TEFF VALUE CHAIN ANALYSIS IN BECHO AND DAWO DISTRICTS OF SOUTH WEST SHEWA, ETHIOPIA

M.Sc. Thesis

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March, 2015

Jimma University

TEFF VALUE CHAIN ANALYSIS IN BECHO AND DAWO DISTRICTS
OF SOUTH WEST SHEWA, ETHIOPIA

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By

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DEDICATION

This thesis is dedicated to my parents and to all those who believe in the richness of learning.

STATEMENT OF THE AUTHOR

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BIOGRAPHIC SKETCH

The author was born in September 1989 in *Basa kebele* of Becho district, Ethiopia. He attended elementary education at Simbiro Ciraca Elementary School, Secondary and Preparatory education at Yehibret Fire Secondary School in Tulu Bolo town. He joined Arba Minch University in September, 2008 and graduated with BA Degree of Economics in June 30, 2011. Thereafter, he was employed by Ministry of education as Graduate assistant at Ambo University in September 2011 up to March 2013. In March 2013, he joined the school of graduate studies at Jimma University for his M.Sc. studies in the Agribusiness and Value Chain Management program.

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LIST OF ABBREVIATIONS

AVCs	Agricultural value chains
CC	Contingency Coefficient
CSA	Central Statistical Agency
DAs	Development Agents
DH	Double Hurdle
ETB	Ethiopian birr
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GCC	Global Commodity Chain
GMM	Gross Marketing Margin
GTZ	German Agency for Technical Cooperation
HHI	Herfindahl-Hirschman Indices
ILO	International Labor Organization
Kg	kilogram
Km	kilometer
MAFAP	Monitoring African Food and Agricultural Policies
NGOs	Non-government Organizations
R and D	Research and Development
SCP	Structure, Conduct and Performance
SNA	Social Network Analysis
SNNP	Southern Nations, Nationalities and Peoples
TGMM	Total Gross Marketing Margin
TLU	Tropical livestock unit
TVA	Total Value Added
UN	United Nations
UNECA	United Nations Economic Commission for Africa
UNIDO	United Nations Industrial Development Organization
VA	Value Addition
VCD	Value Chain Development
VIF	Variance Inflation Factor

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TEFF VALUE CHAIN ANALYSIS IN BECHO AND DAWO DISTRICTS OF SOUTH WEST SHEWA, ETHIOPIA

ABSTRACT

This study investigates the value chain of teff in Becho and Dawo district where the livelihood of farmers depend on the production and marketing of teff. The study was particularly designed for identifying and categorizing the value chain actors, evaluate their roles, value added by value chain actors and relationships in the value chain, analyze the performance of teff market in the value chain, determine the factors affecting value addition of teff producers, and identify the factors affecting market participation and intensity of marketed surplus. Multi-stage sampling procedure was employed to draw sample of 150 teff producers. About 54 traders including urban wholesalers, rural wholesalers, urban retailers and rural retailers, consumers, cooperatives, hotels and restaurants, injera sellers, flour sellers, unions and NGOs were also included in the study. HHI and marketing margin were used to analysis market structure and performance in teff value chain respectively. The value chain analysis approach developed by GTZ, (2007) was used for financial analysis to capture the share of value added by each value chain participant. Double hurdle model was used to identify factors affecting market participation and intensity of marketed surplus of teff. Probit model was used to analyze the factors influencing the decision to add value by teff producers. The market structure of teff in Tulu bolo and Busa town was imperfect market. Teff farmers received higher returns when they sell their outputs directly to rural wholesalers. The findings show that injera sellers added the largest value to teff. Price and standard of teff in the study areas is entirely determined by teff traders. Teff farmers' production and marketing constraints were double taxation, shortage of fertilizer and seed supply, price setting and access to credit whereas that of teff traders were poor infrastructure, capital shortage, access to credit, farmer reluctance to sell, lack of demand, inadequate storage facility and inadequate government support. Teff market participation of smallholder farmers was significantly affected by access to credit, perception of farmers on lagged market price of teff, family size, agroecology, farm size and ownership of transport equipment. The intensity of marketed supply was significantly influenced by family size, agroecology, distance to the nearest market, farm size, perception of current price, income from other farming and off-farm activity, and livestock holding. The findings generally suggest the need to create trust among value chain actors, reliable market information, strong extension intervention on upgrading the value chain, and giving training for farmers on marketing.

Key words: Value chain, *teff,* value addition, double-hurdle, probit.

1. INTRODUCTION

1.1. Background of the Study

Agriculture has a substantial contribution to Africa's economy in terms of employment, aggregate output, foreign exchange earnings, and tax revenue. Integrated value chains and markets offer better opportunities for transforming African agriculture, because they have the potential of expanding market opportunities and enhancing incentives for private investors to undertake long-term investments in agribusiness and agro-processing. Without a strong regional integration, Africa cannot compete in the global economy, because African agriculture is dominated by small-scale producers and markets are small and fragmented (Mulat *et al.*, 2009). Major changes are happening in agricultural and food markets worldwide and especially so in developing countries; supermarkets revolution, share of high-value crops have increased, quality demands rise, food safety requirements for export countries, vertical integration, up-scaling, disintermediation, and branding (Reardon *et al.,* 2012).

In the last decades, globalization has had a strong influence on the economic structures of traditional sectors (Kim and Shin, 2002). Development has led to an increasing international fragmentation of the value chain, meaning that different enterprises and countries often carry out production and processing of one product. Many companies have outsourced some of their production components to foreign countries. The motivation for this behavior is mostly resource based or transaction cost based. This global extension of vertical chains and its allocation across different countries has led to an increasing trade with inputs, intermediate goods, and final products. It is accompanied by growing transport and marketing activities, interregional and intraregional (Faße *et al.,* 2009).

Value-added agriculture has attracted considerable attention in recent years as a means to increase and/or stabilize farm incomes and to rejuvenate primary agriculture and the rural economy. The move to value-added agriculture is fundamentally market-driven. Value-added activities are born from the necessity to adapt to the wide-ranging changes affecting the agriculture and agro-food industry. These changes stem from many interacting factors; the

quick expansion of agricultural trade and the resulting concentration in the agro-food industry, an increasingly segmented consumer base, shifting consumer preferences, changing demographics and income profiles, innovation in food and non-food uses of agricultural products and trade-related issues (Lambert *et al.,* 2006).

Modernization of agricultural value chain systems by which food flows from the farm gate to the consumer is both a consequence and cause of economic development. Commercial demand increases due to income and population growth, urbanization, and trade liberalization. Marketed supply simultaneously rises due to productivity improvements in production, post-harvest processing, and distribution systems (Minten and Reardon, 2008). The combination of increased commercial demand and supply induces the emergence of modern marketing channels employing sophisticated management methods, such as costly grades and standards or vertical coordination or integration of activities that profitably add value to raw commodities through transport, storage and/or processing. Farmers whose comparative advantage allows them to tap the latent demand of better-off or more distant markets made accessible by emergent agricultural value chains (AVCs) typically improve their productivity and profitability, thereby further stimulating commercial demand and supply through reinforcing feedback. The emergence and modernization of AVCs thus result from and contribute to economic development (Reardon and Timmer, 2007).

The scientific name of *teff* is *Eragrostistef (Zucc.)* and is believed to have originated in Ethiopia (Vavilov, 1951). Teff is a tiny, round, khaki-colored grain closely resembling millet. "*Teffa*", the Amharic word for "lost", is so named because of *teff* small size. It is the smallest grain in the world and often is lost in the harvesting and threshing process because of its size. From *teff* the preferred staple diet made in the Ethiopian and Eritrean is *injera* (pronounced *en-ger-a*, and sometimes spelled *injera*), a flat sour-like fermented pancake that is used with "*wot*", a stew made with spices, meats and pulses, such as lentils, beans and split peas (Piccinin, 2002).

Teff is one of the most important crops for farm income and food security in Ethiopia. *Teff* accounts for the largest share of the cultivated area (28.5%) in 2013, followed by maize (20.3%) and the second in terms of quantity of production. However, because its market price is often

two or three times higher than maize, *teff* accounts for the largest share of the total value of cereal production. Since *teff* farm operations such as land preparation, weeding and harvesting are highly labor-intensive, with limited availability of suitable mechanical technology, there are no large-scale *teff* farmers in the country. It is Ethiopia's most important crop by area planted and value of production, and the second most important cash crop (after coffee), generating almost 464 million USD (United states dollars) income per year for local farmers. In the major agricultural season of 2012/13, *teff* was grown by 6.3 million farm households in Ethiopia. Commercial surplus of *teff* is equal to the commercial surplus of the three other main cereals combined in the country (sorghum, maize, and wheat) (CSA, 2013).

Many farmers grow *teff* as a cash crop because of its high market price. *Teff* production expanded by 72 percent between 2004/05 and 2010/11, this growth was achieved mainly due to 29 percent expansion in an area under cultivation and 33 percent increase in yield levels. The share of *teff* in total cultivated areas increased by 2 percent, compared to the decline in barely (25 percent) and wheat (12 percent), and rapid expansion in coarse grains (maize, 11 percent, and sorghum, 19 percent). With only 1.3 tons per hectare, *teff* yield is the lowest among cereal crops. This is mainly due to limited use of improved seeds, inefficient agronomic practices and fragmented farm plots (MAFAP, 2013).

Urban households more readily eat *Teff* than rural households (Minten *et al.,* 2013). Berhane *et al.* (2011) showed, relying on national household consumption data, urban consumption per capita is as high as 61 kg per year and 20 kg per capita per year in rural areas. *Teff* is, therefore, an economically superior good that is relatively more consumed by richer than by the poor. The lower consumption by the poor is also partly explained by the high prices of *teff*, which are typically twice as high as the cheapest cereal, i.e. maize (Minten *et al.,* 2013). *Teff* has great potential as an industrial crop; however, processing *teff* grain into flour and *injera* is limited to a small number of urban processors. *Teff* is nutritionally rich while high in complex carbohydrates. *Teff* is gluten free and can easily be tolerated by patients suffering from celiac disease. *Teff* has also a high content of fiber, calcium, and iron which is important in preventing pregnancy anemia (Dekking and Koning, 2005).

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1.2. Statement of the Problem

Value chain is important in the enforcement of standards, with each player ensuring that the product originating from the previous stage adheres to the standards (UNECA, 2009). According to Fufa *et al.* (2011) *teff* value chain program supports the doubling of *teff* production and ensures farmers to access sufficient markets to capture the highest value from their production, increase incomes and reducing the price to consumers within five years.

Minten *et al.* (2013) studied *teff* value chain by selecting major *teff* producing zone in Ethiopia. The study showed that the adoption of modern farm inputs by farmer's increases, increasing willingness to pay for convenience in urban areas, improvement of foodservice industry, improved marketing efficiency, quality demands rise and shifts from the cheap red varieties to the more expensive white ones. According to this study, transformation happened in the last decade in the staple food value chain in Ethiopia, which contrasts the pervasive view that agricultural value chains in Africa are static and change slowly (Rakotoarisoa *et al.,* 2011). Developing country food value chains are changing rapidly, fueled by the expansion of modern food retailers, wholesalers and manufacturers, which coexist and interact with firms in traditional food value chains. As a result, the structure of food value chains is being shaped in ways that have no precedent in developed countries, where the transition from traditional to primarily modern system occurred (Gómez and Ricketts, 2013).

Gebreselassie and Sharp (2008) studied the commercialization of smallholder agriculture of *teff* growing farmers and identified factor affecting the degree of market participation. The smallholder's farmer in *teff* value chain depends on intermediaries, due to small quantities involved. Haile *et al.* (2004) studied market access versus productivity of *teff* in West Shewa showed the characteristics and roles of each *teff* market participants. This study ignored consumer and supportive actors in the *teff* value chain, which have a major role in giving the feedback on the nature and quality of *teff* supplied to the market and activities of market participants were mentioned, but the value chain concept was not touched.

Despite *teff*, trade is highly profitable; little is known about the farm level competitiveness of *teff* production, and the distribution of the costs and value-added between the chain participants, which include farmers, traders and processors. Although past studies in Ethiopia (Minten *et al.,* 2013; Fufa *et al.,* 2011) have looked at value chain analysis of *teff*, literature on quantitative value chain analysis that captures the cost build-ups along the chain is scarce. This study gives more emphasis on production and marketing segments of *teff* value chain and without mentioning of another actor, financing aspects and supportive services provided to all actors of *teff* value chain.

Becho and Dawo districts have major potential in production of *teff*. Land cultivated for *teff* production in Becho and Dawo was 85% and 80% of the land cultivated in the district respectively (Districts agriculture bureau, 2014). In the study areas the farmer's main sources of income for livelihood was from *teff* production, but contribution *teff* production to farm income was not as much expected by *teff* farmers. Therefore, purposes of this study is to analyze *teff* value chains, market participation and intensity of marketed surplus of *teff* producers and value added by each actor in *teff* value chains in Becho and Dawo Districts.

1.3. Objectives of the Study

The general objective of the study was to analyze *teff* value chain in Becho and Dawo district. The specific objectives of the study are to:

1) identify the value chain actors, evaluate their roles and relationships in the value chain;
2) Assess the performance of *teff* market value chain;
3) identify factors affecting market participation and intensity of marketed surplus and

1.4. Research Questions

The essential question that addressed by this study was in what way *teff* value chain is organized in Becho and Dawo districts? With this essential question, the specific questions the study answered are the following:

1. Who are the actors involved in the *teff* value chain in the study areas?
2. How is the *teff* marketing system organized and functioning along the *teff* value chain?
3. What are the factors affecting the market participation and intensity of marketed surplus?

1.5. Significance of the Study

The study was generated valuable information on *teff* value chain that would assist policy-makers in designing appropriate policies for intervention in the study area. Governmental and non-governmental organizations that are engaged in the development of *teff* sub-sector would benefit from the results of this study.

The results of this study could serve as a major input in the formulation of appropriate marketing policies and strategies in Becho and Dawo districts by identifying interventions that improve efficiency of the value chain. Furthermore, the findings of the study would be used by policy makers, NGOs (non-government organizations), district agriculture and industry bureaus, other concerned body along the value chain and serve as a benchmark for solving *teff* value chain problem. The study fills the gap in existing literature on factors affecting smallholder *teff* producing farmers' market participation, their extent of participation, value addition decision, constraints of producers and traders on teff value chain at Becho and Dawo district. Moreover, the study can pave the road for other similar and detailed research on *teff* in other parts of the same region or in the country.

1.6. Scope and Limitations of the Study

Value chain research in the area of potential *teff* producers in the region is very important to realize the constraints and formulate appropriate correction measures, as the region is known to be the leading producer and marketer of *teff* in the country. But the availability of time, financial resources have narrowed the research coverage to only two district areas of the region namely, Becho and Dawo districts. The use of cross-sectional data for the study may imply underestimation of the *teff* supply with respect to non-price factors. This is because if large farm operators are become smaller over time (say because of demographic change), they would adopt

the pattern of allocating the behavior of their smaller counterparts only with a lag. This implies that cross-sectional *teff* supply elasticity with respect to land size may be underestimated, other things remaining the same. The problem that the researcher encountered during study was some actors of the value chain are not voluntary to give information. The data used in the analysis only covered one production season. It is also important to note that farmers differ widely in their managerial capabilities and also output prices vary with seasons. These results should therefore be interpreted with these limitations in mind.

1.7. Organization of the Thesis

This thesis is organized as follows. Chapter one deals with the introductory part, which constitutes the background, problem statement, objectives, research questions, significance of the study, scope and limitation of the study, as well as the organization of the thesis. Reviews of the selected literatures review are dealt in chapter two. Chapter three introduces background information about the study area and verifies the methods of data collection and data analyzes, followed by chapter four that presents the results and discussion of the study. Finally, chapter five deals with conclusion and recommendations of findings.

2. LITERATURE REVIEW

2.1. The Basics of Value Chains

Value chain is the full range of activities and services required to bring a product or service from its conception to sale in its final markets (MicroLINKS, 2012). A value chain, thus, encompasses the entire network of actors involved in input supply, production, processing, marketing and consumption. These value chain actors operate within an institutional environment, which can either facilitate or hinder its performance (Gereffi, 1995). Laws, rules, regulations, policies, international trade agreements, social norms and customs all contribute to this institutional environment, as do public goods such as infrastructure, research, extension, price information systems and business development services. Businesses that provide crosscutting services such as finance and transport likewise contribute key elements to the institutional environment affecting the value chain performance (Haggblade and Theriault, 2012).

The idea of value chains is quite intuitive. It exists when all of the actors in the chain operate in a way that maximizes the generation of value along the chain. Value chain can be in a narrow or in a broad sense. In the narrow sense, a value chain includes the range of activities performed within a firm to produce a certain output. In other words, all activities constitute the chain which links producers to consumers and each activity adds value to the final product. The broad approach does not only look at the activities implemented by a single enterprise. Rather, it includes all its backward and forward linkages, until the level in which the raw material is produced will be linked to the final consumers (Kaplisnky and Morris, 2002).

A useful methodology for understanding how markets operate, for a particular good, is value chain analysis. A value chain is a set of value-adding activities through which a product passes from the initial production or design stage to final delivery to the consumer and can be local, national, regional or international in scope (Kanji *et al.,* 2005). ILO (2009) also defined value chain as a sequence of target-oriented combinations of production factors that create a marketable product or service from its conception to the final consumer. Primary difference

between a supply chain and a value chain is a fundamental shift in focus from the supply base to the customer. Supply chains focus upstream on integrating supplier and producer processes, improving efficiency and reducing waste, while value chains focus downstream, on creating value in the eyes of the customer. This distinction is often lost in the language used in the business and research literature (Feller *et al.,* 2006).

The basic concept of a supply chain is similar to the value chain. The primary focus of supply chains is thus on cost and efficiencies in supply, while value chains focus more on value creation, innovation, product development, and marketing. While both concepts describe the same network of companies that interact to deliver goods and services, the value chain is essentially about value. The issue is not so much about which approach is superior or preferable, since both can deliver improved business performance and productivity gains for the chain's participants. It must be noted, though, that practitioners often focus on reducing costs and marginal inefficiencies in supply at the expense of focusing on interventions that could lead to bigger additions of value. The difference is that the supply chain refers to the sequence of (upstream) sourcing and (downstream) marketing functions of individual enterprises, mostly of lead companies. Therefore, supply chain management is a business management tool rather than a development concept. It is concerned with logistics rather than market development (GTZ, 2007).

2.2. Approaches and Aspects in Value Chain Analysis

Porter approach

The concept of Value Chain was made popular by Harvard University's Professor Michael Porter. The Porter Value Chain has been widely adopted by the business community as a mechanism to understand and comprehend complexity in business environments, with the ultimate goal of structuring the business to maximize its competitive advantage (Van Rensburg, 2006). According to Porter and Miller (1985), a value chain disaggregates a firm into strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation. Value chain analysis describes the activities within and

around an organization and relates them to an analysis of the competitive strength of the organization.

Global value chain approach

Mayer and Gereffi, (2010) described the global commodity chain (GCC) approach as consisting of sets of inter organizational networks, clustered around one commodity or product, links households to one another within the world economy. GCC approach mainly focusing on the power relations (in the coordination of dispersed but linked production system) which are imbedded in value chain analysis.

Gilbert (2006) global value chains appear to be originally due to Hopkins and Wallerstein, who proposed to analyze a sequence of processes culminating in the production of the final product. This endeavor in part motivated by the realization that many industrial goods are processed in multiple countries prior to final sale, and that trade in intermediate products has become a major component of all international trade. Industrial products typically combine a number of different raw materials and other inputs. Global value chain analysis looks at the value contribution of each of these to the final product.

