

Review on Barley Production and Marketing in Ethiopia

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In Partial Fulfillment of the Requirements for the Degree of MASTER OF SCIENCE IN Agribusiness and value chain management

Abstract

Agriculture is the major supplier of raw materials to food processing, beverage and textile industries. It accounts for more than 85% of the labor force and 90% of the export earnings. Cereal production and marketing are the means of livelihood for millions of households in Ethiopia and is the single largest sub-sector within Ethiopia's agriculture, far exceeding all others in terms of its share in rural employment, agricultural land use, calorie intake, and contribution to national income. Barley is the fourth most important cereal crop in the world after wheat, maize, and rice, and is among the top ten crop plants in the world. Globally, European Union, Russian Federation, Ukraine, Turkey and Canada are the top five largest world Barley producers where, On the African continent, Morocco Ethiopia, Algeria, Tunisia and south Africa were the top five largest barley producers. This study was aimed at reviewing Barley production and marketing in Ethiopia, with specific objectives of reviewing the production and productivity of Barley in Ethiopia, the importance and consumption of Barley in Ethiopia, marketing actors and margin distribution of barley in Ethiopia, the value chain actors of barley and the constraints of Barley value chain and marketing Ethiopia. The data were collected from secondary sources mainly from FAOSTAT, CSA and different published materials on barley value chain in Ethiopia. The general idea of the review shows that Ethiopia has potential for Barley production but the producer faced with lack of modern storage and high postharvest losses. On marketing side, low price of product, lack of storage and low quality of product are the major problems of the barley marketing activities. According to the study the major constraints identified as factors that affect Barley Value Chain includes: Shortage of supply of disease resistant and high yield varieties, Weed and pest occurrence, Low soil fertility and low soil pH, Poor soil drainage, Frost and drought, Diseases, such as scald, net blotch, spot blotch and rusts, Rising costs of transport, Market price fluctuation and others. In Barley marketing, the major actors identified during the review were; farmers, traders, cooperatives and consumers while in the case of value chain the major actor's involved were farmers, traders, cooperatives, unions, wholesalers, processors and consumers. According to the review, farmers are forced to capture a lower share of profit margin due to low price.

Keywords: Barley, production, marketing, Ethiopia

1. INTRODUCTION

1.1. Background of the Review

Ethiopia is the second-most populous country in Sub-Saharan Africa with a population of 96.5 million, and population growth rate of 2.5% in 2014 (WB, 2015) Agriculture dominates the Ethiopian economy. It is the major supplier of raw materials to food processing, beverage and textile industries. It accounts for more than 85% of the labor force and 90% of the export earnings (MOFED 2005).

Cereal production and marketing are the means of livelihood for millions of households in Ethiopia and is the single largest sub-sector within Ethiopia's agriculture, far exceeding all others in terms of its share in rural employment, agricultural land use, calorie intake, and contribution to national income (Shahidur, 2010).

Barley is the fourth most important cereal crop in the world after wheat, maize, and rice, and is among the top ten crop plants in the world (Akar et al. 2004). Globally, European Union, Russian Federation, Ukrian, Turkey and Canada are the top five largest world Barley producers where, European unions produce the greatest quantities of barley with an estimated production of nearly 60 million tons followed by Russian federations with a production of about 20 million tons according to Untied state of Agricultural institute estimate in 2014. On the African continent, ,Morocco Ethiopia ,Algeria, Tunisia and south Africa were the top five largest barley producers for the year 2014 with estimated production of approximately 2.1 million tones, 1.7 million tones, 1.3 million tones, 0.9 million tones and 0.307 million tones respectively.

Barley is an important grain crop in Ethiopia and has diverse ecologies being grown from 1800 to 3400 m altitude in different seasons and production systems (Muluken, 2013) and makes Ethiopia being the second largest producer in Africa, next to Morocco, accounting for about 25% of the total barley production in the continent (FAO, 2014) and recognized as one of the world's most ancient food crop, which is believed to have first domesticated about 10,000 years ago from its wild relatives in the Fertile Crescent of the Near East and center of diversity in Ethiopia.

