average of experience in beer distributing and retailing 2.67 and 15.92 years ranging from 1 to 5 and 9 to 21 years respectively. The average family size of the producers is 6.67 persons and ranges from 2 to 12 persons while the collectors, grain wholesalers, distributors, retailers and consumers have average family size of 4.2 ,7.0,4.67 ,6.125 and 6.4 persons ranging from 3 to 6, 5 to 9, 3 to 4,3 to 7 5 to 9 and persons respectively.

#### 4.1.1. Farming system and source of livelihood of producers

Mixed farming system was the main occupation and source of livelihood for all sample households in the study area. About 87% of the land in the study area is used for different crop production while 13% is used as a grazing land (Appendix Table 2). The respondents depend on different means of income generation strategies where grain production and livestock production were major sources of income for most the producers in LemuBilbilo Woreda as a primary and secondary source respectively. The farming system of the study area

is a mixed crop-livestock type, where crop plays the major role in the livelihoods of the household.

The major crop types grown in the area include cereals (wheat, food barley, and malt barley), pulses (faba bean), oilseeds (linseed) and vegetables (potato) following their suitability to different seasons. Vegetables production especially potato is also considered as the second major means of livelihood in the Woreda. In addition to the mixed farming activities, some respondents have engaged in non-farm activities like small trading and handicraft to earn additional income. Accordingly, from the response of the interviewee, about 34% of the respondents were engaged in off/non-farm activity to earn income for their livelihood in addition to grain and livestock production (Appendix Table 2)

According to the survey result, of the total agricultural (cultivated) land, about 75% of the land was allocated for cereal crops (wheat, food barely and malt barley) which were the principal crops produced in the area while the rest 25 % of the land were used for pulses (5.46%), oilseeds (3.53%), vegetables (2.72%) and others like oats, pea and onion (1.05) during 2016 cropping season. The largest land (32%) were used for food barley production followed by wheat (22%), malt barley (20%) and Faba bean(5%) production approximately and respectively while linseed and potato were the last two crops grown with respective value of 3.5% and 2.7% respectively (Appendix Table 2).

#### **4.2.Malt Barley Value Chain Analysis in LemuBilbilo district**

This part discusses the steps of value chain analysis including; identifying the actors with their respective functions and their roles, mapping the diagram or map of the selected commodity, identifying the possible marketing channels, calculating the margin distributed among the value

##### **4.2.1. Malt barley value chain actors in the study area**

The first steps of value chain analysis are identifying the possible actors involved in the value chain of the selected commodity. This section presents the actors and the role they play in the malt barley value chain in the study area. According to Ghimirayetal. (2007), actors and their role is assessed along the different stages of the value chain as; input supply, production,



marketing, processing and consumption. The pictorial representation of malt barley value chain map (Figure 4) highlighted the involvement of different actors who are participated directly or indirectly in the value chain of malt barley. According to KIT *et al.* (2006), the direct actors are those involved in commercial activities in the chain (input suppliers, producers, traders, retailers, consumers) and indirect actors are those that provide financial or non-financial support services, such as credit agencies, business service providers, government, NGOs, cooperatives, researchers and extensions.

Similarly, in the present study, the primary malt barley value chain actors are those which have directly involved in the input supplying, production, trading, processing and distribution of the product. These actors are input suppliers, producers, farmer primary cooperatives, union, rural collectors, grain wholesalers, processors/malt factories and breweries, urban wholesalers (distributors), retailers (hotels/restaurants) and final consumers.

Even though the supportive actors are not directly involved in production and movement of the product, these actors have significant influence on the quality, efficiency of production and distribution. Support activities serve as the value chain's enabling environment. These actors are finance providers, research centers, government, cooperatives, union, district administrators, NGOs and the like. Similarly, the major actors played the role in provision of supportive service in malt barley value chain in the study area includes: Woreda office of agriculture and rural development (WoARD), Woreda office of cooperatives (WoCoop), Woreda office of Trade and Market Development (WoTMD), Woreda office of Road and Transport (WoRT), Kulumsa Agricultural Research Center (KARC), Oromia saving and credit institution (OSCI), District Micro Finance (DMF), informal creditors, Arsi zone office of Trade and Market development (AZoTMD), Arsi zone office Agriculture and Rural development (AZoARD), Oromia Cooperative Bank (OCB), Commercial Bank of Ethiopia (CBE), Ethiopia Seed Enterprise (ESE), Oromia Seed Enterprise (OSE), Woreda seed Multiplier Cooperatives (WSMCoop) are main supporting actors of malt barley in the study area.

Development agents in the study area were the main extensions services with another service provider like AMF, KARC, beer factories and farmers' cooperative unions. According to the response from focused group discussions in sampled kebele, most of the trainings were given

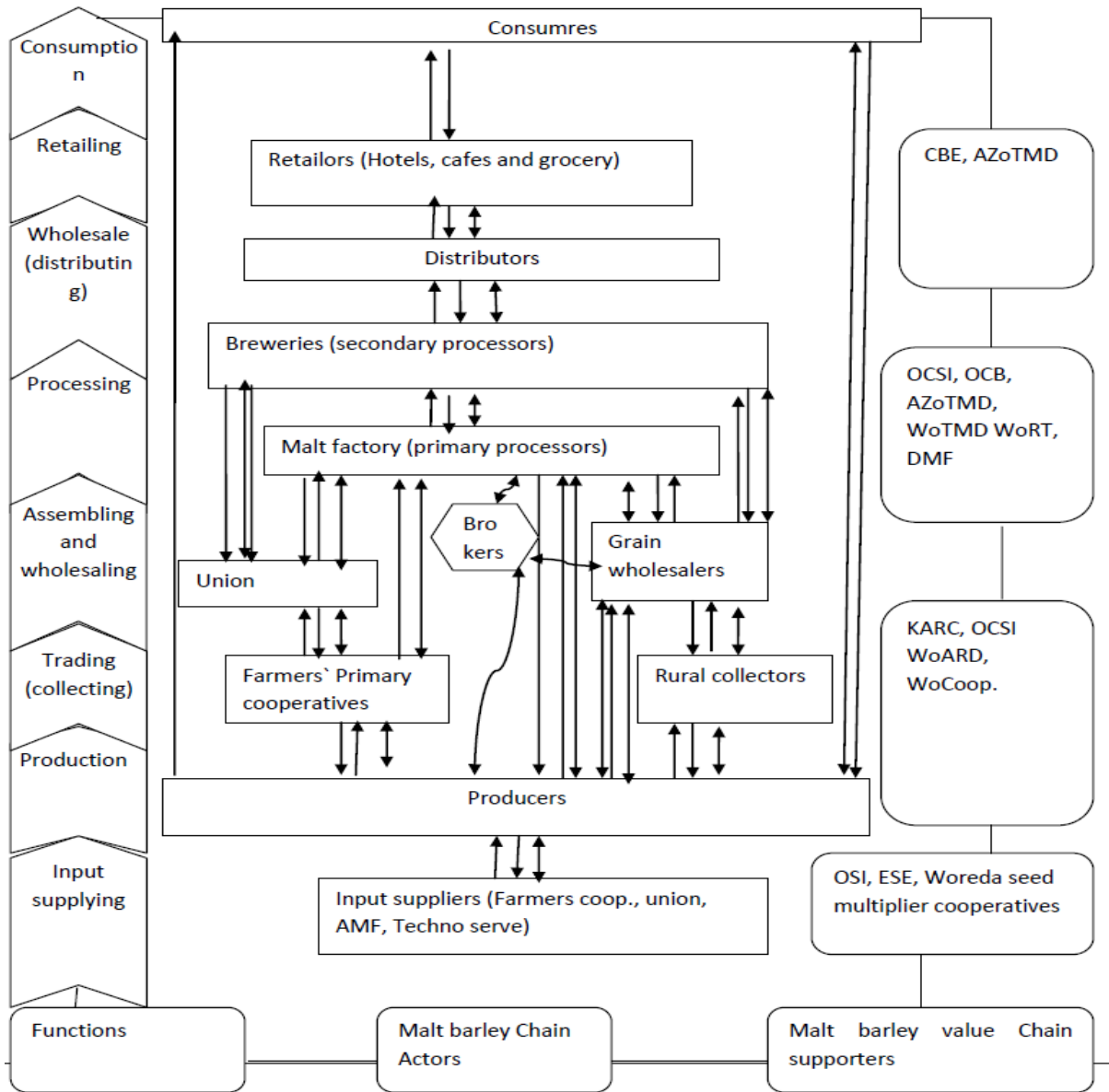
to the malt barley producers on fertilizer application and the other trainings such as crop management, harvesting and post-harvest handling. Agriculture and rural development office of the Woreda through its subject matter specialists (SMS) is the major supporter actor who provides information and advisory service on malt barley from land preparations, sowing, production up to marketing as well as management practices. Moreover, primary cooperatives and unions also the service providers to the farmers including input supplying up to purchasing their product with negotiable price information.

In the study area, farmer's primary cooperatives, Galama union, Asella malt factory, Techno serve (Meta Diageo beer factory) gives inputs for the farmers in the form of credit while Oromia Credit and Saving Institution (OCSI) and individual lenders (traders) have been identified as a potential source for credit on a cash basis. The survey result showed that only 28.7% of sample respondents took credit while the rest 71.3% of them did not get any access to credit. Most of the respondents' reasons for not participating in credit market were high interest, accessibility of alternative sources and some religious which is related to taking or giving interest. Most of traders also get financial services from OCSI and some traders received credit from banks like Cooperative Bank of Oromia.

#### 4.2.2. Malt barley Value chain map in the study area

Following the value chain actors, supporters with their respective function, are the next steps is the so-called mapping. Mapped value chain includes the actors, their relationships, and economic activities at each stage with the related physical and monetary flows. The Smallholder farmers of LemuBilbilo district grow malt barley as both food and a cash crop. The malt barley products pass through the different phases of production, processing, marketing, and final use by consumers. The actual map of the input-output structure of the malt barley value chain originated from LemuBilbilo Woreda is presented in Figure 4 below and the functions performed by each actor in the value chain are represented on a vertical axis. On the left-hand side of the diagram, the main actors are represented using boxes with solid lines at the middle, while the supporters are represented on the right-hand side. The downward arrow shows the exchange of money, the double arrow shows the two-way

information flow while the upward arrow shows the product movement in the study area. The following figure shows the map for the commodity.



Source: Own sketch from survey result, 2016

Key:  $\uparrow$  = product flow,  $\downarrow$  = one way flow of money,  $\updownarrow$  = two way information and technology flow

Figure 4: Value chain map for malt barley in the study area

#### 4.2.3. Actors and their roles in malt barley value chain

From the value chain map of malt barley, the actors and their role are described as follows:

**Input suppliers:** value chain function starts from inputs use to produce malt barley and value added products. There are many actors who are involved directly or indirectly in agricultural input supply in the study area. Currently, the district primary cooperatives and Galama farmer's cooperatives union, Asella Malt Factory and brewery (Meta Diageo through Techno serves) are the major input supplier for the farmers of malt barley producers in the area. All such actors are responsible to supply agricultural inputs like improved seed varieties, fertilizer, herbicide and pesticide, and farm implements which are essential inputs at the production stage. In the study area seed multiplier farmers are actor responsible for the multiplication of improved seed varieties and sale their seed to cooperatives/union/, Asella Malt Factory and techno serve which was given to the farmers according to the agreement between the input suppliers and receivers (farmers).

**Producers:** farmers are the key actors who are directly involved in malt barley production activities and perform most of the value chain functions starting from farm inputs, preparation of their farms or gaining of the inputs from other sources to post-harvest handling and marketing. The major farming and value adding activities which are performed by malt barley producers include plowing, sowing, fertilizing, weeding, pest/disease controlling, harvesting and post-harvest handling (cleaning). The larger quantities of malt barley are sold during and soon after the main (meher season)harvestto cooperatives, local collectors, grain wholesalers, and union and malt factory and to consumers of the area within the same production year. In the study area, due to the recent government and other stakeholders' intervention in promoting group marketing through cooperatives, majority of malt barley producers are members of such cooperatives and have interest to sale their malt barley to the cooperatives. About 40.86% of malt barley volume goes to cooperatives marketing channel from producers.

**Farmer's primary cooperatives:** Cooperatives as a form of business organization are different from the traders. Cooperatives help to sell their members' farm products and maximize the return that they receive for these goods and serve their members in many ways,

including bargaining for better prices, storing and selling members' grain. There are 24 agricultural primary cooperatives which were established in the district with the aim of increasing farmers' bargaining power in the exchange processes of different grain crops including malt barley. Among these, four primary cooperatives from four sample (LemuDima, DawaBursa, Nabo and Tulu Chiba primary cooperatives from LemuDima, Dawa Bursa, BekojiNegesso and Chiba Michael kebele perceptively) were part of the survey in this study. The cooperative is governed by elected members that negotiate on purchase price with the producers and bargain selling price with processors with assist of their union. They had direct communication with union and farmers and indirect communication with the processors of malt barley.

According to the survey result, the existence of cooperatives in malt barley value chain has two functions, firstly: they brought agricultural inputs from Galama union and other supplier by adding transport and other costs and then resale it to both member and non-member malt barley producers. Secondly, they act as major actors of malt barley value chain that has a stabilizing role in the local market through purchasing the product. In the study district cooperatives purchase malt barley from members and non-members and sale to malt barley processors (Asella Malt factory) with premium prices of 5.5 % to market price and bring money to the producers through the union by subtracting their commission.

The exchange activity of the commodity between producers and primary farmer`s cooperative is performed based on observation of physical quality of the produce only without using laboratory test. Because of this, the same level of malt barley is given different price. At similar purchasing time purchasing price of the cooperative are not equal since there is malt barley quality difference among each kebele producers. These price differences sometimes create difficulty between producers and cooperatives leaders. After all cooperatives purchase quality malt barley from both members and non-members by competing with local traders, they stock up each in warehouses after which they transfer bulk of malt barley to Asella Malt factory and to their union

**Union:** union is one of the actors involved in malt barley value chain in the study area. About twenty-four agricultural primary cooperatives are found in the district which jointly

established one union called “Galama farmers cooperatives union” for further increasing producers bargaining power and supplying the bulk volume of malt barley to the processors. Galama union was established in 1992 E.C and is located at Bekoji in the district and it is the only union available in the district. About four districts are included in this union, namely: Lemu Bilbilo, Shirka, Digelu-Tijo and Enkolo-Wabe. Currently, Galama union performs four major activities, first: purchasing and supplying agricultural inputs based on input demand from primary cooperatives which would be distributed to the farmers later, second: Grain marketing (by creating linkage with farmers through cooperatives and which would be distributed to malt factories and breweries (meta Diageo and Heineken beer factories with different price based on agreement and selling to malt factory and breweries in the country), third : mechanization and fourth: training for farmers who are members as well as for non-members of cooperatives.

The unions purchase malt barley from their cooperatives without laboratory sampling test by examining the physical quality only at the district level. They paid average price of 1005 ETB and purchased about 41400quintal of malt barley from cooperatives. About 67.63% of malt barley purchased from cooperatives was sold to AMF while 32.07% and 0.3% of it were sold to Meta Diageo and Heineken brewery factory respectively in 2016 market year. The agreement between union and Heineken were not effective in 2015/2016 production year due to price given by Heineken.

**Rural Collectors:** these are traders or farmer/part-time traders who collect grain from small rural markets from the kebele and from Bekoji market and sell to the grain wholesalers. They play a crucial role, particularly in collecting and transporting grain from inaccessible or distant markets for re-selling it to grain wholesalers without considering the quality of malt barley by negotiable price. They play important role in the malt barley value chain and are responsible for the trading of 22.67% of malt barley from production areas to rural wholesalers in the study areas. The value adding activities of collectors include purchasing, assembling and selling to rural wholesalers.

**Grain wholesalers:** Survey result indicates that about 15 grain wholesales are found in Lemu Bilbilo district which are licensed by trade and marketing sector in the districts and

several local collectors who are not registered but part of the value chain of malt barley. The district is the main assembly center for malt barley grain wholesalers in their surrounding kebeles. They have better financial facilities, storage, and transport and communication access than another traders fund in the district. Almost all grain wholesalers have a warehouse, either owned or rented. These are suppliers of bulk of malt barley to the processors (Asella malt Factory). Grain wholesalers are mainly involved in purchasing malt barley from local collectors and sometimes they collect directly from producers in larger volume and then transport it by lorry or truck to Asella Malt Factory through their brokers/middlemen and some part of it to the brewery especially to Meta Diageo.

**Brokers:** Brokers are agents who work for a commission on behalf of other participants. They specialize in bringing the buyers and sellers together. They disseminate price and other information to the market participants. In the study area, the grain wholesalers and factories use brokers for buying and selling and they connect with producers. The benefit of brokers for the traders in the study area was for saving time and for buying grain at lower price.

**Processors:** malt barley processors are the important actors towards improving malt barley quality as well as increasing the volume of domestically produced malt barley which would be distributed (sold) to different brewery companies in the country. For malt barley, there are two main processing stages done at malt factory and beer factory. The malt factory they entail the transformation of malt barley into a value-added product called malt. Processors have strict quality standards/parameters/ and expect their malt barley suppliers to meet these standards. These standards have different priorities in various malt barley markets (processors).

