

**DETERMINANTS OF SMALLHOLDERS WHEAT
COMMERCIALIZATION: THE CASE OF GOLOLCHA DISTRICT OF
BALE ZONE, ETHIOPIA**

Msc THESIS

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**DETERMINANTS OF SMALLHOLDERS WHEAT
COMMERCIALIZATION: THE CASE OF GOLOLCHA DISTRICT, BALE
ZONE, ETHIOPIA**

A Thesis Submitted to the Department of Agricultural Economics

**In Partial Fulfillment of the Requirements for the Degree of
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(AGRICULTURAL ECONOMICS)**

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DEDICATION

I dedicate this thesis to my mom Derartu Setagn and especially to my dad Girma Gari in heaven.

STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of this thesis. Any scholarly matter that is included in the Thesis has been given recognition through citation.

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BIOGRAPHICAL SKETCH

The author was born from his parents Girma Gari and Derartu Setagn on November 19, 1995 in Bale Zone. He attended his elementary education at Selam primary school. He also attended his Secondary and preparatory school education at Jara senior and secondary school; and joined Addis Ababa University in 2013 and graduated in 2015 by Agricultural Economics. Then after, He was employed at Bonga University as Instructor. He joined university of Gondar to pursue his Msc Studies in Agricultural Economics in 2016.

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ABBREVIATIONS AND ACCRONMYS

ADLI	Agricultural Development Led Industrialization
ASS	Agricultural Sample Survey
BZFEDB	Bale Zone Finance and Economic Development Bureau
CCI	Crop Commercialization Index
CSA	Central Statistics Agency
DAs	Development Agents
FAO	Food for Agricultural Organization
GDOA	Gololcha District Office of Agriculture
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HHs	Households
IFPRI	International Food Policy Research Institute
MAFAP	Monitoring African Food and Agriculture Policy
MDG	Millennium Development Goal
MoARD	Ministry of Agriculture and Rural Development
MoFED	Ministry of Finance and Economic Development
NGOs	Non-Governmental Organizations
OLS	Ordinary Least Square
OoA	Office of Agriculture
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
SARC	Sinana Agricultural Research Center
U.S.	United States
USDA	United States Department of Agriculture
VIF	Variance inflation factor

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ABSTRACT

This study was aimed at analyzing determinants of smallholder's wheat commercialization in Gololcha District of Bale zone with specific objectives of identifying the level of commercialization, assessing Structure Conduct Performance of wheat market and analyze major determinant of volume of wheat marketed/commercialized/ in the study area. The data were obtained from both primary and secondary sources. The primary data for this study were collected from 146 producers, 10 rural traders, 15 urban retailers and 15 wholesalers selected by using appropriate sampling procedures. The descriptive analysis of level of commercialization of sample respondents showed that in 2016, 13.7% were subsistence, 56.2% were semi-commercial and 30.1% were commercial farmers. This result made increments when it was compared with the past three year's levels of commercialization. In 2013 there were 16.4% commercial farmers, in 2014 there were 18.5 % were commercial farmers and in 2015 the number of commercialized farmer were increased to 24.7%. The S-C-P analysis of market showed that the market concentration for largest four traders was found to be 28.93% which shows that the market structure of wheat market in the study area was unconcentrated market structure. Furthermore, the profitability analysis of market showed that all the market actors were profitable. Accordingly, producers, rural assemblers, urban retailers and wholesalers got the profit per quintal of 49.98 birr, 70.97 birr, 95.98 birr and 107.58 birr respectively. The sample farmers got small amount of profit as compared to others, due to inefficiencies in wheat market performance. Multiple linear regressions were run to identify factors determining the volume of wheat sold/commercialized/. The result of the multiple linear regressions indicates that among 14 variables, five variables had shown significant relationship with volume of wheat sold/commercialized/ in the study area. Accordingly, cash expenditure for farming, access to credit and total wheat produced were found to influence volume of wheat sold/commercialized/ positively and significantly and Education status and oxen owned had shown negative and significant relationship with volume of wheat sold/commercialized/. Therefore, emphasis has to be given on identifying new technology, advice on the use of modern agricultural inputs, a need for strengthening the existing credit institution and increasing their number, and there is a need for improvement of market and marketing system.

Key Words: - **Commercialization, Wheat, Smallholders, Multiple linear regressions**

1. INTRODUCTION

1.1. Background

Agriculture sector has particular significance in the Ethiopian economy. It accounts for more than 50 percent of GDP and provides employment for about 83 percent of the total population. It is also the sector that is given an overriding focus in the government's plan for growth of the economy as a whole (Berhanu Gebremedhin, 2012).

However, agriculture suffers from low productivity and increasingly high man to land ratio. It is dominantly undertaken by smallholder farmers who are characterized by use of family labor, low productivity, low income, low degree of specialization and subsistence farming is predominant. In Ethiopia, an estimate of 20 percent of the smallholder farmers' agricultural output goes to market. Therefore, subsistence agriculture has continued to be a means of self-sustenance for the smallholder farmers of Ethiopia (Pingali, 2007).

Sustainable food security and welfare cannot be achieved through subsistence agriculture. As well, smallholder agriculture, which is the predominant source of livelihoods in Africa, has proven to be at least as efficient as larger farms when farmers have received similar support services and inputs (seed, fertilizer, and credit) (World Bank, 2007). Many countries and international development agencies give due concern to intensification and commercialization of smallholder agriculture as a means of achieving poverty reduction; and thus they have reflected it in their official policies Leavy and Poulton, 2007.

Commercialization of subsistence agriculture cannot be expected to be a frictionless process, as it is likely to involve substantial equity issues. The rural poor can be left out from benefiting from the commercialization process due to inadequate services and infrastructure, and new set of transaction costs that emerge from new market institutions and actors. Moreover, economic development, coupled with rising per capita incomes, technological change, and urbanization is causing significant changes in food markets in developing countries. Ethiopia is not an

exception. Hence, governments and development agencies are confronted with the challenge of ensuring that smallholders and the rural poor benefit from commercialization either by participation in the market or providing exit options for employment in other sectors Reardon and Timmer, 2007.

Cognizant of this, the Ethiopian government has prioritized commercialization of farming as a policy agenda since 2005. According to (MoFED, 2010), under its growth and transformation plan linking to goal one of the MDGs, it is working to increase crop productivity by applying good agricultural practices, increase crop production by increasing cultivable agricultural land and improve agricultural production and productivity by improving extension service utilization and agricultural inputs. As it is mentioned in the growth and transformation plan, major food crops are one of the crops getting emphasis of the above listed objectives of the plan.

Specifically, when we come to the production trend of wheat in Ethiopia, Ethiopia is one of the largest grain producers in Africa, and the second largest wheat producer in Sub-Saharan Africa, after South Africa. Wheat production increased 55 percent, from 2.2 million tons in 2005 to 3.4 million tons in 2012. The production of 3.4 million tons in 2012, a record output, made Ethiopia the leading producer of wheat in Sub-Saharan Africa and third on the continent, next to Egypt and Morocco. Neighboring countries produce far less wheat and given Ethiopia's vast land resources, increasing use of modern input technology, irrigation and improved infrastructure (resulting in improved yields), it has great potential to benefit from exporting wheat to neighboring countries (CSA, 2012) .

Accordingly, nearly 561,000 metric tons of wheat was sold by smallholders and state and private Commercial farms in 2008. However, during the same year 545,325 metric tons was commercially imported by the government to stabilize the market). A country domestic production was 29,163,336.88 quintals, of which 58.04% was for household consumption, 19.59% was for seed requirement, and 20.13% was sold for domestic market and others (MAFAP, 2012).

This indicates that, there was increment in production and marketable volume of wheat but the current level of wheat marketed is still low and insufficient to meet the domestic consumption and needs of newly emerging food processing industries. Moreover, in terms of the marketable volume of wheat, it is **estimated that about 21% of the domestic production is marketed, while the bulk of the produce is retained on-farm for consumption and seed (CSA, 2009).**

Wheat is mostly grown in the highlands and mid highland area of the country. Among the nine regions, Oromia and Amhara regions produce 59% and 27% of the country's wheat, respectively, with an additional nine percent coming from the Southern Nations, Nationalities, and Peoples Region (SNNPR). Specifically Arsi and Bale Zones and also some parts of Amhara Region like North Gondar and North Shewa are the major wheat growing areas (MoARD, 2010).

Among the different zone in Oromia region, Bale zone is one of the main wheat growing areas in the South-Eastern Ethiopian highlands. Southeast Oromia is particularly known for its extensive Wheat production and sometimes called "wheat Belt of Ethiopia" (Haimanot Asfaw, 2014).

Nevertheless, in view of the current rapidly growing rate of urbanization, coupled with the increased expansion of existing as well as newly emerging food processing industries, wheat products such as macaroni and spaghetti are highly demanded in the local market and have become an important part of daily diet in the urban and peri-urban areas of Ethiopia. However, almost all local pasta manufacturers depend on imported wheat (EIAR, 2006). At present, the demand for imported wheat is millions of tons of wheat from abroad, costing three hundred million dollars in foreign exchange (CSA, 2013). The key reasons why local industries do not utilize locally produced wheat are: the perceived sub-standards quality.

There is an immense potential for increasing domestic production of wheat to meet the current rapid demand for wheat, but there are a number of constraints that hinder the intensification production and quality of wheat. These include weak seed production and distribution, high seed cost, high fertilizer cost, inadequate coordination between research center, seed multiplication and extension, lack of market information, high transport costs, lack of access to appropriate storage and marketing facilities and poor infrastructure and shortage of access to bank credit.

Furthermore, poor farming management and post harvesting handling is also among the major problems.

1.2. Statement of the Problem

(Afewerk Hagos and Endrias Geta, 2016) noted that “meeting the challenge of improving rural incomes in Africa was require some form of transformation out of the semi-subsistence, low income and low productivity farming systems that currently characterize much of rural Africa”.

In the past decade, the government of Ethiopia had set plans and strategies to build on the ADLI policy framework through commercialization of agriculture and development of the private sector, both within and outside agriculture. However, the current reality shows that commercialization of smallholder farming is not yet high enough to enable farmers benefit from increased income and the farmers are not yet out of the subsistence-oriented agriculture (Berhanu Gebremedhin and Moti Jaleta, 2010).

In Ethiopia agricultural sector is largely characterized by small-scale subsistence farming and low productivity (Thijssen *et al.*, 2008). Thus, the poverty-reduction strategy adopted by Ethiopia seeks to achieve growth through further commercialization of smallholder agriculture. To deal with this, the ongoing Growth and Transformation Plan (GTP) of Ethiopia is also intending to increase production of major crops through increasing crop productivity by applying good agricultural practices (MoFED, 2010).

Commercialization of agriculture is also a core research theme of the Future Agricultures Consortium. Future Agricultures thematic work on agricultural commercialization has observed that, in various countries, different modes of commercialization co-exist and interact with each other Leavy and Poulton, 2007. Consistent to this definition (Samuel Gebreselassie and Sharp, 2007) put forth four categories that represent four potentially complementary “pathways” for commercialization policy in Ethiopia. These pathways categorize farmers under subsistent oriented smallholder farms, market oriented smallholder farms, Small investor-farmers and Large-scale agri-business. Majority of Ethiopian farmers (approximately 11.5 million) are

categorized under the first two categories which assemble smallholder household farms ownership.

The driving forces generally behind commercialization include population growth and demographic change; urbanization; development of infrastructure and market institutions; development of the nonfarm sector and broader economy; rising labor costs; and macroeconomic, trade, and sectoral policies affecting these forces (Berhanu Gebremedhin and Moti Jaleta., 2010).

Commercialization is also affected by many factor markets; laws and institutions; and cultural and social factors affecting consumption preferences, production, and market opportunities and constraints. These factors influence commercialization by affecting the conditions of commodity supply and demand, output and input price, and transaction costs and risks faced by farmers, traders, and others in the agricultural production and marketing system (Pender and Dawit Alemu, 2007).

Wheat was selected because it was primarily grown and marketed by majority of the smallholder farmers in the study area and it is both food and cash crop. But, supply of wheat in the study area is yet subjected to seasonal variation where surplus supply at harvest is the main feature and it cannot still satisfy the demand of the nearby markets.

As mentioned above, wheat is one of the main food and cash crops of the study area. Following this, to know the strong potentials and favorable impacts of wheat commercialization on productivity, poverty reduction and food and nutrition security; factors affecting commercialization of wheat produced are indispensable. But, these have not been systematically studied and documented in the study area. Hence, the present study is initiated to fill the knowledge gap in the understanding of the determinants of commercialization of produce sold and marketing behavior of wheat market which is required in designing appropriate technological, policy, organizational and institutional strategies to ensure smallholders and the rural poor benefit from the process of commercialization.

1.3. Objectives of the Study

1.3.1. General objective

The general objective of the present study was to analyze the determinants of commercialization of wheat among smallholder farmers in the Gololcha District of Bale zone.

1.3.2. Specific objectives

The specific objectives of the study are the following:

- 1) To identify the level of commercialization of wheat in the study area.
- 2) To identify the opportunities and challenges of wheat marketing in the study area.
- 3) To assess Structure Conduct Performance of wheat market in the study area.
- 4) To identify and analyze major determinant of volume of wheat marketed/commercialized/ in the study area.

1.4. Significance of the Study

This study was primarily based on the role of agricultural commercialization in general and identifies factors that determine the performance of wheat commercialization in particular through the evaluation of wheat's current production and productivity and analyzing factors determining the commercialization level of wheat's sold. This study gives a better insight in to the role of commercialization in increasing productivity and improving income of smallholder farmers. Thus, the result of this study provides valuable input to formulate appropriate crop production and marketing policies and procedures. This study can also pinpoint options to promote market oriented production system by giving equal emphasis to both production and marketing side. The result can be also used to make appropriate decisions by the farmers, traders, investors, and other development stakeholders, who need the information for making relevant decision. Finally, the study served as a spring board for other similar studies.

2. LITERATURE REVIEW

2.1. Conceptualizations of Smallholders and Agricultural Commercialization

2.1.1. Operational definition of smallholders

(Lipton, 2005) defines family farms as “operated units in which most labor and enterprise come from the farm family, which puts much of its working time into the farm”. On the other side, the World Bank’s Rural Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank, 2008). Further, FAO defines smallholders as farmers with “limited resource endowments, relative to other farmers in the sector” (Dixon *et al.*, 2003). (Afewerk Hagos and Endrias Geta, 2016) also characterize a smallholder “as a farmer (crop or livestock) practicing a mix of commercial and subsistence production or either, where the family provides the majority of labor and the farm provides the principal source of income”.

There is no clear cut definition of small farms and smallholder farmers. In fact, (Nagayets, 2005) pointed out that “the sole consensus on small farms may be the lack of a sole definition”. The simplest and conventional meaning of a smallholder is the case when the land available for a farmer is very limited (Chamberlin, 2008 and Hazell *et al.*, 2007). However, the meaning goes far beyond this conventional definition and consists of some general characteristics that the so called small farms or smallholders generally exhibit.

(Chamberlin, 2008) has identified four themes on the basis of which smallholders can be differentiated from others. These themes include landholding size, wealth, market orientation, and level of vulnerability to risk. Accordingly, the smallholder is the one with limited land availability, Poor-resource endowments, subsistence-oriented and highly vulnerable to risk. Nevertheless, the smallholder may or may not exhibit all these dimensions of smallness simultaneously. Besides, it is also common to set numeric value as a way to define small farms. (Hazell *et al.*, 2007) note that some literature define small farms as “those with less than two

hectares of crop land” while others define smallholders as “those endowed with limited resources, such as land, capital, skills and labor..”.

2.1.2. Operational definition of agricultural commercialization

(Govere *et al.*, 1999) define agricultural commercialization as “the proportion of agricultural production that is marketed”. According to these researchers, agricultural commercialization aims to bring about a shift from production for solely domestic consumption to production dominantly market-oriented.

(Sokoni, 2007) define commercialization of smallholder production as “the process involving the transformation from production for household subsistence to production for the market”. (Hazell *et al.*, 2007) found out that most definitions refer to agricultural commercialization as “the degree of participation in the output markets with the focus very much on cash incomes”. However, there are some writers who attach profit motive as an integral part of agricultural commercialization.

Among others, Pingali and Rosengrant, 1995 noted that agricultural commercialization goes beyond just selling in the output market. They claim that a household’s marketing decisions, both in the output and input choice, should be based on profit maximization. According the same authors commercialization does not only occur by the reorientation of agriculture to high valued cash crops but it could also occur by reorienting it to primary food crops.