According to the 2014/2015 forecasts from Ethiopia's Central Statistics Authority, of the 12.6 million

hectares under cultivation of the grain crops ,80.78% was under cereals which contributed 87.36% of the grain production and Barley took up about 8 and 7 percent Of the grain crop area, and production respectively (CSA,2014/2015).Between 2003/04 and 2013/14, the number of smallholders growing barley increased from 3.5 million to 4.5 million; yields increased from 1.17metric tons per hectare to 1.87 metric tons per hectare; and total production grew from 1.0million tons in 2005 to about 1.9 million tons in 2014 (CSA, 2005; CSA, 2014).

There are two types of barley that farmers grow in Ethiopia: food barley and malt barley. The majority of barley that farmers grow is food barley and it is the main ingredient for several staple dishes such as injera, porridge, and bread. Food barely is a cheaper cereal than maize, wheat, and teff and is often used as a substitute for lower income families. Recently, there has been an increasing demand for farmers to grow malt barley, which presently constitutes 10 percent of the total barley production. With the introduction of several new malt factories in the country, domestic demand is growing and is showing no signs of slowing down.

Farmers in Ethiopia have an opportunity to meet the growing demand for malt barley, but production is low, and the quality does not match that of imports. Farmers often don't use best practices when growing barley. Over the past ten years, average barley yields have been 1.43 tons/hectare, which is low compared to its regional neighbors and about four times lower than the yields in developed nations such as France and Germany.

There is a need for reviewing Barley production, productivity and marketing for better understanding of the status of production and productivity of barley, the market share among the actors in the marketing exchange of barley and the value chain situation .This review will help for generating the topic for improvement on the production and marketing situation of the barley in general as national or local level. Based on this, the following general and specific objectives are set outs for review of barley production and marketing in Ethiopia as major title.

1.2. Objective of the review

1.2.1. General objective:

The general objective of this review is to understand the production and marketing of Barley in Ethiopia

1.2.2. Specific objectives:

- To review the production and productivity of Barley in Ethiopia.
- To review the importance and consumption of Barley in Ethiopia
- To review marketing actors and margin distribution of barley in Ethiopia
- To review the constraints of Barley marketing and value chain in Ethiopia

2. Review of Literatures and discussions

2.1. definitions of the terms

- 2.1.1. **Agriculture:** - is the science of cultivating the soil, harvesting crops, and raising livestock and also as the science or art of the production of plants and animals useful to man and in varying degrees the preparation of such products for man's use and their disposal. Agriculture: The utilization of biological processes on farms to produce food and other products useful and necessary to man. Both a “way of life” and a “means of life” for the people involved in this industry.
- 2.1.2. **Agricultural productivity:**-is a measure of the efficiency with which inputs are used in agriculture to produce an output (EEA 2002 ;). Productivity is said to be optimal when the combination of inputs produces a maximum output. Its measurement is an important tool for planning and development decisions and shows the characteristics of current performance, future trends and relevance of the system. Increased production is important if it is a result of improved productivity (EEA 2002).
- 2.1.3. **Crop Production:** -is a branch of agriculture that deals with growing **crops** for use as food and fiber. It is the growing of staple food crops, fruits, nuts and other food crops and commercial crops.Crop production deals with the production of various crops, which includes food crops, fodder crops, fiber crops, sugar, oil seeds, etc. It includes agronomy, soil science, entomology, pathology, microbiology, etc. The aim is to have better food production and how to control the diseases.
- 2.1.4. **Area Harvested:** - refers to the land used for agricultural operation reported as many times as it was planted and harvested to the same crop or different crops during the reference period.
- 2.1.5. **Crop yield:** A measurement of the amount of a crop that was harvested per unit of land area which is often used for a cereal, grain or legume and is normally measured in metric tons per hectare (or kilograms per hectare).Crop yield: represents the harvested production per unit of harvested area for crop products. In most of the cases yield data are not recorded but obtained by dividing the data stored under production element by those recorded under element: area harvested. Data are recorded in hectogram (100 grams) per hectare (HG/HA).
- 2.1.6. **Market:**-can be defined as an area in which one or more sellers of given products/services and their close substitutes exchange with and compete for the patronage of a group of buyers. It is the set of the actual and potential buyers of a product (Kotler and Armstong, 2003) and conceptually, a market can be

visualized as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries.