Value chain analysis suggests a number of strategies for adding value. In particular, it emphasizes the opportunities for adding value through increasing buyer service elements of the total product package delivered to buyers. Particularly in fresh-produce value chains, value can be added through the reliability of delivery, speed of delivery and product innovation. In other words, adding value need not involve physical transformation of the product. Global buyers such as supermarkets and large processors are not solely buying a physical product. They are buying a product that is bundled with a set of value-adding services. Moreover, global value chain linkages offer the prospect of private-sector knowledge transfers that should provide up-to-date and relevant information for producers, processors and exporters in developing countries. This knowledge transfer is not automatic (Humphrey and Memedovic, 2006).

Promotion value chains in agricultural development

Value chain analysis is closely connected to the process of chain upgrading and value chain promotion. Value chain promotion is an effective way of fostering rural-urban linkages. Firstly, the concept provides a useful analytical framework for market and sub-sector analysis. Value chains describe productive processes around a product from the provision of inputs to production, transportation, transformation, processing, marketing, trading, and retailing to final consumption. Since production only translates into income once final consumers really demand and buy goods, the value chain approach encourages looking at the production process from the consumer's end. Secondly, the metaphor of the chain emphasizes the fact that most goods are produced by a sequence of interlinked actors and activities. The approach focuses on the analysis of the institutional arrangements that link the various economic players (i.e. trust, vertical and horizontal integration and organization, and contracts). Thirdly, it highlights the importance of private sector development. For the purpose of fostering agricultural growth and aligning the agricultural sector development with urban and other trends in society, it provides a holistic framework, which can encompass a number of different development activities (Maingi, 2006).

Market requirements and demand in value chain

Direct market requirements are set by the buyers. The buyer determines product quality and specifications for which he is willing to invest a certain amount of money. Such immediate market requirements include; price, quality, delivery time, design, quantity, reliability, flexibility, grading of products into categories etc. On the other hand, demand conditions are characterized by consumer trends, seasons and consumer needs etc. Usually medium and large retail companies and producers of consumer goods would conduct market surveys to analyze demand conditions. This market survey would then enable them to design a product/service that meets consumer demand and therefore has market potential (ILO, 2009).

Upgrading in the value chain

Upgrading denotes a development path of a firm, a group of firms or an entire value chain in response to efforts to improve their/its position and level of value addition compared to competitors. Though usually achieved through the application of innovations in the form of new knowledge and technologies, upgrading can also result in organizational improvements and marketing strategies. In its broadest sense, upgrading can be viewed as synonymous with positive value chain development. Upgrading can be distinguished as; Process upgrading, that is transforming inputs into outputs more efficiently by reorganizing the production system or introducing superior technology and product upgrading: moving into more sophisticated product lines (which can be defined in terms of increased unit values). However, functional upgrading acquiring new functions in the chain (or abandoning existing functions) to increase the overall skill content of activities. Chain upgrading is moving to a new value chain (UNIDO, 2011).

Governance

The governance in value chain can be defined as the power relationship that determine how financial, material and human resources are allocated and flow within a chain. Thus, power asymmetry is the central aspect of governance and includes the ability of firms to set rules and standards. Alternative types of vertical coordination emerge depending on the distribution of market power (the ability to set prices, quality standards and minimum delivery quantities), political power and information (on standards and alternate market prices). As a result, adjustments in vertical coordination mechanisms generally require investments in literacy, information and organization that modify the underlying power structure within the value chain. At the same time, these public investments increase prospects for successful horizontal coordination among value chain members, for example, in farmer organizations (Gereffi *et al.,* 2005).

2.3. Mapping the Value Chain

Value chain mapping is drawing a visual representation of the value chain system. Maps identify business operations, chain operators and their linkages, as well as the chain supporters within the value chain. Chain maps are the core of any value chain analysis and therefore indispensable. It serves both an analytical purpose and a communication purpose, as chain maps reduce the complexity of economic reality with its diverse functions, multiple stakeholders, interdependencies and relationships to a comprehensible visual model (GTZ, 2007).

The first step of a value chain analysis is called mapping. In order to do so, the boundaries to other chains need to be defined. The main idea is initial to identify the actors and then to 'map' the traced product flows within the chain, including input supply, production, processing, and marketing activities. The objective is to give an illustrative representation of the identified chain actors and the related product flows. A mapped value chain includes the actors, their relationships, and economic activities at each stage with the related physical and monetary flows (Faße *et al.,* 2009). There are two different kinds of approaches used for mapping.

Functional and Institutional Analysis

Mapping is denoted as a functional and institutional analysis which starts with constructing a 'preliminary map' of a particular chain to provide an overview of all chain actors (institutional analysis) and the type of interaction between them (functional analysis). The results can be presented either in a table or flow chart, which is called the 'preliminary map' of the chain. The methodology includes three essential aspects for developing a preliminary map (Faße *et al.,* 2009):
  ➢ The principal functions of each stage
  ➢ The agents carrying out these functions
  ➢ The principal products in the chain and their various forms into which they are transformed along the entire chain

Once the flow chart has been drawn, these flows are quantified, both in physical and monetary terms. The procedure allows assessing the relative importance of the different stages or segments of the chain. This methodology was applied by Rudenko (2008) identifying and mapping the relevant value chain stages for the cotton and wheat value chain in Uzbekistan. Kaplinsky and Morris (2002) suggest similar procedures for implementing value chain analysis. Their concept consists of two steps in order to map the value chain. The first step includes drawing an 'initial map', which shows the chain boundaries including the main actors, activities, connections and some initial indicators of size and importance. The second step consists of elaborating the refined map by quantifying key variables such as value-added, and by identifying strategic and non-strategic activities.

Social Network Analysis

Another approach for mapping value chains is the social network analysis (SNA) originated in social sciences. Similar to the Faße *et al.* (2009) concept, it serves as a tool for mapping and analyzing relationships and flows between people, groups, and organizations. The initial flow chart of the chain consists of various nodes and links arranged in form of a matrix. The nodes represent the actors while the links describe the relationships and flows between the nodes. SNA is used when the value chain is more characterized by a network than a single vertical chain. SNA provides both visual and mathematical analysis of chain relationships, but it is still in the early stages to be used in value chain analysis. So far, only a few studies have applied this approach.

Clottey *et al.* (2007) used SNA to map the small livestock production system in Northern Ghana for a value network analysis. The objective was to analyze the introduction of animal health care services in the region. Thus, the value-creating linkages were mapped. Afterwards, SNA was employed to determine the pathways of value exchanges and individual relationships among the small farmers and enterprises. As a result, the authors found out that the input supply is weakly linked with the upstream livestock chain activities. In addition, the knowledge flow among farmers and actors from research and development (RandD) needed to be improved to strengthen the entire livestock production chain.

2.3. Economic Analysis of Value Chains

Economic analysis of the value chain is an important input in the decision on development objectives and the upgrading strategy. After all, production costs are the single most important factor determining competitiveness. Assessing the cost structure allows identifying critical points that need to be addressed. Economic data also provide the foundation for the monitoring of the progress made in upgrading, both for the operators and for the facilitators. Economic analyses include assessing: overall value added generated by the chain and shares of the different stages, the production and marketing costs at each stage of the chain, and the cost structure along the chain stages and the performance of operators (GTZ, 2007).

Table 1: Components of value addition calculation

Components of total value generated by a value chain: (Value-added) = (Total sales value) - (Value of intermediate goods)	
Total value generated by value chain =Price*volume of final product sold	**Value added** • Wages • Interests and rents • Depreciation • Direct taxes • Profit **Intermediate goods** • Raw material, inputs • Finished products • Operational services

Source: GTZ, 2007

The problem is that all of these analyses are highly challenging, not only in developing countries or in emerging economies. Hardly any farmer knows his costs of production, nor do the majority of transporters, traders or small-scale enterprises. In most cases, analysts will have to be content with rough estimates. In any case, economic data generated in the context of value chain promotion can only give indications. The entrepreneurial decisions have to rely on firm data, anyway. Value-added is a measure for the wealth created in the economy. To arrive at the value-added generated by a particular value chain, the cost of bought-in materials, components and services has to be deducted from the sales value. The sales value or revenue (price*volume)

achieved by the value chain is divided between the value-added created by the operators constituting the value chain and the intermediate goods, inputs and operational services provided by suppliers who are not part of the core sequence of the value chain. The value-added is distributed between the stages of the chain, and between the chain operators on one side and the external providers on the other. "Value creation" and "value capturing" are interlinked. Capturing value by improving the efficiency of input use increases value-added of the chain stage concerned, but reduces purchase of inputs and thus the value-added of input providers. At the same time, the efficiency gain is likely to translate into improved competitiveness ensuing a greater market share and thus value creation (GTZ, 2007).

2.4. Value Chain Development Approach

ILOs approach to VCD is based on a strong focus on those chains that are most relevant for job creation and job quality improvement. The tools address the underlying systems and institutions that drive competitiveness and job creation in chains by using a market development approach. They build on private sector development strategies that seek to strengthen enterprises, business relationships, market structures, and the business environment so that they channel more benefits to the poor and can create more jobs effectively. Adding value to export and domestic commodities is believed to generate substantial profits and employment along the chains and in this way contributes to poverty alleviation. The promotion of value chains in agribusiness aims to improve the competitiveness of agriculture in national and international markets and to generate greater value added within the country or region. The key criterion in this context is broad impact, i.e., growth that benefits the rural poor to the greatest possible extent, or at least, does not worsen their position relative to other demographic groups. According to ILO, (2009), there are five drivers by which to achieve value chain development.

The five drivers are described below:
System efficiency: It is function and rule that ensure that a given target (market and demand requirement is achieved and the (economic, social) costs associated with this process is low. It has two aspects: Productive efficiency, which describes the ratio between costs and benefits (or inputs and output) of certain productive activities with regard to specified targets and allocate

efficiency is characterized by the degree as to which supply meets consumer demand and a tendency of market prices going towards long-term marginal costs (means costs per unit).

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

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

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

responsible way: it is in the commercial interests of companies to react to this consumer demand.

Enabling business environments: It is an external to the specific value chain sector that plays a crucial role in shaping the political, social and economic environment in which value chain operates and therefore has a strong influence on the ability of a sector to compete on world markets as well as generating income and employment. Value chains do not exist in isolation but they are embedded into a highly complex social, economic, political and cultural environment, which determines the nature and success of business transactions within the chain. Apart from the immediate and sector-specific environment, there is also a wider business environment, consisting of broader government policies, macro-economic stability, public services, international and bilateral trade agreements, but also cultural and social factors (such as attitudes to doing business and demographic trends) and climatic and environmental conditions.

2.5. Framework for Evaluating Marketing Systems

The development of reliable and stable market system has been an important element in commercialization and specialization in the agricultural sector. In order to study the functioning of markets many researchers have applied the Structure-Conduct-Performance (SCP) paradigm. The SCP approach was developed in the United States as a tool to analyze the market organization of the industrial sector, it was later applied to assess the agricultural system, and this framework was to evaluate the performance of industries in the USA (Wolday, 1994). The framework distinguishes between three related levels: the structure of the market, the conduct of the market, and the performance of the market.

2.5.1. Structure of the market

The term market structure refers to the number of buyers and sellers, their size distribution, the degree of product differentiation, and the ease of entry of new firms into an industry (Branson and Norvell, 1983; Cramer and Jensen, 1982; Abbott and Makeham, 1981). Market

concentration defined as the number and size of sellers and buyers in the market. Concentration believed to play a large part in the determination of market behavior within an industry because it affects the interdependence of action among firms. The relationships between concentration and market behavior and performance not interpreted in isolation. Other factors, such as firms' objectives, barrier to entry, economies of scale, and assumptions about rival firms' behavior, will be relevant in determining the degree of concentration and relationship between concentration and behavior and performance (Schere, 1980).

Market structure defined as characteristics of the organization of a market, which seem to influence the nature of competition and pricing behavior within the market (Bain, 1968). Structural characteristics may use as a basis for classifying markets. Markets may be perfectly competitive; monopolistic: or oligopolistic (Scott, 1995; Meijer, 1994). The organizational features of a market should be evaluated in terms of the degree of seller concentration, entry barriers, degree of transparency and degree of product differentiation that condition or influence the conduct and strategies of competitors (Wolday, 1994).

2.5.2. Performance of the market

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

According to Abbott and Makeham (1981), market performance is how successfully the firm's aims are accomplished, which shows the assessment of how well the process of marketing is carried out. Is produce assembled and delivered on time and without wastage? Is it well packed and presented attractively? Is its quality reliable and are terms of contract observed? Is the consumption of the products increasing and sales in competitive market expanding?

As a method for analysis, the SCP paradigm postulates that the relationship exists between the three levels distinguished. One can imagine a causal relations starting from the structure, which

determine the conduct, which together determine the performance (technological progressiveness, growth orientation of marketing firms, efficiency of resource use, and product improvement and maximum market services at the least possible cost) of agricultural marketing system in developing countries (Meijer, 1994).

2.5.4. Concept of marketed surplus

Marketed surplus defined as the portion of production that actually enters the market irrespective of farmer's requirements for family consumption, farm requirements, social and religious payments. It also includes the distress sales. Thus, the marketed surplus may be more, less or equal to the marketable surplus. Marketed surplus is more than the marketable surplus when farmer retains a smaller quantity of crop than his actual family and farm requirements. This is true especially of small and marginal farmers whose need for cash is immediate. This is termed as distress or forced sale. Such farmers generally buy the produce from the market in a later period to meet their requirements. Marketed surplus is less than the marketable surplus when the farmer's especially larger ones with better retention capacity retain some of the marketable surplus in anticipation of fetching higher prices in future period (Acharya *et al.,* 2012).

2.6. Overview of *Teff* Production in Ethiopia

Teff can grow under wide and diverse agro-ecologies. Even though there are areas, where the crop is grown during the short rainy season (Belg), *teff* is mainly cultivated during the main rainy season (Meher). It grows paramount between altitudes of 1800 and 2100 meters with an annual rainfall of 750-850 mm and a temperature range of 10-27 degrees centigrade, though it can also grow in much more varied areas with rainfall up to 1200mm. The length of growing period ranges from 60 to 180 days (depending on the variety and altitude) with an optimum of 90 to 130 days (Deckers *et al.,* 2001). *Teff* performs better than other cereals under moisture stress condition especially when the main rainy season stops early. Farmers also prefer to sow *teff* if there is rainfall delay. *Teff* is considered as an important component on crop rotation practices (Hailu and Seyfu, 2001).

Table 2: *Teff* area cultivated and production for 2012/13 production season by region

Region	Area cultivated ('000' ha)	% share of area planted	Production ('000' Qt)	% share of production	Yield in Qt/ha
Amhara	1,090	39.96	15,281	40.59	14.02
Benishangul	19	0.70	197	0.52	10.37
Oromia	1,256	46.04	17,535	46.57	13.96
SNNPR	202	7.40	2,515	6.68	12.45
Tigray	161	5.90	2,122	5.64	13.18
Total	2,728	100.00	37,650	100.00	12.80

Source: CSA, 2013

In Ethiopia, *Teff* is mainly grown in Amhara and Oromia, with smaller quantities in the Tigray and SNNP regions (Table 2). According to the CSA data on annual agricultural sample survey, there are 46 zones and 9 special districts in the country in which production of *teff* is widely practiced. These include five zones in Tigray regions, ten zones and one special District in Amhara regions, seventeen zones in Oromia regions, three zones in Benshangule-Gumuz regions and eleven zones and eight special districts in SNNPR regions. However, more than 83 percent of the country's *teff* production comes from 19 zones found in Tigray, Amhara and Oromia regions. East Gojjam is the leading zone in *teff* production constituting more than 10 percent of the national annual *teff* production. There are also potential *teff* producing zones in Amhara (North Gonder, North Shewa and West Gojjam zones) and Oromia (West Shewa, East Shewa and South West Shewa zones) regions, which contribute five to ten percent of the national annual *teff* production. Most of *teff* surplus production in the market comes from these major producing areas and is distributed to the deficit markets through the grain market channel (CSA, 2013).

Teff is a labor-intensive crop and farmers currently use a high tillage frequency compared to other cereal crops grown in Ethiopia. The reason for the high tillage frequency is that the *teff* seed is very small and thus germination is difficult in heavy, unbroken soil. According to Kenea *et al.* (2001), the tillage frequency for *teff* in Ethiopia ranges from 3 times in Nazareth and 12 times in western Wellega. The increase of tillage frequency will increase *teff* grain yield. The

highest tillage frequency is reported at up to 12 times in vertisols. Generally, the *teff* tillage frequency varies from place to place depending on the agro-ecology, the soils, and other characteristics of the area including farmers' conditions (Deckers *et al*., 2001).

2.6.1. Nutritional value and demand of *teff*

Teff is well known by Ethiopians and Eritreans for its superior nutritional quality. It contains 11% protein, 80% complex carbohydrate and 3% fat. It is an excellent source of essential amino acids, especially lysine, the amino acid that is most often deficient in grain foods. *Teff* contains more lysine than barley, millet, and wheat and slightly less than rice or oats. *Teff* is also an excellent source of fiber and iron, and has many times the amount of calcium, potassium and other essential minerals found in an equal amount of other grains. When *teff* is used to make *injera*, a short fermentation process allows the yeast to generate more vitamins. *Teff* is nearly gluten-free, and is gaining popularity in the whole food and health food industry in the U.S. as an alternative grain for persons with gluten sensitivity. *Teff* may also have applications for persons with Celiac Disease (Piccinin, 2002). It would seem that because of its superior nutritional qualities, *teff* would be available to all persons in Ethiopia to make *injera*. However, while it is the preferred grain in making injera, its availability is limited by its high cost. *Teff* is currently the most expensive grain to purchase in Ethiopia as it requires labor-intensive harvesting and processing techniques, and produces especially low yields (Hailu and Seyfu, 2001).

In Ethiopia, *teff* has multiple other uses including acting as reinforcement for thatched roofs and mud bricks. It is sometimes used as an alcoholic beverage base although most alcoholic beverages in Ethiopia are primarily made from corn and millet. *Teff* is used in mixtures with soybean, chickpea and other grains and is becoming popular as baby food because of its high mineral content (Piccinin, 2002).

2.7. Review of Empirical Literature

It is worthwhile to assess previous studies undertaken on *teff* value chains and other cereal crops but merely few studies were conducted in Ethiopia on different commodities. A study conducted on innovations in banana value chain in *Metema* (Kahsay *et al.,* 2008) indicated that very limited sucker production and supply, low demand for locally available varieties, absence of improved varieties and limited knowledge of banana production in the area were some of the challenges for innovation in banana value chain to enhance its production and productivity. On the other hand, high market demand for improved banana varieties, production potential of the area, availability of irrigation water in the area, presence of enabling environment including policy support for irrigation agriculture, provision of technical advice from both government and nongovernmental organization to boost banana production and productivity in the area are also mentioned as opportunities for innovation in the value chain.

The major potato value chain actors include input (seed, fertilizer, fungicide, farm implement) suppliers, producers, wholesalers, brokers, retailers and consumers. There is no significant structural difference between the potato value chain in SNNPR and Tigray. The main difference is the quantity of potato marketed and associated prices at different levels and the level of value addition by the different market actors. The constraints of value chain include a lack of technical, business or financial support services, lack or a difficult regulatory framework, poor public infrastructure (roads, telecommunications, electricity, etc.), a lack of information about or weak connections to end markets, and/or inadequate coordination between firms. Costs of vegetable seeds vary significantly based on the source with imported varieties such as tomato and carrot being more expensive. In some instances, the price of seed potato seems lower than the price of ware potato, showing that farmers use inferior quality potato seed tuber (in terms of size, freedom from seed borne diseases and genetic degeneration because of viral infection) for seed (Emana and Nigussie, 2011).