Asella Malt Factory was the only malting factory in the country and carried out both domestic and international procurement of malt barley until 2013 marketing year. In the domestic market, the factory enjoyed monopsony power (one buyer but many sellers) over the malt barley sellers and, consequently, enjoyed some price setting power (Rashid *et.al*, 2014). The entry of new market players Heineken and Diageo and a new malt factory, Gondar Malt, led to competition in the sector. The Asella Malt Factory had to change its purchase prices three times in 2014, with the initial price increased from 600-700 Birr per quintal to 900-1035 Birr

per quintal. Thus, if we find that the market locations are well integrated, this implies that malt barley farmers have benefited because of competition.

**Distributors:** these are wholesalers who involved in distributing the value-added product of malt barley at brewery level to different retailers of different areas in the country. They have their own truck for transportation purpose; however, the estimated price for transporting one crate of bear from Addis Abeba to Asella cost about 8.6 birr. An interview was made with Heineken, Meta Diageo and Habesha beer distributors at Asella town including Walia beer, Harar beer, Bedelle beer, and Meta and Habesha beer to different districts of Arsi zone. According to the response from manager for Arsi zone, they purchase different types of beer with average price of 203 birr/crate with 15% value added tax (VAT) and distributes to hotels, grocery and cafes with 214 birr/crate of average price. They have their own truck which used to transport the product to different customers of their product.

**Retailers (Hotels, cafe and grocery):** - These are traders who are involved in purchasing and retailing different beverages which are the output of malt barley through further processing. They receive the product from the distributors without transportation and loading and unloading cost and sell to ultimate consumers. On average one crate of bear was purchased from distributors with 214 birr /crate and sold to different consumers with an average price of 12 birr/bottle or 288 birr/crate (5.76 birr/crate)

**Consumers:** Consumers are the final users of malt barley products and the unprocessed malt barley. Almost 4% of raw malt barley is goes to consumers at lemu Bilbilo consumers without any processing while nearly 96% of it reached to consumers through processing in processing companies. Consumers include people who are using malt barley and malt barley products such as unprocessed malt barley for home consumption, different foods made from it like bread, soup, porridge, kinche, tela, kolo, bessu, chuko, shorba, and beverages. On the other hand, consumers of malt barley value added product are found at different level of the country. Majority of the peoples in Ethiopia are engaged in drinking alcohol including beer which is the final output of malt barley through adding value to the product.

#### 4.2.4. Malt barley marketing channels



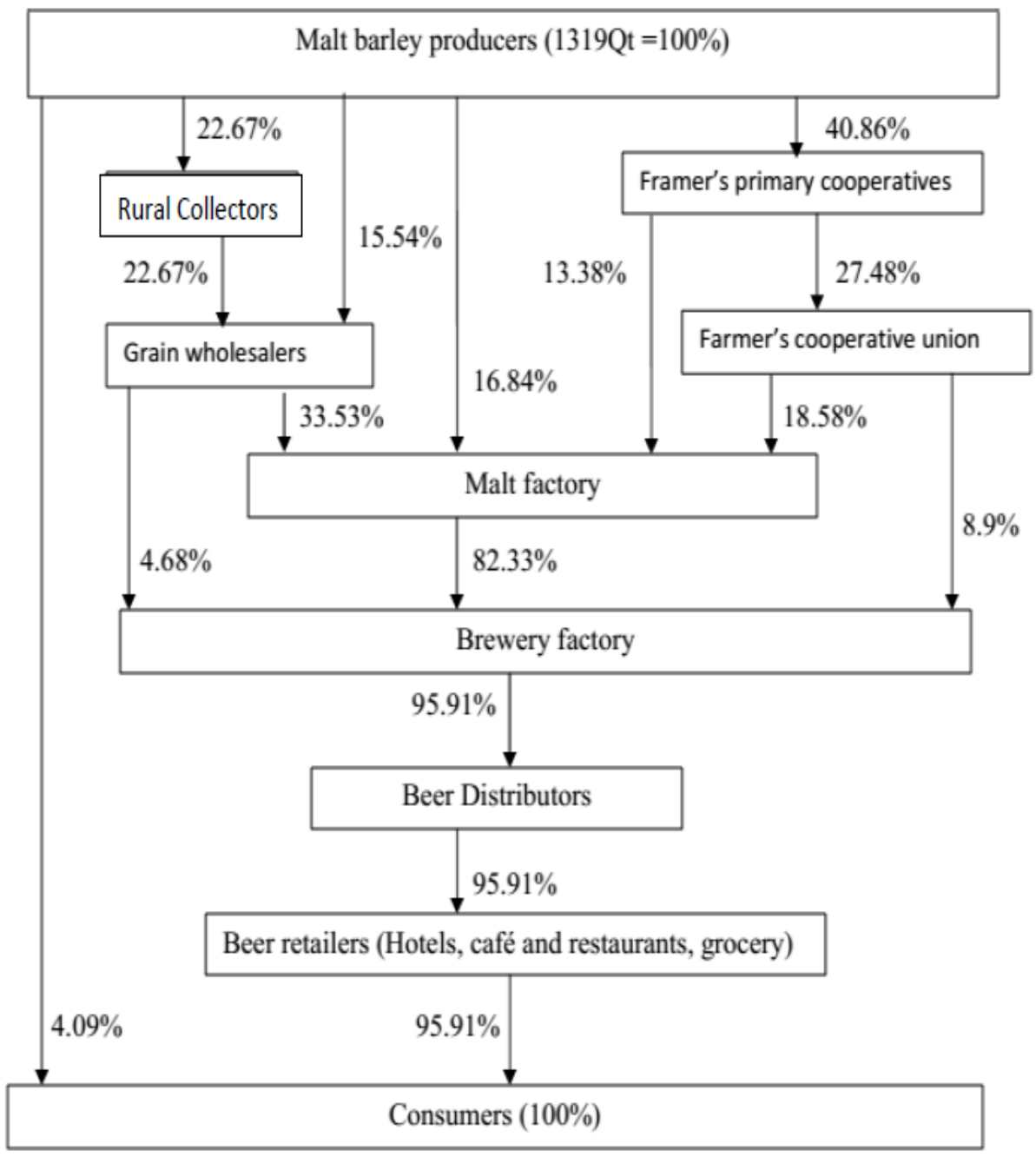
Marketing channel is the set of interdependence organization that ease the transfer of ownership as products move from producer to consumer following a fairly well established channel. This channel may be short or long depending on kind and quality of the product marketed, available marketing services and prevailing social and physical environment (Islam *et al.*, 2001). It starts with growers and end on consumers (Khushk and Sheikh, 2004).

In the current study, marketing of malt barley is carried at local market, farm gate and zonal markets. Pricing is decided mainly by Asella malt factory based on the quality requirement and had six level of price where the higher and lower quality was 1025 and 925 birr per quintal respectively. Some times the price of malt barley was also decided between traders and farmers based on buyers' preferences to some extent based on grading through visual estimation of the product. Marketing of malt barley include different marketing channels for ranging from input supplier to end consumer. The domestic demand for malt and bear factory is met by imported raw malt barley from abroad. Still a large proportion of the local demand is found for malt barley while the supply is limited. Traders, cooperatives, malt factory and bear factory dominate the malt barley value chain in the study area.

From the total 1896 quintal of quantity produced by sample respondents in the study area about 1319 quintal of malt barley were supplied by the farmers to different buyers of malt barley (Figure 5). The main marketing channels identified from the point of production until the product reaches the final consumer through different intermediaries were depicted in figure 4 below. About 95.91% of malt barley is processed in to malt before it reaches to final consumer and the balance (4.09%) is distributed to consumers in the form of whole grain.

The main buyers from producers are a rural collector (village traders), Grain wholesalers, primary cooperatives, Malt factory (Asella Malt factory) and consumers with an estimated percentage share of 22.67%, 15.54%, 40.86%, 16.84%, and 4.09% respectively. Farmers' cooperative union and Asella malt factory were the main buyers of farmer's primary cooperatives with an estimated percentage share of 27.48% and 13.38% respectively, Malt factory and Breweries were the main receivers of grain wholesalers with respective percentage share of 33.53% and 4.68% respectively whereas Malt factory and Breweries (Via

techno serve) were the main buyers of farmers' cooperative union in the study area with respective value of 18.58% and 8.9% respectively.



Source: Own sketch from survey result, 2016 (NB, Qt= Quintal)

Figure 5: Marketing channels Map for malt barley

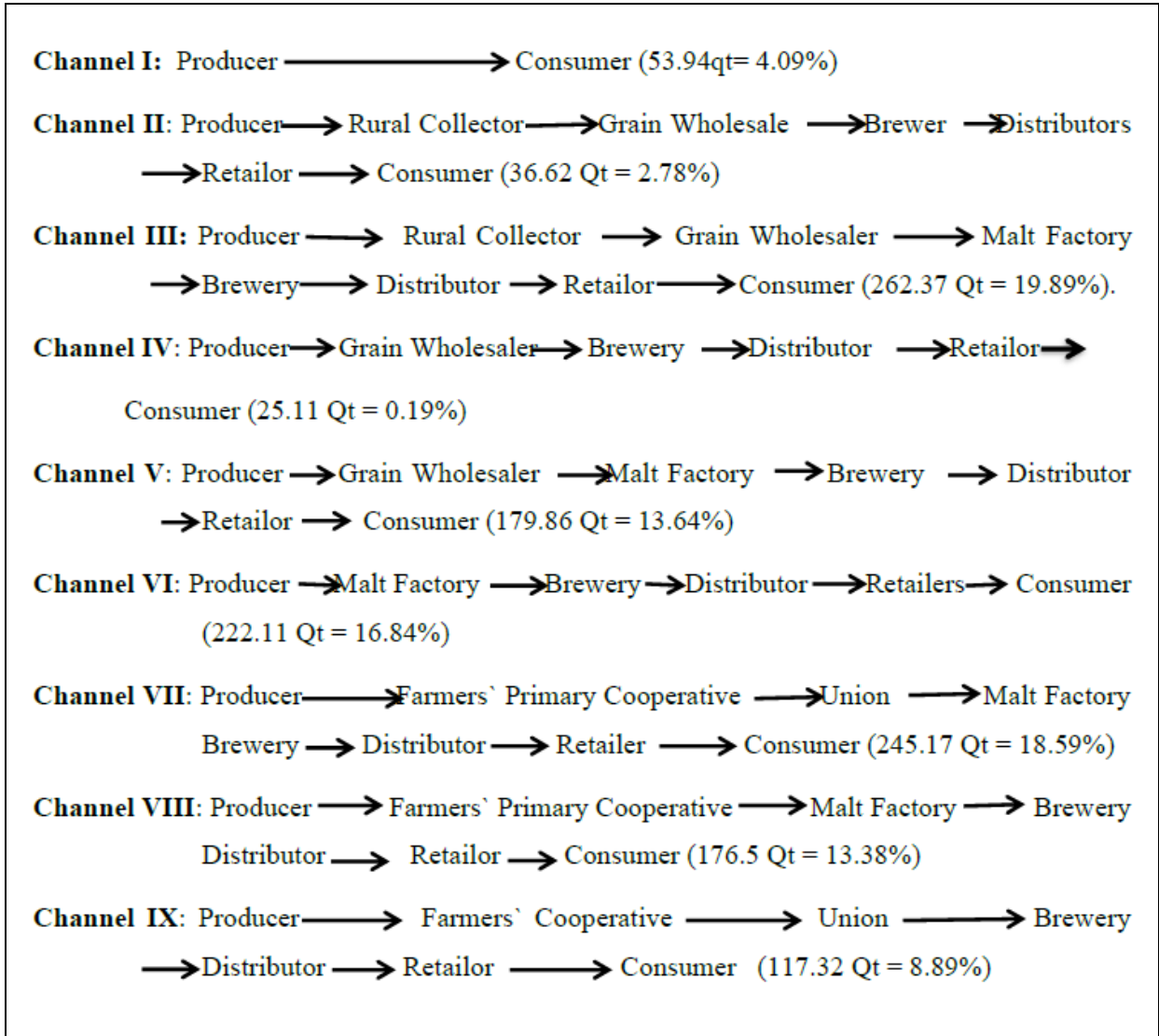
A total of 82.33% of the malt barley was purchased by Asella malt factory. According to the response from AMF malt barley purchasing officer, about 55% ,33% ,8% and 3% of the malted barley was sold to BGI, Heineken, Meta-Diageo and Raya brewery factories in Ethiopia in 2015/2016 manufacturing year respectively. The Breweries after processing the raw malt into beer, they distribute to the distributors which finally sold to retailers like hotel, cafe and glossary and consumed by the consumers as liquid form. According to AMF, from 100kg of raw malt barley about 77kg of malt is extracted and sold with 2000 birr/qt or (1540birr/77kg).

Based on the findings of the study, about nine main alternative channels were identified for malt barley marketing which started from farmer level in the district up to brewery factory which is turned again to the consumer in the country (Table 4). Moreover, based on the volume that passed through each channel starting from producers to consumers, channel comparison was made to understand which channel is the largest or, least, profitable and non-profitable.

Accordingly, about 19.89% of malt barley passed through channel III which is the largest of all in carrying high volume of the product followed by channel VII (18.59%) and channel VI (16.84%) with respective quantity of 262.37Qt., 245.17 Qt. and 222.11Qt. Respectively from the total (1319 Qt) of malt barley supplied by the producers to different stake holders in value chain or market chain with average price of 944 birr/qt.

In another case, the least channels those carried small quantity of the product in the channel are channel IV, channel II and channel I in increasing order and with respective value of 25.11Qt, 36.62Qt and 53.94Qt respectively while the rest three channels were the medium channels among others, these area channel IX, VIII and V with increasing order carrying about 117.32Qt, 176.5Qt and 179.86Qt respectively. The possible channels for malt barley marketing are displayed below table 4

**Table 4:** Possible channels for MaltBarley marketing in the study area



Source: Own computation from 2016 survey data

**Channel I:** in this channel producers/farmers sell their produce directly to consumers without any interfering of middlemen without change of the form of the product with negotiable average price starting from 800 -900 birr per quintal at market place particularly at Bekoji market. This channel gives benefits to the consumers since they purchase the product directly from the farmers and to the farmers since they receive the value of their produce as soon as they sell. In addition to this, they get homogenous product which is not mixed up with different quality by traders. Therefore, they prefer this channel over the rest of channels.

**Channel II:** This channel includes different key actors between producers and consumers which used as a bridge for the product to be reached by the consumers. These include rural assemblers (collectors) and grain wholesalers between producers and consumers. The local collectors purchase the raw barley from producers with price ranging from 870 to 930 birr per quintal based on the quality of malt barley produced and sold to grain wholesalers. The traders purchase with lower price even the higher quality with low price.

**Channel III:** Farmers directly sell to rural collectors in the study area with prices ranging from 870 to 930 birr per quintal which is nearly 900birr on average. This channel is the second largest channel in which high volume of malt barley passed through to final destination. Similar with channel two, it involves a different middleman that links the producer to final consumer. Here the raw malt barely changed in to malt and finally in to beverages in malt factory and beer factory respectively. Brewery performed dual activity here: 1) they purchase the malt which is malted at malt factory and re-processed in beer factory to produce beverages 2) they purchase the raw malt barley from the farmers through cooperative at farm level and produce malt in their company similar with malt factory. Nearly 20% of the malt barley is passed through this channel.

**Channel IV:** The action of grain wholesalers distinguishes this channel from the above three channels. Farmers have access to sell their produce directly to wholesalers rather than to rural assemblers. Wholesalers have the potential to purchase and handle a large volume of malt barley through their brokers which will be sold to the factories with high price. Therefore, farmers have an opportunity to sell the required amount of produce for wholesaler. This in turn reduces the opportunity costs of the farmer (in terms of transportation costs, in terms of labor and time).

**Channel V:** This channel is the third largest marketing channels where malt barley is passed from producers to processors. The role of grain wholesaler here is that they purchased malt barley from producers and sell to the malt factory. On average, they purchased from farmers by 930birr/qt and sell to malt factory and breweries with average price of 1035 birr per quintal.

**Channel VI:** This channel shows the role of processors (malt factory and brewery) in the malt barley value chain analysis. Malt barley can be processed into malt through value adding activity and sold to different breweries for further processing. Different channels including; channel I, channel II and channel IV hinder the malt barley to be transported to malt factory. In this channel, the malt factory purchases raw malt barley from producers directly in the form of contract farming.

**Channel VII, channel VIII and Channel XI:** These channels overview the bridging role of cooperatives and unions over product handling and transferring from farmers to malt factories and breweries. Channel VIII is the largest channel where large volume of malt barley is handled and transferred to the respective destination.

#### **4.3. Performance of Malt Barley Value Chain Actors in the Study Area**

To quantify the performance of each actor in the value chain of a specific commodity, one can use the cost incurred by each actor in production, processing and transporting the product and other else. In order to know the performance of each actor, calculating the production cost for one hectare or one quintal of the selected commodity is important while conducting value chain analysis of a specific commodity.