- 2.1.7. **Marketing:** - Marketing is the adaptation of the commercial activities and use of institutions by the organizations with a purpose to induce behavioral change on a short-term or permanent basis.
- 2.1.8. **Marketing channels:** -is a set of practices or activities necessary to transfer the ownership of goods from the point of production to the point of consumption. It is the way products and services get to the end-user, the consumer; and are also known as a **distribution channel**. Formally, a marketing channel is a business structure of interdependent organizations that reach from the point of product or origin to the consumer with the purpose of moving products to their final consumption or destination (Kotler and Armstrong, 2003).
- 2.1.9. **Marketing margin:** It is a commonly used measure of the performance of a marketing system and is defined as the difference between the price the consumer pays and the price that is obtained by producers, or as the price of a collection of marketing services, which is the outcome of the demand for and supply of such services (William and Robinson, 1990).

2.2. Barley production and productivity in Ethiopia

Ethiopia is ranked twenty-first in the world in barley production with a share of 1.2 percent of the world's total production (USAD, 2014). According to USAD reports on assessments of commodity and trade, Barley cultivation is widely distributed across the country on over one million hectares of land and by more than four million small holder farmers. Currently, it is grown exclusively for the domestic market and is neither imported nor exported. Barley is a high-opportunity crop, with great room for profitable expansion, particularly when connected with the country's commercial brewing and value-added industries. It is the fifth most important cereal crop in Ethiopia after teff, wheat, corn, and sorghum.

According to Shahidur et.al (2015), Ethiopia is the second largest producer of barley in Africa next to Morocco, accounting for about 26 percent of the total barley production in the continent. According to these authors, about 4.5 million smallholder farmers grew barley on more than 1 million meher hectares of land. The total production has been increasing steadily over the past decade it has increased from 1.1 million metric tons in 2003/4 to 1.9 million tons in 2013/14, which is equivalent to an annualized growth rate of 6 percent per year.

Table 1 Estimate of Area, Production and Yield of Crops from 2010/2011 to 2014/2015 Meher Season or from 2003E.C to 2007 E.C in Ethiopia

Year	Area in hectare	Change (GR)	Production in quintal	Change (GR)	Productivity in qt/hec	Change (GR)
2010/2011	1,046,555	-0.09	17,033,465.36	-0.07	16.28	0.03
2011/2012	948,107.43	0.075	15,852,869.21	0.124	16.72	0.05
2012/2013	1,018,752.94	0.00	17,816,522.08	0.071	17.49	0.07
2013/2014	1,019,477.94	-0.025	19,082,624.11	0.024	18.72	0.05
2014/2015	993,918.89	0.00	19,533,847.83	0.00	19.65	0.00

Source: Own computation from CSA from year 2010/2011 to 2014/2015, Meher

NB; "negative sign"= show decrease in area, production or productivity; GR=growth rate

Table 2: Area harvested, production and productivity of Barley in Ethiopia from 2000 to 2014 annual production according to FAOSTAT official data

Year	Area harvested	Production in tons	Yield (ton/hectare)	Growth in area	Growth in production	Growth in productivity
2000	880,360	803,904	0.91	0.07	0.27	0.19
2001	938,010	1,016,940	1.08	-0.12	0.16	0.33
2002	821,383	1,183,541	1.44	0.31	-0.08	-0.30
2003	1,075,437	1,087,373	1.01	0.17	0.26	0.08
2004	1,254,786	1,375,522	1.10	-0.04	0.02	0.06
2005	1,208,631	1,398,395	1.16	-0.17	0.01	0.22
2006	997,868	1,409,688	1.41	0.02	-0.10	-0.12
2007	1,019,314	1,270,680	1.25	-0.03	0.06	0.10
2008	984,942	1,352,148	1.37	0.15	0.29	0.13
2009	1,129,112	1,750,444	1.55	-0.07	-0.03	0.05
2010	1,046,555	1,703,347	1.63	-0.09	-0.07	0.03
2011	948,107	1,585,287	1.67	0.07	0.12	0.05
2012	1,018,753	1,781,652	1.75	0.00	0.07	0.07
2013	1,019,478	1,908,262	1.87	-0.03	0.02	0.05
2014	993,940	1,953,385	1.97	0.26	0.00	0.00
max	1,254,786	1,953,385	1.97	0.31	0.29	0.33
min	821,383	803,904	0.91	-0.17	-0.10	-0.30
mean	1,024,285	1,431,639	1.41	0.04	0.07	0.06