In Ethiopia, *Metema* district, rice value chain was evaluated using the functional, flow and economic analysis methods. Moreover, the study utilized SWOT analysis to identify the challenges and opportunities. The study identified the various actors in the value chain,

strengthen, weakens and opportunities of each actors. Currently, the different agents or stakeholders in the chain include farmers, commission agents, extension agents, researchers, millers, exporters and urban retailers. The rice production is largely subsistence farming and not directly linked with the market. As to the linkage, weak and informal linkage between chain actors characterizes the rice value chain. Lack of post-harvest processing technology (rice polisher), limited access to and supply of inputs, severe termite attack, non-availability of well-developed rice market, high labor demand for crop management, absence of responsible body who works on actors interaction were some of the challenges identified for innovation at various stages of rice value chain. Absence of rice polisher machine was the most critical problem that affects the whole value chain. On the contrary, increased farmer's awareness about and availability of improved rice varieties, existence of favorable land and climatic condition, presence of high consumer demand, and increased institutional support from different governments and NGOs were mentioned as opportunities for innovation (Kassa, 2010).

Benishangul-Gumuz appears to have a comparative advantage with ideal growing conditions for mangoes and high yielding trees. At the production level however, the value chain is quite rudimentary with mainly subsistence level cultivation, harvesting and post-handling techniques that limit the quality of the fruit. Upstream there are also issues with most grading and packaging being undertaken following a long road journey to the capital, undermining not only the quality of fruit but also the potential value generated at the farmer level. At the wholesale level in Addis Ababa, market traders dominate the landscape and operate in ways that make it difficult for new entrants to enter the market. Given the roles they play, it appears that there is not a proportionate addition of value in the chain, and that is where opportunities lie for improving farmer level value capture in the chain (World Vision Ethiopia, 2009).

According to Minten *et.al* (2013) *teff* value chain had divided in to upstream and downstream. The use of modern input such as herbicide, pesticide, improved seed varieties, chemical fertilizer increased productivity in upstream of *teff* value chain, however, broadcasting is common method used for teff sowing. The share of red teff in production declined from 36 percent of total production to 20 percent. The reasons for the decline of red teff produce over time. First, the prices for red teff are significantly low. Second, red teff traditionally used to

have higher productivity than white teff; this is now changing as high-performing white varieties have recently become available. Thirdly, only very few improved red varieties are currently available.

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

Wolday (1994) identified factors that affected market supply of food grain (*teff*, maize and wheat) by using variables such as the size of output, market access, family size, and income from pepper. He identified that size of output (*teff*, maize and wheat) significantly and positively affected *teff*, maize and wheat supplied. On the other hand, access to market significantly and negatively affected volume of sale of *teff* and maize. Poor accesses to the market negatively affected maize sold while positively affected *teff* and wheat sold. Family size also significantly and positively affected quantity supplied of *teff* and wheat while it negatively affected quantity supplied of maize.

There are a number of highlighted constraints that hamper further development of market supply. Singh and Rai (1998) identify factors affecting marketed surplus of buffalo milk in Haryana. They observed milk production and price significantly affected marketed surplus positively while land holding and family size negatively affected. A similar study was conducted by Holloway *et al.* (1999). Their study sought to identify alternative techniques for effecting participation among peri-urban milk producers in the Ethiopian highlands. They found that cross breed cow type, local breed cows, education level of household head, extension contact, and farming experience of household head positively affected quantity of milk sold while distance to the market affected the volume of sale negatively.

Bellemare and Barrett (2006) estimated factors affecting sell of animals in Kenya and Ethiopia. They observed that the net purchase and net sales volume choices depend on expected market participation. The household head sex (female headed), age, family size, herd size, female

TLUs, encumbered males, and small stock (sheep and goat) had significant and negative influence on number of animals sold. Unlikely, assets, land holding, other income, encumbered females, and average price of larger stock (camels and cattle) had correlated positively with number of animals sold.

Kinde (2007) indicated that, the major factors that affect marketable supply of sesame in *Metema* district by using cross-sectional data with dummy and continuous explanatory variables. In his study he implemented multiple linear regression model to identify the relationship between the marketable supply of sesame and the12 hypothesized explanatory variables, hence his study acknowledged that amount of sesame productivity, use of modern inputs, number of language spoken by the household head, number of oxen owned, sesame area and time of selling of sesame influenced marketable supply of sesame positively.

Mussema (2006) identified that the key factors that affecting marketable supply of red pepper at Alaba and Siltie districts of SNNPRS using cross-sectional data with both dummy and continuous independent variables. In her study, she employed Tobit model and came up with the finding that distance to the market, frequency of contacts with extension agents, quantity of pepper produced and access to market information influenced marketable supply of pepper positively at the district. Recent studies are commonly using regression models to estimate the supply function. Abay (2007) conducted a study on vegetable market chain analysis in *Fogera* district. He adopted Heckman two-stage model to estimate the probability of farmer's participation in a market and market supply level.

Mamo *et al.* (2014) studied factors influencing urban and peri-urban dairy producer's participation in milk value addition and volume of milk value added in *Welmera Woreda*, Ethiopia. Heckman two stage econometric model was employed. Among the variables used as explanatory gender, age and education of household head, market distance, number of local milking cows and quantity of annual milk production affected the probability of participation in value addition positively. The sex of household head, income from non-dairy source, distance to market, number of local milking cows and quantity of annual milk production affected the

volume of milk value added positively, whereas number of children less than age of 6 years and number of crossbred milking cows had a negative influence on it.

Ngore *et al.* (2011) determine and quantify the socio-economic factors influencing decision by meat agribusiness operators to add value to their products, describe and characterize the existing systems of value addition in rural Kenya. Probit model was used to evaluate the socioeconomic factors influencing the decision to add value, the study found that credit, management's level of education and age significantly influenced the decision to engage in value addition.

Kuma *et al.* (2011) identify determinants of participations and level of participation in farm level milk value addition by smallholder's dairy farmers in Ethiopia. Heckman two stage econometric model was used to determine the factor affecting participations decision and level of participation in farm level milk value addition by smallholder's dairy farmers. Probit result of Heckman first stage model identified that milk yield, distance from urban centers, household demography (age and child), livestock extension services, the need to extend shelf life, consideration of milk products for social factors such as holidays and fasting, and availability of labor for milk value addition determined household's decision to add values to milk and volume of milk value added.

3. METHODOLOGY

3.1. Description of Study Area

The study was conducted in two districts of south-west Shewa zone (Oromia region) namely, Becho and Dawo district. Becho and Dawo district are located at latitude/longitude of 8°35'N 38°15'E and 8° 45' N 38° 10'E, and at about 80 km and 96 km from the capital Addis Ababa, respectively.

Dawo is one of the districts in the Oromia Region of Ethiopia. Dawo is bordered on the southwest by Waliso, on the west and north by Dendi, on the east by Elu, and on the southeast by Becho. The administrative town in Dawo district is Busa. Dawo is well known for its quality *teff*, which is marketed in Addis Ababa. The 2007 national census reported total populations for this district were 84,336, of whom 42,815 were men and 41,521 were women; 3,779 or 4.48% of its population were urban dwellers. The two largest ethnic groups in Dawo district were the Oromo (93.35%), and Amhara (6.17%); all other ethnic groups made up 0.48% of the population. Oromiffa was spoken as a first language by 98.04%, while 1.88% spoke Amharic; the remaining 0.48% spoke all other primary languages (CSA, 2007).

Becho is one of the districts in the Oromia Region of Ethiopia. Becho is bordered on the south by Kokir, on the west by Walisona Goro, on the northwest by Dawo, on the north by Elu, and on the east by Tole. The administrative town in Becho district is Tulu Bolo. The 2007 national census total populations of the district were 74,016, of whom 37,481 were men and 36,535 were women; 14,476 or 19.56% of its population were urban dwellers. The three largest ethnic groups exists in Becho were Oromo (90.32%), Amhara (6.87%), and Silte (1.66%); all other ethnic groups made up 1.15% of the population. Oromiffa was spoken as a first language by 90.35%, 8.13% spoke Amharic, and 1.05% Silte; the remaining 0.47% spoke all other primary languages (CSA, 2007).

The livelihood of Becho and Dawo District is categorized as mixed farming and the main economic activities are crop production and livestock production. It has dominantly midland

agroecology characteristics with a few highland areas. All wealth groups cultivate *teff*, wheat and chickpeas. The significant annual incomes for all wealth come from own crop sale, including the sale of *teff*, wheat, chickpeas and trees followed by livestock sale and self-employment.
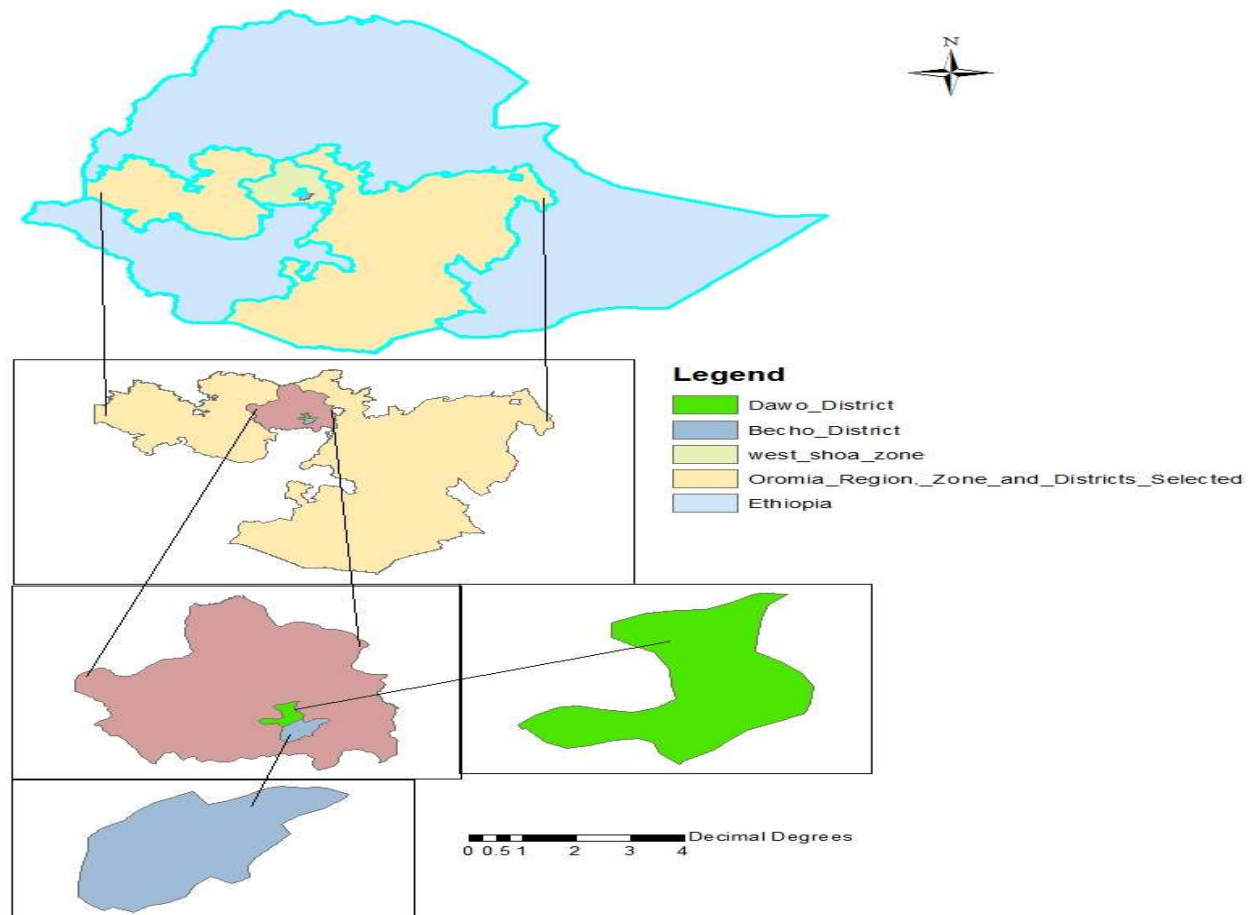
Figure 1: Geographical location of the study area

Source: Adapted from Ethiopia map

3.2. Types and Sources of Data

Both qualitative and quantitative types of data were collected from both primary and secondary data sources. The primary data type was collected from sample *teff* producers, cooperatives, NGOs, traders (wholesalers and retailers), processor (flour seller, hotel and *Injera* makers) and

consumers by using structured questionnaires. The sampled *teff* farmers, cooperatives, NGOs, *injera* seller, flour seller, traders (wholesaler and retailers) were asked through direct interviewing. Secondary data on population size of the study areas, lists of Kebeles administration, list of licensed *teff* traders', amounts of production in the district, traders (wholesaler and retailer) and retail prices of *teff*, number of cooperatives and NGOs engaged in *teff* business was taken from Central Statistical Agency and trade and industry of the districts. Apart from conducting individual interviews, key informant interviews and focus group discussion was held with farmers, traders, consumers, districts agriculture bureau manager, DAs and representatives of *kebeles* farmers.

3.3. Methods of Sampling and Sample Size Determination

The survey was carried out using two stage sampling method, based on the selection of the combination of different sampling methods. First, within each district, the *kebeles* administration was ranked from smallest to the largest producer (in terms of farm size allocated to *teff* production in the district in 2013/14). Then *kebeles* administrations were stratified into two, less land cultivated for *teff* production (cultivating all together 50 percent of the areas in the district) and more land cultivated for *teff* production (cultivating all together 50 percent of the area). According to this stratification in Becho district seven *kebeles* administration was classified under more land cultivated and 12 *kebeles* was classified under less land cultivated. Following the same procedure for Dawo districts, six *kebeles* administration was classified under more land cultivated and 14 *kebeles* were under less land cultivated. Eight *kebele* administrations were randomly and proportionally selected from the two strata. One *kebele* administration was randomly and proportionally chosen from the more land cultivated by *kebeles* administration and three from the less land cultivated *kebeles* administration of each district randomly and proportionally. In the second stage, several *teff* producers sampled from each selected *kebele* were obtained proportionally. Finally, 150 sample households were interviewed from each sample *kebele* randomly and proportionately.

Sample size was determined using probability proportional to sample size-sampling technique Cochran's (1977).

$$no = \frac{Z^{2} * (P)(q)}{d^{2}} \qquad (1)$$

$$n_{1} = \frac{no}{(1 + no/N)} \qquad (2)$$

Where; n_o = desired sample size when population greater than 10,000

n_1 = finite population correction factors when population less than 10, 000

Z = standard normal deviation (1.96 for 95% confidence level)

P = 0.1 (proportion of population to be included in sample i.e. 11%) q =is 1-P i.e. (0.89),

N = is total number of population, d =is degree of accuracy desired (0.05).

$$no = \frac{Z^{2} * (P)(q)}{d^{2}}$$

$$no = \frac{(1.96)^{2} * (0.11)(0.89)}{(0.05)^{2}} = \approx 150$$

Table 3: Distribution of sample households across districts and sample *kebeles*

District	*Kebeles*	Number of households	Proportion	Sample households
Becho	Awash Bune	1615	0.21	31
	Jato	965	0.12	18
	Simbiro Ciracha	958	0.12	19
	Boji	600	0.08	12
Dawo	Neno Gabriel	1298	0.17	25
	Kersa Bombi	929	0.12	18
	Makit Suntare	1047	0.13	20
	Dawo Saden	347	0.04	7
Total		7759	1.00	150

Source: Agriculture Bureau of Becho and Dawo (Own computation)

The total number of *teff* producers in the two districts was 20,025 farmers. The number of *teff* producers in Becho and Dawo districts was 11967 and 8058 respectively (Agriculture office of districts). Depending on the proportion of *teff* producing farmers in the two districts of selected *kebeles* the number of respondents from each district was 80 and 70 from Becho and Dawo districts respectively.

According to information obtained from the districts trade office the total number of licensed *teff* traders in the two districts were 109 and 100 in Becho and Dawo districts respectively. The sample size was determined using Cochran's (1977) sampling formula. The sample size of traders in the two districts was 28 and 26 in Becho and Dawo districts respectively when allocated proportionally based on the number of traders. The other actors included in the sample of this study include; 10 consumers, 5 cooperatives, 2 union, 10 injera sellers, 2 mill houses and 2 flour sellers.

3.4. Method of Data Analysis

3.4.1. Descriptive analysis

This method of data analysis refers to the use of percentages, means, chi-square, t-test and standard deviations. It was employed in the process of examining and describing marketing functions, farm household characteristics, role of intermediaries, marketing margin and value share of actors. Value chain map is a standard tool of a value chain research and analysis (ILO, 2009). It is used to identify and categorize the value chain actors, their roles, and relationships in the *teff* value chain of the study area.

Structure conduct and performance (S-C-P) model was applied to analyze market performance in teff value chain. Mussema (2006) and Kindie (2007) used this model to analyze the market performance of pepper and sesame.

Herfindahl index also known as Herfindahl Hirschman Index is defined as the sum of the squares of the market shares of the 50 largest firms (or summed over all the firms if there are fewer than 50) within the industry, where the market shares are expressed as fractions.

$$HHI = \sum_{i=1}^{m} s_i^2 \tag{3}$$

The result is proportional to the average market share, weighted by market share. As such, it can range from 0 to 1.0, moving from a huge number of very small firms to a single monopolistic producer. Increase in the Herfindahl index implies a decrease in competition and

increase in market power of a few. On the other hand a fall in HH index value suggests an increase in competition and reduced power of a few firms.

Marketing Margin

Marketing margin measures the share of the final selling price that is captured by a particular agent in the marketing chain (Mendoza, 1995).

$$\text{TGMM} = \frac{\text{Consumer price-Producer price}}{\text{Concumer price}} * 100 \tag{4}$$

Producer's gross margin (GMM_P) is the proportion of the price paid by the consumer that belongs to the producer.

$$\text{GMM}_p = \frac{\text{Price paid by the consumer-Marketing gross margin}}{\text{Price paid by the consumer}} * 100 \tag{5}$$

Value-added: To compute the value-added all costs and sales for the various stages were measured as well as the underlying product and input prices. Actual market prices were used for financial analysis. Thus according to guides from GTZ (2007), the following were calculated;

Value Added (VA): It is the difference between the value of output of a product i^{th} (Y_i) and the value of intermediate inputs (I_i) used in the productive activities and represents the value-added by an individual actor j during the accounting period. The intermediate inputs are those factors of production that are totally transformed or consumed during the accounting period and are not available for use during the next period.

$$VA_{ij} = Y_{ij} - I_{ij} \tag{6}$$

Overall value-added

The overall value-added was computed as;

$$TVA_{chain} = \Sigma VA_{agents} \tag{7}$$

3.4.2. Econometric analysis

3.4.2.1. Market participation decision

An econometric concern for modeling market participation is the fact that only a minority of households sell *teff*, thus the *teff* sales of non-sellers the majority of cases is zero. If the distribution of such dependent variable exhibits a reasonably large number of cases lumped at zero, this can create problems for standard OLS regression. Within the context of a study of the determinants of marketed surplus by *teff*-growing households, the rationale for a corner solution model is that a sales value of zero is a valid economic choice to be explained, not a reflection of missing data. The standard approach to modeling a corner solution dependent variable is to use Heckman, Tobit or a double-hurdle (DH) model.