##### **4.3.1. Production cost incurred for malt barley production**

The Table 5: below showed the different types of cost incurred by farmers. Production cost is defined as the cost incurred for different items for one hectare of malt barley in 2015/2016 production year by the individual farmer in the study area. The farmers' production cost calculation assumes 12 person days per hectare for plowing, 8-person day for harvesting and 12-person day for threshing by average per deim of (80 birr per day), 24 oxen days for plowing and threshing (120 birr per pair of oxen) and 28.65 quintal per hectare production of malt barley, on average.

Regarding the input cost, the farmers input cost for one hectare was calculated based on the input price of 2015/2016 production year. Accordingly, the cost for DAP was 1448 Birr/qt, UREA was 1300 Birr/qt (NB=50kg/ha), seed cost was assumed to be 1200 Birr/qt (average

cost for both pure seed and local seed was considered and chemical cost was considered 150Birr/qt). The land cost was considered 8200 Birr/hectares while material cost was 9 Birr /qt (8 birr for sack and 1 birr for sisal rope). This estimation is taken from focus group discussion, key informants and personal interview of the producers (2016 survey data of the study).

**Table 5:** Production cost of malt barley in the study area

<b>Cost Items</b>	<b>Birr/qt</b>
<b>Input cost</b>	
a. Seed	41.873
b. DAP	50.53
c. Urea	22.51
d. Chemicals (herbicides and pesticides)	4.89
<b>Labor cost</b>	
a. Plowing, sowing, chemical application	25.12
b. Harvesting, assembling	22.33
c. Threshing, storing	25.12
<b>Cost for Land rent</b>	286.14
Oxen cost (plowing and threshing cost)	
a. Plowing cost (pair of oxen)	50.25
b. Threshing cost (pair of oxen)	50.25
<b>Material cost</b>	
a. Sack, sisal rope	9.00
<b>Total sum (birr)</b>	<b>588.00</b>

#### 4.3.2. Marketing margin of actors in malt barley value chain

After having mapped the value chain, the next step is to study certain aspects of a value chain in-depth. Cost is the money that an actor sacrifices in the value chain while margin is the money that an actor in the value chain receives. Marketing costs are estimated to compute the share of profit captured by key actors in the marketing chain. Table 6 indicates different types of marketing cost related to the transaction of malt barley by different actors of malt barley value chain and the benefit share of each marketing actors excluding breweries and their buyers due to lack of data from beer factories. Marketing costs refers to those costs, which are incurred to perform various processes along different channels.

In addition to adding value, malt barley value chain actors were experienced in investing cost for different activities of the product at different stage of the value chain. Accordingly, the survey result revealed that, the total cost incurred by malt factory was the highest of all actors followed by unions and cooperatives with value of 22.73, 17.48 and 17.15% respectively while producers` was the least of all which is 10.51percent and the traders were found at middle stages in the value chain of the commodity.

**Table 6:** Cost and Margin distribution of actors in malt barley value chain analysis

Items (birr/qt)	Producer s	Rural collecto r	Grain wholesale r	Cooperative s	Unio n	Malt factory	Horizonta l sum
Purchase price	0	900	940	975	1000	1035	4850
Production cost	588	0	0	0	0	0	588
Marketing cost							
Un/loading cost	0	10	10	6	6	10	42
Transporting cost	35	20	25	25	20	0	125
Material cost	8	8	8	8	8	15	55
Storage cost	0	0	2	2	2	3	9
loss	0	0	0	0	0	159	159
Processing cost	0	0	0	0	0	180	180
Commission fee	0	0	0	0	15	0	15
Tax	0	0	2	0	0	2	4
Total marketing cost	43	38	47	41	51	369	589
Total cost	631	938	977	1016	1051	1404	6017
Total cost (%)	10.49	15.59	16.24	16.89	17.47	23.33	100
Sale price	944	970	1035	1045	1097	1540	6631
Market margin	356	70	95	70	97	505	1193
Share of margin (%)	29.84	5.87	7.96	5.87	8.13	42.33	100
Profit margin	313	32	58	29	46	136	614
Share of profit (%)	50.98	5.21	9.45	4.72	7.49	22.15	100

**Source:** Own computation from survey result, 2016

The market margin is used to show the distribution of the various actors as malt barley move from farmers to different value chain actors and was calculated by subtracting the purchase price from sale price of the commodity in percentage. The relative size of various market participants' gross margins showed where in the marketing chain value is added and/or profits are made (Tegegn, 2013). Of the total market margin of malt barley value chain actors, malt factories have the largest share of marketing margin with value of 42.33% followed by producers (29.84%), Farmers cooperative union (8.13%) and grain wholesalers (7.96%) while the rural collectors and farmers` primary cooperatives shares the least marketing margin with the same values of 5.87% during the survey year of the study area. The producers` `share of



market margin is 0.7 times less than that of the malt factory while the share of malt factory in margin distribution is 1.42 times higher than that of the producers`. This is since, sales price for malt factory is higher as compared to sale price of producers. The cooperatives share of market margin is the least from all actors` share of marketing margin.

Regarding share of profit of actors in malt barley value chain, producers and malt factory got the highest share of profit margins with respective value of 50.98% and 22.15% respectively followed by grain wholesalers (9.45%) and Farmers` cooperative union (7.49%) while Local collectors and farmer`s primary cooperatives shares the least value with respective values of 5.21% and 4.72% profit margin respectively. The percentage share of `profit margin for the producers is higher than malt factory (2.3 times), grain wholesalers (5.4times), farmer`s cooperative union (6.8times), local collectors (9.6 times) and primary cooperatives (10.8 times). The profit margin showed that, the farmers primary cooperatives had the poor position followed by local collectors while the producers had the higher position followed by traders in the value chain of the commodity in the study area. This result also in line with Rashid et al. (2014) stated as, despite heavy public emphasis on farmers` organizations, the cooperatives appear to play a minimal role n the barley value chain.

#### 4.3.3. Marketing performance of actors across malt barley market channels

Marketing performance can be evaluated by analyzing costs and margins of actors in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if it used to show how the consumer`s price is divided among participants at different levels of marketing system (Mendoza, 1995). Understanding the buying and selling price of malt barley in each channel is very important to estimate market margin for actors. It is to mean that the buying and selling price of the commodity in the given marketing channels may not be equal. Malt barley producers have direct linkage with actors like collectors, grain wholesalers, cooperatives, malt factory and consumers and received different selling price (Appendix table 6).

Accordingly, the Marketing margins of malt barley in the nine channels for each group of market players are given below in Table7. The short form of  $GMM_p$ ,  $GMM_c$ ,  $GMM_w$ ,  $GMM_{pc}$ ,  $GMM_{un}$ ,  $GMM_{mf}$ ,  $GMM_{br}$ ,  $GMM_{dis}$  and  $GMM_{ret}$  are gross marketing margins of producers, rural collectors, grain wholesalers, primary cooperatives, union, , malt factory

(processors), brewery (processor), distributor and retailer respectively while  $NMM_c$ ,  $NMM_w$ ,  $NMM_{pc}$ ,  $NMM_{mf}$ ,  $NMM_{br}$ ,  $NMM_{dis}$  and  $NMM_{ret}$  are net marketing margins of local collectors, grain wholesalers, primary cooperatives, union, malt factory, brewery, distributor and retailer respectively. Based on this price the margins across the channel in malt barley marketing would be calculated below as follows.

**Table 7:** Performance of Malt Barley value chain actors along the marketing channels

Margins in percent	I	II	III	IV	V	VI	VII	VIII	IX
TGMM	0	14.29	44.41	11.43	42.55	39.16	39.78	39.78	9.3
$GMM_p$	100	85.71	55.59	88.57	57.45	60.84	60.22	60.22	90.7
$GMM_c$	--	4.77	3.09	-	-	-	-	-	-
$GMM_w$	-	9.52	5.52	11.43	4.63	-	-	-	-
$GMM_{pc}$	-	-	-	-	-	-	2.78	4.20	4.18
$GMM_u$	-	-	-	-	-	-	4.76	-	5.12
$GMM_{mf}$	-	-	32.79	-	37.92	39.16	32.24	35.58	-
$GMM_{bf}$	-	--	--	--	--	--	--	--	--
$GMM_{dis}$	-	--	--	--	--	--	--	--	--
$GMM_{ret}$	-	--	--	--	--	--	--	--	--
$NMM_c$	-	1.14	0.74	-	--	-	--	-	-
$NMM_w$	-	5.05	2.35	6.95	1.73	-	-	-	-
$NMM_{pc}$	-	--	-	-	-	-	0.25	1.67	0.37
$NMM_u$	-	--	-	-	-	-	1.61	-	0.37
$NMM_{mf}$	-	-	13.28	-	15.13	16.37	9.45	12.79	-
$NMM_{bf}$	-	--	--	--	--	--	--	--	-
$NMM_{dis}$	-	--	--	--	--	--	--	-	--
$NMM_{ret}$	-	--	--	--	--	--	--	--	-

**Source:** Own computation from survey result, 2016

Based on the result on the Table 7 above, channel III and channel V have the highest TGMM followed by channel VII or VIII and channel VI while channel I and channel IX had the least total gross market margin (TGMM). Producers shared the highest value of gross margin in channel I, channel IX and Channel IV with respective value of 100, 90.7 and 88.57% implying that creating market linkage directly with consumers and breweries through wholesalers and cooperatives is more worthwhile for producers. About 9.52% and 11.43% of the gross market margin is goes to grain wholesalers in channel I and channel IV respectively implying that direct selling to breweries is more worthwhile for grain wholesalers rather selling to malt factory.

In the VI and V channels about 39.16% and 37.92% of the gross market margin is goes to malt factory implying that direct market linkage with producers and grain wholesalers is worthy relative to having marketing linkages to local collectors or other intermediary like cooperatives or unions. Channel VII, VIII and XI describes the marketing partnership of cooperatives and unions with processing factories like malt and beer factory. In channel VIII about 4.2% of gross marketing margin goes to cooperatives while 2.78% and 4.18% in channels VII and IX respectively implying that creating market linkage directly with processors is worthwhile for cooperatives.

From overall actors involved in marketing of malt barley, the malt factory shared the highest net market margin followed by grain whole sales in channels VI and IV with percentage of 16.37% and 6.95% while the cooperatives and unions shared the lowest net market margin in channel VII and IX with value of 0.25% and 0.37% respectively. From all channels, channel III is the longest and the largest of all carrying larger volume of malt barley in which local collectors, grain wholesalers and malt factory are the main participants. From all actors involved in channel III, the NMM of malt factory was ranked fist followed by grain wholesalers and local collectors with value of 13.28%, 2.31% and 0.74 % respectively.

#### 4.3.4. Value addition and distribution in malt barley value chain

Adding value does not necessarily involve altering a product; it can be the adoption of new production or handling methods that increase a farmer's capacity and reliability in meeting market demand (AAFC, 2004). Value added can be defined in terms of the percentage of value each actor adds or in terms of the profit margin each actor drives from its economic activities, for example by improving quality or delivery time. Even though, there is dissimilarity in quantity, each of the malt barley value chain actors adds value to the product as the product passes from one actor to another. Actors like producers, and traders as well as cooperatives adds value to the product through improving the grade by sorting, cleaning, assembling, transporting, creating space and time utility while processing and packaging are the value addition to malt barley at processor level of malt factory and brewery factories. The value added by the different actors along the marketing channel has been calculated using data obtained from sample producers, traders and processors.

The value added by each of the actors was computed by deducting the costs of all intermediate inputs (including raw material purchase) from the gross value of products sold by each actor. In calculating the value added at each stage, reference has been made to one quintal of malt barley final product called malt and input requirements of preceding activities were determined using standard conversion factors. The malt factory uses 1.3quintal of raw malt barley to produce one quintal of malt (i.e. 1qt raw malt barley = 0.77quintal).

Channel III and channel VII are the longest and the significant channels for value addition of malt barley value chain actors. Since there is no linkage in transferring malt barley from traders to cooperatives/unions and vice-versa, between traders and cooperatives, the two channels were selected for value addition to analyze the value addition of traders and government institution separately.

**Table 8:** Value Added to Value Chain Actors in Malt Barley

<b>Channel III (Producer to processors through traders)</b>						
Actors	Cost	Revenue	Net income	Value added	Value shared	
		(birr/qt)	(Birr)		(%)	
Producers	631	900	269	900	58.44	
Collectors	938	950	12	50	3.25	
Grain wholesalers	997	1035	38	85	5.52	
Malt factory	1404	1540	136	505	32.79	
Total	3970	4425	455	1540	100.0	
<b>Channel IV (Producer to processors through government institutions)</b>						
Actors	Cost	Revenue	Net income	Value added	Value shared	
		(birr/qt)	(Birr)		(%)	
Producers	631	975	344	975	63.31	
Cooperative	1016	1020	4	45	2.92	
Union	1071	1097	26	77	5.0	
Malt factory	1404	1540	136	443	28.77	
Total	4122	4425	455	1540	100.0	

**Source: Own data of 2016 survey result**

As can be seen from Table 8 above, there is value addition as we move from producers to other value chain actors in both selected channels even though there is dissimilarity in amount. From all actors participating in malt barley value chain of channel III and channel VII, the rural collectors and primary cooperatives took the lowest position respectively while

producers added the highest value followed by malt factory in both channels. Grain wholesalers in channel III and Union in channel VII took the third rank in their channels.

The value added /shared of producers were 58.44 and 63.31% in channel III and channel VII respectively followed by malt factory with respective values of 32.79 and 28.77% respectively. The value shared/added by rural collectors and grain wholesalers was about 3.22 and 5.52% while primary cooperatives and unions added a value of 2.92 and 5% in channel III and channel VII respectively.

#### 4.3.5. Governance roles and relationships in malt barley value chain

According to World Bank (2009), governance system describes the interaction between the actors along the value chain. Actors across all value chains establish relations with each other through contracts, vertical integration, alliance and/ or jurisdictionally, and through power influence. These relations can address multitudinous formal and informal arrangements for activities across the value chain: processing, distribution and logistics. Value chain governance refers to the relationships among the buyers, sellers, service providers and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use (Kaplinsky and Morris, 2000).

The actors those who are so dominant in the value chain play enabling role in determining the flow of commodities and level of prices of the commodity while governing the value chain and most other chain actors contribute to the rules set in the marketing process. A question was asked to the actors participated in the malt barley value chain that stating '*who sets the price while selling or purchasing malt barley from or to respective sellers or buyers in the study area?*' The study result indicates that, even though there is some additional price by traders for the sake of purchasing the bulk of the product, the whole malt barley price is governed by processors both Asella Malt Factory and brewery companies in the country based on the quality of malt barley produced at farmer level. Even though small amount, there is also price difference for the same product among malt barley factory and breweries in the study area.

According to the key informant response of Galama union of marketing and purchasing team, the committee was organized from different sectors (Oromia agricultural office, Oromia

cooperative promotion office, Oromia trade and marketing office, Arsi zone trade and marketing office, and farmer's cooperatives unions of Arsi zone) at regional level of Oromia national regional state in 2015 production year in order to set the farm gate price of malt barley not to be below 900 birr per quintal. By taking this price as initial or starting price, Malt factory and breweries usually have their own purchase price ranging from level one up to level six and assume their malt barley suppliers (producers, traders, cooperatives and unions) to come across with these standards.

Accordingly, Asella malt factory current price for first level was fixed to be 1025 birr/ qt while the last level was fixed to be 925 birr/qt for traders and producers with a difference of 20 birr/ qt for each consecutive level of purchase price. However, there is a premium price of 5.5% and 7% for cooperatives and unions to the price received by traders or producers respectively. Thus, Asella malt Factory fixe the price based on their quality requirements while they purchase malt barley from different actors or suppliers in the study area.

Moreover, malt factory fixed price of their value-added products (malt) as they distribute to their customers or bear factories. They have fixed price for one quintal of malt barley which is 2000 birr/quintal (130 kg raw malt barley) in 2016. However, the price among farmers and traders is negotiable sometimes it ups and down based on the quality of the product. Most of the time, the traders purchase both high and low quality of barley from farmers and finally sell to the processors or AMF by mixing together. This makes the processors to criticize the traders while traders are accusing the processors for offering low prices due to low quality of the product.

#### **4.4. Market Orientation Determinants of Malt Barley Producers**

This part describes the dependent the characteristics of dependent and independent variables used in the model to determine the determinant factors of market orientation of malt barley production in LemuBilbilo district.

Market Orientation Index and crop marketability indexes were used to measure the household-specific level of market orientation and degree of market orientation (market participation) of the individual household for specific crop respectively. Based on the

proportion of total amount sold to total production at farming system level, a crop specific marketability index ( $\alpha_k$ ) was computed for malt barley produced at farmer level system as follows.

$$MBMI_i = \frac{\text{Gross value of Malt barley sold by individual farmer in 2016 year}}{\text{Total value of malt barley produced by the farmer in the same year with the same price}} \quad (15)$$

Where  $MBMI_i$  refers to malt barley marketability index for individual farmer in 2015/2016 production year of 2016 market year.

$$\alpha_k = \frac{\sum_{i=1}^N S_{ki}}{\sum_{i=1}^N Q_{ki}}, Q_{ki} \geq S_{ki} \text{ and } 0 \leq \alpha_k \leq 1 \quad (16)$$

Where  $\alpha_k$  is the proportion of malt barley sold ( $S_{ki}$ ) to the total amount of malt barley produced ( $Q_{ki}$ ) aggregated over the total sample households in a farming system.  $\alpha_k$  Takes a value between 0 and 1, inclusive of the value between 0 and 100% if it is converted into percentage. A value of zero would signify a totally subsistence oriented household and the closer the index is to 100, the higher the market orientation in production.