Source: Own computation from FAOSTAT official data

According to CSA of Ethiopia shown above in table 1 the output from area harvested of Barley is increasing from 2010/2011 to 2014/2015 due to efficient utilization of the inputs like fertilizers and applying appropriate agronomic practice and modern technology to the crop. The productivity and production in each consecutive years is increasing, even though the area harvested shows some fluctuation. There is high growth rate in area harvested and production in quintal in 2012 and 2013 while it decreases in 2014 in area harvested but due to high productivity the volume of production in quintal highly increasing during the production year as it is shown in table 1 above.

According to Food and Agricultural Organization Statistical Agency reports, there are high area of harvesting, production and productivity as it was measured in hectare, tons and tons per hectare in 2004, 2014 and 2014 annual production respectively as it was shown in the table 2 above. According to the report or the data, barley production and the respective productivity of the year become an increasing order generally from year to year, even though there was some fluctuation in area harvested which is measured in hectare. These data is nearly the same in line with Central Statistical Agency (CSA) of area harvested crop production in meher season. The maximum and minimum area of coverage occurred in 2004 and 2002 production year respectively while the maximum and minimum year of production and productivity were 2014 and 2002 annual production according to the data shown above in table 3. All the data recorded either CSA or FAOSTAT shows that, barley production in Ethiopia is the most common and highly productive which shows in turn it is highly consumed by the consumers of the country.

The maximum growth rate in area of harvesting, production and productivity of Barley in Ethiopia were occurred between 2002 & 2003, between 2008 & 2009 and 2001 & 2002 years of production respectively while the least or minimum of area harvested, production and productivity were recorded in the years between 2005 & 2006, 2006 & 2007 and 2002 & 2003 respectively as it was reported by Food and Agricultural organization Statistical data from 2000 up to 2014 years of barley production.

2.3. Consumption of barley and barley products

Barley is a staple food grain, especially for Ethiopian highlanders. It matures early which is bridging the critical food shortage that occurs before the harvest time of other crops around September. Barley also serves as a substitute for wheat when wheat prices are high. For millennia, barley has been supplying the basic necessities of life (food, feed, local beverages and roof thatch) for people in the high lands. Many Ethiopian households have

roasting equipment to convert the grain into roasted barley, a popular snack food in Ethiopia. Because of its wide range of uses, barley is considered the “king of grains “in much of the country.

Ethiopia’s per capita food barley consumption is by far the largest compared to other African countries. According to the FAO’s food balance sheets, Ethiopia’s annual per capita consumption of food barley in 2011 was 14 kilograms, which is more than three times the average for Eastern African 13 , four times that of Africa, and fourteen times the world average of consumption ,However, food barley and barley products’ contribution to the Ethiopian diets is small compared to other staple foods. In fact, it is the least important staple in both quantity and share of calories in total consumption (Berhane et al., 2011). Only 20 percent of households in Ethiopia consume barley and barley products, and its share in the total value of consumption is estimated at 9 percent.

2.4. Importance of Barley Crop in Ethiopia as Household Diets

According to (Ejigu, 2012), Barley (*Hordeumvulgare* L.) which is one of the most important cereal crops in the world next to maize, wheat, rice among ten top world plants and one of the main cereal crops produced in the Ethiopia, is an important food crop in the high land parts of Ethiopia. It is an important cereal crop grown by subsistence farmers on small-scale farms (EJIGU, 2012).

According to Kemelew and Alemayehu, reports that, Among the major cereals, barley ranks fifth in area, productivity and total production in Ethiopia as a whole it matures early and an emergency crop bridging the critical food shortage occurs in September (Kemelew & Alemayehu, 2011).Barley accounts for over 60% of the food of the people in the high lands of Ethiopia. It is used in diverse recipes that have deep roots in culture and tradition. Some recipes such as Besso (fine flour of well-roasted barley grain moistened with water, butter or oil), and Chiko (besso soaked with butter alone), which have long shelf life, can only be prepared from barley grain. Other recipes, such as Genfo (thick porridge), Kolo (de-hulled and roasted barley grain served as snack), and Kinche (thick porridge) are most popular when made from barley grain, but can be prepared from other cereals also. Barley is the preferred grain, after tef, for making the traditional bread called Injera, which can be used either solely or in combination with tef flour or other cereal flours. Other recipes, such as Dabbo (bread), Kitta (thin, unleavened, dry bread) and Atmit (soup) can be prepared with only barley or blended with other cereal flours. Among local beverages Tella and Borde are prominent, and best made from barley grain (Grando, 2005).