Cragg (1971) modifies the Tobit model to overcome the restrictive assumption inherent in it, namely, he suggests the "double-hurdle" model to tackle the problem of too many zeros in the survey data by giving special treatment to the participation decision. The model assumes two hurdles to overcome to observe positive values. A non-zero marketed surplus can be observed if, first a decision whether to participate or non-participant decision is made, and second random circumstances permit intensity of participation, once it is participating.

The heckit and the double-hurdle models are similar in identifying the rules governing the discrete (zero or positive) outcomes. Both models recognize that outcomes are determined by the selection and level of participation. They also permit the possibility of estimating the first- and second-stage equations using different sets of explanatory variables. However, the heckit, as opposed to the double-hurdle, assumes that there are no zero observations in the second stage once the first-stage selection is passed. In contrast, the double-hurdle considers the possibility of zero realizations (outcomes) in the second-hurdle arising from the individuals' deliberate choices or random circumstances. The difference between the two models can be illustrated using the following example on market participation. According to the heckit model, only non-participants respondents can report zero intensity of market participation. The model further assumes that individuals who participate in the market do not report zero values at all. On the

other hand, the double-hurdle model assumes that zero values can be reported in both decision stages. The zeros reported in the first-stage arise from non-participants and those in the second stage come from non-sales due to the respondents' deliberate decisions or random circumstances.

The research objectives are to understand both the factors affecting the probability that a household sells *teff* and intensity of marketed surplus. When the household's *teff* market participation decisions and intensity of marketed surplus are made simultaneously, the Tobit model is appropriate for analyzing the factors affecting the joint sales decision. A key limitation of the Tobit model is that the probability of a positive value and the actual value, given that it is positive, are determined by the same underlying process (i.e., the same parameters). However, DH models offer a more flexible version of the Tobit in that they allow the household decision regarding whether to sell *teff* (participation) and what quantity to sell to be determined by different underlying processes. In this regard, the double-hurdle model can be considered as an improvement both on the standard Tobit and generalized Tobit (heckit) models.

The double-hurdle model is designed to analyze instances of an event that may or may not occur, and if it occurs, takes on continuous positive values. In the case of household *teff* sales, the decision to sell or not is made first, followed by the decision on how much to sell (quantity of *teff* sold). The structure of double-hurdle model is as follows:

$$d_i^* = \mathbf{x}_1\boldsymbol{\beta}_1 + \varepsilon_{1i},$$
$$\varepsilon_{1i} \sim N\left(0, \sigma_1^2\right) \tag{8}$$

$$d_i = \begin{cases} 1 \ if \ d_i^* > 0 \\ 0 \ if \ d_i^* \le 0 \end{cases} \tag{9}$$

$$y_i^* = \mathbf{x}_2\boldsymbol{\beta}_2 + \varepsilon_{2i},$$
$$\varepsilon_{2i} \sim N\left(0, \sigma_2^2\right) \tag{10}$$

$$y_i = \begin{cases} y^* \ if \ y_i^* > 0 \ and \ d_i = 1 \\ 0 \ if \ y_i^* \le 0 \end{cases} \tag{11}$$

The subscript i refers to the ith household, d_i is the observable discrete decision of whether or not to sell *teff*, while d_i^* is the latent (unobservable) variable of d_i. y_i^* is an unobserved, latent variable (desired quantity of *teff* sold), and y_i is the corresponding observed variable, actual quantity of *teff* sold. $\mathbf{x}_1$ and $\mathbf{x}_2$ represent vectors of explanatory variables. β_1 and β_2 are vectors of parameters to be estimated and ε_1 and ε_2 are random errors.

Before running econometrics model, all the hypothesized explanatory variables was checked for the existence of multi-collinearity problem. There are two measures that are often used to test the existence of multicollineality. Variance Inflation Factor (VIF) for association among the continuous explanatory variables and contingency coefficients for dummy variables. In this study, a variance inflation factor (VIF) and contingency coefficient was used to test multicollinearity problem for continuous and dummy variables respectively. According to Maddala (1992), VIF can be defined as:

$$VIF(x_i) = \frac{1}{1 - R^2} \tag{15}$$

Where, R is the squared multiple correlation coefficient between x_i and the other explanatory variables. The larger the value of VIF, the more troublesome it is. As a rule of thumb, if the VIF of a variable exceeds 10 (this will happen if R_i^2 exceeds 0.95), that variable is said to be highly collinear (Gujarati, 1995). Similarly, contingency coefficients will be computed for dummy variables using the following formula.

$$CC = \sqrt{\frac{x^2}{n + x^2}} \tag{16}$$

Where, CC is contingency coefficient, x^2 =chi-square value and n= total sample size

3.5. Hypothesis and Definition of Variables

Dependent variables

Market participation decision of *teff* farmers (MPD_F): The binary dependent variable for the Probit stage of the double-hurdle model is =1 if the household sold *teff* in 2013/14, or =0 otherwise.

Quantity of marketed surplus of *teff* (QM_S): It is a continuous variable which represents the outcome (dependent) variable; the actual marketed surplus of *teff* by the farm household. The dependent variable in the second stages is the amount of marketed surplus of *teff* 2013/14 measured in quintals.

Independent Variables

Sex of the household head (SHD_D): It is a dummy variable taking 1 if male and 0 if female. Male headed households have been observed to have a better tendency than female-headed household to enter into a market of *teff*. Thus, hypothesized that being female households would have a positive influence on the market participation and marketed surplus of *teff*. A study by Makhura (2001) on the households' participation in livestock markets indicated that women are more inclined to sell their livestock than men. A study by Lewis *et al.* (2008) on gender difference and the marketing styles at Oklahoma wheat producers showed that men tend to sell grain more frequently than women and women tend store longer and receive 1.4 cents less than men.

***Teff* farming experience (TFE_C):** It is a continuous variable and measured in years. It is a proxy for farming experience of household head. Experienced households are believed to be wise in resource use, and it is expected to have a positive effect on market participation and marketed surplus. Farming experience can also be expected to be negatively associated with market participation, as older household heads (up to a certain maximum) tend to have more dependents and hence more subsistence production activities (Ehui *et al.,* 2009; Gani and Adeoti, 2011).

Distance to the nearest market (PTM_C): It is a continuous variable measured in kilometer that a farmer travels to sell the product to the market. If the farmer is located in a village far away from the market, he/she has limited access to the market and vice versa. Therefore, it is

hypothesized that this variable is negatively related to market participation and marketed surplus. Wolday (1994) studied the food grain market in the case of Alaba Siraro, and identified that poor market access has significant and positive effect on the quantity of food grain supplied. Aklilu (2007) study of village poultry in Ethiopia, distance to markets influenced negatively poultry marketing. Also Shilpi *et al.* (2007) found that the likelihood of sales at the market increases significantly and positively with an improvement in market facilities and a decrease in travel time from the village to the market.

Family size (FS_C): It is a continuous variable, measured in man equivalent *i.e.* availability of the active labor force in the household, which affects farmer's decisions to participate in the market. Since a production is the function of labor, availability of labor is assumed to have positive relation with the marketed surplus of *teff*. Therefore it is hypothesized that it would have both negative and positive impacts on the marketed surplus. Singh and Rai (1998) found a marketed surplus of buffalo milk to be negatively affected by family size.

Literacy status of the household head (LSHH_D): It is dummy variables 1 if the household attended any formal education and 0 otherwise. Those household heads who had formal education determine their readiness to accept new ideas and innovations, and easy to get supplies, demand and price information and this enhances farmers' willingness to participate in the marketing of *teff*. Therefore, education hypothesized to positively influenced market participation and marketed surplus of the *teff*. Holloway *et al.* (1999) argued that education had a positive significant effect on the quantity of milk marketed in the Ethiopian highlands.

Land cultivated for *teff* (LCF_C): It refers to the size of land allocated for *teff* production by producer. It is a continuous variable and measured in a hectare. If the producer allocates more land to *teff* production, he could be benefited from the economic scale of production. Furthermore, producers who allocate large farm size for *teff* likely to participate in the market. Thus, farm size will be expected to have a positive effect on market participation and marketed surplus. According to Elias (2005), one of the variables with a positive effect on coffee supply was the land allocated for coffee production. Land holding has an indirect positive effect on market participation though it is a positive effect on farm output (Iddo *et al.,* 2006).

Gebreselassie and Sharp (2008) the proportion of land allocated to *teff* had a positive and significant impact on a household's degree of market participation.

Access to credit (ATC_D): This is a dummy variable 1 if the household head access to credit and 0 otherwise. Therefore, it is hypothesized that access to credit would have a positive influence on the amount of the production and sales. Stephens and Barrett (2011) showed that household's access to credit has more capability of financing inputs such as hired labor, which could have a positive effect on maize productivity and sales.

Ownership of transport equipment (OTE_D): It is a dummy variable which take value one if household has transport equipment and zero otherwise. Ownership of transport equipment such as animal cart, donkey, bicycles, motorcycles and vehicles is expected to have a positive impact on market participation by reducing the cost of transporting inputs from the market to the farm and output from the farm to the market. Ownership of transport equipment is significantly and positively associated with the decision to sell maize (Arega *et al.,* 2007; Mather *et al.,* 2013).

Perception of lagged market price (PLMP_D): This is a categorical variable taking a value 1 if farmer perception of *teff* price is high, 2 if farmer perception of *teff* price is medium and 3 if farmer perception of *teff* price is low. If the price will be high, it is expected to affect the marketed surplus of *teff* positively and vice versa. Because, lagged prices can stimulate a production and thus marketed surplus of *teff* for the next year. Hypothesized that perceptions of lagged market price have a positive influence on market participation and marketed surplus of *teff*. According to Myint (2003) if prices in one year are bad, farmers will often respond by planting less in the next year. Gebreselassie and Sharp (2008) also showed that last year prices of *teff* had a strong positive and high significant effect on the probability of market participation as a seller of *teff* market participation in Ethiopia.

Perception on current price of *teff* (PCP_C): This is a categorical variable taking a value 1 if farmer perception of *teff* price is high, 2 if farmer perception of price is medium and 3 if farmer perception *teff* price is low for a given post-harvest period. The increase in the price of

a product will be followed by a decrease in the quantity disposed of since a smaller quantity marketed can meet their cash requirements. This variable expected to have a negative influence on market participation and marketed surplus. Renkow *et al.* (2004) have argued that an increase in price for a subsistence crop may increase the producer's real income sufficiently so that the income effect on his demand for consumption of the crop outweighs the price effects on production and the consumption, and hence the marketed surplus may vary inversely with market price.

Livestock owned (TLU): This is a continuous variable defined in terms of the tropical of livestock unit (TLU). Farmer could sell more *teff* when he/she produces more. On the other hand, when the household has less production; it must either borrow money or sell his livestock to meet household needs. Farmers who have low production of *teff* need to specialize in livestock production and hence it has an inverse relationship with market participation and marketed surplus. Study by Mussema (2006) showed that total livestock has a negative effect on the quantity of pepper sales. On the other hand, study by Makhura (2001) on maize market participation suggested that an increase in the value of livestock owned leads to an increase in maize sale. Therefore, it is expected to have positive and negative relationships with market participation.

Off/on farm income (OFI_C): It is a continuous variable that shows income obtained from off/on farm activity by the household head. This income may strength farming activity or reluctant to produce the *teff* to generate money from *teff*. However, getting off/on farm income is assumed to have a positive impact on marketed surplus. Gebreselassie and Sharp (2008) said that the impact of non-farm income and activities on degree of *teff* market participation is mixed. While the coefficient for farmers' participation in non-farm activities was statistically insignificant, the coefficient for income from these activities was negative and significant. A study by Iddo *et al.* (2006) confirmed that non-farm income has affected the decision of farmers to sell their farm output (market participation) negatively in the study of rural Georgia.

Agroecology (AE_D): It is dummy variable and will be included to account for differences in agroecology across the *kebeles*. If kebeles are located in Midland take value one and zero

otherwise. The highlands have the least agricultural potential of *teff* production, while midlands have high potential of *teff* production. It is expected that market participation would be lower in highland *kebeles* and high in midland *kebeles* since production is high in midland *kebeles*.

Table 4: Definition and hypothesis of variables

Variables	Notation	Measurement	Expected effect on
			Market participation
Sex	SHD_D	Dummy:1=if male; 0=otherwise	+
Teff farming experience	TFE_C	Number of years	-
Family size	FS_C	Number of people in the household	±
distance to the nearest market	PTM_C	Kilometers	-
Literacy status of the household head	LSHH_D	Dummy: 1= if attended any formal education; 0= otherwise	+
Access to credit	ATC_D	Dummy: 1=if access credit; 0= otherwise	+
Land cultivated for *teff*	LCF_C	Hectares	+
Ownership of transport	OTE_D	Dummy: 1= if yes; 0=otherwise	+
Perception of lagged market price	PLMP_D	Category: 1=high; 2=medium; 3=low	+
Perception on current prices	PFP_C	Category: 1=high; 2=medium; 3=low	-
Livestock owned	NLO	TLU	±
On/off farm income	NFIA_C	ETB	+
Agroecology	AE_D	Dummy: 1=midland; 0= otherwise	±

4. RESULTS AND DISCUSSION

This part of the thesis presents the major findings of the research work. In the first part, the socio-economic characteristics of the sample respondents are presented in tabular and narrative format. Then comes a part where the findings regarding factors affecting market participation, intensity of marketed surplus and producer's value addition decision are discussed in detail.

4.1. Description of *Teff* Production and Supply Factors

In this part of the thesis, socio-economic characteristics of *teff* producers, traders, value chain participants, constraints of producers and traders, market structure and channels, value share of each participants of *teff* value chain, *teff* value chain map, governance and upgrading activity of value chain discussed in detail.

4.1.1. *Teff* market participation

The demographic characteristics of *teff* market participants and non-participants are shown in Table 4. The average marketed surplus for households participated in the *teff* market is 8.51 quintals per household. Out of the total market participants 88.98 percent were male headed household and the male headed non-participants were 78.13 percent. This discrepancy can be explained by the nature of the crop; being a cash-crop, it is mostly associated with men. There was a significant difference between teff market participants and non-participants households in terms of gender at 10% probability level.

From the total sample, credit was obtained by 73.33% of the farmers. The results of the survey show that among market participating households, 91.53% have access to credit while 6.25% of the non-participating households had access to credit. Credit is important for cushioning cash constrained farmers to be able to meet their farm activities requiring cash on time. Based on the chi-square test there is statistically significant difference between market participant and non-participant of *teff* farmers at 1% probability level. This implies that market participant farmers have more access to credit than non-participants farmers.

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Table 5: Description of variables by market participation status of teff producers

Variable		Mean/proportion			t-/χ^2-value
		Total (N=150)	Participant (N=118)	Non-participants (N=32)	
Age of the household head		46.70	46	49	-0.88
Farming experience		25.47	25	27	-0.86
Family size		7.24	7.21	7.34	-0.31
Sex of the household head	Male	86.67	88.98	78.13	2.57*
Distance to nearest market		9.60	9.60	9.61	-0.01
Farmers perception on last	High	49.33	47.46	56.25	
year price of teff	Medium	28	27.96	28.13	1.28
	Low	22.67	24.58	15.62	
Farmers perception on	High	4	4.24	3.13	
farm gate price of teff	Medium	45.33	39.51	40.62	0.53
	Low	50.67	56.25	56.25	
Land allocated for *teff*		2.08	2.05	2.16	-0.53
Total land owned		2.23	2.4	1.6	1.95*
Income from off-farm activity		2215.4	2190	2314.64	-0.23
Agroecology	Midland	87.33	86.44	90.63	0.39
	Highland	12.67	13.56	9.38	
Literacy status	Illiterate	30	30.51	28.13	1.58
	Literate	70	69.49	71.87	
Access to credit (yes)		73.33	91.53	6.25	93.61***
Ownership of transport equipment (yes)		74.67	70.34	90.63	5.48**
Livestock holding		8.66	8.86	7.93	0.98
Teff production (quintal)		19.21	19.54	18	0.66
Teff consumption (quintal)		6.04	6.12	5.76	0.41
Cost of production per quintal (ETB)		664.44	653.30	705.18	-1.09

***, ** and * are statistically significant at 1%, 5% and 10% probability level, respectively.
Source: Generated from field survey data (2014)

Farm size of sample farmers varies from one hectare to 8 hectares. Land is major constraints that limit farmers' production potential in the study areas. During survey, it was stressed that there was no option for newly formed households to have their own farmland. The only chance for such households was to share what the parent had in the past. The mean size of the total land owned by *teff* market participants and non-participants was 2.4 hectares and 1.6 hectare

per household respectively. In terms of total cultivation land owned by households, there was a significant difference between market participant and non-participant at 10% level of significance. The explanation for this result is that land is a scarce resource in the study area and it is more likely that those with bigger pieces of land resort to cultivation of more crops such as teff, chickpea, grass pea and wheat which lead to high teff production and hence participate in the teff market.

From the total sample farmers 74.67 percent have their own transportation equipment such as animal cart and donkeys which is used to transport the *teff* product from the field to homestead or home to the market in the study area. During the FGDs farmers pointed that their transportation means was animal drawn cart (a cart drown by donkey, and horse), and pack animals (animals used for loading directly on their back without using cart). No farmer reported use of a vehicle to transport *teff* to the market or to their homestead. This could be due to accessibility of cheaper local animal transportation or absence of vehicle to transport the teff product to market or homestead. There was a significant difference between market participant and non-participant farmers in terms of ownership of transport equipment.

4.1.2. Storage and transportation facility at farm level

The storage system is a farming activity used to store the product until price increase or input supply available to buy for the next farming season.

Table 6: Types of storage, transport and purpose of storing *teff*

Variables		Participants		Non participants		χ^2
		N	%	N	%	
Storage material	*Togogo*[1]	47	39.83	12	37.50	0.266
	Gotera	63	53.39	17	53.13	
	Plastic sack	8	6.78	3	9.38	
	Expecting high price	39	33.05	10	31.25	0.307

[1] It is material made of mud and used to store cereal crops products in the study areas

Motive of storing the product	Lack of demand	6	5.08	1	3.13	
	Storing for saving	29	24.58	8	25.00	
	For consumption	44	37.29	13	40.63	
Field to Homestead	Donkey	107	90.68	4	12.50	0.282
	Animal cart	11	9.32	28	87.50	
Home to Local market	Animal cart	33	27.97	11	34.38	
	Handcart	2	1.69	1	3.13	1.06
	Human labor	1	0.85	0	0.00	
	Donkey	82	69.49	20	62.50	

Source: Generated from field survey data (2014)

About 39.83% of the sample market participants point out that they put their *teff* by filling in *Togogo*. Table 9 showed that 33.05% of the samples of market participant households store their products by expecting high price and 37.29% store their product for home consumption and the remaining was for saving and lack of demand. The means of transportation used by farmers were pack animal (most of the time donkey), animal cart and hand cart. The majority of the farmers used the donkey to transport the *teff* product from field to home stead; from home to local market and mill house in percent the number of farmer used donkey for transportation was 74%, 62% and 72% respectively for both market participant and non-participant farmers.

4.2. Socio-Economic Characteristics of Teff Traders

The demographic characteristics of traders in *Becho* and *Dawo* districts are shown in Table 10. The overall mean age of trader was 46.22 years.