After the crop, specific marketability index calculated, household's market orientation index in land allocation ( $MOI_i$ ) was computed from the land allocation pattern of the household weighted by the marketability index of the crop ( $\alpha_k$ )

$$MOI_i = \frac{\sum_{k=1}^K \alpha_k L_{ik}}{L_{iT}}, L_{iT} > 0 \text{ and } 0 < MOI_i \leq 1 \quad (17)$$

Where  $MOI_i$  is market orientation index of farmer,  $L_{ki}$  is amount of land allocated for malt barley in hectare, and  $L_i^T$  is the total crop land operated by farmer measured in hectare. The higher proportion of land a household allocates to the more marketable crops, the more the household is market oriented.

Accordingly, all the sample farmers were malt barley producers and participant in the market. The average gross value of malt barley produced and sales value that supplied to the market were about 11932 and 8301 ETB respectively where 944.02 birr was the average price of malt barley in the production year. Market orientation index of the survey result showed that, the market orientation index of malt barley was below 20% (0.17) where the minimum and

maximum index were 0.067 (subsistent level)) and 0.5 (moderately market oriented) respectively.

The degree of market orientation of malt barley showed that nearly 70% of the crop is sold on average which shows that the crop was important market orientated crops, even though small proportion of land was allocated for it due to different factors in the study area. (Appendix table 13).

#### 4.4.1. Market orientation analysis of malt barley producers

Table 9 below illustrates the variables used in the model and discussed as follows. The independent variables used to assess the determents of market orientation for malt barley producers in the study area are classified in to demographic factors, human capital, institutional support serves, physical assets, social capital and other related factors which were decided by the researcher to be a factor for market orientation.

##### **Demographic factors**

These factors describe the age of the household head, sex of the household head, family size in the household and farming Experience of the farmers in the study area. Accordingly, about 89% of the sample households were male headed while the rest 11% were female headed households where as their average age, average family size, average farming Experience were 49.37 years, 6. 67 person and 9.13 years respectively.

##### **Human capital**

Education of the household is included under human capital and it influence production and productivity of producers through adoption of newly introduced technologies and innovations. The survey result reveled that about 72% of them were literates and received formal education. Hence, literate producers are expected to be in a better position to get and use information which contributes to improve their farming practices and market orientation in production of malt barley in the study area.

##### **Physical assets**



The physical assets owned by the household and included in the study as a determinant for market orientation factors of malt barley production in the study area. These are land and livestock ownership.

Resource endowment especially availability of land for crop production is one of the most important factors that influence crop production. Land is the basic asset of the sample farmers in the study area. The survey revealed that the mean land size of sampled households was 2.19 hectares and ranges from 1.38 to 4 hectares in LemuBilbilo district of sample households. (Appendix Table 3). The result also shows that, the land allocated for malt barley production is an average per household allocation of 0.44 hectares and the standard deviation of 0.17 and ranges from 0.25 to 1.5 hectares during survey year. It is decreased by 20% with that of total land owned by the household heads.

Moreover, the study area is characterized by ownership of livestock resources which are useful in the livelihoods of the rural communities. Even though the holding size varied, all the sampled respondents had owned 3.963 others livestock in TLU, 2.1 oxen and 1.44 equines on average by the total sample households in the study area. Livestock are kept for various economic and social reasons in which major economic reasons include provision or supply of draught power, generation of cash income, food and energy. The most commonly reared livestock in the study area are cattle, sheep, goats, equines and poultry.

Oxen ownership is common among all respondents and is the major contributor to crop production serving as a source of draft power. Almost all farmers hold a pair of oxen which is about 2.1 oxen on average ranging from 1 to 4 oxen and they use them to undertake different agronomic practices, out of which plowing and threshing are the major ones. Land preparation for crop production is done using a pair of oxen; however, there was variability in oxen ownership among farmers in the study area, ranging from one to four oxen.

**Table 9:** Descriptive statistics of variables used in the model

<b>Variables used in the model</b>	Obs	Mean	Std. Dev.	Min	Max
<b>Demographic factors</b>					
Age of the household head (years)	150	49.373	8.330	36	68
Sex of the household head (1=male,0=female)	150	.893	-	-	-
Family size in the household (number)	150	6.673	1.808	2	12
Farming experience (years)	150	9.127	2.137	3	17
<b>Human capital</b>					
Education (1= No education, 2=grade 1- 4, 3= grade 5-8, 4= high school, 5= preparatory,6= certificate 7= diploma 8= degree and others)	150	2.173	-	-	-
<b>Physical assets</b>					
Land allocated for malt barley (ha)	150	.441	.174	.25	1.5
Livestock excluding oxen and equines (TLU)	150	3.962	1.214	2.04	9.02
Oxen ownership (number of oxen)	150	2.107	.913	1	4
Equines ownership (number of equines)	150	1.44	.670	0	3
<b>Institutional factors</b>					
Distance to nearest market (walking hours)	150	.878	.384	.3	2.4
Access to credit (1= yes ,0= No)	150	.2867	-	-	-
Frequency of extension contact (number)	150	4.327	1.724	1	8
Access to market information (1=Yes,2= No)	150	.84	-	-	-
<b>Social capital</b>					
Cooperatives membership (1= yes, 0= No)	150	.693	-	-	-
<b>Other factors</b>					
Productivity of another crop (qt/ha)	150	36.34	10.84	21	65
Access to improved malt barley seed (yes/No)	150	.507	-	-	-
Agricultural input cost (birr/ha)	150	1288.5	547.03	649.5	4659.5
Off or non-farm activity (1=yes, 0= No)	150	.34	-	-	-

Source: Own computation from survey result, 2016,N=Number of respondents

### **Institutional support services**

This section refers to different institutional services that respondent has in the study area. These include; extension services, access to credit, and access to market information, and as well as distance from production area to nearest market.

The extension services contribute to the realization of market orientation objective among smallholder malt barley farmers in the study area. The survey result showed that, almost

allthesample respondents had access to extension service at different intervals ranging once to eight per a year. Office of agriculture and rural development through its development agents is the major actor who provides extension service and advisory service on malt barley production and management practices in the study area.

Moreover, according to the key informant interview in the study area different supporting actors like Kulumsa Agricultural Research Center, Asella malt factory and breweries like meta Diageo through its agent called techno serve were mentioned as source of information, advice and experience to the farmers in case of crop production and producers indicated that they are getting information particularly input application and farming method as well as input supplying for better production and productivity of crop production.

Regarding credit access, the survey result showed that, about 28.67% of the sample respondents had access to credit while majority of them were suffered from this service in the area. The average credit owned an individual farmer for production of malt barley was about 203.23ETB in the last growing season from source of credit indicting that, majority of the farmers in the study area depended on their personal capital to finance farm production needs. The low availability of credit could be explained by lack of information regarding procedures for accessing credit, collateral requirements and lack of commitment by the small-scale farmers to take risks. Lack of credit for the small-scale farmers to buy farm inputs (fertilizers and chemicals) that are required to increase the production could be a major limiting factor to increasing malt barley production which was also the major determents factors of market orientation in malt barley production.

Moreover, regarding to access to market information, more than 84% of the sample household had market information services including price information, market place information and demand of the crop they produce from different stakeholders. According to Greijmans *et al.* (2007), access to information or knowledge, technology and finance determines the state of success of value chain actors. According to the response from interviewee, different stake holders were the main source of information including development agents of the kebeles, Woreda experts, brokers, traders. Distance from producer's house to nearest market was also the factor which determines producer's market orientation in production of malt barley. As

observed from Table7, the average distance needed for producers to travel to nearest market place took an average of 0.878 hour (52.68 minutes) with range from 0.3 hour (18 minutes) to 2.4 hours (144 minutes) respectively.

### **Social capital**

Social capital includes Membership of the cooperatives in which the producers where participated or involved for getting different benefits. Cooperatives improve understanding of members about market and strengthen the relationship among the members. Of the total interviewed sample respondents, about69.33% were members of farmer primary cooperatives as a means of saving and to get guarantee during their emergency period or urgent cash needs in the study area while 30.67% were not members of farmer primary cooperatives. In the study area, from being member of farmers` cooperatives, respondent is more advantageous and obtained fast input delivery, fair farm gate output price, easy access to credit and some of bargaining power in the study area.

### **Access to improved seed and input utilization**

The survey result revealed that, about 50% of the respondent had access to improved seed from different suppliers of seed in the area while the rest 50% of the farmers use home saved seeds from previous harvests. Besides, according to focus group discussion participant producers said that malt barley seed supply is limited. This has led to most of the producers recycling seed from the previous crop which reduces yield per unit area over time. About 36% of the land allocated for malt barley was covered by local seed while the rest 64% was by improved seed with 100kg of application rate per one hectare.

Regarding fertilizer utilization, the rate of DAP applied on one hectare of malt barley land was about 89kg while the recommend rate was about 100kg.similralr, they also applied UREA of 34kg per hectare while the recommended rate was about 50kg per hectare in the study area. Moreover, they incur cost for fertilizers and seed about 1288.45ETB per hectare of land they allocate for malt barley on averagewith649.5 and 4659.5Birr of minimum and maximum cost respectively. The total cost that the farmer incur for the whole activities for the average land allocated for malt barley was about 7597.09ETB (which is about 17,226.96ETB

per one hectare of malt barley). Since the average productivity of malt barley is about 28.65 quintal per hectare with 944.02 ETB average price of the production year, hence, the farmers may receive a profit of about 9819.213 ETB.

#### 4.4.2. Econometric Result

All the farmers in the study area had an index of greater than zero. Thus, the econometric analysis was done using OLS model of regression since all farmers are participant in the production as well as in the marketing of malt barley in though there is quantity different among the farmers.

To examine determinants of market orientation of malt barley producers in the study area, a total of eighteen (18) explanatory (independent) variables were used in the OLS model. The model F- tests applying appropriate degrees of freedom indicate that the overall goodness of fit of the OLS model is statistically significant at less than 1% (Table 10). This shows that the independent variables included in the OLS model regression explain the market orientation determinants of malt barley producers in the study area.

The coefficient of multiple determinations ( $R^2$ ) was found to be 0.7388 indicating that the model has a high explanatory power and implies that the explanatory variables had a significant influence on market orientation in Lemu Bilbilo district. This indicated that, 73.88% of the variation in market orientation of malt barley producers is explained by the explanatory variables. Regarding relationship of the variables with the market orientation of malt barley producers, education level of the household, land size allocated, farming experience, oxen owned, access to credit and access to improved seed had positive relationship whereas family size, productivity of wheat and input cost had negative relationship with malt barley producers' market orientation.

Family size of the household has negative relationship with malt barley producers' market orientation in the study area and was significant at 5% level. A unit increase in family size decreases the market orientation of malt barley producers by 0.47%. This result is in line with Gebremedhin and Jaleta (2010) who indicated that, large household sizes diminish households

from market orientation due to its effect on increasing household domestic consumption requirements.

Education (Literacy) of household head is positively associated with market orientation of malt barley producer and is significant at 5% level,. A year increase in household head's education increases the market orientation of malt barley producers by 0.77%. This can be explained by the fact that as an individual get access to more education he/she is empowered with the market information and skill of production that will outgrowth individual to allocate more land for more market oriented product. This study is in line with a finding of Kemisola al, (2013), who report an increase in market orientation cassava farmer`s by 3.6% as their education increased by a year.

Malt barley area is also positive and significant at 1% significance level It indicates that as households' farm size allocated for malt barley increases by 1 hectare, the farmer`s market orientation increases by 37.44%. This study is in line with Onubuogu and Onyeneke, (2012) who shows that, an increase in farm size cause an increase in market orientation of root and tuber crop production at Imo State of Nigeria. The effect of farming experience in producing malt barley is also positive significant at 5% level The result implies that as the number of years of the farmers' experience increases by one year, the household`s market orientation towards malt barley production increases by nearly 0.32 %. This result is consistent with Agwu (2012), who studied socio-economic determinants of commercialization among small holder farmers in Nigeria and revealed that as the number of years of the farmers' experience increases, the probability of farmers` market orientation also increases.

Productivity of wheat was negatively related with market orientation of malt barley producers and highly significant at 1% significance level. The negative relationship of wheat productivity and market orientation showed that, as the productivity of wheat increase by 1%, the market orientation of malt barley producers decreases by 0.29%. This is true since the productivity of wheat is higher as compared to malt barley and since the farmers need the crop which gives higher productivity; they focused to the crop whose productivity is higher.

**Table 10:**OLS Result for Determinants of malt barley market Orientation

Variables	Coef.	Robust Std. Err.	P-value
Age of the household head (years)	.0003	.0004318	0.562
Sex of the household head	-.0013	.0130485	0.921
Family size (number)	-.0047**	.0020501	0.023
Education level	.0077**	.0036035	0.036
Distance to nearest market (walking hours)	-.0073	.0070211	0.303
Land size for malt barley (ha)	.3744***	.0711708	0.000
Off/non-farm activity (yes/No)	-.0084	.0074082	0.257
Farming experience (years)	.0032**	.0014061	0.025
Productivity of wheat (qt/ha)	-.0029***	.0004887	0.000
Livestock's excluding oxen (TLU)	-.0035	.0026081	0.179
Oxen ownership (number)	.0080**	.0038062	0.037
Access to improved seed (yes/no)	.0161**	.0065973	0.017
Access to credit (yes/no)	.0152*	.0088414	0.088
Frequency of extension contact	.00092	.0020794	0.660
Access to market information (yes/no)	.0063	.0079463	0.430
Cooperative membership (yes/no)	.0022	.0073128	0.762
Input cost for production(birr/ha)	-.00004**	.0000151	0.013
Equine ownership (number)	.0012003	.0043434	0.783
Constant term	.1091	.0493261	0.029

Where \*\*\*, \*\* and \* =significance level @ 1%, 5% & 10% respectively, Number of obs = 150, F (18, 131) = 16.88, Prob>F = 0.0000, R-squared = 0.7388

Moreover, the effect of oxen ownership on market orientation of malt barley producers was positive and their associations statistically significant at 5% significance level. The finding revealed that, for a unit increased in number of oxen, increases the market orientation of

producers by 0.80% keeping other variables constant. This result indicates that households who have a larger number of oxen are more likely to plow more land for production that enabled to produce more malt barley and it is in line with the study by Tefera (2014) who reports as, households who have large number of oxen typically go through in to share in land agreement with farm households who have no ox which and supports the present study.

The effect of access to improved malt barley seed for market orientation for malt barley producers was Positive and statistically significant at 1% level of significance. This indicates that as farmers get more improved seed of malt barley, their market orientation increases by 1.6%, all other factors held constant. This is since; improved seeds increase the productivity and the income of the farmers also increased. Access to credit service had positive and significant influence on market orientation of malt barley producers at 5% significance level. The estimates show that, farmers who have access to credit are more likely to produce malt barley which directly leads to allocate larger proportion of land. The OLS regression result shows that, as farmers` access to credit services increase their market orientation in malt barley production also increases by 1.52% all other factors held constant. This finding is in line with Tefera (2014) stating that, the coefficients of access to credit were positive and significant at 10% level of probability and implies that increases in these variables will lead to increases in the level of chickpea market orientation.

The coefficient for input cost incurred to produce one hectare of malt barley is associated negatively with market orientation of malt barley producers and significant at 5% significant level. The OLS regression result showed that, 1birr increase production cost incurred for production reduces the market orientation of producers by 0.004% and this study is in line with Tefera (2014) who found negative effect on market orientation of chickpea production and states that, increase in fertilizer expense by a birr reduces the market orientation of chickpea.

#### **4.5.Challenges and Opportunities in Malt Barley Value Chain**

One of the merits of value chain analysis is that it helps to clearly identify bottlenecks to the development of the chain right from input supply up until the consumption level in concentrated way. Accordingly, several challenges and opportunities were explained by different actors through group discussion and questionnaire as well as from key informant interview in the study area which are currently hindering the development of the malt barley



value chain and were categorized according to the three basic stages: input supplying stages, production stage and market stage.

#### 4.5.1.Challenges and opportunities at the stage of input supply

The Challenges occurred at input supplying stage includes: high cost of fertilizers and high interest, Low quality of seed from seed supplier companies, mixed seed with other varieties and Shortage of chemicals for emergency disease occurrence while High demand of agricultural inputs, High demand of extension services and Expansion of seed supplier cooperatives in the study area are the major opportunities for input suppliers in the study area of malt barley value chain.