According to (Von Braun *et al.*, 1994) commercialization of subsistence agriculture takes many forms. They state that “Commercialization can occur on the output side of production with increased marketed surplus” but, it can also occur on the input side with increased use of purchased inputs. Commercialization is not restricted to just cash crops; the so called traditional food crops are frequently marketed to a considerable extent and the so-called cash crops are retained to a substantial extent on the farm for home consumption; For instance, groundnuts in West Africa. Additionally, increased commercialization is not necessarily identical with

expansion of the cash economy when there exist in considerable inland transactions and payments with food commodities for land use or laborers.

Finally, commercialization of agriculture is not identical with commercialization of the rural economy. Thus, following the arguments made by Von Broun and his fellow authors, commercialization refers both to marketing of high value cash crops (such as pulse, oil and horticultural crops) as well as primary food crops (such as wheat, wheat, and barley).

2.2. Basic Concepts and Measures of Agricultural Commercialization

2.2.1. Modes of agricultural production

Leavy and Poulton, 2007 found that three different modes of agricultural production exist side by side and interact with each other. These are:-

I. Small-scale farmers: these are further classified into two groups. The first one refers to small-scale “non-commercial farmers” (Type A) - these farmers are subsistence oriented but may also sell some of their production in the output market; but they are not wholly dependent on agriculture for living. And the second one is small-scale commercial farmers (Type B) – which are better integrated with the market than the first group. In fact, they produce crops both for own consumption as well as for the market. They even exert effort to specialize on high value cash crops. In the present study, smallholder households of the study area have similar distribution of both Type A and B.

II. Small-investor farmers- these are exclusively engaged in market-oriented agriculture even though their size dictates their modest scale production. These peoples also referred as people being often educated and urban-based. They are known also as “emerging commercial farmers” (Samuel Gebreselassie and Sharp, 2007).

III. Large-scale business farming- these refer to the capital intensive enterprises that are either private or state-owned.

These three categories indicate the different policy scenarios the government can possibly adhere to, in the course of assisting smallholder farmers to increase their income and mainly to come out of poverty.

2.2.2. Process of agricultural commercialization

Having consensus of many, smallholder commercialization is part of an agricultural transformation process in which individual farms shift from a highly subsistence-oriented production towards more specialized production targeting markets both for their input procurement and output supply. However, there is an ongoing debate about targeting the process of smallholder commercialization. One issue of debate is whether smallholder commercialization should aim at increasing the productivity and marketed surplus of staple food crops or, alternatively, to focus on a newly introduced high value crops. The second issue is, given the targeted commodity types for commercialization, whether to produce these commodities for domestic or export markets (Mebrahatom *et al.*, 2014)

In addition to the underlying socio-economic circumstances under which smallholders operate, the argument on which commodities to target in the process of smallholder commercialization emanates from the agro-ecological circumstances, technical know-how of smallholders, and their risk bearing capacity and attitude towards risk. Since staple food crops have been produced for a longer period under the subsistence system, it is believed that smallholders have the technical know-how and experience in the production of these commodities. Thus, new yield-enhancing technologies for these crops could help in generating more surpluses to the market, increasing household income at a lower risk and improving national-level food security. On the other hand, different modes of production targeting high-value non-traditional commodities could help farm households generate more income per unit of resources used on the farm but at a higher production and market risk. In the latter case, out-grower schemes or contract farming are usually considered major risk-sharing strategies and means to link smallholders to the export markets (Mebrahatom *et al.*, 2014)

(Pingali, 2005) argued that, for many farmers, the transition from subsistence to commercial staple crop production is far more pertinent than a complete shift to specialized high-value commodities. Similarly, (Gebre-ab Nigussie, 2006) stated that the production of marketable surplus of staple food over what is needed for own consumption is initially the most common form of commercialization in a peasant agriculture. Through time, as the level of smallholder commercial orientation increases, however, one observes mixed staple and cash crop production systems giving way to specialized production units for the production of high-value crop and livestock products. Thus, although agricultural commercialization is believed to put increased emphasis on specialization, it is not confined to the production of high-value commodities.

Apparently, the potential gains from high-value agricultural commodities tend on average to be higher than those for staples even though production of high-value commodities can be accompanied by greater uncertainty and risk. A critical issue to be answered by smallholders specializing in high-value outputs is whether their size, be it land or other resources, can profitably support such activities in the long term (Lerman, 2004).

In addition, to a large extent, crop choice is determined a priori by the land potential available to small farmers. So, while high-value crop production may promise higher rewards, that option is not open to all small farmers. For some small farmers, at best, commercialization can offer the possibility of some diversification into non-staples, but not a total specialization (Pingali, 2005).

In conclusion, smallholders can commercialize in staple food commodities, in non-traditional high-value cash commodities, or combine the two types of commodities depending on the agro ecological circumstances, levels of production and price risks, and market conditions. However, one can certainly argue that smallholders were move towards more specialization in the process of commercial transformation in the long run.

The second issue of the debate which deals with the choice of targeting either domestic or export markets in the process of smallholder commercialization, is basically linked to the nature of the targeted commodities. According to (Moti *et al.*, 2009) for countries with large population size, domestic markets could also be a major market target due to higher domestic demand for both

staples and high-value commodities. However, high-value non-traditional commodities are usually produced for the export market.

In targeting the export market for the process of smallholder commercialization, the issue of product quality, sanitary and phytosanitary standards, timely and regular supply, and volume need to be given emphasis in enabling the small-scale farmers to be part of the game (Moti *et al.*, 2009). Despite the national interest in foreign currency earnings from export markets, these and other regulatory issues put smallholders at a higher income risk which might have an adverse consequence on the overall commercialization process. Such constraints can be overcome by vertically coordinated supply value chains that use smallholders as out-growers (Mebrahatom *et al.*, 2014).

Apart from the intercontinental export markets for high-value cash crops, there is a considerable potential demand for staple commodities in the domestic and intraregional food markets of developing countries (Diao and Hazell, 2004; Diao *et al.*, 2007).

2.2.3. Measuring agricultural commercialization

According to (Govere *et al.*, 1999) “Commercialization can be measured along a continuum from zero (total subsistence-oriented production) to unity (100% production is sold)”. (Strasberg *et al.*, 1999) suggested a measurement index called household Crop Commercialization Index (CCI) which is computed as the ratio of gross value of all crop sales over gross value of all crop production multiplied by hundred. The advantage of using this approach is that it “avoids the use of crude distinctions as commercialized and non-commercialized farms”.

However, this index is not without its limitations. For instance, consider the case when a farmer growing one quintal of wheat sells that all and another farmer producing ten quintals of wheat sells only two quintals. The CCI would tell us that the first farmer is fully commercialized (100%) while the second is subsistence (20%). This interpretation does not make sense in such circumstances. Even though this limitation of using CCI is worth noting, there is still some room to use it in practice especially in the context of developing countries where it is less likely to get

smallholders selling all of their output and very large farms selling none of their output (Govere et al., 1999).

As can be understood from the preceding discussion, the degree of participation in the output market is the conventional way to measure commercialization. However, (Von Braun et al., 1994) provide other dimensions to the measurement of commercialization. Commercialization is calculated as percentage of the total produce sold from a household or as a percentage of cash crops as compared to all crops cultivated by a household. The same study specified the forms of commercialization and integration into the cash economy from at least three different angles and measured the extent of their prevalence at the household level with the following ratios according to (Berhanu et al., 2009).

(1a) Commercialization of agriculture (output side)

$$= \frac{\text{Value of agricultural sales in the markets}}{\text{Agricultural production value}}$$

(1b) Commercialization of agriculture (input side)

$$= \frac{\text{Value of agricultural input acquired from markets}}{\text{Agricultural production value}}$$

(2) Commercialization of rural economy

$$= \frac{\text{Value of goods and services acquired through market transaction}}{\text{Total income}}$$

(3) Degree of integration into the cash economy

$$= \frac{\text{Value of goods and services acquired cash transaction}}{\text{Total income}}$$

2.2.4. Wheat production in Ethiopia

According to CSA estimates, Ethiopia produced 3.9 million tons of wheat in 2013, making it the largest wheat producer in Africa south of the Sahara by a considerable margin. The second

largest producer is South Africa with 1.7 million tons, followed by Kenya with just 0.5 million tons. On the other hand, Ethiopian production is relatively small by global standards. Its production is surpassed by two North African countries, Egypt, and Morocco, with more than 7 million tons each, and 27 other countries. Ethiopia represents just 0.6 percent of the 713 million tons produced globally (FAO, 2015). One implication of this is that changes in the volume of Ethiopian wheat imports are unlikely to have a noticeable impact on world prices.

Current wheat yields are roughly double the average wheat yields in 1995-96, implying an annual growth rate of 3.9 percent. Thus, more than half the growth in production since 1995-96 can be attributed to yield growth. The rate of yield growth has been even higher in recent years: since 2008, yield has increased by more than 7 percent per year. Some sources suggest that wheat yields in Ethiopia may be somewhat lower than official estimates. For example, the U.S. Department of Agriculture estimates that wheat yields in Ethiopia are about 2.1 t/ha compared to official estimates of 2.4 t/ha (USDA, 2015). Similarly, the results of a 2008 household survey suggested that wheat yields were about 1.0 t/ha, during the year when official estimates were 1.6 t/ha (Alemu *et al.*, 2008).

Finally, the IFPRI-ATA Baseline Survey found average wheat yields of about 1.4 t/ha compared to the 2.1 t/ha estimates by CSA in the same year, though the former result was based on a much smaller sample size (750 farmers) and a different yield-estimation methodology. More specifically, the CSA used crop cuts to determine yield while the IFPRI-ATA Baseline relied on farmer recall (Minot and Sawyer, 2013). Some experts, in other countries, have questioned the overall reliability of large-scale crop cuts for yield determination (Sud *et al.*, 2011) although the reliability of farmer recall has been questioned as well.

2.2.5. Spatial distribution of wheat production

The main factors influencing the distribution of wheat production in Ethiopia are rainfall and altitude. Wheat grows best at temperatures between 7° C and 21° C and with rainfall between 750 mm/year and 1600 mm/year. Since altitude strongly influences the temperature in Ethiopia, most wheat is grown at an altitude of 1500 meters above sea level and above. For this reason,

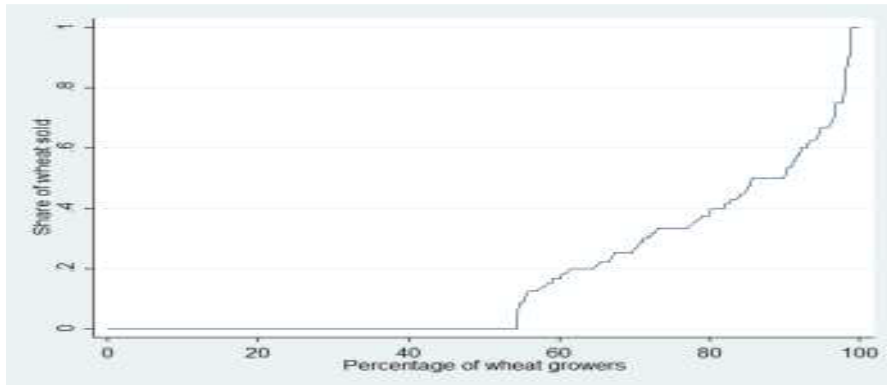
wheat is grown on the central plateau in the regions of Oromia, Amhara, Tigray, and the SNNP. In fact, less than 1 percent of the wheat area is outside these four regions (CSA, 2014).

Wheat yields are highest in Oromia (2.7 t/ha), which has the important wheat surplus zones of Bale and Arsi with prime growing conditions. Wheat yields are lower in SNNP (2.4 t/ha) and Amhara (2.1 t/ha). In Tigray, wheat yields are just 1.8 t/ha, as a result of the low rainfall and poor soils in some parts of the region. As would be expected, wheat area roughly determines wheat production, although there are some variations because of yield differences. For example, Oromia accounts for 59 percent of production, which is even more than its share of area because of the relatively high yields in that region. In contrast, Amhara represents only 29 percent of production, somewhat below its share of the national wheat area. SNNP and Tigray account for just 12 percent of the national wheat production (CSA, 2014).

2.2.6. Wheat marketing

Wheat marketing refers to the process by which wheat moves from farmers to consumers. However, most wheat in Ethiopia is not marketed; instead it is retained by the farmer and used for their own consumption, seed, and possibly other uses. According to the 2013/14 Agricultural Sample Survey, just 18 percent of wheat output was sold. However, the share of wheat production that is sold varies widely across households. Most wheat growers (54 percent) do not sell any of their wheat output. Just 10 percent of them sell more than 40 percent of their harvest while 5 percent sell more than half. Figure 2 displays the distribution of wheat growers according to the share of wheat sold. The top 20 percent of wheat sellers account for 60 percent of wheat sales.

Figure 1 Cumulative distribution of household by share of wheat marketed



Source: (ASS, 2012)

The 2012 IFPRI-ATA Baseline Survey provides some useful information on the patterns of wheat sales by Ethiopian farmers. On average wheat farmers produce 751 kg of wheat and sell 189 kg, so that the marketed surplus ratio is 25 percent. The regional breakdown shows that Amhara has more wheat farmers, but the wheat production and wheat sales per farm are larger in Oromia. As a result, Oromia accounts for about half of all marketed wheat. Amhara is the second-largest supplier of marketed wheat, followed by SNNP and Tigray.

2.3. Benefits of Agricultural Commercialization

The benefits of commercialization are multifaceted. Commercialization plays a significant role in increasing incomes and stimulating rural growth, through improving employment opportunities; increasing agricultural rural productivity; direct income benefit for employees and employers; expanding food supply and potentially improving nutritional status. In most cases, these increased incomes have led to increased food consumption and improved nutrition (Pender and Dawit Alemu, 2007). Others look at the benefits of commercialization from the perspective of comparative advantage.

According to (Govereh *et al.*, 1999) “Commercialization increases productivity and income.” The basic assumption embedded in the comparative advantage is that farmers produce mainly

high value cash crops which provide them with high returns to land and labor and buy household consumption items using the cash they have earned from cash crop sales.

According to (Moti Jaleta and Berhanu Gebremedhin, 2009) smallholder agricultural commercialization is significantly related with “higher productivity, greater specialization and higher incomes”. The authors further stated that the aforementioned outcomes give way to improvement in food security, poverty reduction and economy-wide growth.

(Samuel Gebreselassie and Sharp, 2007) pointed out that agricultural commercialization is a bridge through which smallholder farmers are able to achieve welfare goals. They describe farm household welfare to represent consumption of basic food (grains), high value foods (livestock products), expenditure on clothes and shoes, durable goods, education and health care. They also note that greater engagement in output markets would result in higher agricultural productivity which is, in itself, an intermediate outcome rather than a welfare goal. Nonetheless, agricultural productivity can facilitate the achievement of the welfare goals of small farms.

Another benefit of agricultural commercialization goes to its role in the transformation of subsistence agriculture in to market orientated production. Since the 1980s, smallholder commercialization has received greater attention as part of the agricultural transformation process and as a consequence of urbanization and economic growth (Pingali, 2001). (Doreen, 2012) found smallholder commercialization to be a contributing factor in the transformation of agriculture through enhancing smallholder competitiveness and bargaining power, enhancing linkages to markets and increasing incomes and better livelihood in Sub-Saharan Africa.

Similarly in Ethiopia, commercial transformation of smallholder agriculture entails production decisions based on market signals and significant participation in input and output markets. Hence, analysis of the commercial transformation requires analysis of market orientation and market participation (Berhanu Gebremedhin and Moti Jaleta, 2010).

However, as (Christopher, 2007) pinpointed policies to stimulate productivity growth and commercialization in smallholder agriculture must be coupled with policies to absorb those who were inevitably exit farming as part of the agricultural transformation.

2.4. Factors affecting Success of Commercialization of Smallholder Farming

Commercialization of smallholder farming can achieve its objectives and bring about the required benefits to the poor and rural based households when certain factors influencing its potential success or those that affect a farm household's decision to participate in the market are put in place. These influencing factors may be different in different contexts but empirical data refer to a host of factors common in the context of developing countries. (Von Braun *et al.*, 1994) pointed out that there are several exogenous factors that determine commercialization: population change, availability of new technologies, infrastructure and market creation, and macroeconomic and trade policies are considered to be among the most important driving forces.

Leavy and Poulton, 2007 have identified three critical conditions that need to be in place if agricultural commercialization is to be a success for the smallholder. These are market access, access to staple foods and asset accumulation.