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Table 7: Description of *teff* trade factors by district

Variable			Mean/proportion			t-/χ^2- value
			Total	Becho	Dawo	
Age of traders			46.22	42.68	50	-2.78***
Sex of household head(male)			83.33	89.29	76.92	1.48
Teff trading experience			9.39	10.14	8.58	2.03**
Estimated net capital			310959.3	475221.4	134061.5	1.25
Establishment capital			41815	44364	39069.62	0.65
Amount of teff purchased			2063.19	1675.4	1759.62	0.20
Educational level		Primary	48.15	46.43	50	
		Secondary	50	50	50	0.96
		Preparatory	1.85	3.57	0	
Sources of establishment capital	Bank		25.93	28.57	23.08	2.37
	Microfinance		18.52	17.86	19.23	
	Own		48.15	42.86	53.85	
	Local money lender		3.70	7.14	0	
	Relatives		3.70	3.57	3.85	

***, ** and * are statistically significant at 1%, 5% and 10% probability level, respectively.
Source: Generated from field survey data (2014)

The mean age of traders from *Becho* district was 42.68 years and for *Dawo* district mean age was 50 years. There is a significant difference between the two districts in terms of mean age of traders at 1% level of a significance. That means the mean age of traders from *Becho* district is greater than the mean age of *Dawo* district traders. The estimated net capital mean of *Becho* district was 475221.4 ETB and estimated net capital mean of *Dawo* district was 134061.5 ETB. Mean of establishment capital was 44364 ETB and 39096.62 ETB for *Becho* and *Dawo* district respectively. However, there was no significant difference between the district in terms of estimated net capital and establishment capital. The mean of teff trading experience in Becho and Dawo districts were 10 years and 8 years respectively. In term of trading experience, there is a significant difference between Becho and Dawo districts at 5% level of significance. This implies the mean of trading experience of traders in Becho district is greater than Dawo district.

4.3. Measuring Market Performance and Structure in *Teff* Value Chain

4.3.1. Degree of market concentration

Herfindahl-Hirschman Indices were calculated to assess market concentration for the markets of Tulu bolo and Busa town. The degree of seller concentration was high (above 0.5) in the markets of Tulu bolo and Busa town. This means that the markets were dominated by a few sellers. Table 11 below shows HHI of seller concentration for each market.

Table 8: HHI of seller concentration in the markets

Name of market	HH Indices
Busa	0.65
Tulu bolo	0.87

Source: Generated from field survey data (2014)

The dominance of few sellers in most markets implies low competition among sellers. This would in turn make farmers receive low prices for their teff produce. It would also make other potential traders fail to penetrate the markets resulting in no further innovations in the teff production.

4.3.2. Marketing channel of *teff*

There were eight marketing channels and the major marketing actor involved in marketing of teff includes urban wholesalers, rural wholesalers, urban and rural retailers. In *Becho* district from the total amount of *teff* marketed about 87.98%, 4.68%, 4.16% and 3.18% bought by urban wholesalers, urban retailers, rural retailers and rural wholesaler respectively. In *Dawo* district a total amount of *teff* bought by different agents 80.05% and 14.07% was bought by urban wholesaler and rural retailer respectively.

1. Producer -Rural retailer - Rural wholesaler- Urban Wholesaler – Consumer
2. Producer - Rural Wholesaler - Consumer
3. Producer - urban wholesaler - injera seller – consumer
4. Producer - Cooperatives/union- urban wholesaler - consumer

5. Producer-Rural retailer -Rural wholesaler-urban wholesaler-flour seller–*Injera* seller-consumer

6. Producer - urban wholesaler - hotel and restaurants - consumer

7. Producer-Rural retailer-Rural wholesaler-Urban wholesaler - Urban retailer-Consumer

8. Producer -NGOs (*birmadu folle*) - urban wholesaler - consumer

4.3.3. Marketing margin

There are several varieties of *teff*. In general, there are three main types of *teff*: white, red and brown. White *teff* is the preferred type of *teff* both by consumers and producers. The reason why white *teff* preferred by consumers and *injera* sellers is that the shelf life of *injera* made from white *teff* higher than *injera* made from red *teff*. Farmer's production of red *teff* is very small in the study areas. Even if the farmers produce red *teff* they uses only for home consumption since the prices for red *teff* are significantly lower than white *teff*. Due to this, most farmers in the study areas engaged in the production of white *teff*. Then to calculate the marketing margin across market channels the average price of white *teff* was used.

Table 9: *Teff* marketing margins across different marketing channels

Marketing margin	Marketing Channels							
	I	II	III	IV	V	VI	VII	VIII
TGMM	30.00	21.33	25.00	27.27	37.78	32.35	34.21	28.65
GMM Producers	70.00	78.67	75.00	72.73	62.22	67.65	65.79	71.35
GMM Rural retailers	11.88						5.26	
GMM Rural wholesalers	2.50	21.33			7.22		2.63	
GMM Cooperatives				9.09				
GMM NGOs								4.49
GMM Urban wholesalers	15.62		11.25	18.18	13.89	5.88	2.63	24.16
GMM Urban Retailers							2.63	
GMM Flour sellers					16.67		21.06	
GMM Injera sellers			13.75			26.47		

Source: Generated from field survey data (2014)

The results showed that the TGMM is large in channel II that was 78.67% and followed by channel III that was 75%. This means that out of the price paid by consumers in channels II and

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III; about 78.67 percent and 75 percent goes to the farmers, respectively. Farmers are therefore better off selling their *teff* product through channel II and III. The gross marketing margin of urban wholesaler was 2.63% in channel VII, which was the minimum marketing margin, and the highest marketing margin for wholesaler was in channel VIII that is 24.16%. The study conducted by Mussema (2006), the marketing margin for red pepper is high which showed that higher amount of price paid by consumers is received by red pepper producers in the study area. Other study conducted by Kebato, (2014) also showed high marketing margin of red bean was received by red bean producers. This high marketing margin received by *teff* producers can be explained in part by the efforts made by the Ethiopian commodity exchange, and Oromia agricultural marketing together with other stakeholders to promote teff growing and marketing in the country. On the other hand, teff value adding activity performed at farm level is higher than others segment of the marketing channel which leads to high marketing margin at farm level than other agents.

4.4. *Teff* Value Chain Actors Roles, Linkages, and Gross Margin

4.4.1. *Teff* value chain actors roles and linkages

Chain actors are differing from chain supporters in terms of ownership status they have to the product. Chain actors own the product. Ownership is transferred from one actor to the next actor in the chain. Chain supporters supporting actors in the value chain in finance and providing other services but not own the product. The actors in *teff* value chain are input suppliers, farmers/producers, rural and urban retailers, rural/urban wholesalers, processors (flour sellers and injera sellers), NGO (*Birmadu Folle*), cooperatives/union, *injera* sellers and consumers. The *teff* value chain begins with input suppliers who supply production inputs to producers.

Specific roles played by each chain actors are discussed hereunder:
Supporting actors: They provide supportive services including training and extension, information, financial and research services. Cooperatives, micro finance, and NGOs are main supporting actors who play a central role in the provision of services. The actors need finances for different purposes. The farmers need finance to buy inputs of production, traders need

finance to buy the product and some capital items like equipment and vehicles, processors need finance to buy products from traders and to buy capital items like machinery, vehicle etc., retailers need finance for working capital and warehousing. Microfinances and relatives provided financial service needed by the actor of *teff* value chain as depicted in Table 13.

Input supplier: As revealed by sample farmers the input suppliers in *teff* value chain are farmers, cooperatives/union and district agriculture bureau. The input provided includes seed, fertilizer, herbicides and pesticides. During the KII with district agriculture worker and DAs they said that sometimes there is a shortage of fertilizer and seed supply in *Becho* and *Dawo* district. The problem of *teff* production in the district was the unsuitable usage of seed and fertilizer by the farmers. This happens due to farmer's knowledge of how to use the fertilizer or lack of money to buy the amount of fertilizer that applied per hectare of land.

The survey result show that about 92.86% , 2.86% and 4.28% sample farmers from Dawo district obtained farm input from cooperative/union, agricultural office and market respectively. When Becho and Dawo districts were compared based on access to market information there is a significant difference between the Becho and Dawo districts. The result showed that *Becho* district had better access to *teff* market information than Dawo district. Out of sampled farmers from Becho about 81.25% had access to market information and 75.71% of sampled farmers from Dawo district have access to market information. The survey result indicated that there are four sources of market information for farmers. About 33.85%, 26.15%, 4.62% and 35.38% of Becho district farmers obtained market information from traders, radio, telephone and neighbor respectively, while about 32.73%, 21.82%, 20% and 25.46% of Dawo district farmers obtained market information from traders, radio, telephone and neighbor respectively. The chi-square indicates that there was a significant differences between Becho and Dawo districts in respect of source of market information at 1% probability level.

About 82% of the farmers took the training in 2013/14 farming season on use of input and technology of *teff* production and 18% farmers did not take training in 2013/14 farming season. From sampled *teff* producers in Dawo district 71% took the training in 2013/14 farming season for the use of input and technology of *teff* production (raw planting) and 29% did not take

training in 2013/14 farming season for the use of input and technology of *teff* farming. In terms of training for *teff* production, Becho district farmers were more accessible to training than Dawo district farmers it may due to Becho farmers were more access to service providing by government than Dawo district. There was a significant difference between Becho and Dawo district in terms of training on the *teff* production input use and technology in 2013/14.

Table 10: Sources of services to farmers

Variables		District				χ^2-value
		Becho		Dawo		
		Frequency	Percent	Frequency	Percent	
Sources of input	Agricultural office	5	6.25	2	2.86	
	Cooperative/Union	75	93.75	65	92.86	4.35
	Market	0	0.00	3	4.28	
Access to market information	Yes	65	81.25	53	75.71	0.68
	No	15	18.75	17	24.29	
Sources of market information	From teff traders	22	33.85	18	32.73	23.72***
	Radio	17	26.15	12	21.82	
	Telephone	3	4.62	11	20	
	Neighbor	23	35.38	14	25.46	
Sources of credit	Microfinance	53	96.36	52	94.54	2.92
	Relative	3	3.64	3	5.46	
Take training	Yes	64	80	57	81.43	11.74**
	No	16	20	13	18.57	
Service provided by government	Excellent	26	32.50	13	18.57	11.63***
	Very good	25	31.25	13	18.57	
	Fair	23	28.75	30	42.86	
	Unsatisfactory	6	7.5	14	13.13	
Service provided by NGOs	Excellent	2	2.5	3	4.35	13.75***
	Very good	12	15	1	1.45	
	Fair	13	16.25	5	7.25	
	Unsatisfactory	4	5	2	2.90	
	No service at all	49	61.25	58	84.06	

***, ** and * are statistically significant at 1%, 5% and 10% probability level, respectively
Source: Generated from field survey data (2014)

Functional and institutional analysis approach of a value chain mapping was used to identify the different actors involved in the *teff* value chain, and to understand their roles and linkages. The current value chain map of *teff* in Becho and Dawo district is depicted in Figure 3.
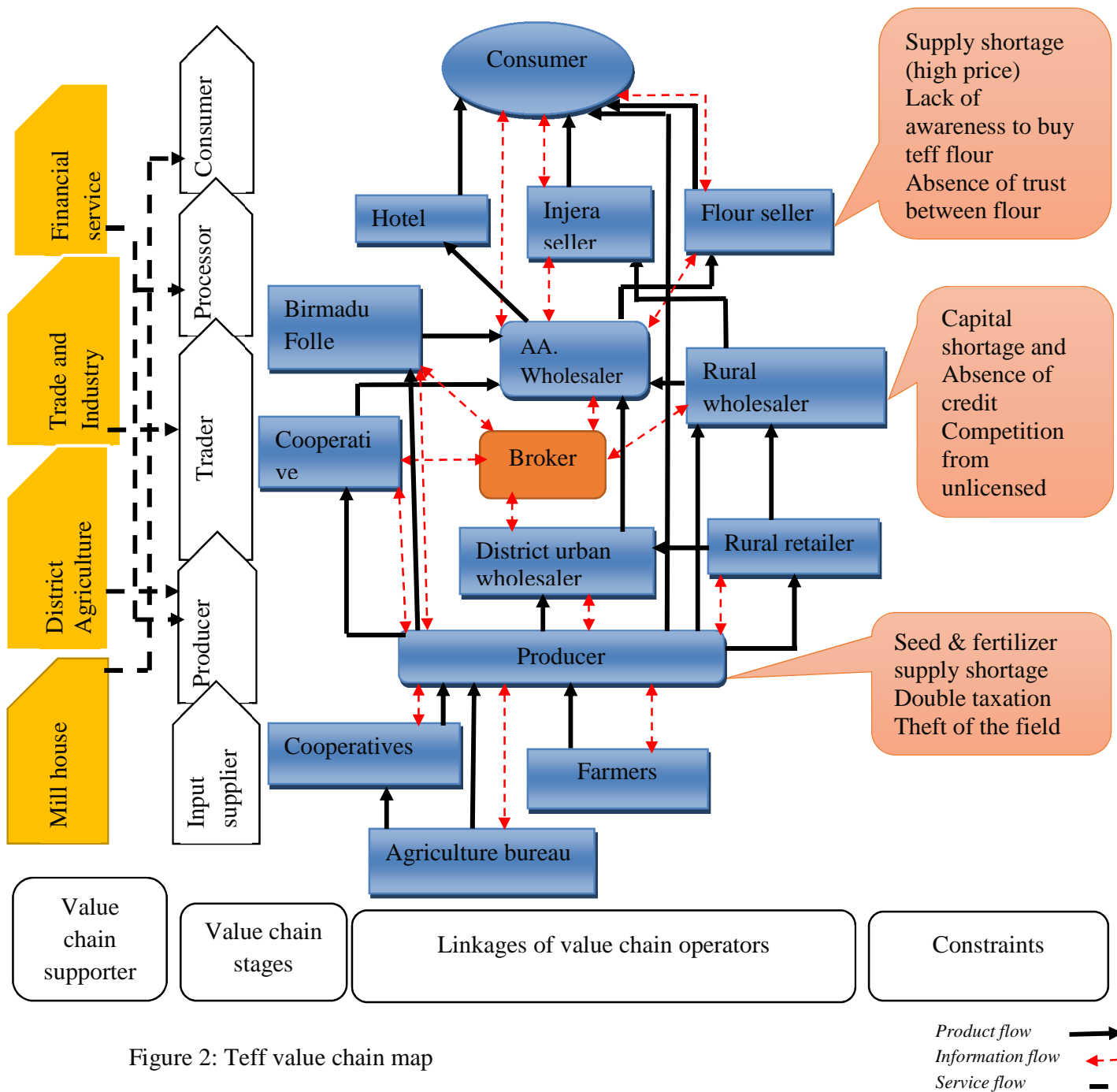
Figure 2: Teff value chain map

Source: Own draw from data collected, 2014

The service provided to the farmer by the government was better in Becho district in which 32.50% of farmers were satisfied with the service provided by government than Dawo district in which 18.57% of farmers were satisfied. There was a significant difference between Becho and Dawo districts regarding the service provided by governments at the 1% level of significance. On the other hand, in Becho District around 61.25% of farmer reported that there was no service provided to them by NGO while in Dawo about 84.06% of the farmers reported that they were not getting any service from NGOs. This is due to the existence large number of a NGOs in Becho district and the existence of a small number of a NGOs in Dawo district. There is a statistically significant difference between Becho and Dawo districts in terms of service provided by NGOs at 1% probability level. Farmers who receive the credit had higher yields, income, and improved access to farm inputs compared to non-beneficiaries. Microfinance were the main providers of credit to the farmers about 96.36% and 94.54% farmers obtained credit service were provided for Becho and Dawo districts, while relatives provided the remaining credit service to the farmers.

Producers/Farmers: *Teff* producers are small-scale farmers who grow *teff* mainly for home consumption and increasingly for income through the marketing of surplus product. The seeds that are used are in most cases home saved seeds of local varieties and improved seed obtained from cooperatives/agriculture bureaus. After harvests, the *teff* is sold mainly to local traders such as retailers and wholesalers; they can also sell directly to local consumers. Farmers are a value chain actors that participate in both productions as well as the marketing of surplus commodities they produce. At the same time, they transport *teff* to the nearest markets or urban markets by themselves, either using a pack animal or animal driven carts. The amount sold to vary from the size of *teff* fields, the amount harvested and food requirement of household (quantities of cereals).

Rural retailer: These can be business-oriented farmers. To be a rural retailer, one needs to have a transportation facility like donkeys, working capital and price information. Rural retailers collect agricultural products from rural areas and supply to major markets. In addition, they will take back consumable items non-available in village markets like salt, kerosene, soap, sugar, coffee etc. in rural areas. The rural retailer role is to gather and bulk quantities of *teff*. Rural retailers are literate and are accustomed to visiting the nearby towns repeatedly. They go into the most remote areas to collect *teff* from farm gates, storage facilities or local trade centers. Once a *teff* is accumulated in

a sufficient quantity, the rural retailers then sell the merchandise in the main trading town centers (*Tulu bolo* and *Busa*) to rural wholesaler and urban wholesalers. They use their financial resources and their local knowledge to buy *teff* from the surrounding area.

Brokers: Brokers are agents who bring together potential buyers and sellers. Most of the Addis Ababa's wholesalers have their own brokers. The function of these brokers is agitating district wholesalers to sell the produce to the wholesalers and sometimes these brokers observed forcing wholesalers/cooperatives to sell their produce to the wholesalers. They disseminate price, types of teff and other information to the market participants and they play the leading role in influencing teff trade and price formation in Addis Ababa *Ehil Berenda* market. These intermediaries play important role in the process of arbitrage on Tulu bolo and Busa markets, in particular for the two district urban and rural wholesalers, cooperatives and Birmadu Folle for selling the product to Addis Ababa market. They get their reward on quintal basis, which is about 5 birr per quintal. The brokers sometimes go beyond facilitation of transaction and tend to control and fix prices, create price symmetry and make extra benefits from the process in addition to convincing the district market wholesalers to sell their teff product at the prices set by Addis Ababa market wholesalers. Moreover, brokers are divided into village level brokers, urban brokers and commission agents.

Rural wholesalers and urban wholesalers: Wholesalers act as a link between the main producing centers and main regional or national markets. These traders collect *teff* from both farmers and rural retailers. Moreover, mixing up and packing takes place at this stage by rural and urban wholesalers. Teff grain is packed in hundred kilograms to transport it to the terminal market in Addis Ababa. These wholesalers need to have a working capital, weighing balance, canvas, negotiating skill in local language, knowledge of the different varieties of *teff*, price information, etc. These wholesalers facilitate transportation of *teff* produces to the terminal market by themselves. Districts wholesalers are major actor of the *teff* value chain who usually buy *teff* of larger volume than any other actors in the teff value chain and resell the products to the urban consumer and processors. Wholesalers usually buy from the farmers/rural retailers and bulk up large quantities to transport in Addis Ababa. Wholesalers in the terminal market directly sell *teff* produce to processors, institutions and consumers through brokers. These wholesalers are responsible to temporarily store and negotiate with purchasers until the produce is disposed. Rural

wholesaler most of the time located outside the market or on the gate of the market where farmers come to the central market. Rural wholesalers have more access to farmers than urban wholesalers. Commodities bought from different sources put together in one place (store) to be categorized so that uniformity of the product attained.

Cooperatives: They are a farmer's organization created by farmers and providing services such as fertilizer, herbicides and pesticides to farmers during the farm season. In addition to providing such services, they buy *teff* from farmers at a fair price and after *teff* bought, they give a dividend to farmers. But in the study areas the activities they were performing were not satisfying farmers because they were not efficient enough in terms of timely provisions of agricultural input and buying of their harvested products.