#### 4.5.2. Challenges and opportunities at production stage

##### *4.5.2.1.Challenges (constraints)*

At this stage the main actors are farmers who engaged in production of malt barley of the study area. Farmers in this stage faced the challenges that deterred the value chain development differently and ranked in line with their order of importance under table 11 below and each of the participants is given to rank the challenges they faced in order of importance. Accordingly, shortage of improved seed varieties, poor linkage with value chain actors, low price of the product, high price of inputs, lack of capital to purchase inputs (improved seed, fertilizer, chemicals, longer market distance from production area to nearest market and lack of storage for the crop they produce was ranked in descending order from first to seventh.

Consequently, Shortage of improved malt barley seed which was significant factor for malt barley market orientation was ranked as first (27.3%) followed by poor linkage with value chain actors and low price of the product they produce (malt barley) was ranked as second and third by 27.3 and 22percent. High price of inputs and lack of capital for purchasing inputs were ranked as fourth and fifth respectively. The sixth and seventh rank was taken by, longer market distance from production area and lack of storage facility for waiting high price for the produce respectively.

Table11: Constraints faced the producers in the study area

<b>Types of constraints</b>	<b>Rank</b>	<b>Number</b>	<b>Percent</b>
Shortage of Improved malt barley seed	1 <sup>st</sup>	41	27.3
Poor linkage with value chain actors	2 <sup>nd</sup>	33	22.0
Low price of product	3 <sup>rd</sup>	25	16.7
High price of inputs	4 <sup>th</sup>	21	14.0
Lack of capital to purchase inputs	5 <sup>th</sup>	18	12.0
Higher market distance	6 <sup>th</sup>	8	5.3
Lack of storage	7 <sup>th</sup>	4	2.7
<b>Total</b>		<b>150</b>	<b>100.0</b>

Source; Own computation from survey result, 2016

Furthermore, the challenges or constraints that faced producers at production stage are from the respondents and discussion results of the study are summarized and discussed below.

*High price, poor quality and low availability of malt barley seed:* Most farmers use home saved seeds from previous harvests; these seeds can be local varieties or improved varieties (holker and traveler). Although, there are existing input suppliers (seed multiplier farmers, Oromia seed enterprise), the high prices make it difficult for farmers to have access to improved seeds. Seed quality is difficult to determine because there is very little control over it. Some seeds can be difficult to find because they are only available in low quantities example Walia.

According to key informant interview and focus group discussions in sample kebeles most farmers used the local seeds due to low availability and high cost of improved seed (which costs 1500-1600birr/qt). According to the result from sample farmer's interview, about 40% of the land under malt barley was covered by local seed while 60% was covered with improved seed of 100kg per hectare application rate (Appendix Table 8). Only few farmers got improved seed while none of the farmers received pure seed indicating that the weakness of research centers.

*Limited services of extension and credit:* Although institutional services are present in the study area, the extension contact per year is limited or no such frequent and it is general approach due to unbalanced proportion of development agents and farmers in the study area. Even though, there are different supporters as well as stakeholders like malt factories and

breweries they work with only crops of their choice and often, focus on postharvest handling and marketing. One of the major problems that smallholders face is that most farmers (more than 70%) of them do not have access to credit from different creditors like Oromia saving and credit institutions and commercial banks. The main reason being that they are not credit worthy and lack collateral as well as high interest requirement while paying back.

*Lower market orientation and commercialization:* land is the basic fixed asset for farmers in the study area. Due to small proportion of land allocating for malt barley in the study area, leads to low supply of it while its demand is high in the market. due to high family size per household level the crop also used for consumption in the family while it is demanded by factory, hence the commercialization level of the farmers become moderate (35%) while the participation in the market is high (Appendix Table 4).

*Poor controlling methods of weeds, pest and diseases:* According to focus group discussion the biotic factors severely impact the final yields of crops produced in the study area. Farmers have a lack of technical knowledge on how to deal with pests and diseases and as a result they received different yield per hectare ranging from 12 to 44 quintal which is larger variation among farmers. These are due to factors like occurrence of pest and diseases, poor weed management and poor agronomic practices as well as poor extension service given by service providers.

#### *4.5.2.2. Opportunities at production stage*

Even though ,there were many challenges faced malt barley at the stage of production, high demand for malt barley production at farmer level, high demand for malt barley by different factories like Asella Malt Factory and brewery factories like Meta Diageo, Habesha, Walia, availability of different buyers (traders) and or users of the product (consumers), its potential for value addition (through processing or product handling), favorable land and climatic condition in the area of production, presence of value chain supporters and enabling policy environment and possibility of farming advice; high productivity potential are the major opportunities of malt barley at production stage in the study area.

#### *4.5.3. Challenges and Opportunities at Marketing Stage*

#### 4.5.3.1.Challenges at marketing stage

*Lack of appropriate storage facility for malt barley:* storage helps the holder of product to increase the shelf life and maintains the quality for better price. It increases farmer's bargaining power as well as other buyers of this product. However, Only the grain wholesalers have warehouse for storing malt barley for waiting price, however the cooperatives and unions have no storing room for a long time Due to lack of appropriate storage, majority of the farmers sell their crop immediately after harvest without seeking to make the best possible profit at the best time or price this is common when farmers sell to the traders.

*Unequal dissemination of market information:* although farmers in the study area have access to market information dissemination problem is occurred due to communication error, there was no such well organized and net worked market information service provider and due to this reason the farmers received different price for the same quality of malt barley. Due to limited market information farmers also sold their produce with forward price by taking the money before harvest from buyers specially from traders which reduced the profit they seek when the sell at normal time of selling.

*Low quality of product:* most farmers suffer in price fluctuation due to low quality of malt barley they produce when it was tested by laboratory at malt factory and breweries. Malt barley which is purchased from farmers or traders is not directly processed to malt and about 23% of loss is extracted from 100kg of raw malt barley currently. In general, side selling of farmers, weak linkage with companies (processors), low quality of production, delay of money from buyers of the crop, low quality of seed from union is the major challenges faced the cooperative in the study area. Moreover, lack of credit access, lack of suitable warehouse, poor linkage with processors, lack of continuous training, competition of traders, side selling of producers to traders, lack of laboratory sampling test, lack of transport access and delay of payments from the buyers/processors/ are the main challenges facing the actors in malt barley marketing.

*Shortage of malt barley:* due to shortage of malt barley, the demand of the buyers was not met as per the plane to purchase in a year. Due to small land allocation of the crop in the study area, the unions and larger traders failed to supply why they agreed to their clients.

*Lack of laboratory sampling test:* the exchange of malt barley between sellers and buyers are taken place by observing the physical appearance of the product without measuring the level. Most of the time this is occurred when the farmers sell their produce to the traders and government institutions at farm level. Thus, the level of the product is told to the farmers oral and the farmers received as per the buyer's preference. However, the brewery and malt factories purchase malt barley from their clients by measuring the product using laboratory sampling test.

*Presence of unlicensed traders:* according to the trade and market development of LemuBilbilodistrict, there are only fifteen grain wholesalers of traders who are legally licensed. However, there are number of traders specially those who collected the malt barley from producers at farm gate level. The presence of unlicensed traders in the study area affects both the government and producers by giving lower price to farmers and failed to pay the tax for government.

#### 4.5.3.2. Opportunities at marketing stage

Expansion of breweries in the country, high competition among the buyers of malt barley, government investment on infrastructure development are some of the opportunities at marketing stage of malt barley, establishment of cooperatives in the study area, establishments of credit providers and closeness of study areas to Asella Malt Factory are some the opportunities for malt barley value chain at the study area.

## **5. SUMMARY, CONCLUSION AND RECOMMENDATION**

### **5.1. Summary of the study**

This study was done at LemuBilbilo district of East Arsi zone found in Oromia National Regional State of Ethiopia to analyze value chain of malt barley with specific objectives of understanding the malt barely value chain, examining the performance of chain actors in the value chain of malt barley, analyzing the market orientation determinants of malt barley producers and assessing the challenges and opportunities of malt barley along the value chain in the study area.

The data were produced from primary and secondary sources. The primary data were generated from individual interview using pre-tested semi-structured questionnaire and checklist while the primary data were collected from 150 randomly selected households from four sample kebeles selected purposively based on the actual level of production in the district, from fifteen rural assemblers, from nine grain wholesalers, from four primary cooperatives, from one malt factory, from three beer distributor (wholesale), from twelve retailers (Hotels, grocery and cafes) and from ten consumers. The analysis was made using descriptive statistics and econometric model using STATA software with multiple regression models (OLS methods) to analyze factors affecting market orientation of malt barley producers in the study area and the major findings of this study are summarized as follows.

The descriptive statistics result showed that from the total of 150 sample households considered in this study 89 % were male headed households and 72% of could read and write. The average age of the sample household heads, farming experience and family size were 49.37 years, 9.13 years and 6.2 persons respectively. The study area is characterized by ownership of livestock resources and all the sampled respondents had owned 3.963 others livestock, 2.1 oxen and 1.44equines. On average households own about 2.19 hectares of land in which 87 and 13% were cultivated and grazing land respectively. Mixed farming system was the main occupation and source of livelihood where grain production and livestock production were primary and secondary source respectively. The average distance needed for producers to travel to nearest market place took an average of 52.68 minutes with 18 and 144

minutes of minimum and maximum respectively. The survey result showed that, sample respondents had access to institutional services like credit access (29%) and market information (84%) services including price information, market place information and demand of the crop they produce from different stakeholders. Moreover, about 69.33% of the sample households was members of farmers' cooperative in the study area and 50% of them had access to improved malt barley seed. The productivity of wheat is the highest from all crops produced in the study area which was about 36.3 qt per one hectare while 28.65qt per hectare for malt barley. The average input cost used for malt barley was about 1288 ETB per hectare where the average land allocated for malt barley was 0.441 hectare per household in the area. About 40% of the land was covered with local seed while the rest 60% with improved seed in the production year.

Input suppliers, malt barley producers, primary farmer's cooperatives, union, local collectors, grain wholesalers, processors (malt factory and beer factory), beer distributors, retailers (hotels, cafes and grocery) and consumers are the main value chain actors of malt barley value chain in the study area. About nine market channels were identified from the survey results and the producers have five main marketing channels through which malt barley is passed to the respective buyers including: local collector, grain wholesalers, cooperatives, malt factory and consumers marketing channels. Rural collectors were engaged in purchasing malt barley from rural areas and sell for grain wholesalers at district level in the study area. Grain wholesalers purchase malt barley from producers and rural collectors and sell to processors (AMF and Brewery) by using brokers.

Processors (Malt factories) transform malt barley into malt and sell to Breweries while the breweries transform into variety of value-added products (beverages) and sell to beer distributors. Distributors found at Asela town distributes the beverages to hotel/restaurants, and then they trade products to ultimate consumers. The market channels for malt barley, link from producers, cooperatives, union, traders, processors, retailers and to consumers. Producers of malt barley at LemuBilbilodistrict are the initial point in the malt barley market channels while household consumers in lemuBilbilodistricts are ultimate users of foods made from malt barley through variety of value adding activities and users of malt barley products (beverages) are households of the country.

To assess the benefit share of the major actors in the malt barley value chain, market performance was measured through the price differences of sales prices and average costs of commodity at each stage of the value chain to describe economic fitness of major actors across the chain. Moreover, the result of the study indicated that, malt barley had long channel that links chain actors as well as supporters with available enabling environment for better value chain development of malt barley to farmers` income would be enhanced. Commonly, local collectors, grain wholesalers, cooperatives, malt factories and consumers are the direct buyers of malt barley for re-selling it to respective buyers by adding value to some extent to the product. Marketing cost in malt factory is the highest as followed by unions and grain wholesalers while the local collectors incur the least cost. Producers in the district incur costs mostly during production periods rather than marketing which are considered as operating cost in malt barley value chain.

## **5.2. Conclusion of the study**

There is need to focus attention on improving malt barley market orientation among rural households. This is because close to 70% of malt barley of total production is sold, suggesting that the crop is an important component of the household cash source.

The market orientation index of the producers revealed that, malt barley is found at nearly subsistent level (below 20 percent) indicating that, there is a resource allocation problem for this crops or small proportion of land is allocated for the crop while its degree of market participation is higher among the farmers in the study area.

The important factors including literacy status, land size allocated for the malt barley, farming experience, oxen owned by house hold, access to credit service and access to improved seed were found to be significantly affecting market orientation of malt barley producers positively. Hence, promoting these factors increases farmers` market orientation in resource allocation for the commodity the study area.

Moreover, family size in the house, productivity of wheat and agricultural input cost were found to be significantly affecting market orientation of malt barley producers negatively.



Hence, these significant factors need to be intervening to enhance the farmers` orientation and to increase the possible gain that could be drawn from malt barley value chain particularly in the study area.

Farmers` Cooperatives are the most important buyers of malt barley from producers, followed by traders and malt factories. Farmers` cooperatives accounts for 41% of producer sales while rural collectors and grain wholesalers together account for 38% of producer sales of malt barley in the study area.

The market margin, profit share and value addition of value chain actors indicated that, the farmer`s primary cooperatives and rural collectors are poor positioned followed by grain wholesalers and Unions while malt factory is the higher positioned in malt barley value chain.

Farmer`s cooperatives could not enjoy the benefits in malt barley value chain due to limited working capital, business management skill, and short market channel. Thus, strong upgrading strategy is needed for cooperative to perform well and to make competent with others.

Malt barley producers at the district have five main malt barley marketing channels (cooperative, malt factory, local collector, grain wholesalers and consumers marketing channels). Even though, producers prefer to sell to the cooperative marketing channels, the large volume of malt barley of producers goes to local collector channels (19.89%). This is due to the limited purchasing ability of cooperatives in the area.

Producers received different price when they sell to traders, cooperatives and consumers. At district level cooperatives, rural collectors, grain wholesalers and unions purchase malt barley only by inspecting physical quality (color and impurity) of malt barley. Only physical quality inspection not enough to check the whole malt barley quality. Therefore, farmers need intervened to get the same price for the same level of product. Moreover, there is a communication gap between producers and end buyers of the product in malt barley value chain and needs an intervention for better communication.

Shortage of good quality seed, Shortage of chemicals for emergency disease occurrence, high cost of fertilizers and high interest, Low quality of seed from seed supplier companies and mixed seed with other varieties are the major challenges for malt barley value chain development at input supplying stage.

Shortage of Improved malt barley seed, Poor linkage with value chain actors, Low price of product, High price of inputs, Lack of capital to purchase inputs, Higher market distance, Lack of storage materials, diseases and pest attacks, poor quality and low availability of malt barley seed, and Limited services of extension are the major constraints of malt barley value chain and for the low market orientation recorded in the area.

Product quality problem, presence of unlicensed traders, low price for the products, limited function of cooperatives, lack of appropriate storage facility, unequal dissemination of market information, shortage of malt barley and lack of laboratory sampling test during selling and purchasing of malt barley are the major constraints identified at marketing stage of malt barley value chain in the study area.

### **5.3. Recommendation**

Based on the findings of the study, the following recommendation would be forwarded and intervened for better value chain development in the study area.

- ▶ As malt barley is highly demanded crop in the factory, improving technical knowhow of farmers on malt barley farming experience and facilitating adult education are recommended for increasing market orientation of malt barley producers, thus, all the concerned and responsible body should work effectively on these at the study area.
- ▶ Accessing credit availability and increasing its sustainability would be very important for farmers to participate in malt barley production, to facilitate their market access and to improve their value adding activities for better value chain development and to enhance the market orientation of malt barley producers. Thus, the creditors should rearrange credit access for producers in the study area.
- ▶ Increasing the size of land may not be an alternative for market orientation of malt barley production since land is a limited and fixed resource. Therefore, implementing process

upgrading strategy by government and non-government organization as well as private enterprises through promoting and provision of improved technology packages and better practices would increase the productivity of malt barley which can be increase the farmers` attitude in toward production of malt barley.

- ▶ Development intervention by governmental and nongovernmental organization should consider in assisting farmers to own oxen or looking for other mechanism that can solve the shortage of oxen.
- ▶ Moreover, adequate and easy way of credit access and managerial and business skill training should be provided to the existing farmer`s cooperatives and union managers by respective government bodies, larger buyers (malt factory and brewery) to strengthen and to make good linkage with malt barley producers and processors.
- ▶ To assure mutual benefits of cooperatives and producers, cooperatives need to improve the quality and coverage of buyers` preference information delivery to producers and need to be capacitated through business management training and encouraged through long-term credit to compete with the dominant groups like malt factory and Brewery Company.
- ▶ In order to minimize the price variability among producers and buyers of malt barley, laboratory sampling test should be promoted by respective government bodies in the districtto increase the price received by farmers in the study area.
- ▶ In order to strengthen and to make good linkage with producers and processors, vehicle access, adequate and easy way of credit access and managerial and business skill training should be provided to the existing farmer`s cooperatives and union managers by respective government bodies, buyers and other stakeholders.
- ▶ Improving input supply system will protect farmers from purchasing low quality inputs by high inputs cost. Thus, the role of research institutes and universities are crucial in identifying high yielding and disease resistant varieties to improve production of malt barley to meet the demand of factories in the country.
- ▶ Government support for easy access to inputs, strengthening linkage between input suppliers and farmers, strengthening research center, strengthening farmers seed multipliers in the study area and designing product upgrading for all input suppliers should be done by respective government bodies and others stakeholders to minimize the constraints of malt barley value chain at input supplying stage.