The major determination of barley profitability is yield. To maximize yield, it is important to ensure that the crop has every chance to succeed several a biotic and biotic factors that have contributed to this low productivity. Some of the constraints are poor crop management practices, new introduced barley varieties are susceptible to mildew, barley yellow dwarf virus, net blotch and scald diseases and the limited availability of the very few improved cultivars released, weeds, insects and the inherently low yield potential of the prevalent local varieties (Bayehe & Stefania, 2011)

According to (Haile Michael and Peter, 2011), there are different reasons for farmers to produce barley .Some of the reasons that makes Barley important the farmers are:Suitable for high altitude, performs better than other crops, Can be produced both in belg and meherseasons, Tolerant to weather and agronomic stresses like frost, water logging, weeds, diseases, and insects, Suitable for many kinds of dishes (including injera)with a better taste, Good source of energy and consuming barley foods gives body strength, Medicinal purposes for gastritis, headache and can heal broken bones and fractures, The best choice for local beverages, Relatively high yielding with low management, Produces high quantity and quality straw for feed, which is preferred by animals, Quality straws for roofing (thatching) houses and bedding, Grain, flour and food products store better than other crops and Good cash crop as it is highly demanded for local beverages prepared in towns for sale.

2.5. Marketing chains and the marketing Margins of barley in Ethiopia

2.5.1. Marketing chain of Barley:

Marketing chains vary depending on the infrastructure and other market fundamentals at the location of production. According to CSA, 2014 and Shahidur et.al.2015 According to the study conducted on Value chain of barley inEthiopia, the case of Gonder and arsi zone and secondary CSA, 2014 data shows, farmers in Arsi produce both food and malt barley and market through cooperatives and traders, farmers in Gondar exclusively market their malt barley through cooperative (CSA, 2014) where a large number of actors are involved atthe beginning of the marketing chain, that is, in providing input supplies. In both Arsi and Gondar, there are several government agencies (national research system, seed enterprises), cooperatives, holding companies, NGOs, and private seed companies that are involved in seed marketing. Therefore, it is very surprising that modern input use is so low. An obvious implication is that perhaps there is very little coordination among these actors to promote input supplies to the barley growers. Thus, enhancing coordination among actors and streamlining their mandates, if necessary, can contribute towards improving modern input supplies and ultimately enhancing barley productivity. Second, in the Arsi marketing chain both traders and cooperatives appear and compete in marketing

both food and malt barley. This is a bit counter-intuitive given our earlier results that cooperative's share in total marketed volume is small (0.4percent). Thus, if one relies on the national statistics, a cooperative's share in Arsi would be very small, even though in reality they do engage in trade.

Finally, north Gondar is unique in that cooperatives market all of the malt barley .The case of cooperatives' existence in this context is clear: there are fundamental weaknesses in the infrastructure and product aggregation. As a result, primary cooperatives along with their unions account for more than 90percentof the malt barley market. Though the market share of cooperatives is relatively smaller in Arsi Zone, home of the oldest malt factory, cooperatives are reportedly preferred marketing channels by malt processors because of the volume and quality they process. Farmers also appreciate cooperatives in terms of their effect on price and service adjustments in the marketplace. However, as private infrastructure improves and the private sector evolves, the costs of marketing will go down, and the private sector will be able to aggregate, ensure quality, and market directly to the breweries. Therefore, cooperatives will have to improve their efficiency to compete and remain as legitimate market actors.