Flour seller: These actors of *teff* value chain are located in Addis Ababa, which buy *teff* from wholesaler and mill the *teff*. After *teff* is changed to flour, they measure and pack the flour according to the demand of consumer and sell to hotels and restaurants, *injera* sellers or consumers. The problem encounters the flour sellers in an Addis Ababa market were people's awareness about consuming the packed *teff* flour. This is due to the absence of trust between flour sellers and consumers of teff. The consumer suspects that the flour sellers mixed teff flour with the other cereal flour.

Injera seller: Injera is a sourdough-risen flatbread with a unique, slightly spongy texture. Injera sellers were teff value chain actor existed in Tulu bolo, Busa and Addis Ababa. They buy the teff from different actors such as rural retailer/wholesaler, urban wholesaler or flour seller.

Birmadu Folle: Facilitator for Change is a national resident child-centered community development organization without religious, political or government affiliation. It was established in Ethiopia with the aim of facilitating the development process among disadvantaged grass-root communities to tackle the root cause problems behind child vulnerability. Birmadu Folle Project is parts of project designed by facilitator for change, which is operating in Dawo, *Seden sodo* and Becho district of South west Shewa zone on Women Capacity Enhancement program, Education and Skill Training and household food security and market promotion program components. The

role of these NGOs is enhancing the capacity of women in the district through engaging them in the market. To be a member of group marketing they paid five birr monthly, after that, *Birmadu Folle* gives some money to buy *teff* from farmers located in the *kebeles*. They sold *teff* product to urban wholesaler and each member take dividend at the end of the year.

Consumer: Most of the consumers who were interviewed were earned income with an average monthly income of 500- 3000ETB. They showed varied preferences for eating *teff* with only 42.5% saying they had preference to consume magna *teff*, 45% had preference to consume mixed *teff* and 7.5% did prefer to consume red *teff*, whereas 5% were indifferent between consumption of mixed and magna *teff*. On average, the rural dwellers consume 4.98 quintals per year. During the interview the consumer revealed that the problem of *teff* consumption was high price of product that about 75% of consumer said that the price of *teff* is the serious problems that exist in the study areas. Consumers buy *teff* from cereal market/wholesalers/farmers, take the *teff* home for cleaning, get the *teff* milled at the mill house, and then prepare the *injera* at home. Consumer incurs cost of milling *teff* that is paid to mill house due to service provided by a mill house.

4.4.2. Gross margin and value share of *teff* value chain actors

Value added represents the contribution of payments to the primary factors of production such as seed, fertilizer and other inputs, the more value a *teff* farmers can add to a product for a given primary and intermediate cost configuration, the greater its profitability. The potential for farmers to add value to their produce lies in their ability to keep intermediate input costs as low as possible (GTZ, 2007). To calculate the value added by each actor of *teff* value chain two channels is considered. The first channel is the channel through which the *teff* products reach the district consumer. The second channel considered for calculation of value added by each actor of *teff* value chain is the channel through which the *teff* products reach the Addis Ababa city *teff* consumer.

The intermediate cost incurred by farmers to produce a quintal of *teff* includes cost of input (seed, fertilizer and pesticide cost), harvesting, threshing and transport cost. The *teff* producing farmers in Becho district added a value of 455 birr per quintal, which is 33.58% of the total value added in the district. The Dawo district farmers adding a value of 404 birr per quintal that is 34.71% of the

total value added in the district. Value added by *teff* farmers in Dawo district was greater than that of Becho district, this is due to the price paid and marketing cost difference between the two districts. The value added by a farmer was smaller than a value added by *injera* seller. The intermediate cost the farmer incurs was greater than intermediate cost incurred by *injera* seller. As indicated in Table 14 the share value added by farmers was higher at district market compared to Addis Ababa market. Results indicated that the presence of brokers in a value chain reduces the share of value added by farmers. Reddy *et al.* (2010) also concurs that shorter marketing chains present more benefits to farmers than longer ones. The higher benefits can be attributed to lower transaction and marketing costs.

Table 11: Distribution of value added of teff across actors and district

Becho Actors	Sales price	Intermediate inputs	Value added by actor at district	Value added by actor at AA	% share of value added	% share of value added at AA
Producer	1100	645	455	455	33.58	27.33
Rural retailer	1350	1115	235	235	17.34	14.11
Rural wholesaler	1450	1360	90	90	6.64	5.41
District urban wholesaler	1570	1470	100	100	7.38	6.01
Injera seller *	2075	1600	475		35.06	
AA wholesaler	1650	1600		50		3.00
Flour seller	1860	1700		160		9.61
Injera seller	2275	1700		575		34.53
Dawo						
Producer	1090	686	404	404	34.71	26.42
Rural retailer	1300	1120	180	180	15.46	11.77
Rural wholesaler	1420	1315	105	105	9.02	6.87
District urban wholesaler	1500	1445	55	55	4.73	3.60
Injera seller *	1950	1530	420		36.08	
AA wholesaler	1650	1600		50		3.27
Flour seller	1860	1700		160		10.46
Injera seller	2275	1700		575		37.61

Note: ***** indicate the actor involved at the district only and **AA** represents Addis Ababa

Source: Generated from field survey data (2014)

The value adding activity performed by rural retailer was cleaning and packaging of *teff* as it is appropriate to sell to urban/rural wholesalers. Rural retailers added 235 birr per quintal in Becho district and the rural retailer add birr 180 per quintal in Dawo district. The percentage of a value added from the total value added is 17.34% and 15.46% for Becho and Dawo districts respectively (Table 12).

The percentage share of value added by rural wholesaler and urban wholesaler in Becho district were 6.64 and 7.38 percent respectively. While in Dawo district the value share of rural and urban wholesaler was 9.02 percent and 4.73 percent respectively. The value adding activity undertaken by wholesaler is arranging the category of *teff*, cleaning, packaging and transportation of *teff* to scarce areas. The rural wholesaler added a value of 90 birr per quintal and urban wholesaler added a value of 100 birr per quintal in Becho district. The value added by Dawo district rural wholesaler is greater than Becho district rural wholesaler.

The intermediate costs averaged 1600 birr per quintal of *teff* for district *injera* sellers. One quintal of *teff* converted to 593 *injera* and average selling price of one *injera* was 3.50 birr. Then the sales price of one quintal of *teff* after converting to *injera*, was 2075 ETB for Becho district. Calculation of value added by the *injera* seller for Busa town and Addis Ababa city was done by the same procedure. Injera seller adds 475 birr per quintal, which is 35.06% of the total value added in Becho district for *teff* sold in Tulu bolo town. The percent share of total value added was 36.08% in Dawo district, which is about 420 birr per quintal for *injera* sold in Busa town. Tulu bolo town Injera seller took the highest percent of value shares of Becho district *teff* value chain actors.

Flour seller value chain actor only existed in the Addis Ababa market. Flour seller adds 9.61% and 10.46% of the total value added for *teff* supplied to Addis Ababa from Becho and Dawo districts respectively, which is about 160 birr per quintal for Becho and Dawo districts *teff*. Value addition by Addis Ababa *injera* seller for *teff* supplied from Becho and Dawo district was 575 birr per quintal, which is about 34.53% and 37.61 of the total value added respectively. The *injera* seller added the highest value added at district and Addis Ababa. This implies that the value adding activity performed by *injera* seller is greater than other actor involved in the *teff* value chain.

4.4.3. Value chain governance and operators linkages

The forms of a chain governance range from spot market to vertical integration of the entire value chain. Analyzing the existing business linkages includes judging the intensity and sustainability of cooperation, the existence of lead firms and their attitude and commitment. A related point is the analysis of conflicts arising from differences in negotiation power, asymmetric information and competition for resources between value chain operators. Business linkage studies also include the degree of sector organization, especially the capacity of commercial business associations (GTZ, 2007).

Chains are characterized by a dominant party, known as the lead firm, which coordinates the interaction between the links in the chain and becomes responsible for upgrading activities in the individual links. The role of 'governance' can undertake either by buyer-driven chains or by producer-driven chains (Gereffi, 1995). In Becho district about 85% of the producers accepted the price and product specification determined by the buyer, even though the price was lower than the average market price. In the case of the Dawo, about 12.65% of producers had to accept the price determined in negotiations with traders and the rest accept the price offered by the buyers. It appears that the producers in the study areas have limited bargaining power. This is due to the lack of a proper market information system, highly scattered production structure, lack of producers' organizations, and minimal bargaining power, smallholders' farmers are highly dependent on intermediaries to take their produce to the markets and forced to accept the price set by buyers. There is buying and selling (transaction) but little exchange of information and learning from one another (interaction) in *teff* value chain in both districts. This type of value chain governance is market-based relationships, because the conditions of exchanging goods and services are based on the market price. This means that buyers (traders) govern *teff* value chain in study area.

Improving flow of information between farmers and potential buyers is crucial in reducing transaction costs within the value chain because it lowers the cost of searching for information. Monitoring costs is reduced if information regarding buyers, sellers, and other market conditions such as price transmission and product quality is effectively relayed between various chain

participants. Information asymmetry affects the coordination of the value chain actors. Based on the quality of information transmitted from buyers/other sources about the price of *teff* to supplier there was a problem in which only 10.77% and 0% farmers obtained adequate information on the price of *teff* in Becho and Dawo districts. The survey result indicates that the farmers took the *teff* product to market based on information obtained from different sources.

Table 12: Price determination and linkages of farmers

Variables		Districts		Chi-square
		Becho	Dawo	
Price setting	Buyers	85	83.33	
	Set by demand and supply	7.50	0.00	8.92***
	Negotiations	7.50	12.65	
Quality of market information	Wrong information	23.08	38.46	
	Medium information	66.15	61.54	7.98**
	Adequate information	10.77	0.00	
Farmers linkage with buyers (yes)		2.50	5.71	1.00
Farmers linkage with other farmers (yes)		12.50	15.71	0.32
Member to cooperatives (yes)		93.75	95.57	0.59
Difficulty of getting buyer by farmers (yes)		53.75	72.46	5.53**
Place to put the product if buyer not exist	Take back to home	19.23	24.07	
	Sold at other market	23.07	14.815	
	Sold at low price	44.23	33.335	10**
	Put at relative house	13.46	27.78	
Farmers level of buyer trust	Very little	18.75	22.86	0.39
	Little	68.75	65.71	
	Moderate	12.50	11.43	

***, ** and * are statistically significant at 1%, 5% and 10% probability level, respectively
Source: Generated from field survey data (2014)

About 53.75% and 72.46% of Becho and Dawo districts farmers faced difficulty of getting *teff* product to buyers and forced to sell their product to low price, otherwise put relative house and transfer the product to other market in which the farmers incur additional transportation cost. There was significant difference between Becho and Dawo districts in terms of difficulty to get a buyer when they supplied *teff* product to the market due to an asymmetric information flow between *teff* producers and buyers.

When the transaction (mainly buying and selling) takes place between enterprises at different stages of the value chain it is called vertical linkages. The farmers' linkages with buyers of his *teff* product are vertical linkages. However, the survey result showed that only 2.50% and 5.71% of the farmers had linkages with their *teff* product buyers from Becho and Dawo districts respectively. Horizontal business linkages refer to the transactions between enterprises operating in the same functional segment of the value chain. These are, for example, joint purchase and sales activities and joint use of equipment and facilities. The *teff* farmers' linkages with other *teff* farmers showed that there is only 12.50% and 15.71% of Becho and Dawo districts farmers linked to obtain the market players and transfer farming experience in the study area. This implies that there were weak linkages among the *teff* producers in the study areas.

Table 13 indicates that 93.75% of the farmers belong to cooperatives from Becho district and 95.57% of the farmers were member of cooperatives from Dawo district. During the FGD farmers mentioned various reasons of being members of the cooperatives to get fertilizers, pesticides and other services because it is a requirement by the Agriculture bureau or cooperatives. A trust index based on a household's rating of their level of confidence in buyer was scaled on a 1 (very little) - 5(very much) point scale. Information was found to flow from buyers, through their agents and/or brokers, to the farmers. Out of the total sample from Becho district 18.75%, 68.75% and 12.50% of the farmer level of their buyers trust were very little, little and moderate respectively. In Dawo district about 22.86%, 65.71% and 11.43% of the farmer level of their buyer trust were very little, little and moderate respectively. This implies that on average majority of the farmer didn't have the trust on their buyers.

The *teff* value chains in the study areas are characterized by a highly fragmented. The majority of study areas value chain actors have very little direct contact with producers of *teff*. The disadvantages of fragmented form of *teff* value chain in Becho and Dawo districts were;

➢ There was no guarantee for the quality of the *teff* supplied, because there was very little feedback from the wholesaler or processors to their suppliers and contracts didn't exist to enforce certain quality standards.

- It was impossible to trace the supplied *teff* products. In the light of increasing demand for teff consumption, this situation is a big drawback in *Becho* and *Dawo* districts.
- Disintegrated value chains were accompanied by high search costs, since most of the actors were not embedded in the chains. In other words, since wholesalers or processors didn't have strong relationships with their suppliers and purchasers, they have had to look for the suppliers being able to deliver the right quality and quantity.
- Knowledge transfer was reduced because chain specific channels were missing. Knowledge about quality standards, prices, and market trends couldn't reach the upper ends of the chains or farmers.

4.4.5. Constraints of value chain actors

4.4.5.1. Production and marketing constraints of *teff* producers

The marketing problem that market participant farmers face includes absence of infrastructure, storage facility, farmer reluctance to sell, double taxation, price setting and others are depicted in Table 15. Out of the market participants farmers 9.32% had the problem of double taxation and 83.05% had price-setting problem.

Table 13: Production and marketing problems of farmers by market participation

Variable	Mean/proportion			t-/χ^2-value
	Total	Participants	Non-participants	
Shortage of fertilizer supply (yes)	20.67	18.64	28.13	1.38
Shortage of seed supply(yes)	39.33	38.14	43.75	0.33
Shortage of cultivable land(yes)	27.33	27.12	28.13	0.01
Occurrence of disease(yes)	18.67	16.95	25	1.08
Theft of the field(yes)	24.67	25.42	21.88	0.17
Double taxation (yes)	8.67	9.32	6.25	0.30
Price setting(yes)	80.67	83.05	80.67	2.02

Source: Generated from field survey data (2014)

From the total non-participant's farmers 6.25%, faced the problem of double taxation and 80.67% faced price setting problem. In terms of the marketing problem such as double taxation and price setting there was no significant difference between market participants and non-participants. The production problem that encountered market participants and non-participants are shortage of

fertilizer, seed supply and land and the sudden occurrence of diseases. There was no significant difference between market participants and non-participants, farmers in terms of shortage of fertilizer, seed supply, and land availability, the sudden occurrence of diseases and theft on the field.

During the FGD and KII with farmers, DAs and Agriculture bureau workers the following issues were raised as a problem that encountered *teff* producers in the study area;

High price of fertilizer: The price of fertilizer was very high which difficult to buy and reduce the amount of production. Despite existence of input suppliers, the high prices made it difficult for farmers to have access to fertilizer.

Poor access to extension services: In spite of the availability of extension services in the districts, their staffs did not work during the summer season when it is a critical time to help farmers professionally. On the other hand, they concentrated on the production aspect with giving less emphasis on marketing aspect and handling of products.

Poor market orientation of farmers: Farmers used to sell their crop immediately after harvest without seeking to make the best possible profit (at the best time or the best price) this was due to liquidity constraints.

Farmers have a strong mistrust towards buyers: Farmers thought traders, especially local traders, had cheated them through the use of fake weights and measurements.

Poor capacity of cooperatives: Cooperatives had low in capacity to bulk, process, add value, and sell together. Even though some cooperatives acquired stores, but they underutilized them.

High marketing costs: Due to the poor conditions of roads and the lack of access to means of transportation, it was costly and time-consuming for farmers to market their produce. For example, *teff* producing farmers in Dawo got it expensive to bring *teff* to Busa for sale.

4.4.5.2. Marketing constraints of traders

The major marketing constraints that encountered traders were absence of infrastructure, absence of government support, and absence of the storage facility, capital shortage, access to credit, farmer reluctance to sell and lack of demand. The absence of infrastructure was the problem in both districts. Out of the total sample traders 78 percent of traders reported that there was a problem of infrastructure in the district.

Table 14: Marketing problems of traders

Variable	Mean/proportion			χ^2-value
	Total	Becho	Dawo	
Absence infrastructure (yes)	78	82.14	68.18	1.38
Absence of storage facility (yes)	63.83	60.87	66.67	0.17
Information flow problem (yes)	11.11	7.14	15.38	0.92
Capital shortage (yes)	64.81	78.57	50	4.16**
Access to credit (yes)	9.26	10.71	7.69	0.15
Absence of government support (yes)	75.93	71.43	80.77	0.64
Lack of demand (yes)	3.70	7.14	0	1.66
Farmer reluctance to sell (yes)	88.68	92.59	84.62	0.84

** is statistically significant at 5% probability level, respectively

Source: Generated from field survey data (2014)

The problems that faced urban wholesalers, rural wholesalers, rural and urban retailers were absence of infrastructure, government support, and storage facility and farmer reluctance to sell their *teff* product. Especially during the survey, traders said that the government organized the farmers in the form of cooperatives to buy the *teff* product and reduced the amount supplied to the traders.

Table 15: Problem of teff value chain actors in Becho and Dawo districts

Variables	Value chain actors								χ^2-value
	Urban Wholesalers		Rural retailers		Urban retailers		Rural wholesalers		
	N	%	N	%	N	%	N	%	
Absence infrastructure (yes)	27	79.41	5	71.43	4	100.00	3	60.00	2.29
Absence of storage facility (yes)	19	61.29	5	71.43	3	75.00	3	60.00	0.51
Information flow problem (yes)	3	8.57	2	25.00	0	0.00	1	14.29	2.36
Capital shortage (yes)	24	68.57	6	75.00	1	25.00	4	57.14	3.54
Access to credit (yes)	3	8.57	1	12.50	1	25.00	0	0.00	2.01
Government support (yes)	27	77.14	6	75.00	2	50.00	6	85.71	2.89
Lack of demand (yes)	1	2.86	1	12.50	0	0.00	0	0.00	2.23
Farmer reluctance to sell (yes)	30	88.24	7	87.50	3	75.00	7	100.00	1.66

Capital shortage was the problem that encountered urban and rural retailers. When the problems were checked across different actors of the value chain, there was no significant difference between the actors. In addition to interviewing of traders KII was held with different supporters of *teff* value chains such as DAs, agriculture and trade and industry bureaus of the districts they said that there is mistrust among the different actors of the value chain due to each actor run to cheat other actors. The flow of product did not take into consideration the existence of demand for the product at that time, traders may decrease the price of the product, and farmer's reluctance to sell the *teff* happened.

4.5. Factor Affecting Market Participation and Marketed Surplus

The results of DH model for factor affecting market participation and intensity of marketed surplus are displayed in Table 18. Diagnostic test for multicollinearity which is a common problem in any regression analysis was conducted based on VIF and CC to identify any potential misspecification problems that may exist in the estimated models (Appendix Table 5 and 7). This implies that multicollinearity is not a problem with the estimated models. Breusch-Pagan / Cook-Weisberg test for heteroscedasticity test also shows there is no problem of hereroscedasticity in the 1st and 2nd stages of Double Hurdle model (Appendix Table 6).

The Wald chi-square value is 116.54 for market participation decisions that are significant at 1% significance level and indicating that explanatory variables jointly explained the probability of participating in the *teff* market. Smallholder farmer's decision to participate in *teff* market is determined significantly and positively by agroecology, access to credit, farm size, perception of lagged market price and ownership of transport equipment while it is significantly and negatively determined by family size.