- ▶ Facilitating Training to smallholders on disease/pest control method, Strengthen credits service provider's institutions, improving storage facility, increasing the extension service for the producers, credit services and designing process upgrading strategy should be implemented by respective government bodies and other concerned bodies to minimize the constraints at production stage to create the value chain development for malt barley in the study area.
- ▶ Strengthening functions of farmer's cooperatives, Controlling unlicensed traders; Increasing credibility and market linkages of malt barley value chain actors, improving farmers bargaining power by supporting farmer's cooperatives and improving the information dissemination about different marketing aspects of malt barley should be done at marketing stage by all responsible bodies to reduce the constants and to create the value chain development of malt barley at the study area.

Generally, designing interventions policies to promote market orientation of malt barley would encourage smallholder access to credit, access to market information and creates linkages with different actors including larger processing company and creates value chain development of the crop in the area. Moreover, reducing the challenges in each stage of the value chain of malt barley is principal in enhancing market orientation of malt barley producers as well as for value chain development of malt barley in the study area.

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## **7. APPENDIXES**



## APPENDIXES TABLES

**Appendix Table 1:** Demographic characteristics of the producers

Demographic characters	Category	Percentage (100%)
	No education	28.0
	Grade 1-4	35.3
	grade 5-8	30.0
Education level of the household head	high school	4.7
	preparatory	2.0
Farming activity	Mixed farming	100.0
	Off/non-farming	34.0

Source: Own computation from survey result, 2016

**Appendix Table 2:** land holding by households in the study area 2016 survey season

Land allocation	Hectares	Percentage	Mean	Std.Dev.	Min	Max
Total land	329.275	100	2.1952	.50545	1.38	4.00
Cropping land	286.9	87.13	1.9127	.44392	1.25	3.50
Grazing land	42.375	12.86	.28250	.099737	.125	.750
Wheat land	73.97	22.46	.4931	.19353	.00	1.00
Food barley land	106.38	32.31	.7092	.24003	.25	1.50
Malt barley land	66.15	20.08	.4410	.17373	.25	1.50
Bean land	17.98	5.46	.1199	.13145	.00	.50
Linseed land	11.63	3.53	.0775	.13015	.00	.50
Potato land	8.95	2.72	.0597	.10345	.00	.50
Others land	3.46	1.05	.0231	.06396	.00	.43

Source: Own computation from survey result, 2016

**Appendix Table 3:** Major crops produced in the study area during 2016 cropping season.

Major crops grown	Farmers		Area covered (ha)		Average yield (Qt/ha)	
	Number	Percent	Mean	Std.Dev.	Mean	Std.Dev.
Wheat	139	92.67	.4931	.19353	36.34	10.83546
Food barley	150	100.0	.7092	.24003	24.8467	4.43860
Malt barley	150	100.0	.4410	.17373	28.6511	8.29736
Faba bean	80	53.33	.1199	.13145	6.0803	5.94212
Oilseeds (linseed)	41	27.33	.0775	.13015	2.2331	3.59313

Source: Own computation from survey result, 2016

**Appendix Table 4:** Indexes of producers` in the study area

Types of crops	MOI		HCI		CMI	
	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
Wheat	.1519	.06006	0.3187	0.13729	.5805333	.1954372
Food barley	.0927	.04618	0.1164	0.05686	.2593333	.1272669
Malt barley	.1742	.07293	0.3851	0.13947	.6956765	.05999348
Bean	.0199	.03126	0.0273	0.04506	.1462667	.2021115
Linseed	.0350	.05555	0.0314	0.04950	.2972667	.4381748
Potato	.0237	.04235	0.1211	0.20539	.224	.3604025
Average	0.0847	0.0144	0.1667	0.105595	.3748667	.115129

Source: Own computation from survey result, 2016

**Appendix Table 5:** Conversion factors for tropical livestock unit

Animal category	Tropical livestock unit (TLU)	Animal category	Tropical livestock unit (TLU)
Ox	1.10	Goat	0.09
Caw	1.00	Donkey	0.50
Heifer	0.50	Horse	0.60
Bull	0.60	Mule	0.70
Calves	0.20	Poultry	0.01
Sheep	0.01	Goat	0.09

Source: stock et al., (1991)

**Appendix Table 6:** purchasing and selling price of malt barley in 2016 production

Actors	Purchase from or sell to						
	Farmers	Collectors	Wholesalers	Cooperatives	Unions	AMF	brewery
Collectors	900	-	950	-	-	-	-
Wholesalers	930	950	-	-	-	1035	1050
Cooperatives	975	-	-	-	1020	1061	-
Unions	-	-	-	1005	-	1097	1075
Malt factory	985	-	1005	1043	1097	-	1619
Brewery	-	-	1050	-	1075	1619	-

Source: Source: Own computation from survey result, 2016

**Appendix Table 7:** Gross value, sales value and market orientation index of malt barley

Items	N	Mean	Std.Dev.
Gross value of malt barley produced (Birr)	150	11932.4128	5049.20861
Sales value of malt barley sold (Birr)	150	8301.0825	3659.11167
Malt barley marketability Index	150	0.6956765	0.05999348
Malt barley Market orientation index	150	0.1741533	0.07293481
Selling price for malt barley (Birr/quintal)	150	944.0200	33.35742

Source: Own computation from survey result, 2016

**Appendix Table 8:** Utilization of inputs and costs in the study area

Items (production inputs)	Per average land allocated for malt barley			
	Mean	Std.Dev	Rate (kg/ha)	%
DAP (qt/ha)	0.3936	0.17655	89.25	
UREA (qt/ha)	0.1528	0.10266	34.65	
SEED (qt/ha)	0.441	0.17373	100	
ImprovedSeed (qt/ha)	0.2643	0.23082	100	
Localseed (qt/ha)	0.1767	0.23980	100	
Total input cost (birr/ha)	1288.4478	574.02539	-	
Total production cost (birr/ha)	7597.0920	3252.61565	-	

Source: Own computation from survey result, 2016

**Appendix Table 9:** Multicollinearity test using (VIF) for continues variables

Variable	VIF	1/VIF
LNDALCTD	6.87	0.145480
INPUT_COST	6.56	0.152325
PRDCTVTY	1.53	0.655707
AHHH	1.13	0.887949
TLSTKN	1.11	0.898731
FHHH	1.10	0.910451
FRMXP	1.09	0.918852
FRQCY	1.08	0.927795
OXOWN	1.07	0.931110
EQN_SHIP	1.07	0.931137
DMRKT	1.06	0.940918
Mean VIF	<b>2.15</b>	

Source: Own computation from survey result, 2016 (STATA OUT PUT)

**Appendix Table 10:** Contingency coefficient (CC) for dummy variables used in OLS model

Variables	SHHH	EHH H	OFFR M	ACIMBS	ACCRD T	ACCMr kt	COPM B	CC
SHHH	0	0.142	0.071	0.076	0.039	0.033	0.004	0.052
EHHH	0.142	0	0.095	0.153	0.144	0.104	0.061	0.100
OFFRM	0.071	0.095	0	0.019	0.005	0.146	0.05	0.055
ACIMBS	0.076	0.153	0.019	0	0.065	0.045	0.038	0.057
ACCRDT	0.039	0.144	0.005	0.065	0	0.138	0.038	0.061
ACCMrkt	0.033	0.104	0.146	0.045	0.138	0	0.18	0.065
COPMB	0.004	0.061	0.05	0.038	0.038	0.18	0	0.065
CC	0.052	0.100	0.055	0.057	0.061	0.092	0.053	<b>0.455</b>

Source: Own computation from survey result, 2016

**Appendix Table 11:** Heteroscedasticity test using stata command hettest (Breusch-pagan test)

Heteroscedasticity test using stata command hettest (Breusch-pagan test)
<pre>. hettest  Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of MARO  chi2(1)      =    60.55 Prob &gt; chi2  =    0.0000</pre>

Source: Own computation from survey result, 2016 (STATA OUT PUT)

**Appendix Table 12:** Correlations between explanatory variables used in the model

```
. corr( AHHH SHHH FHHH EHHH DMRKT LNDALCTD OFFRM FRMXP PRDCTVTY TLSTKN OXOWN ACIMBS ACCRDT FRQCY ACCMrkt COPMB ACCTrF INPUT_COST EQN_SHIP)
(obs=150)
```

	AHHH	SHHH	FHHH	EHHH	DMRKT	LNDALCTD	OFFRM	FRMXP	PRDCTVTY	TLSTKN	OXOWN	ACIMBS	ACCRDT	FRQCY
AHHH	1.0000													
SHHH	-0.0261	1.0000												
FHHH	0.0639	0.0692	1.0000											
EHHH	-0.1423	-0.0502	0.0599	1.0000										
DMRKT	-0.0040	0.0873	0.1239	-0.0859	1.0000									
LNDALCTD	-0.1760	-0.0948	-0.0391	0.0069	0.0465	1.0000								
OFFRM	-0.1035	-0.0711	-0.2448	0.0318	0.0611	0.0053	1.0000							
FRMXP	-0.1094	0.0104	-0.1664	-0.0304	-0.1033	-0.0241	0.0366	1.0000						
PRDCTVTY	-0.0526	-0.0485	-0.0815	-0.0563	-0.0634	-0.5187	0.0854	0.0817	1.0000					
TLSTKN	-0.0573	0.0906	-0.0694	0.1774	-0.0732	-0.0593	-0.0208	-0.1237	-0.1196	1.0000				
OXOWN	-0.0635	-0.0544	0.0375	-0.0442	0.1481	0.0553	-0.0686	-0.0757	0.0634	-0.0254	1.0000			
ACIMBS	-0.0600	-0.0386	0.0209	0.0672	0.0594	0.0544	0.0045	-0.1291	0.0058	-0.0540	0.1303	1.0000		
ACCRDT	-0.0747	0.0758	0.0004	0.0546	-0.0252	-0.0047	-0.0193	-0.0308	0.0421	0.1740	-0.0581	0.0653	1.0000	
FRQCY	0.1115	-0.0726	0.0668	0.0426	-0.0229	0.1207	-0.0136	0.0543	-0.1319	-0.1209	-0.0564	-0.0762	-0.1377	1.0000
ACCMrkt	0.0284	-0.0330	0.0924	-0.0729	0.0336	0.1241	-0.1474	-0.0850	0.0048	-0.1019	-0.0687	-0.1397	-0.0450	-0.0229
COPMB	0.0543	0.0044	-0.0805	0.0449	-0.1272	0.0049	0.0501	-0.0080	0.0593	0.0653	0.0303	0.0378	0.0379	0.0002
ACCTrF	0.0911	0.0397	0.0196	0.1080	-0.0885	0.0756	0.0029	-0.0837	-0.0139	0.0888	-0.0135	0.1388	-0.0963	0.0190
INPUT_COST	-0.2096	-0.1249	-0.0000	0.0411	0.0190	0.9167	0.0469	-0.0395	-0.4801	-0.0539	0.0481	0.2241	0.0694	0.0869
EQN_SHIP	0.0088	0.1306	-0.1243	-0.0046	-0.0025	-0.0092	-0.0935	0.0545	0.0016	-0.0907	0.1421	0.0711	0.0018	-0.0845
	ACCMrkt	COPMB	ACCTrF	INPUT_COST	EQN_SHIP									
ACCMrkt	1.0000													
COPMB	0.1830	1.0000												
ACCTrF	0.0037	0.1594	1.0000											
INPUT_COST	0.0761	0.0315	0.0784	1.0000										
EQN_SHIP	-0.0120	0.0918	-0.0183	-0.0515	1.0000									

Source: Own computation from survey result, 2016 (STATA OUTPUT)

Appendix Table 13: OLS result for MOI of producers (robust methods)

Linear regression						Number of obs = 150	
						F( 18, 131) = 16.88	
						Prob > F = 0.0000	
						R-squared = 0.7388	
						Root MSE = .03975	
MARO	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]		
AHHH	.0002508	.0004318	0.58	0.562	-.0006034	.0011049	
SHHH	-.0012961	.0130485	-0.10	0.921	-.0271091	.0245169	
FHHH	-.0047155	.0020501	-2.30	0.023	-.008771	-.00066	
EHHH	.0076552	.0036035	2.12	0.036	.0005266	.0147839	
DMRKT	-.0072586	.0070211	-1.03	0.303	-.021148	.0066309	
LNDALCTD	.3744438	.0711708	5.26	0.000	.233651	.5152366	
OFFRM	-.0084427	.0074082	-1.14	0.257	-.023098	.0062126	
FRMXP	.0031796	.0014061	2.26	0.025	.0003981	.0059611	
PRDCTVTY	-.0029321	.0004887	-6.00	0.000	-.0038988	-.0019654	
TLSTKN	-.0035231	.0026081	-1.35	0.179	-.0086826	.0016364	
OXOWN	.0080071	.0038062	2.10	0.037	.0004775	.0155367	
ACPMBS	.0160189	.0065973	2.43	0.017	.0029678	.0290699	
ACCRDT	.0151953	.0088414	1.72	0.088	-.0022951	.0326857	
FRQCY	.0009166	.0020794	0.44	0.660	-.003197	.0050301	
ACCMrkt	.0062922	.0079463	0.79	0.430	-.0094274	.0220118	
COPMB	.0022169	.0073128	0.30	0.762	-.0122495	.0166832	
INPUT_COST	-.0000379	.0000151	-2.51	0.013	-.0000678	-8.05e-06	
EQN_SHIP	.0012003	.0043434	0.28	0.783	-.0073919	.0097925	
_cons	.1090678	.0493261	2.21	0.029	.0114889	.2066467	

Source: Own computation from survey result, 2016

**APPENDIX 1: QUESTIONNAIRE FOR HOUSEHOLD SURVEY**

**PRODUCERS' INTERVIEW QUESTIONNAIRES**

This questionnaire is prepared to collect data for value chain analysis of malt barley (*Hordeumvulgare l*): the case of LemuBilbilo woreda, East Arsi zone of Oromia regional state, and Ethiopia research for MSc in Agribusiness and Value chain Management in Jimma University.

Remark: The personal profile obtained from respondents with regard to the theme will be kept confidential and will not have any consequence on the respondent in any ways. Please give correct answers to the following questions. The information which was given by the respondent is relevant to address the following specific objective:

The Specific objectives of the study include:

- To identify actors and to draw up value chain map of malt barley value chain in the area
- To analyzethe performance of malt barley value chainactors at the study area
- To analyze determinants of market orientation for malt barley producers at study area
- To identify challenges and opportunities of malt barley value chain at the study area

Instructions to Enumerators

- ✓ Try to give short, prices and brief introduction for the purpose of this data to the farmers before starting any question,
- ✓ announce yourself to the farmers,
- ✓ reply them in local ways (in Afan Oromo)
- ✓ Make perfect the objective of the study.
- ✓ Try to fill the interview schedule according to the farmer’s response
- ✓ Write answers on the space provided.

**Part 1: Demographic Characteristics**

Name of the Respondent: \_\_\_\_\_

1. Fill the table accordingly

Ke bel e	Age (years)	Sex (male/femal e)	Educatio n level	Marital status	Family size		
					Below 15years	15-65 years	Above 65 years

- 2. Farming experience (in years)\_\_\_\_\_
- 3. Distance from production area to alternative market\_\_\_\_\_ (walking hourse)
- 4. Distance from production area to FTC (\_\_\_\_\_walking hours)

5. Distance from production area to weather roads \_\_\_\_\_walking hourse. /
6. Do you have your own Agricultural land? (√) 1.  Yes 2.  No
7. If you say yes, on Q.3 (please **use the local measurement: 1ha=4 timad,**) i) Total land [\_\_\_\_\_] hectare, ii) Total land used for crop production [\_\_\_\_\_] hectare, iii). Total grazing land [\_\_\_\_\_] hectare, IV). others [\_\_\_\_\_] hectare
8. What are your primary and secondary activities in the household head and how much income did you earn from each of the activities you involved in? (Please use the sign√/based on the farmer's response and put the income under the column in ETB based on 2008 E.c

Activities	Primary	Secondary	Income earned (birr)
Crop production			
Livestock rearing			
Mixed farming			
Off-farm employment			
No-farm activities (trade)			
Others			

9. Did you participate in off/non-farm activities? (√) 1.  Yes 2.  No
10. If yes on Q#7, what types of activities did you participate? 1.  selling local drink 2.  selling fire wood/charcoal 3.  handicraft, 6.  trading 7.  clothes making (sawing), 8.  others specify\_\_\_\_\_
11. What is the reason behind for you or your family members to be engaged in off farm activities? (√) 1. Shortage of land 2. Excess family labor 3. Attractive income from off-farm activities 4. Other, specify\_\_\_\_\_

## Part 2: Crop production and average selling price of the commodity

12. Did you produce crops in 2008 E.C (2008 E.c) year? (√) 1.  Yes 2.  No

13. If yes, fill the table below based on 2008 E.C production year

Types of crops	Area in hectare	Production in quintal	Amount sold in quintal	Left seed for in quintal	Selling; price in ETB
Wheat					
Food barley					
Malt Barley					
Maize					
Bean					
Oilseeds					
Potato					
Others (specify)					

14. Which crop is highly productive in your production experience? 1. Wheat 2. Food barley 3. Malt barley 4. Other (specify)
15. Which of the crop you interested to produce relative to productivity and price of malt barley in your area? 1. Food Barley 2. Malt barley 3. Other (specify)



16. Why you interested to produce the above crop on Q# 15, you preferred?

17. \_\_\_\_\_  
\_\_\_\_\_

18. What are the estimated average costs (labor, capital, agricultural inputs, materials costs, and others (etc.) costs?) from production up to marketing one quintal of malt barley in ETB?