The success and failure of smallholder commercialization is influenced by many enabling and constraining factors which can be physical, political, economic, socio-cultural, technological and individual (Louw *et al.*, 2008). Moreover, lack of supportive institutions; poor access to productive resources, markets, market information, public services, technology and skills; high transaction costs; poor agro-ecological conditions, prevalence of diseases; limited commercial mindsets and negative beliefs are other major constraints to smallholder commercialization (Rukuni *et al.*, 2006; Hazell *et al.*, 2007; Louw *et al.*, 2008; Poulton *et al.*, 2008; Kirsten *et al.*, 2012).

Similarly, in Ethiopia, (Pender and Dawit Alemu, 2007) developed a long list of factors that affect commercialization at local level based on the findings of different researchers. To them, commercialization is affected by agro-climatic conditions and risks; access to market and

infrastructure; community and household resources and endowments; development of local commodity, input and factor markets; laws and institutions; and cultural and social factors affecting consumption preference, production, and market opportunities and constraints. From a different perspective but in the same vein, (Mahelet Getachew, 2007) assessed the literature and found several factors that can either facilitate or constrain the commercialization of smallholder farming in the context of developing countries in general and Ethiopia in particular. Accordingly, these factors include, among others, distance to the market, transport access and road access; availability of credit, extension services and market information; output, input and factor prices; land size, access to modern inputs and storage facilities; and integration into the output market.

2.5. Review of Empirical Evidences

There are a number of empirical studies on factors affecting the marketable supply of agricultural commodities. For instance, (Kinde Aysheshm, 2007) identified factors affecting the marketable surplus of sesame by using OLS regressions. He found that sesame marketable supply was affected by; time of sale, use of improved production inputs, membership in local organization, extension contact and distance to market. (Abay Akalu, 2007) analyze the determinants of vegetables market supply by applying OLS regressions. Accordingly, the study found out that marketable supply of vegetables were significantly affected by family size, distance from main road, number of oxen owned, extension service and lagged price.

(IFPRI, 2015) Analysis of determinants of marketed surplus of wheat identify that the age of the household head has a negative coefficient while age squared has a positive coefficient, implying a U-shaped relationship between marketed share and age. Farm size is also positively and significantly related to the marketed surplus ratio for wheat though the effect is rather small: each additional hectare is associated with a two percentage-point increase in marketed share. Ownership of livestock and farm implements both contribute to a higher share of marketed wheat. This may be because the assets contribute to a higher yield or because these households are less vulnerable to market-related risks. Households that are located far from a cooperative or an all-weather road tend to sell a smaller share of their wheat output, presumably because of the higher costs of obtaining inputs and transporting crops to market.

Moreover, (Solomon Gebreselassie and Ludi, 2010) showed that likelihood to generate cash income improves consistently as the size of farm increases. Large farmers in general and especially those who cultivate above 5 ha of land generate substantially large cash income. Keeping the effect of other factors constant, the result implies the positive effect of operation at higher level in coping with the risk of higher variance of returns in cash crop production.

(Abafita *et al.*, 2016) survey conducted on “smallholder commercialization in Ethiopia”, fertilizer use and ownership of traction power (oxen) found to significantly and positively influence amount of crops sold. On the other hand available land size had significant positive effect on values of crops sold and among institutional services and infrastructure, access to credit and access to all weather road significantly enhanced volume of crops sold.

(Asfaw *et al.*, 2010) results also showed that, the effect of value of crop production and livestock endowment in determining the market position of households are apparently reflected in the estimation results. On the average, an additional crop production with a value of Birr 10,000 increases the likelihood of being a net seller in crop market by 11%. Households with larger livestock endowments are less likely to be net buyers in crop market. The availability of larger family labor for agriculture affects the likelihood of being a net seller (buyer) in crop markets positively (negatively). This might be due to the inefficiency of labor market where households with more family labor could produce more outputs (Moti Jaleta and Berhanu Gebremedhin, 2012).

(Berhanu Gebremedhin and Dirk, 2008) in their study of the determinants of market participation using household level regression model found that population density is positively associated with proportion of Teff, chickpea and Niger seed produce sold indicates that given the decision to grow Teff, chickpea and Niger seed, households in high population density areas offer higher amount of their produce to market. Thus, it implies that both urban and rural population growth has positive impact for food and cash crops.

(Alene *et al.*, 2008) also noted that non-farm income contributes to more marketed output if the non-farm income is invested in farm technology and other farm improvements. Otherwise, marketed farm output drops if non-farm income triggers off-farm diversification. To meet both household consumption requirements and market demand, a household intuitively needs to generate surplus output. (Key *et al.*, 2000) and (Makhura *et al.*, 2001) found that distance to the market negatively influences both the decision to participate in markets and the proportion of output sold. Thus, the variable transport costs per unit of distance increases with the potential marketable load size.

Moreover, (Mebrahatom *et al.*, 2014) OLS econometric model was used to identify and analyze factors that determine the extent of smallholders participation in output market. Accordingly, ownership of equine, cash expenses for farming, specialization in Teff (land allocated to Teff), ownership of oxen were those explaining the variation of Teff output sale positively as evidenced by the OLS model while distance from homestead to the nearest market place and distance from homestead to all weather road found to affect negatively. Similarly, road and market infrastructure as well as ownership of oxen and equine are the other critical issues that need intervention emphasis to increase the level of commercialization of Teff production.

According to (Asfaw *et al.*, 2010) on their research entitled “Does technology adoption promote commercialization” conducted at Debrezeit, by using double-Hurdle model they found that farmers who knew more number of varieties during preceding year probably have better information about the advantages of the varieties and hence increase cash expenditure for new varieties and are likely to adopt and allocate more land for the commodity during the year.

Furthermore, (Shiferaw *et al.*, 2008) found the same result on their studies for pigeon pea varieties, for cowpea varieties and for maize varieties respectively that to farmers technology awareness have a positive effect on adoption of these high yielding varieties. Moreover, the authors found that the level of adoption of improved chickpea varieties were strongly related to a range of household wealth indicator variables. Thus, adoption of high yielding varieties was lead to high allocation of land for that commodity and increase of cash expenditure for farming and hence marketing surplus. Here, knowledge of improved varieties increases the cash expenditure

for production of a given crops and lies as an advantage to increase production, productivity and volume of crops sold.

(Ayelech Tadesse, 2011) identified factors affecting the marketable surplus of fruits by using OLS regressions. She found that fruit marketable supply was affected by; education level of household head, quantity of fruit produced, fruit production experience, extension contact, lagged price and distance to market. (Getachew Nigussie, 2009) identify factors affecting honey supply in Burie District. Honey supply is found to be significantly affected by experience, non-farm activities, training and improved inputs.

In a similar way, A study in Alaba Siraro District by (Wolday Amha,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.

3. RESEARCH METHODOLOGY

This section consists of description of the study area, research design (sampling design and Sampling methods), data collection methods, data types and methods of data analysis.

3.1. Description of the Study Area

Bale zone is one of the zones in Oromia National Regional State which is surrounded by one National regional state and five neighboring zones. It is bounded with Somali National Regional State in the East, East Hararghe zone in the North East, West Hararghe zone and Arsi zone in the North, West Arsi zone in the West and Guji zone in the South.

The study was conducted in Gololcha District. Available information suggested that the name of the District might have derived from Gololcha River. The District town is called Jara. The name Jara implies “century” in Afan Oromo. From 1996-1998 Gololcha and Gasera District were merged together and form Gololcha Gasera District by assigning Jara as a capital of the District. But from 1998 onward, the two Districts split each other and form their own administrative District. Gololcha District has endowed by numerous historical places and tourist attraction like Dire Sheik Hussein, Dire Dadala, Sofoumer hammara, Arab lij and Qachama sare (GDOA, 2016).

3.1.1. Topography and location

Astronomically, Gololcha District lies between 7°N - $71/2^{\circ}\text{N}$ latitude and 4°E - $4\ 1/2^{\circ}\text{E}$ longitude. It is located in the Northern extreme parts of the Bale zone. It is bounded by Gasera District in the East, Lega-hidha and Sawena Districts in the West, Ginir District in the North and Arsi zone in the South. Gololcha District is one of the administrative territories of Bale zone with an area of $2,392\text{ km}^2$ (239,200ha) which is ranked 10th among the Districts in the zone. The area of the District leads the District to have a share of 3.16 percent from the total area of the zone ($69,661\text{km}^2$). It is located at a distance of 122 km from zonal capital called Robe and 550km

from capital city of the country (GDOA, 2016). The location map of the District is presented below.

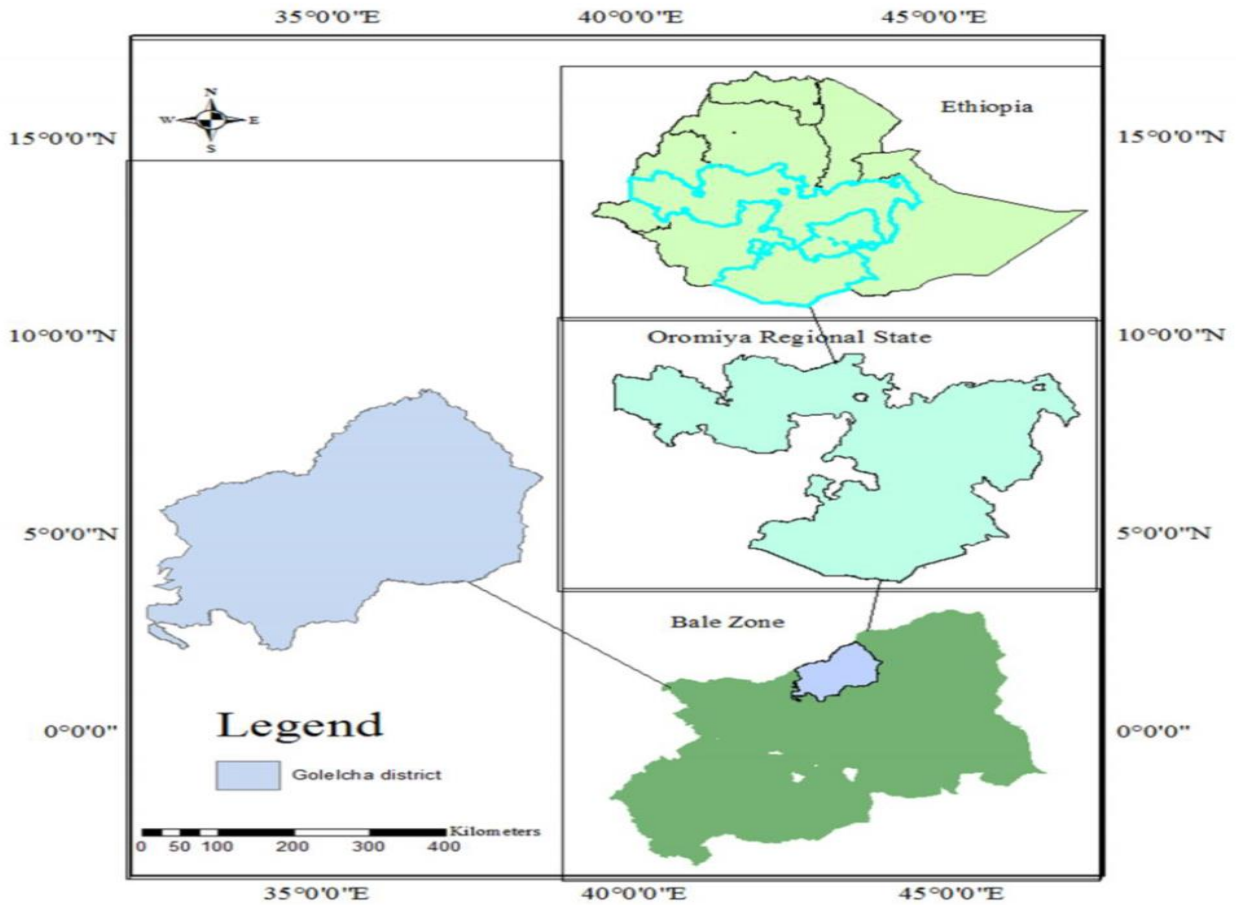


Figure 2 Location map of the District

Source: - (GDOA, 2016)

3.1.2. Population characteristics

The total District population is 114,274. Out of which 58,345 (51.06%) are male and 55,929 (48.94%) are female. Population is unevenly distributed in the District. Since the majority of the population is engaged in agricultural activity, the rural population has 93.99 percent share out of the total population of the District. Thus, there are high concentrations of the population in rural

areas of the District than urban areas. The average density of the population for Gololcha District (2013-2015) varies between 44-53.7 person/km² (BZFEEDB, 2016).

3.2. Data Sources and Methods of Data Collection

The study was used both primary and secondary data. The secondary data on commercialization, trends in agricultural production, wheat marketing and other secondary data relevant for data analysis was collected from District and zonal planning offices, District office of Agriculture, and Disaster Prevention and Preparedness Office of the District.

Primary data was collected through a household survey. The household survey focused on collecting quantitative data on production and marketing of farm produce, as well as demographics, resource ownership, and non/off-farm activities using pre-tested questionnaire. The qualitative fieldwork was done through focus group discussion, key informant interview, and participant observation methods.

3.3. Sample Size and Sampling Procedures

Formally sample size was a function of the variability of population characteristics, the desired degree of precision and the degree or level of confidence desired in the estimate (Mendoza, 1995). Moreover, the sample size depends on the number of wheat market participant, and traders on the basis of their size. For the primary data collection, a multi stage sampling technique was used to draw the sample.

In the first stage, Gololcha District was selected purposively based on highly and agro-ecologically suitable and potential area for wheat production and it is one of the potential areas among five identified wheat production areas of Bale zone.

In the second stage, in consultation with agriculture office of the District, three kebeles selected purposively based on their wheat production potentials. These kebeles are namely: Dire Gudo

having wheat producers of 853, Dinsa having wheat producers of 782 households and Kenjila having wheat producers of 500 and total wheat producers of 2135 (GDOA, 2016).

In the third stage, based on the population number of sample kebeles, representative wheat sellers/producers/ were selected using probability proportional to size sampling technique from each sample kebeles. The maximum number of respondents was determined by using a formula developed by (Yamane, 1967). See the table below

$$n = \frac{N}{(1+N(e^2))}$$

Where:

n= is the sample size (146)

N= is the population size (2135)

e= is the level of precision (0.08)

Table 1 Number of sample respondents

Name of kebeles	Total number of Wheat producers	Percent	Sample size drawn
Dire Gudo	853	40	58
Dinsa	782	37	54
Kenjila	500	23	34
Total	2135	100	146

Source:-Survey result, 2017

For this study, data from traders was also collected. The sites for the trader surveys were market towns in which a good sample of wheat traders existed. The list of traders (wholesalers and retailers)were obtained from Gololcha District office of trade and industry and for other traders there is no recorded list (unlicensed traders).Both licensed and unlicensed traders were included in the traders survey. 15 wholesalers, 15 retailers and 10 rural assemblers were randomly selected constituting 40 traders from Dire Gudo, Dinsa and Kenjila markets.

3.4. Methods of Data Analysis

3.4.1. Descriptive statistics analysis

Descriptive statistics such as measures of averages, percentages and standard deviation was employed to assess the current level of commercialization of wheat production in the study area, and in the process of explain variation in the level of commercialization of wheat among households. Besides, an OLS econometric analysis was used to pinpoint factors which might explain variation in the level of commercialization, regressing demographic and socio-economic characteristics of the household and other farm characteristics. The degree of commercialization of the sample households categorized in to three (subsistence, semi-commercial and commercial) based on the proportion of wheat they sold; defining as those who sold greater or equal to 60% of their production as most commercialized, and those who sold less than 30% as subsistence and between 30%-60% are semi-commercialized (Degye Goshu, 2015). To analyze the commercialization level of sample respondents, household commercialization index was determined for all respondents by using the following formula.

$$\text{Household commerciliazation index(HCI)} = \frac{\text{Amount of wheat sold in the market}}{\text{Amount of total wheat produced}}$$

3.4.2. Analysis of structure conduct and performance (S-C-P) model

The model examines the causal relationships between market structure, conduct, and performance, and is usually referred to as the structure, conduct, performance (S-C-P) model. In agricultural economics, the most frequently used model for evaluating market performance is based on the industrial organization model. (Muhammed Urgessa, 2011) also used this model to evaluate Teff and wheat market in Alaba District. In this study S-C-P model was used to evaluate how efficiently wheat market in the study area is functioning.