Land allocated for *teff* production positively and significantly affects the probability of market participation at 10% probability level. The result is similar to expectation and a unit increases in the farm size increases the likelihood of market participation by 15.5%. A farmer who has a large farm size would have high probability to allocate more land for production of *teff*. Similar to the

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study done by Masoku *et al.* (2001) which showed that positive and significant relationship between land size and market participation in the maize market.

As expected, access to credit positively and significantly influences the likelihood of farmers in market participation at 1% significance level. A shift from lack of credit to access credit has increased the probability of market participation by 39.6 percent. It implies that access to credit gives the farm households the economic power to cultivate on large scale by buying more land for *teff* production and enables farmers to buy others farm inputs. Randela *et al.* (2008) also found that access to credit had a positive and significant impact on producers' likelihood to participate in cotton market in South Africa, because availability of credit reduces transaction costs of both in input and output markets. Similarly, a study done by Alene *et al.* (2007) found positive and significant relationship between access to credit and maize market participation decision.

Farmer perception on lagged (last year) market price of *teff* is significant at 10% and 1% probability level for farmers whose perception on last year price are medium and low respectively. The change in probability of market participation when perception on lagged market price goes from 'high' to 'medium' decrease by 6.8%. Farmer whose perception on lagged market price of *teff* is low, about 13.5% less likely to sell *teff* relative to farmer who perceived lagged market price as high. This implies that when perception of lagged market price by farmers is high it motivates the farmers to produce more, they have surpluses to supply to the market and the lagged price can act as a motivation for them to participate or not to participate in the market. This is in line with Myint (2003) if prices in one year are bad, farmers will often respond by planting less in the next year. Gebreselassie and Sharp (2008) also discussed that last year prices of *teff* had a strong positive and high significant effect on the probability of market participation as a seller.

Agroecology is positively and significantly affects the probability of market participation by smallholder farmers at 5% probability level. This implies that if the farmers are from midlands the probability of market participation increases by 13.5% than farmers from highlands. This implies that highlands have the least agricultural potential of *teff* production and midlands have high potential *teff* production.

Table 16: Regression result for double hurdle model of market participation

Variables	Probit			Truncated		
	Coefficient	Robust Std. Err.	Marginal effect	Coefficient	Robust Std. Err.	Marginal effect
Sex of the household head	-1.45	1.148	-0.08	-0.195	0.134	-0.192
Farming experience	-0.046	0.0372	-0.003	-0.001	0.0054	-0.001
Family size	-0.300*	0.157	-0.017	-0.059**	0.0248	-0.059
Distance to nearest market	-0.002	0.0906	-0.0001	-0.024*	0.0126	-0.023
Literacy status	-1.133	1.036	-0.063	0.023	0.120	0.023
Access to credit	7.158***	2.093	0.396	-0.099	0.123	-0.098
Farm size	2.795*	1.570	0.155	1.257***	0.182	1.238
Perception of lagged market price	-1.388*	1.103	-0.068	0.143	0.114	0.141
	-2.790**	1.352	-0.135	-0.150	0.122	-0.146
Perception on current prices	-0.114	5.403	-0.006	0.497**	0.253	0.476
	0.372	5.461	0.021	0.762***	0.260	0.738
Agroecology	2.447**	1.125	0.135	0.257*	0.145	0.253
Transport equipment	1.977*	1.029	0.109	-0.058	0.104	-0.057
On/off-farm income	-0.06	0.223	-0.003	0.127***	0.041	0.125
Livestock owned	0.09	0.077	0.005	-0.021**	0.0097	-0.021
Constant	-12.13*	6.742		-0.775*	0.420	
Wald/LR Chi square	116.54			133.80		
Log-likelihood	-13.99			-82.56		

***, ** and * are statistically significant at 1%, 5% and 10% probability level, respectively
Source: Generated from field survey data (2014)

As hypothesized ownership of transport equipment is positively and significantly influences the market participation at 5% probability level. Thus, a shift from lack of transport equipment would increase the likelihood of market participation by 10.9%. This is because after production, farmers are constrained by transport cost and households own transport equipment would sell more because ownership of transport equipment would reduce transportation cost. Ownership of transport equipment such as donkeys and animal carts have positive impact on market participation by reducing the cost of transporting inputs from the market to the farm and output from the farm to the market. The finding corroborates that of Jagwe (2010) who found that in Great Lake Regions

of Burundi, Rwanda and Democratic Republic of Congo ownership of means of transport had have a positive and significant effect on the probability of farmers participating in banana markets. Also, it is consistent with the finding by Kabeto (2014) that showed ownership of transport equipment lowers the proportional transaction costs, thereby enhancing the probability market participation of red bean.

Family size is negatively associated with the probability of market participation at 5% level of significance. An increase in the household size by one person decreases likelihood of market participation by 1.7%. The larger family size lower marketed surplus than smaller family size, since the larger family size, the higher quantity consumed, and the less available for sell. This finding is inconsistent with Gani and Adeoti (2011) that family sizes have positive relationship with the probability of market participation decision.

To analyze the factor affecting intensity of market participation second stage of double hurdle (Truncated) model was used. Out of the variables included in the model six were found to affect the intensity of market participation significantly namely; farm size, family size, perception on current price, distance to nearest market, number of livestock owned (TLU) and on/off-farm income. The coefficient for farm size allocated for *teff* production, perception of current price, agroecology and income from on/off-farm activity have positive relationship with quantity of marketed surplus, whereas coefficient of family size, distance to the nearest market, and number of livestock owned have been negatively affect the intensity of marketed surplus.

Household size is negatively associated with the intensity of *teff* sold at 5% probability level. An increase in the household size by one person decreases sale of *teff* by 5.9%. This implies that households with larger family sizes were less likely to participate in the *teff* market as sellers; they sell small *teff* when they participate. This could be because a large family size increases the quantity of *teff* needed for home consumption thereby reducing the marketed surplus. On the other hand, a larger household is labor-inefficient and produces less output but consumes a higher proportion, leaving smaller and decreasing proportions for sale. This finding is in line with Omiti and Mccullough, (2009) that showed negative relationship between family size and amount of marketed surplus in case of rural and peri-urban areas of Kenya.

Geographical locations of the households have positively and significantly affect intensity of market participation at 10% probability level. The amount of marketed surplus of *teff* increases by 25.3% if the farmers are from midland as compared to its counterpart. This implies that highlands are characterized by poor infrastructure and relatively low economic activity. These characteristics hugely reduce the likelihood of households participating in *teff* markets. The cheaper transport option lowers the proportional transaction costs and the exposure to wider markets lowers the fixed transaction costs associated with *teff* marketing for farmers from midlands.

Distance to the nearest market negatively and significantly influences the intensity of marketed surplus at 10% significant level. When the household is located one Kilometer away from the market, the quantity of *teff* sold decreases by 2.3%. It implies that as the distance from the nearest market increases, variable transport costs increase and this discourages smallholder farmers from selling high volumes of *teff*. These results are consistent to finding of soybean market participation by smallholder farmers in Zimbabwe in which distance to the market negatively influences smallholder farmers' extent of market participation (Zamasiya *et al.,* 2014).

Farm size allocated for *teff* production is positively and significantly affects the extent of marketed surplus at 1% significance level. One hectare increase in the farm size allocated for *teff* production increases volume of *teff* sold by 1.238%. The larger the farm size, the larger the area allocated to *teff* production thereby increasing the quantity of produce available for sale. This is in line with the study done by Abayneh *et al.* (2013) which showed a positive significant relationship between land size and extent of market participation in haricot bean market in Ethiopia. Olwande and Mathenge (2012) also found that the size of land cultivated has had a significant and positive relationship with the extent of market participation among poor rural households in Kenya.

Farmer medium and low perception on current price of *teff* is positively and significantly affected quantity of marketed surplus as compared to its counterpart (reference category is high perception on current price) at 5% and 1% probability level. Marginal effect of farmer perception on current price of *teff* showed that farmers who perceived current price of *teff* medium and low are just as likely to sell *teff* as farmer who have high perception on current price of *teff*, and sold about 47.6%

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and 73.8% more marketed surplus respectively. This is due to decrease in the price of product followed by increase in the quantity marketed surplus, since a higher quantity marketed can meet their cash requirements and vice versa. On other hand, lowest potential region react to higher expected *teff* prices by reducing their quantity of selling *teff*. On the other hand, negative price response is due to poor agro ecological environment (i.e. low supply elasticity) and the fact that *teff* constitutes a larger portion of household income (i.e. high-income elasticity). Strong household preferences to store food rather than rely on the market and low substitution effect between food and other goods. This finding is consistent with Renkow *et al.* (2004) that showed an increase in price for a subsistence crop may increase the producer's real income sufficiently so that the income effect on his demand for consumption of the crop outweighs the price effects on production and the consumption, and hence the marketed surplus may vary inversely with market price.

On/off-farm income earned by *teff* farmer is found to be positively and significantly affect volumes of *teff* sold in the market at 1% probability level. One percent increase of income from on/off-farm activity is associated with 0.125% increase in amount of marketed surplus of *teff*. This result implies that farmers engaged in off-farm activity and other farming activity earning income other than *teff* farm income tend to dedicate more time to production and marketing of *teff*, which possibly results in higher quantities of *teff* sold. On the other hand, farmers who were liquid from on/off farm income were able to finance production and produced more marketed surplus of *teff*. The result is consistent with the finding of Siziba and Diagne (2011) that studied determinants of cereal market participation by sub-Saharan Africa smallholder farmer and found that there are positive relationship between off farm income and extent of market participation.

The number of livestock owned by households is negatively and significantly affects the intensity of marketed surplus by smallholder's farmers at 5% probability level. This implies that when the household has less production; it must either borrow money or sell his livestock to meet household needs. Farmers who have low production of *teff* need to specialize in livestock production and hence it has negative impacts on marketed surplus. The result shows that one percent increase in the livestock causes 2.1 percent decrease in the intensity of marketed surplus. This is in line with study by Mussema (2006) that total tropical livestock unit has a negatively and significantly affected quantity of pepper sales.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusions

Teff is the most important crop in Ethiopia in terms of area and value of production, and is the second most important cash crop after coffee. In Becho and Dawo districts, there are eight *teff* marketing channels and the highest gross marketing margins, farmers received is 78.67% and 75%, whereas the lowest gross marketing margin received by farmers is 62.22%. The market structure of *teff* in the *Tulu bolo* and *Busa* town was imperfect market.

Value chain actors of *teff* value chain in the districts were input suppliers, farmers, rural retailers, rural wholesalers, urban wholesalers, urban retailers, cooperatives/unions, *injera* sellers, flour sellers, NGOs (*Birmadu Folle*) and consumers. The supporter of value chain actors includes financial institution (microfinance), district agriculture office and cooperatives (union). The input suppliers in the *teff* value chain of Becho and Dawo districts were the district agriculture bureau and cooperative (Union) and they supply the input to farmers. During the production, farmers obtain services such as the amount of fertilizer, seed and herbicides used per hectare from the district agriculture bureau through DAs. After production, the farmers sell the product to rural retailer, rural wholesaler, urban wholesaler and cooperatives (union) and passing through this linkage the product reach the end consumer. The value share of producers, rural retailers, rural wholesalers, district urban wholesalers and district *injera* sellers in the *teff* value chain for Becho districts were 33.58%, 17.34%, 6.64%, 7.34% and 35.06% respectively. While for Dawo districts the value share from the total value added were 34.71%, 15.46%, 9.06%, 4.73% and 36.08% for producers, rural retailers, rural wholesalers, district urban wholesalers and district *injera* sellers in the *teff* value chain for Dawo district *teff* respectively.

The production and marketing constraints that encounter farmers were shortage of fertilizer, seed supply, price setting, theft on the field, the high price of fertilizer, poor access to extension services; farmers has a strong mistrust towards buyers, poor capacity of cooperatives, high marketing costs and the sudden occurrence of disease. Traders of *teff* in the district has the absence of infrastructure, capital shortage, access to credit, farmer reluctance to sell, information flow, lack of demand,

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absence of storage facility and the absence of government support. Among those problems that traders faced was capital shortage are statistically significant difference between market participant and non-participant *teff* farmers. Price determination and product specification in the teff value chain are governed by traders.

The market participation decision of *teff* farmers is influenced significantly and positively by the land allocated for *teff* production, access to credit, ownership of transport equipment and agroecology while farmer's perception on lagged market price of *teff* and family size negatively affects participation decision. The intensity of market participation is influenced by family size, agroecology, distance to the nearest market, farm size, TLU, the income obtained from other farming and off farm activity and farmers perception on current price. Among the factors significantly affecting the intensity of marketed surplus; family size, TLU, and distance to the nearest market are negatively affect marketed surplus while farm size, agroecology, perception of current price and off/on farm income positively influences the amount of marketed surplus of *teff*.

5.2. Recommendations

Based on the findings of this study the following recommendations are necessary to develop value chain of *teff* that are locally adapted and acceptable to cut down the high price of *teff* and increase competitiveness of smallholder *teff* producers. Despite extension services are being largely provided by government efforts still remain important to empower farmers to best practices through training and information. Improved market information should be made available to all participants in the chain.

Strengthening market linkages between farmers and traders through provision of market information and promote collective marketing. This is due to information is crucial to strengthen the bargaining power of farmers, and to help them make the right decisions when it comes to selling their product (at the right time and the right price). Farmers have access to better markets information and better prices when they work in group. Markets should be regulated to reduce exploitation of farmers by potential buyers by making *teff* traders to obey the rules and regulations of Ethiopia commodity exchange and Oromia agriculture product marketing institutions. A pricing

mechanism that takes cognizance of the production cost by smallholders should be adopted to avoid using prices that only favor upstream traders.

The value addition activity performed by different types of traders engaged in *teff* was cleaning and packing of *teff*. However, the price they charged to sell to the consumers was around double, which affect the consumers of *teff* in urban areas. The districts administrations bureaus and cooperatives (unions) should intervene trader's activity by organizing the urban *teff* consumers in cooperatives.

Even though there was a standard set for *teff* price determination, traders were not guided by these standards. To solve this problem the Ethiopia commodity exchange, Oromia agriculture product marketing office, district agriculture office and unions must increase the capacity of cooperatives to reduce the price determination of traders and increasing the bargaining power of farmers.

Agriculture office and cooperatives should have policy interventions that enable farmers to consider venturing into value addition practices such as cleaning, processing and packaging their *teff* for the local supermarkets.

Access to credit is seen as a great enabler for smallholder farmers to improve their production methods and ultimately increase outputs on farms. To enhance borrowing and use of credit, district agriculture office and Oromia credit and saving institutions together with other credit schemes and credit institutions should formulate educational programs to educate farmers on credit acquisition and use.

In addition, development of infrastructure should be improved; especially roads facilities should be established around the production centers. This will lower the rate of transaction cost thus enabling farmers to present more produce of better quality for sale.

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7. APPENDIX

Appendix A. Tables and Figures

Model specification test

The table below indicated that there is no problem of Probit and truncated model specification since the p-value for **_hatsq** is insignificant for both model.

Appendix Table 1: Linktest for log-truncated model specification

Truncated regression					Wald chi2(2) = 129.14	
Log likelihood = -85.54294					Prob > chi2 = 0.0000	
QM_S	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
_hat	1.526	0.479	3.19	0.001	0.588	2.464
_hatsq	-0.142	0.123	-1.15	0.250	-0.384	0.1001
_cons	-0.445	0.452	-0.99	0.324	-1.331	0.441

Source: Own computation from survey, 2014

Appendix Table 2: Linktest for Probit model for market participation decision

Probit regression					LR chi2(2) = 116.82	
					Prob > chi2 =0.0000	
Log likelihood = -73.845023					Pseudo R2 = 0.8084	
MDF_D	Coef.	Std. Err.	Z	P>z	[95% Conf.Interval]	
_hat	1.077	0.267	4.02	0.00	0.552	1.602
_hatsq	0.074	0.085	0.87	0.38	-0.092	0.241
_cons	-0.085	0.294	-0.29	0.77	-0.663	0.491

Source: Own computation from survey, 2014

Appendix Table 3: Conversion factors used to compute tropical livestock units

Animal category	TLU
Calf	0.25
Weaned calf	0.34
Heifer	0.75
Cow or ox	1.00
Horse/mule	1.10
Donkey adult)	0.70
Donkey young)	0.35
Camel	1.25
Sheep or goat adult)	0.13
Sheep or goat young)	0.06

		0.013
Chicken		0.013
Bull		0.75

Source: Storck *et al*., 1991

Appendix Table 4: Contingency coefficients for dummy variables

	SHD_D	LSH_D	ATC_D	PLMP_D	PFP_C	AE_D	OTE_D
SHD_D	1						
LSH_D	-0.018	1					
ATC_D	0.118	0.042	1				
PLMP_D	0.041	0.084	-0.031	1			
PFP_C	-0.112	0.184	-0.144	0.252	1		
AE_D	0.090	0.008	-0.133	0.002	0.023	1	
OTE_D	0.003	0.013	0.143	0.003	-0.021	-0.038	1

Source: Own computation from survey, 2014

Heteroscedasticity test for 2nd stage double hurdle model

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of lQM_S1 and MDF_D

Appendix Table 5: Heteroskedasticity test result

	Probit model (1st)	Truncated model (2nd)
Chi2 (1)	3.25	0.06
Prob > chi2	0.3658	0.8082

Source: Own computation from survey, 2014

Appendix Table 6: Variance inflation factor for continuous explanatory variables

Variable	2nd stage of DH model		1st stage of DH model	
	VIF	Tolerance	VIF	Tolerance
LCF_C	1.40	0.714	1.33	0.749
TFE_C	1.37	0.731	1.25	0.799
NFIA_C	1.29	0.775	1.24	0.806
FS_C1	1.26	0.796	1.14	0.874
PTM_KM	1.09	0.919	1.04	0.959
TLU	1.06	0.939	1.06	0.943
Mean VIF	**1.24**		**1.18**	

Source: Own computation from survey, 2014

Appendix B. Questionnaires

Introduction to questionnaire

The purpose of this research is to analyze *Teff* value chain in *Becho* and *Dawo* District of South West Shewa, Ethiopia. You are being invited to participate in this research study. Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any question. To the best of my ability your answers in this study will remain confidential.

I. Demographics information

	Household characteristics	Code
1	Sex of household (Code I)	
2	What is your family size?	
3	Age of household	
4	Religious of household (Code II)	
5	Marital status of household (Code III)	
6	Educational level of household (Code IV)	
7	What is your household size?	**1. 14-65 age_____ 2. >14 age____ 3. <65 age ___**

Code I	Code II	Code III	Code IV
1. Male	1. Muslim 2. Orthodox Christian	1. Single 2. Married	1. Illiterate 2. Primary
0. Female	3. Protestant 4. Catholic	3. Divorced 4. Widow	3. Secondary 4. University
	5. *Waqefata* 6. Other (specify) ---		5. Above degree

II. Area information

1. Districts   1. Becho   2. Dawo
2. Name of Rural Peasant Administration------------
3. Distance of your residence from the nearest market center _____Kms.
4. Distance of your residence to the nearest development center _____Kms.
5. Distance to all weather road_____Kms.
6. Distance of your residence from the nearest urban center_____kilometres.