2.5.2. Marketing Margin Analysis of Barley, the case of Arsi and Gonder

One of the main challenges in conducting any agricultural commodity value chain is the estimation of appropriate marketing margins. According to the study on Barley value chain in Ethiopia by Shahidur Rashid, et al, published in 2015, estimates were attempted in two zones (i.e., Arsi and North Gondar) using rapid rural appraisal. For performance analysis of the actors, in these two zones, detailed information like farm budget, sales, and other transaction costs through a set of focus group interviews in selected villages in the respective zones and triangulation were made from other market actors including assemblers, wholesalers, cooperatives, and processors. Subsequently, the results were aggregated at four levels: farmers, assemblers (primary coops.), wholesalers (coop unions), and processing/malt factories.

Table 3: distributions of margin to actors of Malt barley along the value chain in Ethiopia

a) For Arsi zone ,Ethiopia :						
Functions	Main actors	Price received ETB (Birr/qt)	Share of final price	Production cost (Birr/qt)	Cost to price ratio	Net margin
Production	Farmers	870	54%	566	65.0%	35.0%
Trade(Assembling)	Traders (assemblers)	1000	62%	918	91.8%	8.2%
Wholesaling	wholesalers	1035	64%	1020	98.5%	1.5%
Processing	Malt factory	1609	100%	1315.83	81.8%	18.2%
b) For North Gonder ,Ethiopia						
Functions	Major actors	Price received ETB (Birr/qt)	Share of final price	Production cost (Birr/qt)	Cost to price ratio	Net margin
production	Farmers	1000	65%	637	63.7%	36.3%
Trade(assembling)	Primary cooperatives	1032	67%	1012	98.1%	1.9%
Trade (wholesaling)	unions	1153	75%	1124	97.5%	2.5%
processing	Malt factory	1540	100%	1289	83.7%	16.3%

Source: Barley value chain in Ethiopia published in 2015, the case of Arsi and Gonder zone result

Tables 6:a and b :illustrate the findings for Arsi and north Gondar, respectively. The results are striking and go against the conventional wisdom that agricultural commodity value chains in developing countries are non-competitive, and that farmers are often exploited. The estimates of the Authors in the study areas, suggest that in both Arsi and Gondar, farmers retain the highest share of the final price. In Arsi, farmers net margin is estimated to be 35percent, which compares with less than 10percent for assemblers and wholesalers combined, and a little over 18percent in case of malt factories. In north Gondar, the estimated margin for farmers is over 36percent, more than a full percentage point higher than that of Arsi. Also, the margin of the malt factories is lower at about 16percent. An interesting feature here is that cooperatives' margins (primary cooperatives and unions) are far lower than the margins estimated for the assemblers (primary cooperative) and whole sellers (cooperative union) in Arsi. A primary cooperative in north Gondar earns only 1.9percent, which compares to over 8percentin Arsi. By contrast, while a whole seller in Arsi makes only 1.5percent, a cooperative union in north Gondar makes 2.5percent. This variation is contrary to available studies on input marketing through cooperatives, where margins are pre-set by the government. Therefore, it is surprising that different margins are observed in different locations in case of barley.

2.5.3. Barley Value Chain Actors (main actors)

According to kaleb.et al. (2014) study on Innovation platforms for improving productivity in mixed farming

systems in Ethiopia: Institutions and modalities, the major Barley value chain actor was identified as shown below; these are:

Farmers- According to the study on Barley value chain, farmers were classified in to malt barley and food barley producing farmers. Malt barley producers are those that have entered agreement with malt factories and premium prices are granted. This type of arrangement encourages farmers to engage in malt barley production. Such arrangement also provides good opportunities for factories to substitute imported malt barley and reduce their transaction costs

Collectors- according to these authors` Food barley collectors are the same traders that come to the village to collect many other types of grains. These traders are not specialized for barley only. As a result malt food barley collectors usually collect the grain at times of harvest and also during slack season from village markets. Collectors are agents for traders at woreda, and other traders coming from major towns.

Traders:- according to the study, the traders were classified in to two: *Traders at woreda town* and *traders from major towns*. *Traders at woreda town* are one of the actors in the malt barley and have direct link with collectors. They buy all produces from collectors. Together with collectors they determine the price of produce at a given season. *Traders from major towns* are traders those who have direct link with both collectors and traders at woreda town. These traders are powerful in the value chain, who determines the ultimate price of produce.

Processors – According to the study, the processors are the malt factories where the factory has established a scheme to buy malt barley from surrounding farmers. The factory pay premium price for malt barley producers to encourage them produces quality grain.