Structure of market

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

Concentration ratio (CR)

The concentration ratio is a way of measuring the concentration of market share held by particular suppliers in a market. "It is the percentage of total market sales accounted for by a given number of leading firms". Thus a four-firm concentration ratio is the total market share of the four firms with the largest market shares. The greater degree of concentration is the greater the possibility of non-competitive behavior existing in the market. For an efficient market, there should be sufficient number of firms (buyers and sellers) (Degye Goshu, 2015).

$$s_i = y_i / \sum y_i$$

Where S_i = market share of buyer i

y_i = amount of product handled by buyer i

$\sum y_i$ = Total amount of the product

$$C = \sum_i^m S_i, i = 1, 2, \dots, m$$

Where s^i represents market share of i^{th} firm and

m is number of largest firms for which the ratio is going to be calculated.

Market conduct

Market conduct refers to the patterns of behavior that enterprises followed in adopting to the markets in which they sell or buy. The principal dimensions of market conduct according to

(Tadie Mirie, 2016) include price setting, the manner in which the value and quality ranges of products are determined, advertising and marketing strategy, research, development planning, implementation, and legal tactics. To study market conduct there are no agreed upon procedures for analyzing the elements. The existence of formal and informal producing and marketing groups; the availability of price information and its impact on prevailing prices; and the feasibility of utilizing alternative market outlets pricing, buying and selling practices was assess.

Market performance

Marketing efficiency is essentially the degree of market performance. It is defined as having the following two major components: (i) the effectiveness with which a marketing service would be performed and (ii) the effect on the costs and the method of performing the service on production and consumption. These are the most important because the satisfaction of the consumer at the lowest possible cost must go hand in hand with maintenance of a high volume of farm output (Dagne Getachew, 2014).

The two approaches to measure marketing performance are: marketing margin and the analysis of market channel efficiency. A large number of studies have analyzed the marketing margins for different types of commodities to examine the performance of agricultural products marketing (Jema Haji, 2008) argued that even though variations in the margin over time might be attributable to marginal marketing costs under perfect computation, additional factors such as seasonality, technological changes, and sales volume may also explain the variations in the margin.

Estimation of marketing costs and marketing margins

Different types of marketing costs (including transport, packing, processing, loading unloading etc.,) relating to transaction of wheat for producers and each trader (local assemblers, cooperatives, wholesalers and retailers) was collected per quintal basis.

The term marketing margin is commonly referring to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity Tomek and Robinson, 1985. However, it may also describe price differences between other points in the marketing chains. It is a price charged for providing a mix of marketing services such as assembling, transportation, handling, packing, processing, storage etc. plus profit. Marketing margins for the various wheat traders were estimated using the following formulas.

$$TGMM = \frac{\text{retailing price} - \text{farm gate price}}{\text{retailing/consumer price}} * 100$$

$$GMM_{RA} = \frac{\text{rural assembler price} - \text{farm gate price}}{\text{retailing/consumer price}} * 100$$

$$GMM_W = \frac{\text{wholesaler price} - \text{rural assembler price}}{\text{retailing/consumer price}} * 100$$

$$GMM_R = \frac{\text{retailing price} - \text{wholesaler price}}{\text{retailing/consumer price}} * 100$$

$$NMM = TGMM - TMC$$

$$GMM_P = 100\% - TGMM$$

Where

TGMM is Total Gross Marketing margin;

GMM_{RA} is the percentage of the total gross marketing margin received by rural assemblers;

GMM_{WS} is the percentage of the total gross marketing margin received by wholesalers;

GMM_R is the percentage of the total gross marketing margin received by retailers;

GMM_P is the producer's gross marketing margin;

TMC is the total marketing cost;

NMM is the net marketing margin.

3.4.3. Econometric analysis

3.4.3.1. Model for volume of wheat sold.

In this study, multiple linear regression was used to analyze factors affecting the volume of wheat sold in the study area because dependent variable is continuous. This model is also selected for its simplicity and practical applicability (Greene, 2000). Econometric model specification of supply function in matrix notation is the following.

$$Y = X'B + U$$

Where: Y = Volume of wheat marketed

X' = A vector of explanatory variables

B = A vector of parameters to be estimated

U = Disturbance term/Error term/

Multicollinearity test

Multicollinearity is a situation whereby there exist strong linear relationships among independent variables is more than 75 percent (Gujarati, 2005). If two variables are highly collinear, then this will result in inefficient estimates. In this study, before running multiple linear regression analysis, Multicollinearity was tested by using a variance inflation factor for continuous variable and contingency coefficient for dummy variable.

Variance inflation factor (VIF)

It is used to assess the degree of association among continuous explanatory variables. As a rule of thumb, if the VIF is greater than 10 the variable is said to be highly collinear. According to (Gujarati, 2004), the Variance Inflation Factor (VIF) is calculated as follows:

$$VIF = \frac{1}{1 - R^2}$$

Where, VIF is variance inflation factor

R^2 =Is the multiple correlation coefficients between explanatory variables, the larger the value of the R^2 higher the value of VIF (X_i) causing higher collinearity between the variables.

Contingency coefficient (CC)

It is used to detect the degree of association among dummy explanatory variables (Healy, 1984). It measures the relationship between the row and column variables of a cross tabulation. The value ranges between 0-1, with 0 indicating no association between the row and column variables and value close to 1 indicating a high degree of association between variables. The decision criterion, if the contingency coefficient value is ($CC > 0.75$) the dummy variables are said to be collinear and is computed as follow.

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

Where x^2 is chi-square

N is total sample size (146 in this case)

3.5. Hypotheses and Definition of variables

3.5.1. Dependent variable

To deal with smallholders' commercialization of wheat, which is the main issue explained in the present study, the volume of wheat produce sold is used as a dependent variable to measure commercialization level of wheat production.

3.5.2. Explanatory variables

1) Age of household heads: It is a continuous variable measured in number of years. A study conducted by (Woldemichael Woldehanna, 2008) confirmed better experience and wise resource use of older household heads and he reveal positive effect of age on market participation and marketable surplus. Thus, if the self-sufficiency preference or attitude towards risk of households would change as the household grows older, we would expect a U-shape or an inverted U-shape relationship between age of the household and volume of output sold.

2) Sex of the household head: This is a dummy variable that takes a value of one if the household head is male and zero, otherwise. Male headed households, due to their potential crop production efficiency advantages over female headed households, are expected to be more market oriented, and to sell more produce (Haimanot Asfaw, 2014). Similarly, in the present study, sex of the household head is expected to affect volume of wheat sold positively.

3) Educational status of the household head: It is continues variable that represents number of grades of schooling of the household head. This variable reflects the ability to retrieve and interpret information. A study by (Von Broun *et.al.*, 1994) revealed the key role of education to promote commercialization of agriculture. Literate or households with higher grade education are expected to have better skills, and better access to information and ability to process information. This helps them to produce efficiently and thus may be positively associated with a volume of produce sold.

4) Ownership of oxen: It is a continuous variable measured as the number of oxen owned by the household heads. The aim of this variable is to know impact of number of oxen on households' volume of wheat sold through their impact on the volume of wheat produced. Studies conducted by (Berhanu Gebremedhin and Dirk, 2007), (Samuel Gebreselassie and Sharp, 2007), (Berhanu Gebremedhin and Moti Jaleta, 2010) and (Goitom Abera, 2009) showed significant positive effect this variable on commercialization of cereals. Similarly, in the present study, it is hypothesized that farmers who own more number of oxen will be more output market participant

than others. This is because; oxen ownership would help farmers to carry out agricultural operations like ploughing, sowing and others on time that would improve productivity.

5) Ownership of equines: Equines are expected to have a positive effect through their role in reducing marketing (transportation) costs. A study of the economic effects of the Market Integrated Rural Transport Project in Tanzania concluded that the use of donkeys had enabled farmers to transport larger harvests from the fields to the market. It also showed that farmers owning donkeys will be able to use more fertilizer, because it could be transported easily at low cost from the market place to the homestead and from the homestead to the fields (Sieber, 2000). Similarly in Ethiopia, donkeys are a major mode of transport Fernando and Starkey, 2002. Hence, it is hypothesized to relate to the volume of output sold positively.

6) Distance to the market center: It is a continuous variable measured as average distance to market center in kilometers. Near road accessibility can have important influence on markets from both the supply and demand side because it reduces the imperfect information and transaction costs. (Binswanger *et al.*, 1993) identified that the lack of roads is a significant barrier to the ability to respond to agricultural supply. Similarly in Ethiopia, (Pender and Dawit Alemu, 2007) and (Berhanu Gebremedhin and Moti Jaleta, 2010) and other authors also examined that marketing costs is completely hindering or limiting the level of smallholder market participation. Hence, in the present study it is hypothesized to affect volume of wheat sold negatively.

7) Frequency of extension contact: This is a continuous variable measured by number of visits by extension agents per year. Farmers that contact with DAs frequently will have better access to information and could adopt better technology as well as they are more likely to know the advantage of commercialization that would increase their marketable supply of wheat. According to (Berhanu Gebremedhin and Dirk, 2008), extension service was found to enhance farmer skills and knowledge and develops their production and market participation. Hence, this is hypothesized to affect volume of output sold positively.

8) Access to credit: This is a dummy variable which represents whether the farmer has obtained formal credit or not during the production season. If the farmer has access to credit facility, the variable takes a value of one and zero, otherwise. Access to credit improves the financial capacity of farmers to buy modern inputs, thereby increasing production which is reflected in the marketable supply of wheat. According to (Pender and Dawit Alemu, 2007) and (Lerman, 2004) credit is found to ease liquidity and input supply constraints. Thus, it is hypothesized that farmers who have access to credit sources are more efficient and could sell more of their produce than others.

9) Income from off/non-farm activities: It is a continuous variable measured as the total income earned from wage employment, self-employment activities and remittances in Birr. Income from off/non-farm activities are expected to supply the cash requirement of the household. A study conducted by (Adam Bekele, 2009) found less commercialized group of farmers following income diversification, share cropping and off-farm and non-farm employment strategies more than the highly commercialized group during his survey year. The same authors revealed that, off/non-farm income had significant negative effect on the level of crops market participation. In the present study too, the impact of this variable is expected to affect quantity of wheat sold negatively.

10) Household labor size (man equivalent): According to (Berhanu Gebremedhin and Moti Jaleta, 2010), Wheat is a laborious crop and households with higher family labor supply are more likely to grow it, given the labor market imperfection in the study area. Moreover, (Samuel Gebreselassie and Sharp, 2007) indicate that; Keeping other factors constant, farmers participating in output markets follow more labor-intensive farming since, employing higher man-days per hectare is expected to affect both production and output markets participation. Thus, this variable's is expected to affect volume of produce sold positively.

11) Amount of land allocated to wheat: This variable is a continuous variable measured in terms of number of hectares allocated to teff and was expected to affect the household market participation and level of teff marketed surplus positively (Muhammed Urgessa, 2011). This is

because, producers who own large area holding can produce more than a producers who own less area and thus to supply more to the market.

12) Cash expenditure for farming: It is a continuous variable that values the use of modern farm inputs such as fertilizers, improved seeds and pesticides (measured by cash expenditure on the purchase and transport of these inputs). This variable indicates the use of modern agricultural inputs and the degree of commercialization in input side which are the basic preconditions of output side commercialization. (Samuel Gebreselassie and Sharp, 2007) found that cash expenditure on inputs such as fertilizer, pesticides, and peak-season hired labor also significantly affects the total volume of farm output. Hence, this is expected to correlate with quantity of output sold positively.

13. Access to market information (ACCMIF): its dummy variable that takes values 1 if the household accessed market information and 0 otherwise. Farmers market decision are based on market price information, poorly integrated markets may convey inaccurate price information, and leading to inefficient product movement. It has been hypothesized to positively influence the volume of wheat marketed of farm households. Because, producers that have access to market information are likely to supply more wheat to the market. (Mohammed Urgessa, 2011) found that if wheat producer gets market information, the amount of wheat supplied to the market increases.

14. Quantity of wheat produced: It is an economic factor and continuous variable that can affect the household level of wheat marketed surplus and measured in quintals. The variable was expected to have positive contribution in smallholder marketed surplus of wheat. (Muhammed Urgessa, 2011 and Habtamu Gemedu, 2015) found that quantity produced affect the marketable supply and the level of market participation respectively , because a farmer that obtains high yield can supply more to the market than a producer who had fewer yields.

The overall explanatory variables used in multiple linear regressions are summarized in table 2 below.

Table 2 Summary of explanatory variables used in the multiple regression analysis

Explanatory variables	Type	Measurement	Expected effect
Sex of household head	Dummy	Male=1,Female=0	+ve
Age of household head	Continuous	Year	+ve
Education of household head	Continues	Number of grades	+ve
Oxen owned	Continuous	TLU	+ve
Equine owned	Continuous	TLU	+ve
Access to credit	Dummy	1=yes 0=no	+ve
Distance to the market center	Continuous	Km	-ve
Off and non-farm income	Continuous	Birr	-ve
Specialization in wheat	Continuous	Hectare	+ve
Available family labor	Continuous	Man Equivalent	+ve
Cash expenses for farming	Continuous	Birr	+ve
Frequency of extension contact	Continuous	Number of contacts	+ve
Access to market information	Dummy	1=yes 0=No	+ve
Quantity produced	Continues	Quintals	+ve

4. RESULTS AND DISCUSSIONS

In this chapter, the results of the findings from quantitative as well as qualitative data and key informant interview are discussed thoroughly followed by the discussion of the respective issues of interest. First, descriptive and statistical analyses of the demographic and socioeconomic characteristics of the sample households are presented. Next, econometric (empirical) analyses of the commercialization of smallholder farming households are presented.

4.1. Descriptive Results

4.1.1. Demographic and socio economic characteristics of sample households

Table 3 and 4 below presents demographic and socio-economic characteristics of the sample respondents with their respective statistical tests. The sample population of wheat producer respondents handled during the survey was 146. From the total interviewed wheat producers 76.7% were male-headed households and only 23.3% were female-headed. The survey showed that no respondents were single. According to the survey result, regarding the respondents' religion, most of the household heads 94.5% were Muslim and the remaining 5.5% were Orthodox Christians.

Age

It is believed that age of the household head determines whether the household benefits from the experience of an older person or base its decision on the risk taking attitude of the younger producer. The average age of the sample household heads was 39.04 years with minimum and maximum ages of 22 and 75 years, respectively.

Educational Status

It is clear that education can influence productivity of producers and adoption of newly introduced technologies and innovations. Hence, literate producers are expected to be in a better position to get and use information which contributes to improve their farming practices. According to survey result the average educational status of farmers was 2.60 with minimum and maximum educational status of 0 and 9 grades.

Family size

The average family size of the sample households was 7 persons, with minimum and maximum family size of 3 persons and 15 persons, respectively. Moreover, the average family labor in man equivalent was found to be 5.37.

Livestock holding

Farm animals have a key role in rural economy. They are source of draught power, food, such as, Milk and meat, cash, animal dung for organic fertilizer and fuel and means of transport. Beside this, livestock are important sources of cash in rural areas to allow purchase of farm inputs and to finance commercializing activities (combiner harvesting, storage facilities, transport facilities and the like) thereby increase quantity sale of producers. The types of livestock found in the study area were cattle, equine, sheep, goat and poultry chicken.

In the study area oxen power is the major input in wheat production and all wheat producers' use oxen for cultivation of their land, the average oxen owned by the sample household heads in TLU were 2.60 with the minimum and maximum ownership of 1 and 8 heads. Furthermore, in the study area Equines are the most abundant livestock than other livestock, the average equines owned by the sample household heads in TLU was 1.45. Livestock disease and shortage of water are major problem of livestock production in the study area.

Land allocation

One of the most important factors that influence crop production is availability of land for crop production. An average land held by the sample respondents was 2.77 hectares with minimum and maximum land holding of 0.4 and 15 ha. An average size of land allocated for wheat production per household was 1.75ha with minimum and maximum number of 0.2ha and 7.5ha, respectively.

Total production and commercialization

Farming was the main occupation and source of livelihood for all sample producers where the major ones are crop production and grain trading. Moreover, in addition to the farming activities, some respondents (3.4%) have also engaged in non-farm activities like petty trading and transport services using donkey carts and earn additional non farm income of on average 397.26 birr per year.

Crop production in the study area was not only for home consumption but also for meeting cash requirements of the producers. Particularly wheat was produced for market and was the main cash crop for sample respondents of the District. According to the survey result, in the study area wheat average production was 56.03 quintals with minimum and maximum wheat production of 13 and 180 quintals during 2016 cropping year. On average 29.73 quintals of wheat was sold with minimum and maximum wheat sold of 3 and 140 quintals and also on average 15.11 quintals was for home consumption.