III. Resource ownership and tenure

1. What is the type of house you have? 1. Grass roofed   2. Iron sheet roofed   3. Both
2. Do have your own plowing tools (*Mofer, Kenber, maresha etc*)   1. Yes   2. No
3. How much land do you own and rent respectively?_____and _____hectare
4. What is the total size of your farmland under agriculture (size in hectares)?_____
5. From the total farmland how many hectare you allocate for *teff* production?_____hect
6. Ownership of communication and transport equipment

Do you have own the following things?	Radio	Tape recorder	Mobile phone	Cart owned	Bicycle	Animal cart
1. Yes 0. No						

7. Number of livestock owned by household

Type of livestock	Cows	Oxen	Heifers	Calf	Weaned calf	Sheep young	Sheep adult	Donkey adult	Donkey young	Horses	Mules	chicken	bull
Number owned in 2013/14													
No. of sold													
Cash income from sold (Birr)													

IV. Production of crop

7. How many years have you been working in *teff* cultivation?_____years

8. Production of *teff* and food grains in 2013/14

	Type of crop	Area in *he*	Quantity produced (qt)	Seed Types used (1. Improved 2.Local 3. both)	Quantity consumed (qt)	Quantity sold (qt)	Price/qt
1	*Teff*						
2	Wheat						
3	Chickpea						
4	Grass pea						
5	Other						

9. What was your input for teff production & their sources in 2013/14?

Type		1.Yes 2.N0	Source (**Code I**)	Amount use (kg)	Value (Birr)	1.Cash 2.Credit	Sources of input (**Code II**)
Fertilizer	Urea						
	DAP						
	Organic						
Insecticide							
Herbicide							
Code I: 1. Agriculture office 2. Cooperative 3. Union 4. Market 5. Own production 6. Others___				**Code II: 1.** From market 2. Agriculture Office 3. Development center 4. Own production 5. Other (specify)			

10. Total number of persons employed in your farming activity in 2013/14?

Employee	Permanent				Temporary			
	M	Cost	F	Cost	M	Cost	F	Cost
Family members								
Non family members								
Total								

V. Income from non-farming and other farming activity in 2013/14

1. Did you have obtained income from the following?

Sources	Did you receive income from the following items? 1. Yes 0.No	If yes, actual amoun received per year

Rented out land			
Rented out oxen for ploughing			
Salaried/wage employment			
Pension income			
Income from trade			
Homemade drinks			
Remittances			
Sale of crop residues /hay /charcoal			
Rental property other than land and ox			
Other farming activity	Wheat		
	Chick pea		
	Lentil		
	Grass pea		
	Field pea		

VI. Access to credit and extension services

1. Credit status of the household in 2004

Did you need credit? 1. Yes 2. No	If "yes", did you get it? 1. Yes 0. No	Amounts of credit	Source of credit	Purposive of credit (**Code II**)

Code I		**Code II**	
1. Relative	6. Money lender	1. Fertilizer	5. Non-farm business or trade
2. Bank	7. Traders	2. To rent in land	6. To purchase animals (oxen)
3. Micro finance	8. NGO	3. Seed for grain	7. To purchase food grain
4. Saving and credit	9. PAs	4. Consumption	8. Other (specify)---
5. Friends	10. Other	5. To pay tax	

2. Have you given any loan to other households during 2013/14 cropping season? 1. Yes   0.No

3. Did the household save money in 2013/14 in any form?_____1.Yes   0.No

4. If yes to **Q3** above, saving balance during 2013/14_____ birr

5. Did you get extension advice in relation to *teff* production in the 2013/14? 1. Yes 0. No

6. How you evaluate the support from governmental organization in terms of providing various services such as: farming consultation services, animal medication, farm practice trainings, input supply arrangement, etc? Tick X in front of your choice.

It is excellent: I get more than expectations	
It is very good: as per my expectation	
It is fair: below expectation but satisfactory	
Unsatisfactory: far below my expectations	

7. Evaluate the previous question for Nongovernmental Organizations (NGOs).

It is excellent: I get more than expectations	
It is very good: as per my expectation	
It is fair: below expectation but satisfactory	

| Unsatisfactory: far below my expectation | |
| No service at all | |

8. If yes, rank the below source accordingly?

Source of extension agent	1.Yes 2.No	Contribution of extension **Code I**	**Code I:** 1. Seedling 2. Storage 3. Harvesting 4. Price 5. Compost preparation 6. To whom to sell 7. Marketing 8. Post-harvest handling 9. chemical application
Government			
NGO			
Cooperatives			
Other (specify)			

9. Have you ever attended farmer's training in 2004?   1. Yes   0. No

10. If yes, how many days of training? _____

11. If yes, do you think the training is adequate?

  1. Not at all   2. Slightly   3. Somewhat   4. Moderately   5. Extremely

VII. Marketing aspect

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

2. What was /were problem/s created by brokers in 2013/14? 1 took to limited client 2 cheating scaling (weighing) 3 charged high brokerage 4 wrong price (market) information   5 Others

3. Did you face difficulty in finding buyers when you wanted to sell *teff*? 1. yes 2. No

4. If yes, in **Q 3** is it due to: 1. Inaccessibility of market   2. low price offer   3. Lack of information   4. other (specify) --------

5. What did you do, when the teff you offered to the market was not sold? 1. Took back home 2. Took to another market on the same day 3. Sold at lower price 4. Sold on other market day

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

7. What influence do you have on price agreement? 1. No bargaining power 2. Little bargaining power 3. Moderate bargaining power 4. Equal negotiating power

8. What is the level of trust with your buyer? 1. Very little 2. Little 3. Moderate 4. Much   5. Very much

9. How did you get your price perception while selling your *teff* in 2012/13?   1.Low   2.Medium   3. High

10. How did you get your price expectation while selling your *teff* in 2013/14?   1. Low   2. Medium   3. High

11. Is your perception about existence of post-harvest loss affects your *teff* selling behaviors? 1. Yes 2. No

12. If your answer for **Q11** is "yes" what happen to the amount of *teff* you sold?   1. Increase   2. Decrease   3. The same

13. How did you transport teff -----from farm to home? 1 Head/back loading   2 Animal's cart 3 Pack animal   5 Other (specify)

14. Have you any link with others farmers to obtain good price for your product? 1. Yes 0. No

15. Have you any contractual agreements with traders/consumers of teff? 1.yes 0. No
16. If yes to question **15.** What is the advantage of contractual agreement for you and traders/consumers?_____
17. Do you differentiate your product? 1. Yes 2. No
18. If "yes" to **Q17,** what criteria do you use to differentiate your products?_____
_____
19. Are you able to respond to market opportunities? 1. Yes 2. No
20. If "yes" to **Q19** what kind of the market opportunities are you able to acquire?
   1. Use of technology on production and marketing 2. Others _____
21. Did you know the nearby market price before you sold your teff? 1.Yes 2.no
22. Did you know Addis Ababa market price before you sold your teff? 1.Yes 2.no
23. Are you a member of cooperatives? 0. Yes 1. No
24. If yes what is the criteria to a member of cooperatives?
_____
25. Did you sell teff in 2013/14? 1. Yes 2. No
26. If your answer for **Q.25** is No, why you did not sell? _____
27. If your answer for **Q.26** Yes, Answer the below question accordingly

Time of sale	Quantity sold (qt)	Where did you sale Market?	To whom did you sale agents?	What factors do you consider to whom to sell?

28. Cost of *teff* production and marketing

Operati onal cost	Producti on cost	Land preparati	Seedling	Planting	Harvesti ng	Winnowi ng	Threshin g	Storage cost	Cost of bags	Taxes
Units										
Price/unit										

29. How did you get information on supply, demand & price of teff in other markets?

	Source of information (**Code I**)	**Code I:** 1 Other teff traders 2 Radio 3personal observation 4 ETV 5.Broker 6 Telephone 7 Newspaper 8 Others
Supply		
Demand		
Price		

30. How did you evaluate your source of information?
   1 it was reliable 2 it was adequate 3 it was timely 4 other (specify) -------------
31. What are other problem of teff production and marketing that affect the marketing and production of teff in the district?
32. Did you face problem in teff production and marketing?

Problem faced	1. Yes 2. No	If yes what do you think was/ were) the cause/s) of this problem?	What is your suggestion to solve each problem?
Fertilizer supply			
Seed supply			
Shortage of land			
Disease			
Loan payment			
Absence of credit			
Theft on the field			
Double taxation			
Price setting			

Questionnaire for trader

I. Demographics information and area information

	Household characteristics	Code
1.	Sex of household (**Code I**)	
2.	Age of household	
3.	Religious of household (**Code II**)	
4.	Marital status of household (**Code III**)	
5.	Educational level of household (**Code IV**)	

Code I	Code II	Code III	Code IV
1. Male	1. Muslim 2. Orthodox Christian	1. Single 2. Married	1. Illiterate 2. Primary
0. Female	3. Protestant 4. Catholic	3. Divorced 4. Widow	3. Secondary 4. University
	5. Waqefata 6. Other (specify)----		5. Above degree

6. Districts   1. Becho   2. Dawo

7. Name of Rural *kebeles* Administration------------

8. How many years are you associated with *teff* trade?_____years

9. Did you trade alone or in partnership? 1. Alone 2. Partnership 3. Others

10. Total number of persons employed in your business in 2013/14?

Employee	Permanent		Temporary	
	M	F	M	F
Family members				
Non family members				
Total				

11. When did you do your business in 2013/14? 1 Year round   2 During holidays only

    3 when purchasing price low or high supply   4 Other (specify) -----------

12. Did you have occupation (s) before becoming teff trader? 1.Yes 2.No

13. If yes, for how long?_____years

14. If "yes" did you get income from your work? 1. Yes   2. No

15. If "yes" How much income you earn yearly?_____birr
16. Types of trader   1. Wholesaler   2. Retailer   3. Other

II. Fixed business and financial capital

1. What was the amount of initial working capital when you start this business?_____ Birr
2. What was the amount of your working capital in 2013/14? _____Birr
3. What was the source of the working capital in 2013/14?
    1 own   2 loan   3 gift   4 Share   5 others (specify)
4. If it was loan, from whom did you borrow?   1 Relative/family   2 private money lenders   3 micro finance institution   4 Bank   5 NGO   6 Friends   7 other, (specify) -------
5. How much was the rate of interest? _____Birr for formal--------------or informal
6. What was the reason behind the loan? 1 to build store   2 to purchase a car   3 for working capital   5 other (specify) -----
7. How was the repayment schedule?   1 Monthly   2 Quarterly   3 Semi-annually
     4 when you get money   5 other (specify) ----
8. How did you attract your supplier?   1 By giving better price relate to others   2 by fair scaling weighing   3 by visiting them   4 other (specify)
9. How did you attract your buyers? 1 By giving better price relate to others   2 Quality of your product   3 by fair scaling weighing   4 by visiting them   5 by giving credit   6 other

III. Purchase practice

1. From which market and supplier did you buy *teff* in 2013/14?

Purchased from Market,	Purchased from sellers,	Why you choose this seller?	Average quantity purchased per market in a week (qt)	average price per qt	Term of payment 1.cash 2. credit 3.advance payment

2. Who purchase *teff* for you in 2013/14?
   1 Myself   2 through broker   3 Family members   4 commission agent   5 Friends   6 other--
3.   If others purchased for you how you did pay them?
    1 __birr/quintal   2 Above the price you decide   3 % on purchase price 4 Other (specify)
4. If you used broker, what were problems created by them in 2013/14?
      1. took your sellers & buyers to other traders   2. cheating scaling weighing   3. charged high brokerage   4. cheating quality   5. wrong price information   6. Other (specify) ---
5. Is your usual purchasing price higher than your competitors? 1.yes 2.no
6. If "yes" **Q. 5** what was the reason? 1. To attract more supplier   2. to buy more quantity
     3. to kick out your competitor from   the market   4. to get better quality teff   5 others
7. What was your packaging material?   1 Sisal sack2 Plastic sack '*Madaberya*' 3 Sisal sack 'jonia' 4 Basket   5 Others (specify)--------
8. Who set your purchasing price in 2013/14? 1. Myself   2. The seller 3. negotiation between me and the seller   4. by market 5. other traders from Addis Ababa 6. other (specify)
9.   If you decided on the purchasing price, how did you set the price?

1. Individually   2. Collude consultation with other traders   3. other (specify)-------------

IV. Selling practices

1. To whom did you sell in2013/14 GC?

Sold to buyers,	Why you choose this buyer?	To whom you sold your product?	Average quantity purchased per market in a week (qt)	average price per qt	Term of payment 1.cash 2. credit 3.advance payment

2. Who decided on your selling price 2013/14?   1. Myself   2. By the market   3. Purchaser 4. other traders   5. negotiation between me & the purchaser   6. Other (specify)
3. If you decided on the selling price, how did you set the price? 1. Individually 2. consult with other traders   3. Other (specify)
4. Who sold teff for you in 2013/14? 1. Myself 2. through broker   3. Family   4. commission men   5. Other (specify)----
5. If others sold for you how you did pay them? 1___birr/quintal   2. Above the price you decide 3. % on sales price 4. Other
6. Did you give bonus per quintal at the time of your sales? 1. Yes 2. No
7. If yes, how many kg per quintal?---------Kg
8. Are there restrictions imposed on unlicensed teff traders? 1. Yes 2. No

V. Marketing Services

1. Did you pay tax for the *teff* you purchase and sell in 2013/14? 1. Yes 2.No
2. What was the basis of tax? _____
3. Indicate your average cost incurred per quintal in the trading process in 2013/14?

Marketing cost components in the chain		Birr/qt
Purchased price of white teff per quintal		
Packaging material		
Labor employed to fill the bag and stitch		
Load and unload		
Brokerage		
Transportation:	Vehicle	
	Cart	
	Head/back load (animal)	
License fee		
Taxes		
Wage for permanent employee		
Storage cost		
Electricity		
Telephone expense		
Information cost		

Personal travel & other expense	
Others (specify)	
Total costs	
Selling price of quality *teff* per quintal	

VI. Information and Transportation

1. How did you get information on supply, demand & price of *teff* in other markets?

	Code I	Code I
Supply		1 Other teff traders 2 Radio 3 Telephone 4 personal observation
Demand		5 Broker 6 Newspaper 7 TV 8Others------
Price		

2. Was there transportation problem? 1. yes 2. No

3. If yes what was the problem? 1 No transportation service   2 high fare 4 other--

4. How was this market roads look like in rainy season for vehicle transport?

     1 It was difficult   2 No problem

VII.Linkage among value chain actors

1. Were you organized in the following organization?

Organization	1.Yes 2.No	Benefit (**code I**)	**Code I** 1. Access to credit 2. financial support when incur a loss 3. Encourage to save 4. facilitate joint marketing 5. no benefit 6. Got market information 7. Coordinate purchase and sale 8. Protection against unfair competition 9. Credibility 10. Other
Social association: 'idir'			
'iqub'			
Contractual agreement with farmers			
Trade association			
Teff marketing cooperative			

2. Are there problems on teff marketing?

Problem	1.Yes 2.No	If yes what are the cause of this problem?
Infrastructure:(Road and telephone)		
Multiple taxation and other fees		
Shortage of supply		
Storage problem		
Information flow		
Capital shortage		
Access to credit		
Absence of government support		
Lack of demand (low price)		
Competition with licensed traders		
Competition with unlicensed traders		
Farmers reluctance to sell (lower price)		

Other (specify)		

Consumers Interview

1. Zone: _____District:_____Village_____

2. Age of respondent :(_____) years

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

4. Education level of the respondent: 1. Illiterate 2. Primary 3. Secondary   4. Higher education
   5. Above degree

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

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

7. How much do you earn per year:_____birr

8. Is teff consumed in your family?   1. Yes   2. No

9. Experience in teff products consumption? _____years

10. Do you produce or purchase the teff you consume? 1. Purchase   2. Produce

11. If no consumption of teff product, why? _____

12. Do you consider any quality requirements to purchase *teff*?   1. Yes   2. No

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

14. Do you know the benefits of consuming *teff* product?   1. Yes   2. No

15. What should be done to increase teff product consumption?_____
    _____

16. What are the constraints hindering consumption of *teff*? Rank horizontally (1. most severe, 2.
    second severe and etc)

Crop type	Supply shortage	Income shortage	Lack of storage at home	High price of product	Poor product handling	Lack of market information	Post-harvest loss
Teff							

17. Revenue and operational cost of *teff*

Particulars	Units	Price/unit
Buying price		
Milling cost		

Questionnaire for cooperatives

1. Name of organization _____

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

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

4. What was the establishment capital? _____ETB_____sources.

5. What is the source of establishment capital? _____

6. How many members your cooperatives have? _____

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

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

9. What are the impacts of your organization on other teff traders?
_____

10. How much and from whom did you purchase Teff Product?

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

11. How do you transport these Teff Products from the source?

No.	Mode of transportation	Distance of transport (Km)	Ow ned	Ren ted	Amount of transport	Amount of loss (%)	Cause of loss
1	Vehicle ⌐						
2	Tractor ⌐						
3	Bicycle ⌐						

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

13. What *teff* processing related activities your organization involved in?
_____

14. Do you process the *Teff* products before selling or storage? 0. Yes   1. No

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

33. What are the challenges this organization face in the past?
_____

34. How much and to whom did you sell *Teff* Product?

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

6	Consumers				
7	Injera Maker				

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

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

36. Who sets the price? 1. Traders themselves at central market □   2. Brokers □
3. Negotiation □   4. Other, specify _____

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

Flour seller/ Injera sellers

1. Name of organization_____

2. Zone: _____District:_____Village_____

3. Age of respondent :(_____) years

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

5. Education level of the respondent: 1. Illiterate 2. Primary 3. Secondary   4. Higher education
    5. Above degree

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

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

8. If you sold "*teff flour/injera*" to other person/business institution, what service you obtained from government? _____

9. What is the selling price of one *Kg teff flour/one injera*? _____

10. What is the selling price of one *injera*? _____

11. How many injera made from one kg/quintal of teff? _____

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

13. Do you consider any quality requirements to purchase *teff* that you process to flour/injera?
    0. Yes 1. No
14. If yes, what quality requirement do you consider for? _____
15. How much and from whom/to whom did you purchase/sell Teff flour/injera?

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

16. What are the constraints hindering sell of teff *flour/injera*? Rank horizontally (1. most severe, 2. second severe and etc)

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

16. Did you store your Teff Products before selling? 0. Yes ⌑   1. No ⌑

Checklist for Key Informants Interview

I.   Personal background

1. Name of the organization: _____Types_____
2. Role of the interviewee in the organization:_____
3. Location and contract information: Region/Zone/District/Kebele/_____
4. Organization mission, vision and objectives_____
5. What is your job responsibility?
6. How long have you served in this district and in what capacity?

II.   Production, Marketing, and Farm Characteristics

1. What is the primary means of livelihoods for the people in this District?
2. What are the main food and cash crops grown in this District/ why?
3. What services and assistance do the farmers get from your office?
4. What efforts are done to integrate the smallholder farmers with the market?
5. What are the challenges and opportunities at their disposal?
6. What are the major non-farm activities farmers in your District mainly engaged in?
7. How many hectare of land is potentially suitable for production of *teff* in your district?
8. What portion of land is allocated for the production of *teff* currently?
9. Who is the primary buyer of the commodity from the farmers?
10. Are there any marketing cooperatives in this District?

11. If so, is *teff* product traded through these cooperatives?

12. What is the role of your organization in strengthen teff value chain in the study area?

13. What are the challenges and opportunities you faced in undertaking those roles assigned to your organization? _____

14. Linkage/interaction/partnership/coordination between actors_____

15. What services you provided to each actor of teff value chain?

16. What problem did think all actor of teff value chain facing?