Consumers- According to the study by (Kaleb, et.al.2014), the consumers are one of the actors involved in barley value chain particularly food barley and they are the rural residents. The consumption of food barley in towns is low compared to rural areas.

2.5.4. Barley value chain supporters

The chain supporters (Support giving actors) to barley value chain are enormous like Wheat value chain. According to the study by kaleb, et.al., (2014) the support actors that are currently providing support to the value chain are agriculture office of the woreda through supply of technical support through extension system; seed enterprises both the federal and regional enterprises that are providing seed to the farming communities through cooperatives, woreda administration, store service providers, transporters, universities and private chemical traders. According to (Shahidur Rashid, et.al.2015), on barley value chain in Ethiopia, the major actors in the value chain are the farmers, traders, cooperatives and consumers in different regions of the country where barley is highly productive.

2.5.5. Performance of Barley value chain actors in Ethiopia

According to the report the REAP: which is Analytical Support For the Agricultural Transformation Agency (ATA) on Barley value chain in Ethiopia in 2014, as reported by (Shahidur Rashid, et.al.2015), there are wide variations across the regions when determining which farmers sell their barley. However, at the national level, traders are the single largest actor in barley marketing, handling over 70percent of the marketed surplus. Next in line are consumers and farmers, accounting for 17.1 and 10.4percent, respectively. Most of the sales to farmers consisted of seed, and the consumers are the deficit households in the community as shown in the table below.

2.6. Constraints of barley marketing and value chain in Ethiopia

2.6.1. Storage

According to the study on Barley value chain analysis in Ethiopia in 2015, Storage plays a central role in improving the value chain of an agricultural commodity. Proper storage with appropriate institutions such as Warehouse Receipts System can alleviate farmers` liquidity constraints, reduce price volatility, and improve the well-being of both consumers and producers.

In Ethiopia, commodity storage is primitive and similar to most other developing countries, except in the case of cash crops, mainly coffee and exportable pulses.

Table 4: Ownership of storage facilities and reasons for storage

Storage facilities	Tigray	Amhara	Oromia	SNNPR	National
Access of Recent harvest in storage (yes,%)	90	84	89	84	86
Methods of storage					
Unprotected pile	0	0	0	26	6
Heaped in house	6	15	3	5	7
Bags in house	77	28	78	60	58
Metallic in house	0	0	0	0	0
Other in house	17	57	19	9	29
Primary reason for storage					
Household consumption	99	86	82	64	81
Secondary reason for storage					
Sell at higher price	0	10	14	27	14
Seed for planting	99	86	82	64	81

Source: *Shahidur, et, al, 2015 (authors' computation) based on CSA's 2013 Post Harvest Survey.*

According to CSA, 2013 Post Harvest Survey data, shows, the storage of farm households. At the regional level shows, an overwhelming majority of barley growers store their barley; the primary reason for storage is for future consumption, which implies limited commercialization. For example, consider the case of Oromia, where 89percent of the farmers store their barley immediately after harvest. However, 93percent of the households reported that the primary reason for storage was for consumption and the secondary reason was seed (82percent). Only 14percent of the farmers reported having stored their barley to sell at a later time for a higher price. At the national level, 92percent of the farmers reported that the primary reason for storage was for consumption; and the main secondary reason was for seed (81percent) and future sale (14percent), respectively

Second, responses to the methods of storage indicate that farmers use very primitive storage facilities. At the national level, no farmers used metallic storage facilities for their cereals; 58percent of the farmers store their barley in bagson the floor, with the proportion ranging from 78percent in Oromya to 28percent in Amhara; and 29percent use other means of storage within their home. Finally, unless the storage constraints are alleviated, commercialization will not take root and the country will continue to be dependent on barley imports. However, this does not mean that each farmer requires storage facility of their own to address the liquidity constraints and to reduce market volatility. There can be an alternative institutional mechanism—such as community storage—that can address the farm level constraints.