According to the survey result, the average cash expenditure for wheat production by sample respondents in 2016 cropping year was 20022.36 birr. This cash expenditure included the expenditure for farming, seed, fertilizer, herbicide up to storage etc.

Proximity to market

Moreover, sample respondents travelled on average, 1.87 Kilometers up to the market center in which they sold their wheat with a minimum and maximum distance of 0(sold at their resident) and 4 Kilometers respectively.

Moreover the significant t-test value for continues variables for sample respondents that sold below mean and above the mean reveals that Age of household head, Land allocated for wheat and quantity of wheat produced affected the volume of wheat sold under 1% and ownership of equines under 10% significance level respectively. It implies that; there was a significant difference in age, land allocation and quantity of wheat produced for households which sold above and below average wheat sold; which means that households which was an old, allocate more of his/her land for wheat, more equine owned and produce more quantity of wheat was sold large volume of wheat as compared to his/her counterparts. Therefore, the concerned body should give adequate veterinary services, good advice on the use of modern inputs that increase production and productivity, give training on wise use of resource and resource allocation and also should change the attitude towards risks of farmers through education. However, farmers also should have to allocate more of his/her lands for wheat production which increases the commercialization of wheat.

The insignificant chi-square value for other variables reflected that; there was no a significant difference in variables (family labor, oxen owned, distance to the market center, cash expenditure for wheat production off and non farm income and educational status of household heads) for sample respondents that sold below average wheat sold and that sold above average wheat sold. The overall demographic and socio economic characteristic of sample respondents for continues variables with their respective statistical tests were briefly explained in table 3 below.

Table 3 T-tests for demographic and socio economic characteristics for continuous variables

Variable	Below Mean (Mean)	Above Mean (Mean)	Overall	Std.dev	t-value	Sig.
Age (years)	37.01	42.21	39.04	9.85	-3.21	0.0016***
Family Size	6.76	6.70	6.74	1.912	0.19	0.849
Family labor	5.16	6.70	5.37	0.2353	-1.13	0.261
Oxen	2.61	2.59	2.60	0.9133	0.066	0.948
Equines	1.36	1.59	1.45	0.725	-1.904	0.059*
Total land	2.47	3.24	2.77	1.65	-2.79	0.006***
Cultivated land	2.31	3.11	2.62	1.59	-3.06	0.0026***
Land for wheat	1.46	2.19	1.80	0.84	-4.83	0.0000***
Fallow land	0.16	0.12	1.45	0.34	0.69	0.4928
Distance to market	1.94	1.77	1.87	1.21	0.85	0.398
Cash expenditure	19519.65	20807.28	20022.36	6698.171	-1.134	0.259
Off/Non-farm income	235.96	649.12	397.26	2445.21	-0.956	0.321
Educational status	2.44	2.84	2.60	2.08	-1.146	0.2537
Quantity produced	37.13	85.54	56.03	33.35	-12.12	0.0000***

*, and *** showed that statistically significant at 10%, 1% respectively.

Source:-Survey result, 2017

4.1.1.1. Institutional factors

Institutional support services are essential precondition for enhanced wheat commercialization. More specifically, access to cooperative services, access to market information, access to credit and access to extension contact are the most important services in the increment of wheat commercialization and thereby increase income of the producer. According to (Martin *et al.*, 2007) found that access to information or knowledge, technology and finance determines the state of success of commercialization.

Cooperatives member

Cooperatives improve understanding of members about market and strengthen the relationship among the members. Of the total interviewed sample respondents 27.4% were members of farmer primary cooperatives while 72.6% were not members of farmer primary cooperatives.

Access to market information

In the study area 46.6% of producers knew price to be offered by market outlet before selling wheat. Major sources of market information for producers include 79.4% traders, 13.2% cooperatives, 7.4% market participant producers. This indicated that the use of modern communication mass media like radio, television and printouts was lacking. In this line, access to modern communication mass media is extremely limited in the Ethiopian grain market (Eleni Gebremedhin, 2001). Even though, producers have access to information from different directions, the type of information they get particularly input availability and price was from local traders.

Furthermore, during group discussion; the producers reported that they lack reliable information and the power of deciding on the price of wheat. This is because local traders mainly focus on their profit and they deliver low market price for wheat that was not profitable for producers. This showed that there is a potential to expand information sources through effective use of modern communication technologies for enhanced wheat commercialization. Again, this showed that more promotional effort is needed to reach majority of producers to expand markets.

Access to extension services

The survey result showed that among the total sample of wheat producers, 70.5% had better access to extension services in 2016 production year. OoA through its DA was the major actor who provides information and advisory service on wheat production and management practices. Besides, model farmers, neighbor farmers/friends and Sinana agricultural research center were also mentioned as source of information, advice and experience.

Furthermore, producers indicated that they were getting information particularly input application and farming method. However, there was the a shortage of trained man power (DA) where the maximum number was only 2 DAs per kebeles to disseminate the required extension service was not acquired on time by sample respondents.

Access to credit

According to the survey results, only 29.5% from the total sample households had access to credit and the remaining 70.5% had no access to credit. Cooperatives, Oromia credit and saving institution, traders and NGOs were the sources of credit in the study area. Particularly at harvesting time traders also lend loans to the producers and then secure their supply. Although taking interest was not their priority, they tend to secure their supply by giving the loans and increase their bargaining power. Moreover, the sample respondents reported that huge bureaucracy of access to credit has been the most critical constraint in the start-up and expansion of the wheat production.

The insignificant chi-square value of corresponding variables reflected that marital status, Religion, Participation on non-farm activities, being in cooperative member, Access to market price information, Extension contact and Mobile ownership of household heads all have no significant effects on volume of wheat sold (there was no a significant mean difference in the above variables for households which sold below and above average wheat sold). The significant Chi-square value at 5% and 10% significance level of sex of household heads and access to credit among sample of wheat producers that sold below mean and above mean implies that farmers who were male headed and have access to credit would sell relatively large amount of wheat than those households who was female headed and have no access to credit respectively. Therefore, creating environment where adequate credit service and increasing the participation of females at the right time and place would be offered to farmers is an important policy issue for the concerned body so that farmers benefited from the sale of wheat. The overall demographic, socio economic and institutional characteristics of sample respondents with respective statistical tests are summarized in table 4 below.

Table 4 Chi² for demographic and socio economic characteristics for categorical variables

Variable	Below Average	Above Average	Overall	Percent	Std.dev	χ^2 -value	Sig.
Sex							
Male	62	50	112	76.7	0.035	6.3414	0.012**
Female	27	7	34	23.3	0.035		
Marital Status							
Married	82	49	131	89.7	0.025	1.515	0.469
Divorced	4	4	8	5.5	0.019		
Widowed	3	4	7	4.8	0.018		
Religion							
Muslim	84	54	138	94.5	0.018	0.0084	0.927
Christian	5	3	8	5.5	0.018		
Nonfarm/income							
Yes	2	3	5	3.4	0.015	0.9556	0.328
No	87	54	141	96.6	0.015		
Cooperative Member							
Yes	22	18	40	27.4	0.037	0.8220	0.365
No	67	39	106	72.6	0.037		
Market Information							
Yes	46	22	68	46.6	0.041	2.3923	0.122
No	43	35	78	53.4	0.041		
Extension Contact							
Yes	61	42	103	70.5	0.038	0.4427	0.506
No	28	15	43	29.5	0.038		
Access to Credit							
Yes	21	22	43	29.5	0.038	3.7632	0.052*
No	68	35	103	70.5	0.038		
Mobile Ownership							
Yes	75	49	124	84.9	0.029	0.0780	0.780
No	14	8	22	15.1	0.029		

*, ** was statistically significant at 10% and 5% significance level

Source:-Survey result, 2017

4.1.1.2. Input utilization of sample respondents in 2016 cropping year.

Input application was one of the most important agricultural practices that are used by wheat producers in the study area. Moreover, proper application of the recommended input rate is important to obtain the required quality and quantity produced thereby increasing quantity of market supply (Goitom Abera, 2009).

Wheat varietal technology

Table 5 showed that wheat varieties used by sample households with their respective statistical tests. Seed is a basic requirement and one of the most precious resources in crop production Almekinders and Louwaars, 2008. The use of improved wheat seed varieties is no doubt part of the solution towards increased and sustainable wheat production to meet the ever increasing wheat demand of the country's food processing industries. About 60.3% of wheat producers were used improved wheat seed varieties while 32.2% wheat producers were used local seed varieties and 7.5% used both varieties. This implies that the District wheat producers prefer improved seed varieties to local seed varieties and also almost all sample of respondents had awareness about the importance of improved seed varieties.

Table 5 Wheat variety used by sample households during the year 2016.

Variables	Below Mean	Above Mean	Overall	Percent	Std.dev	chi ² -value	Sig.
Local	34	13	47	32.2	0.04		
Improved	49	39	88	60.3	0.038	3.7780	0.151
Both	6	5	11	7.5	0.075		

Source:-Survey result, 2017

Even though producers prefer improved seed varieties, they always obtain below their requirement and the quantity, the quality, the uniformity and time was not at the desired level. Besides, according to focus group discussion participant producers said that seed supply was limited. This has led to most of the producers recycling seed from the previous crop which reduces yield per unit area over time. Moreover, in the study area producers used improve seed on average at a rate of 1.04 quintals per hectare while the recommended one was 1.5 quintals per hectare (SARC, 2016). Furthermore, Bakkalcha, Obsaa, Ejersa and Udee were the most preferred improved wheat varieties.

Furthermore, Table 6 revealed that 81.8%, 10.1%, 6.1% and 2% of the respondents got improved seed varieties from the Cooperatives, Traders, and Agricultural Office and research centers, respectively. According to this, the major seed source in the District was Cooperatives.

Table 6 Source of improved wheat seed varieties for sample respondents

Variables	Number (N=146)	Percent
Cooperatives	81	81.8
Traders	10	10.1
Agricultural Office	6	6.1
Research Centers	2	2

Source:-Survey result, 2017

Fertilizer used

Table 7 revealed that access and payment of fertilizer by the sample respondents. It is evident that chemical fertilizer could boost both production and productivity. Particularly reports had also showed that increased usage of fertilizer is considered to be one of the primary means of increasing wheat grain yields in Ethiopia (Asnakew *et al.*, 1991). Grain yield and quality of wheat as influenced by fertilizer application has also been investigated by (Haimanot Asfaw, 2014).

According to this study 99.3% of the sample respondents reported that they applied DAP on their wheat farms, whereas 78.8% of the sample respondents reported that they applied both DAP and UREA. The average amount of DAP and Urea applied per hectare were about 86.44kg and 60.24kg respectively. This indicated that fertilizer application in the study area was generally below the recommended level of 100kg of DAP per hectare for wheat (SARC, 2016).

Table 7 Access and payment of fertilizer by Sample respondents

Variables	Number (N=120)	Percent
Access to Herbicide		
Yes	146	100
Access to Fertilizer		
Yes	146	100
Payment		
Cash	139	95.2
Credit	7	4.8
Reason not to use		
High Price	34	39.1
Quality Problem	30	34.5
Limited Supply	23	26.4

Source:-Survey result, 2017

About 39.1%, 34.5% and 26.4% of the sample respondents reported that high price of fertilizer, Quality problem and Limited supply of fertilizer was the main reasons not use it as recommended level respectively. The major sources of fertilizers were cooperatives, traders in local markets and union. About 88.4% of wheat producers reported that they purchased fertilizer through cooperatives, about 8.2% of wheat producers purchased fertilizer from traders in local market. The remaining respondents procured fertilizer from the Agricultural Office.

4.1.1.3. Harvesting and handling activities

Harvesting and threshing

In the study area wheat harvesting and threshing were mostly done by combine harvesters. All sample respondents reported to have used combine harvester. The average cost for renting a combine harvester was about 40.4 Birr per quintal of wheat grain harvested. These combine harvesting cost include transportation cost from the farm to producers storage place. According to focus group discussion, participant producers said since all wheat producers used combine harvester, the owners of the combine harvesters sometimes increase cost of renting. This was because all producers need combiner at similar time period (harvesting time) and these lead producers for unnecessary competition. In the study area generally at the harvesting time there was shortage of combiner harvester.

Handling activities

Handling Activities are the major functions of each actor who seeks to support each other in wheat commercialization so as to increase their efficiency and competitiveness. Besides, wheat producers to find better market prices, decrease unnecessary losses and develop higher level of value for processors their by increase satisfaction of the end user of wheat products. In the study area, the major handling activities include filling in sack, storing, grading, adding tablet against storage pests and transporting.

Transport

Transporters take or carry wheat from one place to another place by means of vehicle, pack animals and animal pulled carts and it create place utilities. Currently the new asphalt road connected Bale zone to different region of the country. However, the District roads are bad as well as main bridge (which connects the District from the zone town “Robe” was not well constructed. During the rainy season, this causes flooding and makes a road impassable. Cooperatives and wholesalers stated that transporters charge high price to transport wheat from the District city town “Jara” to processors. A price charged on average was around 120 Birr per quintal.

Moreover, sample producers indicated that they used pack animals (donkeys) and animal pulled carts to transport their wheat grain from their storage place to market place (local collectors’ or cooperatives ware house). A price charged on average was 18.72 Birr per quintal. During the market days only, there was vehicle transport from the District town to rural areas.

4.1.1.4. Level of commercialization

Table 8 reveals that the level of commercialization of sample respondents from 2013 to 2016. According to survey result, in 2016, 13.7% of households were subsistent, 56.2% were semi commercial and 30.1% of the households were commercialized farmers. Most of the sample households were semi commercial i.e. they sold 30%-60% of their wheat produce.

Moreover, the level of commercialization of sample respondents increased over past four years. In 2013 only 16.4% were commercial farmers but, in 2014 and 2015; 18.5% and 24.7% were commercial farmers respectively. Therefore, to settle appropriate food security policy and poverty reduction strategy adopted by Ethiopian government seeks to achieve growth through commercialization of smallholder agriculture, the government should more focus on subsistent and semi-commercial households’ and ways of increasing their commercialization level to join them on commercialized categories. Moreover, the study revealed that, the awareness of households about commercialization was increased over years.

Table 8 Level of Commercialization of Sample Households

Level of Commercialization	Percent	Std.dev
In 2013		
Non-Producers	8.9	0.236
Subsistence	6.2	0.019
Semi-Commercial	68.5	0.038
Commercial	16.4	0.308
In 2014		
Subsistence	7.53	0.022
Semi-Commercial	73.97	0.036
Commercial	18.5	0.322
In 2015		
Subsistence	22.6	0.038
Semi-Commercial	52.7	0.041
Commercial	24.7	0.036
In 2016		
Subsistence	13.7	0.028
Semi-Commercial	56.2	0.041
Commercial	30.1	0.381

Source:-Survey result, 2017

4.2. Wheat marketing Problems and Opportunities

Marketing problems

Market information- inadequate availability of market information is resulted in uninformed marketing decision. Most farmers obtained information on local markets on their neighbors and local traders. Many decisions were made by the buyer of the product. About 35% of sample farmers reported that, lack of market information is one among the major problem that affects wheat marketing in the study area.

Imperfect pricing system-is frequently low price at the peak supply periods that based not on the real supply and demand interaction but the information collusion and gang upon between buying participants. About 56% of sample farmers reported that, imperfect pricing system was one among the major problem that affects wheat marketing in the study area. Wholesalers were mostly the beneficiaries and they controlled and regulated the market.

Scale cheats- lack of well knowledge about scaling that resulted from education status of the farmers affect marketing decision. Most farmers' sold their products to buyers by believed because they have not knowledge about scaling. But buyers cheat farmers by scaling by ignoring their faith. About 9% of sample farmers reported that, scale cheating was one among the major problem that affect wheat marketing in the study area.

In addition to the above marketing problems, lack of strong cooperatives was a major marketing problem that was identified by cooperative experts/key informants/. Although there were many multipurpose cooperatives in the study area which were established to safeguard farmers' and rights over their marketed produces, farmers were exposed to baseless traders and ultimately sold their produce at low price.

Opportunities

Wheat production and marketing was not only with problems but it had opportunities in the study area. Among the major opportunities that prevailed were the trend in the growth of production and marketing tradition in the area one that drew attention. Experience (learning effect) and neighborhood effect are much important in technology adoption. The start of row planting and improved wheat seed were to due attention. The natural advantage of good soil fertility and good agro ecological situation which increase the production and productivity of wheat was also among others.