Major costs	Cost incur(birr/qt) or birr/littr,birr/person	Total cost incurred
Agricultural inputs cost		
Labor cost (lading /unloading)		
Transportation cost		
Materials cost (sacks)		
Others (specify) (tax...)		

Note: - ETB=Ethiopian birr, Qt=quintal

19. Do you have your own livestock (other than equines and oxen)? (√) 1. [ ] Yes 2. [ ] No

20. If your answer for **Q.19** is Yes, how many livestock Number do you have?: Cows/heifers [\_\_\_\_], Calves [\_\_\_\_], Goats [\_\_\_\_], Sheep[\_\_\_\_], , Others [\_\_\_\_]

21. Do you have oxen that used for plowing your land currently? (√) 1. [ ] Yes 2. [ ] No

22. If you say “yes” on Q # 21, how many oxen do you have? \_\_\_\_\_

23. Do you have equines (back animals) used for transport facility? (√) 1. [ ] Yes 2. [ ] No

24. If you have yes, on Q.23: how much do you have? Donkeys [\_\_\_\_], Horses [\_\_\_\_], Camels [\_\_\_\_], Mules [\_\_\_\_].

25. Do you have access to other transport facility 1? Yes 2. No

26. If yes on Q.25, what are they? List outs-----  
-----

### Part 3: Input Supply for agricultural activity

27. Have you ever used agricultural inputs (fertilizer, chemicals, improved seeds etc.) for the production of Malt barley? (√) 1. [ ] Yes 2. [ ] No

28. **If you say yes on Q#27**, where did you get these agricultural inputs? (√)1.[ ] agricultural office 2.[ ] research center 4.[ ] legal market 4.[ ] from farmers cooperatives 5.[ ] from illegal market 6.[ ] from malt factory 7.[ ] from beer factory 8.[ ] **others**

29. How much birr did you paid for one quintal of DAP -----birr, UREA\_\_\_\_\_birr and improved seed \_\_\_\_\_birr?

30. Do you have access to improved malt barley seed? (√) 1. [ ] Yes 2. [ ] No

31. If no on Q#30 what was the problem? ( express your idea freely)

\_\_\_\_\_

32. If you do not have improvedseed, how did you cover your land for malt barley? 1. I use my own seed in the house 2. I purchase from other farmers 3. I change for other crop

33. If yes, on Q#30, did you use improved seed in 2008 E.C year? (√) 1. [ ] Yes 2. [ ] No

34. What types of malt barley seed did you use last year? Please the table below accordingly:

Types of malt barley improved seed	Quantity used in 2007/2008	Productivity ( quintal per hectare)	Price (birr/quintal)

35. Is there diseases affecting your crop in your area? 1. Yes 2. No  
 36. If yes on Q#35, how did you control them? Explain or specify them
- 

**Part 4: Social organization of self-help group**

37. Is there any cooperative or self-help group that you are involved in? (√) 1. [ ] Yes 2. [ ] No  
 38. If your answer for Q#35is “yes”, which association do you belong to? 1.[ ] Farmer’s Cooperative 2.[ ] Savings and Credit Institution 3.[ ] Other (please specify): \_\_\_\_\_  
 39. If No on Q#35, why? \_\_\_\_\_  
 40. If yes, on Q# 35, what are the functions of the cooperative/s you benefited from among the following? (√) (multiple response is possible) and thick by (√) sign on your own benefits

Benefit gained from being member of cooperative	Use (√) here
Fast Input Delivery	
Affordable Input price	
Fair farm gate output price	
Easy access to credit	
Low cost credit	
strong bargaining power	
Other (specify)	

**Part 5: Extension services**

41. Did you get any advisory service on Malt barley either production or marketing practices before and in this year of production? (√) 1. [ ] Yes 2. [ ] No  
 42. Who provides the advisory service for you? (Multiple responses is possible) 1. [ ] Development agents of the kebele 2. [ ] Woreda agricultural experts 3. [ ] Research centers (specify) 4. [ ] Malt factory (specify) 5. [ ] beer factories 6.[ ] Others (specify)\_\_\_\_\_  
 43. How often (number of contact) did you get the services at 2008 E.C annual production of malt barley on your area of production? \_\_\_\_\_

**Part 6: Marketing and market channels**

44. Did you participate in malt barley marketing? (√) 1. [ ] Yes 2. [ ] No  
 45. How much quintal of malt barley did you supply in 2008 E.C in the market? \_\_\_\_\_  
 46. To whom did you sell your malt barley in this year? (Multiple response is possible)

Potential buyers	Number of quintal sold	Selling price (in birr)
Rural collectors		
Urban assemblers		

Cooperatives		
Unions		
Malt Factories		
Bear Factories		
Pothers (specify) _____		
Consumers		
List if any other channel		

47. Where did you sell the malt barley you produce? (√): 1.  At farm gate 2.  At local market 3.  Zonal market 3.  In regional market 4.  In other areas (specify)

**Part 7: Access to market information of the producers**

48. Do you have marketing information in last year about malt barley? (√) 1.  Yes 2.  No

49. If your answer for Q#46 is yes, from whom did you get the market information of your product? (√) 1.  From Development Agents 2.  from kebele manager 3.  from Woreda experts 4.  Radio 5.  from Brokers 6.  From market 7.  Others (specify) \_\_\_\_\_

50. What type of information did you get? (√) 1.  Price information 2.  Market place information 3.  Buyers' information 4.  Other (specify) \_\_\_\_\_

51. How did you sale your produce in 2008 E.C? 1.  Direct to the purchaser 2.  through commission man to the purchaser 3.  through broker 4.  others (specify) -----

52. Who sets your selling price for malt barley in 2008 E.C? 1.  Myself 2.  Set by market force 3.  Buyers 4.  Negotiations 5.  Others (specify) -----

53. When did you sell? Selling strategy select the number

- 1) Store and sell when price rises 2) Sell as soon the purchase 3) Sell in pieces as buyers comes 4) Sale before purchase 5) Others (specify)

54. When did you take the money after you sell your malt barley from your buyers? (√) 1.  during exchange 2.  after a month 3.  after a year 4.  Others (specify) ----

55. Do you have Linkage with commercial value chain actors? (√) 1  Yes 2.  No

56. If your response on question #53 is yes, what are the commercial value chain actors' that you have linkage with? (√) (Multiple responses are possible) 1.  Cooperatives 2.  collectors 3.  urban assemblers 4.  processors (malt factories) 5.  Brokers 6.  bear factories 6.  Others (specify) \_\_\_\_\_

**Part 8. Credit Access of the producers**

57. Did you have an access for credit/loan in this year? (√) 1.  Yes 2.  No

58. If you say yes on Q#55, what was your major source? 1.  savings and credit institutions 2.  Informal creditors 3.  commercial banks 4.  other (please specify) \_\_\_\_\_

59. How much did you borrow? \_\_\_\_\_ ETB.

60. For what purpose, did you take the credit in relation to malt barley production? 1.  Purchased fertilizer, improved seeds, chemicals etc. 2.  Rented-in land for production 3.  Hired farm laborer 4.  Other (please specify)

61. If "No", Q.55. What was the main reason? 1.  Lack of Access 2.  High interest 3.  Collateral requirement 4.  Availability of other alternatives 5.  other (please specify)

62. **What are the constraints you faced regarding malt barley marketing?**

Challenges	Rank them as 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , ....etc.	Opportunities
Lack of market		
Low price of product		
High price of inputs		
Lack of storage		
Lack of transport		
Lack of market information		
Poor linkage with value chain actors		
Low quality of product		
Shortage of supply		
Lack of demand		
High market distance		
Others (specify		

**Part 9: Value Addition activities of the producers**

63. Did you hear anything about value addition in your area before? (√) 1.  Yes 2.  No
64. Did you add any value on Malt barley that you produce before? (√) 1.  Yes 2.  No
65. If your answer for Q#61 is yes, what are those values you add to your malt barley? (\*Multiple responses are possible)

Crop	Value adding activities (1=yes, 0=no)	Hint: use the following if you practices it and if any other specify it	How much it costs (Birr/qt)
Malt barley		1 = cleaning	
		2 = sorting	
		4 = storage	
		5 = processing (specify)	
		6= packaging	
		6 = any other (specify) it	

**Thank you very much for your response:**

**TRADERS' INTERVIEW QUESTIONNAIRE**

**Annex 2: questionnaire for malt barley traders (collector, urban assemblers)**

I. Interviewee information

- Name of the organization: \_\_\_\_\_ Year of establishment \_\_\_\_\_
- What are the Types of trade you involved in? (√) 1.  collector 2.  Assembler 3.  wholesaler 4.  retailer 5.  others
- Ownership and management status: (√): 1.  owner 2.  Manager 3.  owner and manager
- Age \_\_\_ sex \_\_\_ education level \_\_\_\_\_ marital status \_\_\_\_\_ family size \_\_\_\_\_
- Trading experience of malt barley \_\_\_\_\_ year
- Number of employees in the organization: \_\_\_\_\_

II. Malt barley purchasing

- Did you participate in malt barley trading? (√): 1.  Yes 2.  No

8. If yes, on Q#8, how many quintals did you purchase per year on average? \_\_\_\_\_
9. What is your source of capital for trading?\_\_\_\_\_
10. From where did you purchase the malt barley? Multiple response is possible
11. What was the purchasing price for one quintal of Malt barley in 2015/2016? \_\_\_\_\_ETB
12. What price did you received last year for one quintal of malt barley?\_\_\_\_\_ETB
13. Who are your suppliers of Malt barley? (√): 1.  Individual farmers 2.  Farmers cooperatives 3.  Middlemen (specify 4. Others(specify)\_\_\_\_\_
14. Who is setting the price when you buy Malt barley? (√): 1.  Farmers 2.  Local middlemen 3.  Brokers 4. Government 5. processors 6. Others (specify)
15. Where do you get information about price and other market related issues of Malt barley in the local market? (√): 1.  from radio 2.  From extension workers 3.  From middlemen 4. From brokers 5. Others (specify)
16. Did you get all your Malt barley supply requests from suppliers this year? (√): 1=Yes , 0=No
17. If no what are the main reasons? (√): 1.  Low availability of Malt barley 2.  Low quality of Malt barley3.  High price of Malt barley 4. Lack of reliable supplier 5.Others(specify)\_\_\_\_\_
18. For whom are you selling the Malt barley supplied to you? Multiple response is possible:  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
19. On average how much is your selling price of one quintal of malt barley? \_\_\_\_\_ETB
20. Do you use brokers when you buy malt barley from farmers? 1. Yes 2. No
21. What are the estimated average expenses (transport, labor, tax, storage, interest, etc.) to buy and sell one quintal of Malt Barley in ETB? Fill the table below.

No.	Types of cost	Estimated cost(birr/qt)	Remark
1.	Transport cost		
2	Labor cost ( loading /unloading)		
3	Interest cost		
4	Storage cost		
5	Tax		
6	Others(specify)		

22. What value did you add on the malt barley that you supplied from producers?  
\_\_\_\_\_
23. What are the challenges you faced regarding malt barley trading in general?  
\_\_\_\_\_
24. How did you solve these challenges?\_\_\_\_\_

**Annex 3: questionnaire for malt barley processors (malt factories and beer factories)**

1. Name of the organization\_\_\_\_\_
2. Address of the organization: Region\_\_\_\_\_ Zone\_\_\_\_\_ town\_\_\_\_\_
3. Age\_\_\_\_sex\_\_\_\_educationlevel\_\_\_\_\_maritalstatus\_\_\_\_\_family size\_\_\_\_\_

4. Processing experience of malt barley \_\_\_\_\_ year
5. When did you start processing in your organization (years)\_  
\_\_\_\_\_
6. What are the major agricultural products that you are engaged to process? List the major ones; \_\_\_\_\_
7. Do you process malt barley in your processing organization? 1.[ ] yes 2.[ ] No
8. If yes, what are your outputs that you get from processing of raw malt barley? \_\_\_\_\_
9. Where did you get the raw material (Malt barley) for processing activities?

Sources of malt barley	Purchase price (birr/quintal)
Farmers	
Traders	
Cooperatives	
Owne production	
Others (specify)	

10. What is the average purchasing price for one quintal of Malt barley? \_\_\_\_\_ ETB
11. How much ton of malt barley demanded your Malt factory per year (currently)? \_\_\_\_\_ ton
12. Did you get all the demand that you planned currently? 1.[ ] yes 2.[ ] no
13. If no, why? \_\_\_\_\_
14. How much kilogram (kg) of Malt did you get from one quintal of raw malt barley on average?  
\_\_\_\_\_
15. Do you use brokers when you buy malt barley from suppliers? 1. Yes 2. No
16. What are the inputs you used for processing other than raw malt barley during processing?  
i. \_\_\_\_\_ ii. \_\_\_\_\_ iii. \_\_\_\_\_ iv. \_\_\_\_\_

17. What are your major costs for processing (estimate by input type)

No.	Types of input used	Measurement	Estimated cost(birr/measurement)	Remark
1	i.			
2	ii.			
3	iii.			
4	iv.			

18. To whom do you sell processed products (malt) that you obtained from processing of malt barley?  
\_\_\_\_\_
19. What is the selling price of quintal of malt in birr? \_\_\_\_\_ ETB
20. What value do you add on malt barley other than processing?  
\_\_\_\_\_
21. Did you get the required raw material for malting as you demanded ? 1.[ ] Yes 2.[ ] No
22. If No, what do you think the reason was?

23. Is there any bi-products extracted during processing? 1.  yes 2.  No
24. If yes, on Q#21, what byproduct did you get from processing of Malt barley?  
\_\_\_\_\_
25. Where did you put these bi products, you obtained? \_\_\_\_\_
26. Did you manufacture beverages? 1.  yes 2.  No
- If your response is yes on Q#24, answer the following questions from 25-27, if No skip them:
27. What are the different types of beverages that you are manufacturing currently?  
\_\_\_\_\_
28. How many hectoliters of beer (beverages) did you extract from one quintal of malt on average?

No.	Types of beverages (Bear)	Estimated hectoliters of beer extracted from one quintal of malt	Selling price (birr/full box of bear)	
			For wholesalers	For retailers
1				
2				
3				
4				

NB. [1hectolitre =1000 liters, 1m<sup>3</sup> =10 hectoliter, 1m<sup>3</sup>=10<sup>4</sup> liters]

29. To whom did you sell these beverages?  
\_\_\_\_\_
30. How did you sell your product to your customers? \_\_\_\_\_
31. Please list the constraints that you encountered regarding to processing or trading activity

**Thank you for your response!**

#### Annex 4: Wholesalers interview questionnaire

1. Name of the organization (name of the owner) \_\_\_\_\_
2. Address: region \_\_\_\_\_ zone \_\_\_\_\_ district \_\_\_\_\_ town \_\_\_\_\_
3. Age \_\_\_ sex \_\_\_ educationlevel \_\_\_\_\_ maritalstatus \_\_\_\_\_ family size \_\_\_\_\_
4. Trading experience of malt barley products (brewery) \_\_\_\_\_ year
5. How long (year) since you started the business \_\_\_\_\_
6. Did you trade raw malt barley? 1.  yes 2.  No

If your response on Q# 5 is No.... skip questions 6 and 7 and go to question number 8

7. If you say yes, on Q# 5, from whom did you purchase?
  - a. From farmers \_\_\_\_\_ birr/quintal
  - b. From rural collector \_\_\_\_\_ birr/quintal
  - c. From assembler \_\_\_\_\_ birr/quintal

- d. From others (specify) \_\_\_\_\_ birr/quintal
8. If you are engaged in raw malt barley trading, for whom did you sell the raw malt barley that you purchased from the above clients?
- a. For beer factory (specify name ) \_\_\_\_\_ birr/quintal
- b. For malt factory (specify name ) \_\_\_\_\_ birr/quintal
- c. For consumer \_\_\_\_\_ birr/quintal
- d. For others (specify) \_\_\_\_\_ birr/quintal
9. Did you participate in Beverages trading? 1.[ ] yes 2.[ ]No
10. If yes on Q# 8, what is your position? 1. [ ] wholesaler 2. [ ] Retailer 3.[ ] both 4.[ ] others
11. If yes, from where did you get these beverages and what is the purchasing and selling price for one full box of beverages? ( use the table below)

No.	Types of beverages	Sources: of beverages	Purchasing price (birr/bottle)	Selling price (birr/bottle)
1				
2				
3				
4				

12. For whom did you sell (Who are your customers? \_\_\_\_\_)
13. What cost did you incur for one full box of bear (25 bottles of individual bear)?