Generally, according to the study on barley value chain in Ethiopia, studied by Shahidur et.al 2015, suggest that **storage is a pervasive and systemic problem at all levels of the value chain**. In most of the kebeles and woredas, the largest storage facilities are owned by the cooperatives; and neither retailers nor wholesaler reported to have large storage facilities. Moreover, many traders reported that grain storage is discouraged by the government. Storage is a serious constraint in Ethiopia's grain markets in general and malt barley in particular. This constraint is unlikely to be alleviated through market forces, implying that deliberate policy action may be needed. Instead private investment in storage should be encouraged and bolstered by appropriate and transparent rules and regulations.

According to the study by Kaleb Kelemu, et.al, (2014), the following are major constraints identified as factors that affect Barley Value Chain. These includes: Shortage of supply of disease resistant and high yield varieties ,Weed and pest occurrence ,Low soil fertility and low soil pH,Poor soil drainage ,Frost and drought ,Diseases, such as scald, net blotch, spot blotch and rusts, Rising costs of transport ,Market price fluctuation and others.

According to this author, most farmers are not able to access pesticide and fungicide in the nearby market. Problems of adulteration and selling after expiration dates were often mentioned. At present cooperatives are providing fertilizers but often at unaffordable prices

3. Conclusion and Recommendations

3.1. Conclusion

Based on the review on Barley production and marketing in Ethiopia, the following points concluded as major pints;

Generally, barley is major staple grain which accounts for over 60% of the food of the people in the highlands of Ethiopia and cultivated by small holders in every region of the country. Even though it is able to grow at all elevations, but it performs best at the higher elevations in the northern and central regions of the country. Based on CSA and FAOSTAT official data of recent, the production and productivity of Barley shows nearly increasing pattern, but constrained by low rainfall and depilation of soil fertility which are the major causes of yield losses. In addition to these, Crop damage during planting, harvesting, and post-harvest handling

is another major abiotic factor that causes significant barley yield losses in Ethiopia.

Generally, in the marketing activities, farmers get the highest net margin (share) as compared to traders and processors due to the smaller cost they incur followed by Processors and traders. The major actors in the barley value chain are the input suppliers, farmers, rural assemblers, cooperative unions, grain wholesalers, processed food wholesalers, grain retailers, and retailers of processed food. The support actors that are currently providing support to the value chain are agriculture office of the woreda through supply of technical support through extension system; seed enterprises both the federal and regional enterprises that are providing seed to the farming communities through cooperatives, woreda administration, store service providers, transporters, universities and private chemical traders.

The major constraints of Barley marketing involve poor storage and handling, poor value chain development, and low upgrading strategies to the commodity. Moreover, the major constraints identified as factors that affect Barley Value Chain are: Shortage of supply of disease resistant and high yield varieties, Weed and pest occurrence, Low soil fertility and low soil pH, Poor soil drainage, Frost and drought, Diseases, such as scald, net blotch, spot blotch and rusts, Rising costs of transport, Market price fluctuation and channel choice problems by producers.

3.2. Recommendation

- ✓ For barley production and marketing the following policy measures will be recommended. The production and productivity of barley is constrained by different factors as listed in the conclusion parts, therefore, research on barley production that affects yields should be done by researcher's and the possible solutions should be put down accordingly.
- ✓ Markets are highly constrained by low storage and low post harvest management of the commodity, there for the post-harvest management sectors should do more on this. Farmers are selling to the local traders in bulk, but if they select other channel they can get more benefit from the production the produce: the researchers should focus on determinants of market outlet choice of producers, the case of barley producers in Ethiopia.
- ✓ Proximity to the market place promotes farmers to enhance barley productivity via making easy access to essential inputs for barley production; that in turns improve productivity. Therefore, transportation roads and inputs distribution networks need to be reorganized to improve barley productivity.
- ✓ To assure mutual benefits of cooperatives and producers, cooperatives need to improve the quality and coverage of buyers' preference information delivery to producers.. Accordingly, cooperative need to be capacitated via business management training and encouraged through long-term credit to compete with the dominant groups like wholesalers.
- ✓ Environmental factors such as droughts or excessive rains may adversely affect harvests and lead to insufficient raw malt barley to meet required production volumes for breweries and malt factories. Storage problems also the main problems for low quality malt barley and reduction in price for the producer. To mitigate these it needs Government investments irrigation systems under the Growth and Transformation Plan (GTPII), the Post-harvest management practices and other mitigation activities to alleviate these problems.

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