The existence of good policy framework in agricultural development and manifested by deploying development agents and cooperative experts at each kebeles, and infrastructural development could facilitate cereal production and marketing. The increasing use of mobile telephone was also the other infrastructural advantages to improve the marketing system.

Moreover, the existence of some development projects like AGP, which facilitates the production of agricultural products by storing knowledge and facilitating knowledge sharing from other areas and existence of some food complexes increase the demand for wheat; which

increase the production and productivity of wheat was also among opportunities for farmers in the study area.

4.3. Analysis of Structure Conduct and Performance of Wheat Marketing

The study employed structure-conduct and performance to evaluate the degree of competition, behaviors of marketing actors and their achievement in wheat marketing in Gololcha District.

4.3.1. Wheat market structure

Market structure in food marketing is analyzed based on the degree of market concentration, barrier to entry (licensing procedure, lack of capital and know how, and policy barriers) and degree of transparency (Pender *et al.*, 2004). In this study the structure of wheat market was evaluated by using market concentration ratio and barrier to entry and exit into wheat market.

Market concentration

Table 9 depicted that concentration ratio of sample wheat traders in Gololcha District. Market concentration refers to the number and the relative size distribution of buyers and sellers in the market. For an efficient market, there should be sufficient number of firms (buyers and sellers). Firms of appropriate size are needed to fully capture economies of scale; there should be no barriers to entry into and exit from the market, and should have full market information.

The concentration ratio is expressed in terms of CR_x, which stands for the percentage of the market sector controlled by the biggest X firms. Four firms concentration ratio (CR₄) is the most typical concentration ratio for judging the market structure (Kohl and Uhl, 1985). A CR₄ of over 50% generally considered as strong oligopoly, CR₄ between 33% and 50% weak oligopoly and CR₄ less than 33% is unconcentrated.

The analysis of the degree of market concentration ratio was carried out for all sampled wheat traders of the study area. It was measured the percentage of wheat handled by the largest four

traders or concentration ratio was estimated by taking annual volume of wheat purchased by sample traders in the study area. Here concentration ratio for four traders was meant for all wheat traders across the study area with the largest volume handled.

Based on the rule of thumb of market structure criteria; suggested by (Kohl and Uhl, 1985), a four largest enterprises concentration ratio of 50% or more as an indication of a strongly oligopolistic market. The result of the District level concentration ratio was found to be 28.93 percent. This indicates that the top four traders handled 28.93 percent of wheat marketed; which was less than 33%. Hence, according to (Kohl and Uhl, 1985) wheat market at the District level has unconcentrated market structure.

Table 9 Wheat trader's concentration ratio in Gololcha District

No of traders	Cumulative Frequency	Percentage of traders	Quantity purchased in quintals	Total quantity purchased	% share of purchase	%cumulative purchase
1	1	2.5	4,200	4,200	7.64	7.64
1	2	2.5	4,100	4,100	7.46	15.1
2	4	5	3,800	7,600	13.83	28.93
3	7	7.5	3,500	10,500	19.11	48.04
3	10	7.5	3,100	9,300	16.92	64.96
3	13	7.5	2,500	7,500	13.65	78.61
2	15	5	1,500	3,000	5.46	84.07
2	17	5	600	1,200	2.18	86.25
3	20	7.5	550	1,650	3.02	89.27
3	23	7.5	500	1,500	2.73	92
3	26	7.5	450	1,350	2.46	94.46
2	28	5	400	800	1.45	95.91
2	30	5	350	700	1.27	97.18
2	32	5	200	400	0.73	97.91
2	34	5	180	360	0.65	98.56
3	37	7.5	150	450	0.82	99.38
2	39	5	120	240	0.44	99.82
1	40	2.5	100	100	0.18	100
40	100		54,950		100	

Source:-Survey result, 2017

Barriers to entry

The barriers to entry into wheat market reflect the competitive relationships between existing traders and potential entrants. If the barriers to entry are low, new traders can easily enter into wheat market and compete with the established traders. Trade barriers have often led to the groundwork for market imperfection. Whether by intent or not, many regulatory actions by state or local units have the result of restricting freedom to entry and the free flow of goods and services (Kohl and Uhl, 1985). The major barriers to entry into wheat market in the study area include; lack of working capital, administrative problem, information collusion and stiff competition with unlicensed traders.

Lack of working capital

Working capital refers to the amount of money required by wheat traders to enter into the trading business. But lack of capital is a major problem in wheat marketing. According to the survey result, about 37.5% of the sample traders identified that lack of capital was one of the major entry barriers to wheat trading in the study area. About 42.5% and 20% of sample traders were using their own capital and borrowing from traders and microfinance without interest, respectively. The rest 25% and 12.5% of sample traders had share with their peers and gift from their families to expand their trading activities respectively. Therefore, access to working capital was one of the major factors that discourage entry barrier into wheat trading in the study area. In this regard, a number of studies have also demonstrated this lack of working capital as a major barrier to entry in commodity marketing (Bosena Tegegne, 2008; Adugna Geleta, 2009; Ashenafi Amare, 2010; Ayelech Tadesse, 2011).

Administrative problem

Administrative refers to pertaining to activities related to business administration and management required by wheat traders to enter into the trading business. According to the survey result, about 15% of the sample traders identified that administrative problem was another entry barrier to enter into wheat trading in the study area. Among these administrative problems

identified by the sample traders were; complicated process to get credit, imposition of high tax without the consideration of income gained by the traders and license for each type of grains. In order to solve these administrative problems that the sample traders identified were improve the credit providing system, the government should employ skilled experts and give training for them about how to do their job; and improve the licensing system. Therefore, good administrative system about marketing was the major factor that discourage entry barrier into wheat trading.

Information collusion/Market information problem/

Access to timely market information on price and quantity plays crucial role in reducing the risk of losing money on a market transactions. Market information specifically included information on price, product demand, product supply, market place and buyers and sellers. According to the survey result, about 12.5% of the sample traders identified that information collusion was one of the major barrier to enter into wheat trading in the study area. Therefore, timely accessed and reliable market information was the major factor that discourage entry barrier into wheat trading.

Stiff competition from unlicensed traders

In many business activities licensing is a major barrier. As a rule, a trader who has license in one business is not allowed to perform any other businesses; other than the business he/she is licensed. However, there were unlicensed traders that perform wheat trading in the study area. Based on the survey result, all rural assemblers and 12.5% of retailers were undertake wheat trading without having license in the study area. About 35% of the sample traders pointed out one of the serious barrier was stiff competition with unlicensed traders in wheat market. This is one of the indications of the presence of imperfect information in wheat marketing. Therefore, having license for any business activity was one of the major factors that discourage entry barrier into wheat trading. In this regard, a number of studies have also demonstrated this stiff competition with unlicensed traders as a major barrier to entry in commodity marketing (Bosena Tegegne, 2008). Table 10 presents the entry barriers and source of working capitals for sample of wheat traders in Gololcha District.

Table 10 Entry barriers and source of working capital for sample traders

Variables	Percentage	Std.dev
Lack of working capital	37.5	0.0775
Stiff competition with unlicensed traders	35	0.0763
Administrative problems	15	0.0572
Information collusion	12.5	0.0529
Sources of working capital for sample traders		
Own capital	42.5	0.0791
Loan	20	0.0641
Gift from families	12.5	0.0529
Share with peers	25	0.0693

Source:-Survey result, 2017

4.3.2. Wheat market conduct

Market conduct refers to the pattern of behavior that firms follow in adapting or adjusting to the markets in which they sell or buy (Ashenafi Amare, 2010). There are no agreed upon procedures for analyzing the elements of market conduct. Rather, some points are put to detect unfair price setting practices and the conditions under which such practices prevail. In this study conduct of the wheat market is analyzed by in terms of producers' and traders' price setting, purchasing and selling strategies.

Producers' market conduct

Wheat is the most important cash income generating cereal crop in the study area. During the survey, farmers pointed out that higher supply of wheat to the market occurs mainly from January to March and from July to September. This higher supply of wheat to the market is due to payment of tax for land, credit repayment for fertilizer and purchase for fertilizer. According to the survey result, about 59.6% and 6.1% of the total yearly sold of wheat was made from January to March and April to June respectively. The remaining portion of wheat 18.6% and 15.8% was sold from July to September and October to December, respectively. Respondents also reported that April and May are the months when the price of wheat reaches at its peak while December up to February is the months when the price of wheat becomes lowest. According to the survey result, farmers also reported that, they sold their produce to the market

without the interference of brokers. Hence, the selling strategy of the respondent farmers was open to any buyer. Thus, all farmers sell their produce to anybody as far as they offer better price.

The survey result further confirmed that, about 9.6% of the sample farmer respondents reported that the market price of wheat was set by the interaction of demand and supply (market) and about 73.3% of sample farmer respondents reported that the market price of wheat was set through negotiation with traders. The remaining 17.1% of farmer respondents reported that market price of their produce was set by buyers of the product. Majority of farmers identified that market price was the major determining factor that affect their decision to sell their produce. Hence, there existed absence of competitive pricing system, indicating the deviation of market from the competitive market structure.

4.3.3. Wheat market performance

Wheat market performance was analyzed by estimating the marketing margins, by taking into consideration associated marketing costs for key marketing channels. Based on production costs and selling prices of the major marketing participants along the chain, margins at producers, at rural assemblers, at wholesalers and at retailers level was estimated and analyzed.

Marketing margin

Table 11 presents Wheat marketing margin (%), selling price, marketing cost, and profit (birr/qt) for major marketing actors in wheat marketing chain. Market efficiency assess whether profits are too high for different marketing actors. To test the market efficiency/performance/estimation of marketing margin is essential. Marketing margins are the difference between prices at two market actors. The term marketing margin is most commonly used for evaluating market performance which refers to the difference between producer prices and end user prices of an equivalent quantity and quality of a commodity.

However, it may also describe price differences between other points in the marketing chain, for example between producers and wholesalers, or between wholesalers and retailers price (Aseffa Abebe, 2009). Marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The margin covers costs involved in transferring produce from one stage to the next and provides a reasonable return to those doing marketing. It can be interpreted as a cost of providing a mix of marketing services. Therefore, wheat marketing margin was analyzed based on the average sale price of different marketing participants in the marketing chain.

Table 11 Wheat marketing margin (%), selling price, marketing cost, and profit (birr/qt)

Marketing channel participant	selling price	% of gross marketing margin	profit/year
Producers	795.41	83.67	2,800.38
Rural Assemblers	864	7.94	11,002.5
District Retailers	896	3.57	46,070
Wholesalers	950.67	5.75	331,357.08

Source:-Survey result, 2017

TGMM (complete distribution channel) = 16.33%

GMM (Rural assemblers) =7.94%

GMM (District retailers) =3.57%

GMM (Wholesalers) =5.57%

GMMP (Producer participation) =100%-TGMM=100%-16.33%=83.67%

As presented in table 11, about 16.33% of total gross marketing margin was added to wheat price when it reached the final consumer in the study area markets. Out of the total gross marketing margin 7.94%, 3.57% and 5.75% were gross marketing margin of rural assemblers, District retailers and wholesalers in the study area, respectively. The producers' shares of price to the end users were 83.67%. Therefore, District retailers were receive smaller percentage of consumer price. The analysis in table 11 clearly showed that the net earnings of wholesalers were greater than the net earnings of producers, District retailers and rural assemblers in the study area. The net benefit calculated for producers, rural assemblers, District retailers and wholesalers were birr 2,800.38/year, 11,002.5/year, 46,070/year and 331,357.08/year respectively. From these figures

it is better to capture the net earnings of wholesalers and District retailers were better than rural assemblers and producers. This situation implies that there was poor performance of wheat market chain.

4.4. Analysis of wheat profitability

Producers' profitability analysis

Table 12 indicates the cost and profitability analysis of wheat production and marketing for farmers in 2016 production year in the study area. This section of the study focuses on activities and associated costs related to production and marketing of wheat at farmers level. Whenever profitability analysis of any activity is under taken, production costs and benefits obtained must be included in the analysis. This provides an insight about wheat market performance in the study area. In order to calculate profit average quantity produced by a sample farmer, average costs and sale prices of producers were used. The average wheat produced by a single farmer was 56.03 quintal per year for the production year of 2016 in the study area.

In order of performance, the major costs incurred by the sample farmers for the production and marketing of wheat in the study area were production costs (48.7%), transportation cost (2.5%), packaging cost (3.1%), threshing and clearing cost (5.4%) and other costs in marketing (40.3%). This shows a farmer who incurred an average cost of 745.43 birr per quintal and with average sale price of 795.41birr per quintal would generate annual profit of 49.98 Birr per quintal; a farmer would generate annual profit of 2800.38 birr per year. This figure shows sample farmers got small amount of profit as compared to rural assemblers, District retailers and wholesalers; due to inefficiency of wheat market performance in the study area.

Table 12 Analysis of costs and profit of sample Farmers (birr/Qt)

Costs	Cost per quintal	Percent
Production Costs	363.31	48.7
Transportation cost	18.72	2.5
Packaging cost	23	3.1
Threshing and cleaning cost	40.4	5.4
Other costs	300	40.3
Total Costs	745.43	100
Average sale price of wheat	795.41	
Profit/Qt	49.98	
Profit/Year	2,800.38	

Source:-Survey result, 2017

Traders' profitability analysis

Table 13 clearly shows the profitability analysis of different wheat traders in the study area, namely rural assemblers, District retailers and wholesalers described in the market. During the analysis of profitability, average quantity handled in quintal, average purchase price per quintal of wheat, different average marketing costs per quintal and year; and average sale price per quintal were included. According to the survey result, the amount of marketing costs across traders were varies. Accordingly, the total cost incurred by rural assemblers, District retailers and wholesalers were birr 122,917.5, 384,010 and 2,596,706.52 respectively. The survey result indicates that rural assemblers were incurred higher transportation cost per quintal as compared to other traders, due to the market far apart from their residence. Wholesalers transaction cost was higher than rural assemblers and District retailers. This could be due to higher telephone cost and higher tax levied by the government. This higher telephone cost and tax were compensated by higher volume of wheat.

Table 13 Analysis of costs and profit of sample traders

	Rural Assemblers	District Retailers	Wholesalers
Average quantity Handled in quintals	155	480	3,080
List of average costs			
Purchase price/Qt	718	754	797.67
Labor for packing/Qt	5	3.5	3
Loading/unloading/Qt	8.5	3	5
Transport cost/Qt	35	2	1.5
Sorting/Qt	0	1.25	0
Storage cost/Qt	0	20.25	30.25
Loss in transport and storage/Qt	2	9.25	2
Telephone cost/year	0	250	870
Other personal expenses/year	3,800	1,600	4,110.5
License and taxes/year	0	1,400	6,312.42
Total cost/year	122,917.5	384,010	2,596,706.52
Selling price	864	896	950.67
Revenue/year	133,920	430,080	2,928,063.6
Profit/year	11,002.5	46,070	331,357.08
Profit/Qt	70.97	95.98	107.58

Source:-Survey result, 2017

4.5. Marketing Problem of Traders

Table 14 summarized the basic problems identified by sample traders. The major marketing problems sample traders face in the study area were capital shortage, credit access, poor quality of the commodity, infrastructure, lack of demand, price setting problem, government policy.

Table 14 Marketing problems of sample traders

Marketing problem	Percent
Capital shortage	40
Capital shortage, infrastructure	2.5
Credit access	15
Credit access, quality problem	2.5
Government policy	7.5
Infrastructure	12.5
Lack of demand	2.5
Price setting	7.5
Quality problem	10

Source: Survey result, 2017

4.6. Econometric Results

4.6.1. Determinants of households volume of wheat sold

Table 15 presents the multiple linear regression results for determinants of volume of wheat sold. The econometric analysis was intended to examine determinants of volume of wheat sold. There are a number of determinants that influence producers' wheat commercialization. Multiple linear regression analysis was performed to identify those factors that determine the volume of wheat sold of smallholder farm households. The level of total crops sold vary from household to household; some with as high as 140 quintals of crops sold and others with as low as 3 quintals of crops sold. Ahead of moving to the multiple linear regressions, multicollinearity, heteroscedasticity and specification tests were conducted.

The VIF values were ranging between 1.05 and 1.81 and the mean VIF value was 1.33 (Appendix Table 3) and contingency coefficient for categorical variables were not greater than 0.75 (Appendix Table 4). These results indicated the absence of serious multicollinearity and endogeneity problems among the independent variables. Furthermore, the problem of heteroscedasticity is always common and expected when analyzing cross-sectional data (Gujarati, 2004). However, this study tested the existence of heteroscedasticity by employing Breusch- Pagan test using STATA command estat hetttest. Hence, tests showed that there was no heteroscedasticity problem (Appendix Table 5). Correspondingly, detection of specification error

for omitted variables test result also showed that there were no omitted variables and specification error (Appendix Table 6).