No.	Types of cost	Estimated cost (birr/box)	Remark
1	Transport cost		
2	Labor cost(loading/unloading cost)		
3	Storage cost		
3	Tax cost		
4	Others		

14. What are the constraints you faced during wholesaling this malt barley product?

Specify \_\_\_\_\_

Questionnaires for retailers (Hotels/Cafes/restaurants)

- 1 Name of the organization: \_\_\_\_\_ Year of establishment \_\_\_\_\_
- 2 What types of trade activities you engaged on currently? 1[ ] retailing 2.[ ] wholesaling 3. assembling .[ ] others
- 3 Ownership and management status: (√): 1. [ ] owner 2. [ ] Manager 3. [ ] owner and manager
- 4 Year of birth: \_\_\_\_\_
- 5 Sex: (√): 1. [ ] Male 2. [ ] Female)



- 6 Level of Education: (√): 1. [ ] No education 2. [ ] junior education 3. [ ] Elementary education (4) High school (5)  other \_\_\_\_\_
- 7 Number of employees in the organization: \_\_\_\_\_
- 8 If your response on question number 2 is retailing, do you involved in beverages retailing activities? 1.[ ] yes 2.[ ] no
- 9 If yes on Q#\*8, from where did you purchase these beverages? \_\_\_\_\_
- 10 What is the purchasing price of one full box of beverages in ETB? \_\_\_\_\_
- 11 For whom did you sell your beverages? \_\_\_\_\_
- 12 What is the selling price of one bottle of beverages in ETB? \_\_\_\_\_
- 13 What amount of cost you incur for one bottle of beverage?
- Loading /unloading cost \_\_\_\_\_birr/box
  - Transport cost \_\_\_\_\_birr/box
  - Labeling cost \_\_\_\_\_birr/box
  - Tax cost \_\_\_\_\_birr/box
  - Others (cost ) specify\_\_\_\_\_
15. Is there price variability for different quality? How much is the price difference between best and least quality product?
16. Who are your customers? \_\_\_\_\_

#### Annex 5: consumer questionnaire

- Name of the consumer \_\_\_\_\_
- Address: Region \_\_\_\_\_zone \_\_\_\_\_town \_\_\_\_\_
- Age \_\_\_\_\_educational status \_\_\_\_\_marital status \_\_\_\_\_
- What is your major source of income? 1. [ ] farming 2. [ ] trading 3. [ ] government or NGO employed 4. [ ] others
- Did you participate in cereal marketing? 1=yes 2= No
- Did you participate in malt barley purchasing activity? 1=yes 2= no
- When did you start purchasing and consuming malt barley ?\_\_\_\_\_
- If yes on Q# 7, from where did you purchase?
  - From farmers \_\_\_\_\_birr/quintal
  - From traders \_\_\_\_\_birr/quintal
  - From cooperatives\_\_\_\_\_birr/quintal
  - From others (specify) \_\_\_\_\_birr/quintal
- Did you consume malt barley as a food in your home? 1=yes 2= No
- If yes on Q#6, what types of foods you prepared from malt barley?  
\_\_\_\_\_

11. Did you get the processed malt barley from producers or others? 1=yes 2=No
12. How did you see the quality of malt barley that you purchased from farmers at market?  
\_\_\_\_\_
13. What problem do you observe on the quality of malt barley that you purchased?  
\_\_\_\_\_
14. Are you drinking any beverages (beer) made from malt barley? 1=yes 2= No
15. If yes on Q# 9, what price did you pay for one bottle of beer?
16. From where did you purchase these drinks?
17. What challenges did you face concerning malt barley? -----

**Checklist for Interview with middlemen/ Brokers**

1. How long since you engaged in brokering activity? \_\_\_\_\_
2. What are the agricultural products you broker?
3. Can you indicate the volume of transaction for each product you handle in a given period (last year?)
4. Do you act on behalf of Seller? \_\_\_\_\_ or buyer \_\_\_\_\_ or Both \_\_\_\_\_
5. If you act on behalf of seller, what is the mode of payment?
  - a) On credit \_\_\_\_\_(% advance if any)\_\_\_\_\_ maximum repayment duration(months)
  - b) On cash \_\_\_\_\_(as transaction concluded) or Bank transfer \_\_\_\_\_
  - c) Both proportion on credit (%) \_\_\_\_\_ on cash (%) \_\_\_\_\_
  - d) Amount of commission you charge to seller per unit of the product \_\_\_\_\_
  - e) Do you provide any credit for seller for input or other emergencies? (Y/N) \_\_\_\_\_
6. If you act on behalf of buyer, what are the activities you do?  
Sorting: \_\_\_\_\_  
Transportation: \_\_\_\_\_
7. Amount of commission you charge to seller per unit of the product \_\_\_\_\_
8. What are key problems in the marketing of the product you handle?
9. What other activities you do besides brokering activity (farming) \_\_\_\_\_ other business \_\_\_\_\_ or \_\_\_\_\_
10. Do you have license for doing brokering business (Yes/No)? \_\_\_\_\_

**CHECKLIST FOR KEY INFORMANTS INTERVIEW**

M.Sc. Thesis on Value chain analysis of malt barley; the case of Lemu-Bilbilo district in Arsi zone of Oromia national regional state, Ethiopia

Woreda \_\_\_\_\_

Kebele \_\_\_\_\_

Date \_\_\_\_\_

Name of interviewee \_\_\_\_\_

Name of the organization: \_\_\_\_\_

1. Which cereal crops are commonly grown in your area (you may provide rank based on production?)
1. What are the threats for malt barley extension service and input supply?
2. What are the most important constraining infrastructures affecting malt barley production?
3. What are the possible solutions to correct these problems?
4. What is the role of FTCs on malt barley production? How?
5. What outputs are achieved on dissemination of malt barley technologies?
6. Who are the major buyers of malt barley in your kebele? How?
7. How the producers of malt barley are connected to their larger buyers specially malt factories or breweries?
8. Do the farmers are satisfied with the price given to malt barley by their buyers?
9. Who sets the price of malt barley largely? Why?
10. For what crops do the farmers allocate more of their land? Why?
11. How do the challenges will be solved? What did you think?
12. What was the community price given by the different buyers of malt barley to the farmers?
  - a. Local traders \_\_\_\_\_birr/qt
  - b. Grain wholesaler \_\_\_\_\_birr/qt
  - c. Cooperatives \_\_\_\_\_birr/qt
  - d. Malt factory \_\_\_\_\_birr/qt
  - e. Techno serve \_\_\_\_\_birr/qt
  - f. Unions \_\_\_\_\_birr/qt
  - g. Consumers \_\_\_\_\_birr/qt
  - h. Others (specify) \_\_\_\_\_birr/qt
13. What is the different cost the farmers incurred from production to marketing of malt barley production on average per quintal of malt barley?
14. Do all farmers have access to improved malt barley seed? 1. Yes 2. No
15. If no, where did they get to cover their land?
16. What is the role of your organization in malt barley value chain in the study area?

17. What are the challenges and opportunities you faced in undertaking those roles assigned to your organization?
18. Is there pests or disease occurred for malt barley in the area?
19. What are the diseases occur? How do farmers control them?
20. Linkage /interaction/ partnership/ coordination between malt barley value actors\_\_\_\_\_
21. Do you think value chain actors of malt barley are competitive and efficient?
22. Where does intervention needed in value chain of malt barley?
23. What are the possible opportunities excited for malt barley value chain in the area?

### **CHECK LIST FOR FOCUSED GROUP DISCUSSION**

M.Sc. Thesis on Value chain analysis of malt barley; the case of Lemu-Bilbilo district in Arsi zone of Oromia national regional state, Ethiopia

2. Do all farmers participant in malt barley production? 1=yes 2= No
3. What are the major crops grown in your area?
4. Do farmers allocate their land for all crops equally?1 =yes ,2= no
5. I f “no” on Q.2, for what crop majority of the land is allocated in this woreda? Please list in descending order from larger to lower land allocated crops
6. Why major land is not allocated for malt barley in this woreda?
7. Is there yield variability in production of malt barley from farmer to farmer? 1. Yes 2. No
8. If no, what were the major reasons?
9. What are the different actors involved in malt barley value chain?
10. What are the major supporters involved in malt barley value chain?
11. What typs of support did the farmers gate from these supporters in your area?
12. Who are the major buyers of malt barley from the farmers in this woreda?
13. What was the community price given by the different buyers of malt barley to the farmers?
  - i. Local traders \_\_\_\_\_birr/qt
  - j. Grain wholesaler \_\_\_\_\_birr/qt
  - k. Cooperatives \_\_\_\_\_birr/qt
  - l. Malt factory\_\_\_\_\_birr/qt
  - m. Techno serve \_\_\_\_\_birr/qt
  - n. Unions \_\_\_\_\_birr/qt
  - o. Consumers \_\_\_\_\_birr/qt

- p. Others (specify)\_\_\_\_\_birr/qt
14. What is the different cost the farmers incurred from production to marketing of malt barley production on average per quintal of malt barley?
- q. Input cost**
1. Fertilizer :DAP\_\_\_\_\_birr/qt , UREA \_\_\_\_\_birr/qt
2. Seed :Pure seed \_\_\_\_\_birr/qt , Improved seed \_\_\_\_\_birr/qt; Local seed \_\_\_\_\_birr/qt
3. Chemicals
1. Pesticides \_\_\_\_\_birr/litre
  2. Herbicides \_\_\_\_\_birr/litre
  3. 2-4 D \_\_\_\_\_birr/litre
- ii. Production cost ;
1. Land rent \_\_\_\_\_birr/hectare, Plowing ,sowing ,weeding\_\_\_\_\_birr/hectare  
Harvesting \_\_\_\_\_birr/hectare
2. Threshing ,storing \_\_\_\_\_birr/hectare
- b. Transport cost \_\_\_\_\_birr/qt
  - c. estimated cost for pair of oxen in the area \_\_\_\_\_birr heacte 9for plowing, threshing )
15. Is the farmers received the same price from different buyers of malt barley? A.yes B. no
16. If no, what is the major reason that makes farmers to received different price for the same commodity?
17. Do farmers receive their sales value as soon as they sell to their clients? 1=yes, 2= no
18. If No, on question17, after what time they received?
19. What is the major function of malt barley for the farmers?
20. What are the different traditional foods made from malt barley?
21. Which types of barley is mainly used for consumption? A. food barley 2. Malt barley
22. Do the farmers use malt barley for consumption? 1=yes 2= no
23. What value is added to malt barley at the farmer level in the woreda?
24. What are the major challenges faced by farmers from production up to marketing of malt barley in this woreda?
25. Does the crop is affected by pest or diseases in your area?
26. How farmers protect them?
27. How the different challenges will be solved regarding malt barley? Give your opinion
28. What are the possible opportunities excited for malt barley value chain in the area?

## CHECK LIST FOR BEER FACTORY

Appendix 3: Questionnaire for malt barley processors of beer factories

1. Name of the organization \_\_\_\_\_
2. Address of the organization: Region \_\_\_\_\_ Zone \_\_\_\_\_ town \_\_\_\_\_
3. When did you start processing in your organization (years) \_\_\_\_\_
4. How did you get malt for manufacturing of beer? 1. From malt factory (specify) 2. Own malting 3. Importing

No.	Source of malt	Purchase price (birr/qt)	Amount in quintal
1.			
2.			
3.			
4.			

5. How much ton of malt demanded your beer factory in 2015/2016 manufacturing year?  
\_\_\_\_\_, did you get all the demand that you planned currently? 1. [ ] yes 2. [ ] no, if no, what were the major reasons? How much quintal of malt did you use for one brew?
6. What are the different types of beverages that you are manufacturing currently from malt barley? How many hectoliters of beer (beverages) did you extract from one quintal of malt on average?

### ii. CONVERSION FACTORS

1. How much hectoliter did your factory produce from one quintal of malt?  
\_\_\_\_\_
2. How much crate of beer do you produce from one hectoliter?

### iii. COST INCURRED FOR ONE BREW

1. Input cost
  - a. Local Malt \_\_\_\_\_ birr/brew
  - b. Foreign malt \_\_\_\_\_ birr/brew
  - c. Raw malt barley \_\_\_\_\_ birr/brew
  - d. Chemicals (all types ) \_\_\_\_\_ birr/brew
  - e. Other input cost \_\_\_\_\_ birr/brew
2. Processing cost \_\_\_\_\_ birr/brew
3. Storage cost \_\_\_\_\_ birr/brew
4. Packaging cost \_\_\_\_\_ birr/brew
5. Packing material cost \_\_\_\_\_ birr/brew
6. Labor cost \_\_\_\_\_ birr/brew
7. Transport cost (inputs) \_\_\_\_\_ birr/brew
8. Transport cost (outputs) \_\_\_\_\_ birr/brew
9. Depreciation cost \_\_\_\_\_ birr/brew
10. Tax cost \_\_\_\_\_ birr/brew
11. Other costs \_\_\_\_\_ birr/brew
12. Total cost \_\_\_\_\_ birr/brew

### iv. PURCHASING ACTIVITY

1. Purchase price \_\_\_\_\_ birr/crate (on average) for beer
2. Purchase price \_\_\_\_\_ birr/litre (draft) on average
3. To whom did you sell these beverages?
4. How did you sell your product to your customers?

5. Please list the constraints that you encountered regarding malt barley that you used for processing  
**Thank you for your response!**

### CHECK LIST FOR UNIONS

#### v. Unions

1. The name of unions \_\_\_\_\_ Location \_\_\_\_\_ year of establishment \_\_\_\_\_
2. Number of districts included in the union \_\_\_\_\_ and name of districts \_\_\_\_\_
3. Major task of the union \_\_\_\_\_
4. Does your union participate in purchasing and selling activity of malt barley? 1. Yes 2. No
5. If yes on Q.6,
  - a. From where did you purchase malt barley?
  - b. For whom did you sell it? Give Brief response with selling price (Birr) please!
  - c. How much birr did you received for one quintal of malt barley on average?
  - d. Who sets the price for both purchasing and selling of the malt barley?
6. What are the major costs you incurred while purchasing and selling malt barley?
  - a. Purchasing cost \_\_\_\_\_ birr/qt
  - b. Loading/unloading cost \_\_\_\_\_ birr/qt
  - c. Storage (warehouse cost) \_\_\_\_\_ birr/qt
  - d. Sack and sisal \_\_\_\_\_ birr/qt
  - e. Commission fee \_\_\_\_\_ birr/qt
  - f. Transport cost \_\_\_\_\_ birr/qt
  - g. Tax cost \_\_\_\_\_ birr/qt
  - h. Others cost \_\_\_\_\_ birr/qt
7. How money is transferred to the farmers from malt factory?
8. Is the farmers received the sales value immediately they sell to their clients? 1.yes 2=no
9. If, No on Q.9 after what time they received?
10. What benefit did you receive from this purchasing and selling process while the malt barley passed through?
11. What were the challenges you faced or you know regarding malt barley (production, quality, input supplying, purchasing, selling etc.)

### CHECK LIST FOR FARMERS COOPERATIVES

1. How many farmers' cooperatives are found in the woreda?
2. Do the cooperatives involved in purchasing malt barley from farmers?
  - a. Yes
  - b. No
3. What was the average purchasing price of one quintal of malt barley from the producers (farmers)?
4. Who determined your purchasing price?
5. For whom did you sell the malt barley that you purchased from farmer?
  - a. For unions \_\_\_\_\_ birr/qt
  - b. For malt factory \_\_\_\_\_ birr/qt
  - c. For techno serve \_\_\_\_\_ birr/qt
  - d. For others (specify) \_\_\_\_\_ birr/qt
6. How did you get the malt barley from the farmers?
7. What types of agricultural inputs do you supply to the farmers?
8. From where did you get the inputs?

9. How did you purchase the malt barley from the farmers?
10. Do all farmers who are members of the cooperative sell their malt barley to your cooperative? 1. Yes 2. No
11. If No, on Q.8: what do you think about the reason was?
12. What are the major challenges you faced in your cooperatives?
13. How did you solve these challenges? What measure would be taken?

**Purchasing and selling price**

1. What was the average purchase price of malt barley per quintal from farmers?  
\_\_\_\_\_birr/qt
2. Is there price variability from year to year for malt barley? 1. Yes 2. No
3. If yes, on question 2, is the variation decreasing or increasing? 1. Decreasing 2. Increasing 3. The same
4. What are the main factors of price variability among farmers or year to year?
5. What are the costs you incurred from purchasing to selling of malt barley to your clients?
  - a. Purchasing cost \_\_\_\_\_birr/qt
  - b. Loading/unloading cost \_\_\_\_\_birr/qt
  - c. Transport cost \_\_\_\_\_birr/qt
  - d. Storage cost \_\_\_\_\_birr/ qt
  - e. Commission fee \_\_\_\_\_birr/qt
  - f. Sack. Sisal cost \_\_\_\_\_birr/qt
  - g. Tax cost \_\_\_\_\_birr/qt
  - h. Other cost \_\_\_\_\_birr/qt
6. Why all your members do not sell their produce to your cooperatives?
7. Is techno serve company has relation with your cooperatives? 1=Yes 2= No
8. How do you purchase the malt barley from the farmers to techno serve?
9. What benefit did you gain from techno serve?
10. What would be your suggestion and direction as an organization regarding the governance, production, quality and others?