The multiple linear regressions found that among 14 variables, five variables had shown significant relationship with volume of wheat sold in the study area. Accordingly, cash expenditure for farming, access to credit and total wheat produced were found to influence volume of wheat sold positively and significantly as expected. Contrary to this, Education status of household head and oxen owned had shown negative and significant relationship with volume of wheat sold. Hence, these variables require special attention if commercialization level is to be increased thereby increase income of producers.

Table 15 Multiple linear regression results for determinants of volume of wheat marketed

Volume of wheat sold	Coef.	Std. Err.	t	P>t
Age HHs	.0745347	.0897657	0.83	0.408
Sex HHs	-1.96004	2.0504	-0.96	0.341
Education status	-.7270851	.3861579	-1.88	0.062*
Land for wheat	-1.645472	1.007657	-1.63	0.105
Cash expenditure	.0004714	.0001576	2.99	0.003***
Family labor	.1037818	.2985248	0.35	0.729
Market price information	1.347813	1.593739	0.85	0.399
Distance to market center	.366268	.6497995	0.56	0.574
Access to credit	3.712269	1.832157	2.03	0.045**
Extension contact	.0134327	.0257483	0.52	0.603
Oxen owned	-3.865301	1.135681	-3.40	0.001***
Equine owned	.0527655	1.175266	0.04	0.964
Total off-farm income	.0002024	.0003218	0.63	0.530
Total wheat production	.6242439	.0297419	20.99	0.000***
_cons	-4.472511	5.222328	-0.86	0.393
N				146
R-squared				0.8512
Adjusted R-squared				0.8353
Multicollinearity test (VIF),				1.34
Test for omitted variables,			Pr>F	0.0398
Heteroscedasticity test,			Prob>Chi ²	0.0000

*, ** and *** at 10%, 5% and 1% significance level respectively

Source: Survey result, 2017

Cash expenditure for farming: As expected, this variable had positive and significant influence on volume of wheat sold at 1% significance level. The regression coefficient showed that one birr increase in cash expenditure for wheat production would result in a 0.00047 quintals increase in the amount of wheat sold; keeping the influences of other factors constant.

Access to credit: As expected, this variable also had positive and significant influence on volume of wheat sold at 5% significance level. The regression coefficient showed one times increase in credit utilization would result in a 3.712 quintals increase in amount of wheat sold.

Oxen owned: The impact of this variable on volume of wheat sold was found to be a contradiction to the previous hypothesis. The regression coefficient showed that a TLU increase in oxen owned by the household would result in 3.86 quintals decrease in the amount of wheat sold; *ceteris paribus*. The reason for the expected sign change of the effect of the variable was that in the study area, households who have more oxen owned changed income sources from sell of wheat to sell of oxen, which in turns reduce the amount of wheat sold in the market.

Total wheat production: As expected, this variable also had positive and significant influence on volume of wheat sold at 1% significance level. The regression coefficient showed one quintal increase in wheat production would result in a 0.624 quintals increase in volume of wheat sold. This is in line with the findings of (Rehima Musema, 2006), (Aseffa Abebe, 2009), (Ayelech Tadesse, 2011), (Muhammed Urgessa, 2011), (Abraham Tegegn, 2013), (Amare Tesfaw, 2014) and (Habtamu Gemed, 2015) found that the amount of potato, pepper, honey, avocado and mango, teff and wheat, and Vegetables (potato, cabbage and tomato), produced by farmers/households influence quantity of supplied to the market for each commodity positively and significantly.

Educational status of household head: The impact of this variable on volume of wheat sold was found to be a contradiction to the previous hypothesis. The regression coefficient showed that a grade increase in educational status of the household head would result in 0.727 quintals decrease in the volume of wheat sold; *ceteris paribus*. The reason for the expected sign change of the effect of the variable was that when producers are getting educated they probably tend to

shift to another business. The finding of this study is congruent with the findings of (Gizachew Getaneh, 2006 and Almaz Gizachew, 2012) that found a negative relationship of household education with dairy supply and found negative relationship between educational status and supply of leafy vegetables respectively.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

This study was undertaken with the aim of analyzing the determinants of smallholders' wheat commercialization in Gololcha District of Bale zone. The specific objectives of the study include identifying the level of commercialization, assessing Structure Conduct Performance of wheat market and analyze major determinant of volume of wheat marketed/commercialized/ in the study area.

The data were generated from both primary and secondary sources. The primary data were generated from individual interview using pre-tested semi-structured questionnaire and checklist. The primary data for this study were collected from 146 randomly selected households from three kebeles of the District, 15 local collectors from Dire Gudo, Dinsa and Kenjila kebeles markets and 15 rural wholesalers from Jara town. Moreover 10 urban retailers were selected using systematic random sampling. The analysis was made using descriptive statistics and econometric model using STATA and SPSS software. Multiple regression models were applied to analyze determinants of wheat commercialization in the study area. The findings of this study are summarized as follows.

The descriptive analysis of level of commercialization of sample respondents showed that 13.7% were subsistence, 56.2% were semi-commercial and 30.1% were commercial farmers in 2016 cropping year. This result made increments when it was compared with the past three year's level of commercialization. In 2013 there were 8.9% non-producers, 6.2% subsistence, 68.5% semi-commercial and 16.4% commercial farmers. In 2014 there were 7.53% subsistence, 73.97% semi-commercial and 18.5 % were commercial farmers. This series of commercialization level explained that there were increments in level from year to year; which means that farmer's attitude towards commercialization, use of improved inputs etc were increased. Moreover, in 2015 there were 22.6%, 52.7%, 24.7% subsistence, semi-commercial and commercial farmers in the study area.

Therefore from the past four years the movements toward commercialized level for farmers increased i.e. 16.4%, 18.5%, 24.7%, and 30.1% in 2013, 2014, and 2015 and in 2016 were commercial farmers respectively.

The S-C-P analysis of market showed that the market concentration for largest four traders was found to be 28.93% which shows that the market structure of wheat market in the study area was unconcentrated market structure. The barriers to entry also explain deviation from competitive market structure. In the study area the major entry barriers were lack of working capital, administrative problems, information collusion and stiff competition with unlicensed traders. Accordingly, 37.5%, 15%, 12.5% and 35% of sample traders pointed out that lack of working capital, administrative problems, information collusion and stiff competition with unlicensed traders respectively were the major entry barriers.

Moreover, the survey confirmed that higher supply of wheat to the market and lowest price occurs mainly from January to March and from July to September. About 9.6% of sample farmers reported that the price of wheat was set by the interaction of demand and supply and about 73.3% reported that price of wheat was set by negotiation with traders and 17.1% set by buyers. Hence the existence of absence of competitive pricing system indicates that deviation of market from competitive market structure.

Furthermore, the profitability analysis of market showed that all the market actors were profitable. Accordingly, producers, rural assemblers, urban retailers and wholesalers got the profit per quintal of 49.98 birr, 70.97 birr, 95.98 birr and 107.58 birr respectively. The sample farmers got small amount of profit as compared to others, due to inefficiencies in wheat market performance and rural assemblers incurred higher transportation cost than others due to distance from their residents to market center is far.

Multiple linear regressions were run to identify factors determining the volume of wheat sold. The result of the multiple linear regressions indicates that among 14 variables, five variables had shown significant relationship with volume of wheat sold in the study area. Accordingly, cash

expenditure for farming, access to credit and total wheat produced were found to influence volume of wheat sold positively and significantly as expected. Education status of household head and oxen owned had shown negative and significant relationship with volume of wheat sold. Hence, these variables require special attention if commercialization is to be increased thereby increase income of producers.

5.2. Recommendations

Given the potential of the area for wheat production and its significant contribution to ensure food security and self-sufficiency as well as source of income for producers and meeting ever increasing demand of wheat processors, results of this study have implications for wheat commercialization development in the study area.

The results of econometric analysis indicated that volume of wheat sold is positively and significantly affected by utilization of credit access. Thus, viable credit market could be strengthened to encourage the producers to use more of the rightful inputs, to facilitate their market access. There is a need for policy and institutional arrangements to strengthen already established cooperatives and increasing number and availability of other credit services providers beside the cooperatives to improve access and availability of modern means of production and marketing.

Oxen owned also affected the volume of wheat sold by farmers negatively and significantly. Therefore, the volume of sold will be increased if households that have many oxen should cooperate with that have less oxen owned and support each other in farming, increase productivity, rather than selling their oxen to the market.

Cash Expenditure for farming also affected volume of wheat sold positively and significantly. Therefore, advice on the benefit of farm land management practices, use of recommended fertilizers and the benefit of crop rotation and improved varieties over local varieties etc should be given more concern by concerned body to increase the cash expenditure for farmers to use

modern inputs thereby increase the production and productivity of wheat in order to increase volume of wheat sold by farmers.

Quantity of wheat produced influences the volume of wheat supplied to the market positively and significantly. Therefore, the public authorities should focus on increasing the production and productivity of wheat. This could be achieved through identifying new technologies and management systems that would boost the production and productivity of wheat.

Education of the household was associated with volume of wheat sold negatively. From the result of this study, it was realized that producers were not in a position to obtain better income as a result of exploitation by traders and middlemen due to poor bargaining power and poor wheat market performance. As a result of this, they tend to shift to other business. Therefore, much emphasis has to be given to improvement of market and marketing system.

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7. APPENDICES

Appendix Table 1 Conversion factors used to compute tropical livestock unit

Animal	Conversion factors
Calf	0.25
Weaned calf	0.34
Heifer	0.75
Cow and ox	1.00
Horse	1.10
Donkey (adult)	0.70
Donkey (young)	0.35
Camel	1.25
Sheep and Goat (adult)	0.13
Sheep and Goat (Young)	0.06
Chicken	0.01

Source: (Storck *et al.*, 1991)

Appendix Table 2 Conversion of Household Labor force into man equivalent

Age Group	Male	Female
Less than 10	0.0	0.0
10 – 13	0.2	0.2
14 – 16	0.5	0.4
17 – 50	1	0.8
Above 50	0.7	0.5

Source: (Samuel Gebreselassie and Sharp, 2007)

Appendix Table 3 VIF for multicollinearity diagnosis (continues variables)

Variable	VIF	1/VIF
Cash expenditure for farming	1.79	0.557305
Oxen owned	1.81	0.553878
Land for wheat	1.53	0.652558
Equine owned	1.19	0.838745
Distance to the market center	1.06	0.944450
Extension contact	1.12	0.895359
Total off-farm income	1.05	0.951936
Family labor	1.19	0.841794
Age of household head	1.33	0.749834
Total wheat production	1.47	0.679942
Education status	1.11	0.899814
Mean VIF	1.33	

Appendix Table 4 Contingency coefficient for multicollinearity diagnosis (dummy variables)

	Sex HHS	Credit Access	Market price information
Sex HHS	1	0.274	0.07
Credit Access		1	0.091
Market price information			1

Appendix Table 5 Heteroscedasticity test (hettest)

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: fitted values of volume of wheat sold

Chi² (1) = 82.96

Prob > chi² = 0.0000

Appendix Table 6 Specification test (ovtest)

Ramsey RESET test using powers of the fitted values of volume of wheat sold

Ho: model has no omitted variables

F (3, 128) = 2.86

Prob > F = 0.0398

Appendix Table 7 Shapiro Wilk test of normality of residuals

Variable	Obs	W	V	z	Prob>z
Residuals	146	0.88268	13.338	5.865	0.00000

8. INTERVIEW SCHEDULE

Wheat producers Interview Schedule

Survey on Determinants of Wheat Commercialization: The case of Gololcha District of Bale zone, Ethiopia

Instructions for Enumerators:

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

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

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

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

During the process write answers on the space provided.

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

1. General Information

1. Date of interview -----

2. Name of the kebeles-----

2. Household Characteristics

1. Name of household head-----

2. Age of household head -----years

3. Sex of household head 1.Male 2. Female

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

5. Religion of household head 1.Muslim 2. Christian 3. Other (Specify) -----

6. Education status of the household head 1.Unable to read and write 2.Able to read and write
3.Religious education 4. Formal education (please indicate in years): -----

7. Total family size including you-----

No	Name	Age	Educational level(year in schooling)	Sex	
				Male	Female
1					
2					
3					
4					
5					
6					
7					
8					

8. What is your household's major means of income generation? (Multiple answer possible) 1. Crop production 2.Livestock production 3.Handcrafts 4.Grain trading 5.Livestock trading 6. Other income generation (specify) -----

9. Are you a member of cooperative? 1. Yes 2. No

10. If yes, what is the name of the cooperative -----?

11. What service did you get from the cooperative? -----

12. If your answer for #10 is no, what is the reason? -----

3. Land Use Information

1. Total land holding -----hectares

2. Cultivated area -----hectares

3. Cultivated area for wheat production-----hectares

5. Fallow land-----hectares

4. Production Information

1. Production of grain, vegetable and other cash crops in 2008 E.C.

Type of Crops	Total area in Hectare	Total production in (Qts)	For Store in (Qts)	For Consumption in (Qts)	For Seed in (Qts)	For Sales in (Qts)	Selling Price (Birr/Qt)	
							Minimum	maximum
Wheat								
Lentils								
Barley								
Maize								
Oat								
Teff								
Bean								
Pepper								
Peas								
Chat								
Onion								
Tomato								
Others								

2. Why do you engage in wheat production? 1. High demand 2.Disease resistance 3.Resource suitability 4.High price 5.Being in contract farming 6. Other reasons, specify -----

3. How long have you been in wheat production? -----Years

4. How much you Produce wheat in 2005 E.c.....2006 E.c.....2007 E.C.....in quintals.

5. How much you sold wheat in 2005 E.c.....2006 E.c.....2007 E.c.....in quintals.

6. What was your selling capacity of wheat from 2005-2008 E.c? 1. Increase 2.Decrease 3.As it is (constant).

5. Input utilization

1. What type of wheat seed variety did you use? 1. Improved 2.Local 3. Both

2. If you use improved variety, which varieties did you use? -----,-----,-----

3. What is your source? 1. Agricultural office 2. Cooperatives 3.Traders 4.Research centers 5. Others, specify ----

4. How did you get? 1. Cash 2. Credit 3.Others (specify) -----

5. At what price did you purchased -----birr/Qt? And how much do you buy-----Qt?

6. Did you get enough amounts and type's seed as you need? 1. Yes 2. No

7. If no, what are the possible reasons? 1. High price 2. No credit facilities 3.Limited supply 4.Quality problem 5.Others (specify) -----

8. is there any problem relating to improved seed supply? 1. Yes 2. No

9. If yes, what are these problems? -----

10. Did you use fertilizers and chemicals? 1. Yes 2. No

11. If yes, where did you get? 1. Agricultural office 2.Cooperatives 3.Traders 4. Others specify --

12. How did you get? 1. Cash 2.Credit 3. Others specify-----

13. Did you get enough amounts and type as you need? 1. Yes 2. No

14. If no, what are the possible reasons? 1. High price 2. No credit facilities 3.Limited supply 4.Quality problem 5. Others (specify) -----

Pesticide and chemicals used for wheat production	DAP		UREA		Pesticide			
	Qt	Price(birr/Qt)	Qt	Price(Birr/Qt)	Herbicide		Anti Rusting	
					Liter	Birr/Liter	Liter	Birr/Liter
Total								

15. is there any problem relating to fertilizers and chemicals supply? 1. Yes 2. No

16. If yes, what are these problems? -----

17. How do you cultivate your land for wheat production? 1. Hand tool 2 Oxen 3.Tractor 4. Others specify -----

18. If you rent oxen, what is the rate of payment for your farm operation per day? -----
Birr/day/pair and total days rented-----

19. Labor source for wheat production

Activities	Sources of labor and quantity required in a year (days)					Others (Specify)
	Family			Hiring		
	Men	Women	Child	Quantity	Wage/Day	
Plowing(Land preparation)						
Sowing						
Weeding						
Chemical Application						
Harvesting (Combiner rent)						

6. Information Access

1. Did you know market price before you sold your wheat? 1. Yes 2. No

2. If yes, what was/were your source of wheat market information? 1. Traders 2.Mass media (News paper, TV, Radio) 3.Cooperatives 4.union 5. DA's 6.Market participant farmers 9.Others (specify) -----

3. Do you have mobile phone? 1. Yes 2. No

4. If yes, for what purpose do you use it? -----

5. If your answer for #1 is no, what are the possible reasons not get it? -----

7. Market access

1. Name of nearest market 1.Jara 2.Dinsa 3.Dobi 4. Others specify-----
2. Distance of your residence from the nearest market center----- Km (minutes/hrs).
3. To whom you sale your wheat? (Multiple answers is possible) 1. Cooperatives 2.Trader in kebeles market 3. Traders in the Jara market 4.Local assemblers 5. Other (specify) -----

4. What is the reason you selected to sale to the one selected in #3? 1. Pays high price than others
2. Low transportation cost 3. Frequent purchase 4.If others, please specify: -----
5. Where could (did) you get them? 1. At the farm level 2.at the District market 3.At the local market 4. Others, specify-----
6. How much you sold for 1.Cooperative -----Qts at -----Br/Qt 2.Trader at kebele market-----Qts at -----Br/Qt 3.Local assemblers-----Qts at----- Br/Qt
4.Trader at Jara market -----Qts ----- Br/Qt 5. Other -----
7. How many Km you need to travel to get the following (on foot) 1.Cooperative -----km
2.Trader at kebeles market -----km 3.Local assemblers -----km 4. Trader at Jara market -
----- km
8. Who determine selling price 1.Myself 2.Traders 3.Depending on demand and supply 4. Cooperative 5.Through pre-agreed price 6. Others/ specify-----

9. Is there any problem in determination of selling price -----

10. What are marketing costs you incur when you take your produce to the market?

Items	Cost(Birr/Qt)	Remark
Transport cost		
Loading/Unloading		

11. What do you expect about future wheat price? 1. Increase 2.Decrease 3. No change
12. How much hectare did you cultivate for wheat in 2008 E.c----- hectare?
13. How much did you sell wheat in 2008 E.c -----quintals?
14. What price did you receive during in 2008 E.c -----Birr/Qt?

8. Access to Credit

1. Did you borrow money for wheat production before? 1. Yes 2. No

2. If your answer for Q.1 is Yes, from where and for what purpose did you collect the credit?

(*Multiple response is possible)

No	Source	*Purpose (write codes)	
1	Micro finance		1. Payment for hired labor 2. Purchase of fertilizer and seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Purchase of transport animals 6. To rent in land to extend wheat production 7. Others (specify)
2	Cooperatives/unions		
3	NGOs (specify)		
4	Bank (specify)		
5	Trader		
6	Relatives		
7	Iqub/Iddir		
8	Others (specify)		

3. If your answer for Q.1 is yes, have you paid the loan? 1. Yes 2. No

4. If your answer for Q.1 is No, what is the reason? -----

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

6. If your answer for Q.5 is yes, what was the problem? (Multiple responses is possible) 1.

Limited supply of credit 2.Limited access to transport 3.Huge bureaucracy 4. Others (specify)

7. How did you solve these problems? _____

9. Livestock Ownership

- 1. Do you have livestock? 1. Yes 2. No
- 2. If your answer for Q.1 is Yes, livestock Number: Oxen/bulls -----, Cows/heifers -----, Calves -----, Goats -----, Sheep-----, Donkeys -----, Horses -----, Camels -----, Mules -----, Chickens -----, Bee hives -----, others-----

- 3. Do you have your own transportation facilities? 1. Yes 2. No
- 4. If your answer for Q. 3 is yes, what type? 1. Vehicle 2. Transport animals 3. Cart

10. Extension Services

- 1. Did you get extension service in relation to wheat production in 2008 E.C? 1. Yes 2. No
- 2. If yes, who provides the extension services? 1. DA's 2. Office of Agriculture 3. NGO's 4. Model farmers 5. Research centers 6. Cooperative 7. Others (specify) -----
- 3. What type of extension services did you get? 1. Input use 2. Product storage 3. Credit use 4. Product marketing 5. Others-----
- 4. If you had an extension contact in 2008 E.C production year, how frequent did you meet with them specially for wheat production? 1. Every-day 2. Every week 3. Every month 4. Two time a year 5. Others (specify) -----
- 5. What do you think is the role of extension agents in your village? To give advice on; 1. Crop production and protection 2. Livestock production and forage development 3. Natural resource conservation 4. use of inputs 5. More focuses on wheat production and marketing 6. Others (specify) -----
- 6. If your answer for #1 is no, what are /were the reasons not get it? -----

- 7. Have you ever attended any demonstration field days regarding wheat production? 1. Yes 2. No
- 8. If yes how did you get it? -----
- 9. Do you have linkage with different institutions or organizations and NGOs like university researchers, regional research centers, participation in different leadership position and participation in any social activities to get information about price, quality control, weather data

and other important information to produce and marketing wheat? 1. Yes 2. No. If yes which information did you get-----?

10. Is there any problem relating to extension services? 1. Yes 2. No

11. If yes, what are these problems? -----

11. Income from Off-farm and Non-farm activities

1. Do you /your family participate in off/non-farm activities? 1. Yes 2. No

2. If yes, fill the next table for 2008 production year

Type of off-farm and non-farm activities	Family involvement, indicate the participants			Total annual income (birr)
	Men	Women	Children	
A. Total Annual Income generated from non-farm activities(in birr)				
1. Petty-trade (grain, vegetables, fruits, livestock, etc.)				
2. Handcraft (Pottery, Weaving, wood work/carpenter, Blacksmithing)				
3. Consumer goods retailing(drinking, coffee, bread, sugar, kerosene etc)				
Total Annual income generated from off and non-farm (in Birr)				

12. General questions

1. What are the major problems (challenges) relating wheat production and trading in your area? Specify in order of importance

2. What are the existing good opportunities that encourage wheat production and trading in your area? -----

3. What kind of support or facilities did you get from government (zone, District, kebeles etc) to upgrade the current wheat commercialization? -----

13. Perception questions

1. Whom do you think benefits more from the wheat commercialization? 1. Producers
2.Cooperatives 3.Union 4.Processor/industry 5.Jara trader's 6.Kebeles traders 7.Consumers 8.
Others

2. Whom do you think contributes more to wheat commercialization? 1. Producers
2.Cooperatives 3.Union 4.Processor/industry 5.Jara traders' 6.Kebeles traders 7.Consumers 8.
Others -----

Thank you very much for responding to the questions.

Wheat Traders Interview Schedule

A) General information

- 1. Name of trader..... Age Sex.....
- 2. Type of trade: 1.Retailer 2.Wholesaler 3.Collectors/Rural Assembler 4. Others (specify).....
- 3. Marital status 1. Single 2. Married 3.Divorced 4.widowed
- 4. Family size (including you): Male..... Female..... Total.....
- 5. Educational level of the respondent.....
- 6. Position of respondent in the business: 1. Owner- manager 2.Employed manager 3.Daughter of the owner 4.Son of the owner 5. Relative to the owner 6. Other (specify)
- 7. How long have you been operating the business? years
- 8. Did you trade alone or in partnership? ; 1. Alone 2.Partnership 3.Other (specify)
- 9. If your answer for Q. 8 is partnership, how many are you in the joint venture?persons.

	Male	Female	Total
Family member			
Non-family member			
Total			

11. What is your main business? /Put in order of importance and business proportions/

Activity	Business rank
Wholesaling	
Retailing	
Assembling	
Brokerage	
Others (specify)	

12. Do you participate in wheat trading year round? 1. Yes 2. No

13. If your answer to Q.12 is No, at what period of the year do you participate? 1. When purchase price becomes low 2. During high supply 3. Other (specify)

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

15. If your answer to Q.14 is yes, what? _____

16. Number of market days in a week? _____

17. What percent of the total wheat produce is sold on local market in 2016?%

18. What percent of the produce will go to Addis Ababa market in 2016?%

19. What was the amount of your initial working capital when you start this wheat trade business?birr.

20. What is the amount of your current working capital? A) Less than 50,000 birr B) 50,000-100,000 birr C) 100,001-150,000 birr D) Above 150,000 birr

21. What is your source of working capital? ; 1. Own 2. Loan 3. Gift 4. Share 5. Others (specify)

22. If it was loan, from whom did you borrow? ; 1. Relative/family 2. Private money lenders. 3. NGO (specify) 4. Friend 5. Other traders 6. Micro finance institution 7. Bank 8. Others

23. How much was the rate of interest? _____ % for formal, _____ % for informal.

24. What was the reason behind the loan? 1. To extend wheat trading. 2. To purchase wheat transporting vehicles/animals 3. Others

25. How was the repayment schedule? 1. Monthly 2. Quarterly 3. Semi-annually 4. When you get money 5. Others (specify)

26. Is there change in accessing finance for wheat trade these days? 1. Improved 2. Deteriorated 3. No change

27. What mode of transportation did you use? Give in percentage

Mode of transport	Percentage
Man power	
Animal transport	
Vehicles	
Cart	
Others (Specify)	

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

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

II. Purchase practice

1. From which market and supplier did you buy cereals? (*Multiple market area is possible, ** Multiple answers are possible and write the codes in correspondence to the market area and other answers should be written in accordance).

Crop types	Market* (location name)	From **		Quantity purchased (qt)	Average price/kg	%age of purchased Cereals	Payment
			1. Producers				1. Cash
			2. Retailers				2. Credit
			3. Wholesaler				3. Advance payment
			4. Collectors				
			5. Rural assemblers				
Wheat			6. Cooperatives				
Teff			7. Brokers				
Maize			8. Unknowns				
Barley			9. Others (specify)				
Finger millet							

2. From which market do you prefer to buy most of the time?

.....

3. Why do you prefer this market? 1. Better quality 2. High supply 3. Shortest distance 4. Others (specify)

4. Are all your purchasing centers accessible to vehicles? 1. Yes 2. No.

5. If your answer to Q.4 is yes, what proportions are accessible?%.

6. How much quintals of wheat did you buy this year?

7. How much wheat product is bought/purchased from: 1=Producers.....qt. 2=Rural Assemblers.....qt 3= Cooperatives.....qt 4= Retailers.....qt 5= Wholesaler.....qt

8. How do you measure your purchase? 1. by sack 2.By basket 3. By weighing (kg) 4. Others (specify) _____
9. Who were your major suppliers in 2016? Rank 1.Wholesalers 2.Retailers 3.Rural assemblers 4.Cooperative 5.Farmers/producers 6. Others (specify.....)
10. How was the supply of wheat in 2016 compared to the previous year? 1. Increased 2.Decreased 3. No change
11. Who sets the purchase price? 1. Yourself 2. Set by demand and supply 3.Sellers 4. Other (specify)
12. Who purchase wheat for you? 1. Yourself 2.Broker 3.Commission agent 4.Family members 5.Friends 6. Others
13. How do you attract suppliers? 1. Giving better price 2.By visiting them 3.Fair scaling /weighing 4.Extending credit 5. Using brokers 6.Advertizing using influential peoples 7. Other (specify)
14. Do you consider quality requirement of your customers in purchasing activities? 1. Yes 2. No
15. If your answer to Q.14 is Yes, what quality requirement do you consider?
.....
16. What was your source of information about quality requirement of your customers?
.....
17. Is your purchasing price higher than your competitors? 1. Yes 2. No
18. If your answer to Q.17 is yes, what was the reason? (Multiple answer is possible); 1. To attract suppliers 2. To buy more quantity 3. To kick competitors 4. To get better quality 5. Others (specify)
19. How many regular suppliers do you have? Producer's _____, Collectors/Rural Assemblers _____, Processors _____, Wholesalers _____, Retailers _____, others_____
20. Have you ever stopped purchasing due to lack of fund? 1. Yes 2. No

21. If your answer to Q.20 is Yes, for how long.....

22. Is obtaining sufficient volume is a problem? 1. Yes 2. No

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

24. If your answer to Q.23 is Yes, for how long.....

25. What major constraints do you face in wheat trading system?

.....

26. What are the major opportunity and constraints of the system.....

.....

III. Selling Practices

1. To which market and to whom did you sell vegetables. (*Multiple market area is possible, ** Multiple answers are possible and write the codes in correspondence to the market area and other answers should be written accordingly)

Crop types	Market* (location name)	From **	1. Consumers 2. Retailers 3. Wholesaler 4. Collectors 5. Rural assemblers 6. Cooperatives	Quantity purchased (qt)	Average price/kg	%age of purchased Cereals	Payment 1. Cash 2. Credit 3. Advance payment
Wheat							
Teff							

Maize			7. Brokers				
Barley			8. Hotels				
Finger millet			9. Unknowns				
			10. Others (specify)				

2. How much wheat product is sold for: 1= Consumers.....qt. 2=Urban Assemblers.....qt
3= Cooperatives.....qt 4= Retailers.....qt 5= Wholesaler.....qt

3. Who were your major buyers in 2016? Rank 1. Wholesalers 2. Retailers 3. Urban assembler 4. Millers/processors 5. consumers 6. Cooperatives

4. How did you sale your produce? 1. Direct to the purchaser 2. Through broker 3. Other (specify)

5. When did you get the money after sale? 1. as soon as you sold 2. After some hours 3. On the other day after sale 4. Other _____

6. What do you do, if the product is not sold on time? 1. Took back home 2. Took to another market 3. Sold it at lower price 4. Sold on other market day

7. When did you sell? 1. Store and sell when price rises 2. Sell as soon the purchase 3. Sell in pieces as buyers come 4. Sale before purchase 5. Other categories (specify)

8. Which are the months of the year when price of wheat is lowest?

9. Which are the months of the year when price of wheat is highest?

10. How did you attract your buyers? 1. By giving better price relative to others 2. By visiting those 3. By using brokers 4. By fair scaling 5. By Advertizing 6. Others (specify)

11. How many regular buyers do you have? Wholesalers____, Consumers____, Processors____, Rural Assembler____, Retailers____, exporters____, others____

12. What is your packaging material? 1. Sisal sack 2. Plastic sack 3 Basket 4. Others _____

13. Do you know the market prices in different markets (on farm, village market and other areas) before you sold your wheat? 1. Yes 2. No

14. What is your source of information? _____

15. Who sets selling price? 1. Yourself 2. Set by demand and supply 3. Buyers 4. Other (specify)

16. Do you want to expand wheat trading? 1. Yes 2. No

17. If your answer to Q.15 is yes, why? _____

18. If your answer to Q.15 is No, why? _____

19. Are there problems on wheat marketing? If yes what are the problems, and your suggestion to overcome each Problem in 2016?

No.	Problem faced	Yes	No	What do you think the causes of this problem?	What is your suggestion to solve?
1	Credit				
2	Scaling/weighing				
3	Price setting				
4	Shortage of supply				
5	Storage problem				
6	Lack of demand				
7	Information flow				
8	Natural quality				

	problem				
9	Government policy				
10	No government support to improve wheat marketing				
11	Others(specify)				

20. Indicate your average cost incurred per quintal in the trading process of wheat.

Cost components	Cost incurred in birr/qt
Purchase price	
Labor for packing	
Loading/unloading	
Transportation fee	
Sorting	
Storage cost	
Loss in transport and storage	
Processing cost	
Telephone cost	

Watching and warding	
Other personal expenses	
License and taxes	
Other cost (specify)	
Total cost	
Selling price	
Revenue	

IV. Marketing Services

1. Is wheat trading in your locality needs a trading license? 1. Yes 2. No
2. If your answer to Q.1 is Yes, how do you see the procedure to get the license? 1. Complicated
2. Easy
3. Did you have wheat trade license? 1. Yes 2. No
4. If you do not have specific wheat trading license what is your joint trading license? 1. Cereal
2. General 3. Pulses 4. Other
5. How much did you pay for wheat trade license for the beginning? _____birr 6. How much is the yearly renewal payment? _____birr
7. Are you restricted by District or administrative boundary to operate? 1. Yes 2. No
8. Are there restrictions imposed on unlicensed wheat traders? 1. Yes 2. No
9. Did you store wheat before you sold? 1. Yes 2. No
10. If your answer to Q.9 is Yes, for how long did you store wheat in the store?

Thank you very much for responding to the questions.

Key Informant Interview with Agriculture and rural development and Cooperative experts

A. Personal background

1. What is your job responsibility?
2. How long have you served in this District and in what capacity?

B. 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 and 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? What are the challenges and opportunities at their disposal?
5. What are the major non-farm activities farmers in your District mainly engaged in?
6. How many hectare of land is potentially suitable for production of wheat in your District?
7. What portion of land is allocated for the production of wheat currently?
8. Who is the primary buyer of the commodity from the farmers?
9. Are there any marketing cooperatives in this District?
10. If so, is wheat product traded through these cooperatives?

If you have any comment please list here: _____