Research on Humanities and Social Sciences
ISSN 2224-5766 (Paper) ISSN 2225-0484 (Online)
Vol.10, No.23, 2020

Malt Barley Value Chain in Arsi and West Arsi highlands of Ethiopia

Mesay Yami
Ethiopian Institute of Agricultural Research (EIAR), National Fishery and Aquatic Life Research Center (NAFALRC), Sebeta, Oromia

Abstract
The study was undertaken in four districts of Arsi and West Arsi zones where malt barley is highly produced. Different participatory rural appraisal approaches were employed to conduct the study. The findings indicated that land allotted for malt barley production has been increased in the study areas since 2010, scarcity was noticed due to constraints related to quality and existence of malt barley competing outlets. Malt barley marketing is complex and dynamic where various actors are involved in its marketing. The marketing route changes over time depending on the demands at the terminal markets. Assela Malt Factory (AMF) plays a great role in determining malt barley price while producers are price takers. Among five major malt barley marketing channels only three of them are supplying to the factory. AMF accessed to 90% of malt barley from the channel via traders and the direct supply by farmers via cooperatives was not more than 10%. The channel via cooperatives which is strategic for both producers and the factory was serving below anticipated due to the financial constraints and management skill gaps of the cooperatives. Although a variety of constraints were existing at each identified nodes in the value chain, the major problems attributing to shortage of malt barley production within the country are inability to produce good quality malt barley because of poor field management, traders' grain blending practice, weak linkage among farmers, cooperatives, AMF and absence of contract among farmers. Hence, improving input supply to enhance productivity and strengthening linkages among farmers, farmers' cooperatives/unions and AMF are the major focus areas that call for policy interventions in the future.
Keywords: cooperatives, malt barley, marketing route, traders
DOI: 10.7176/RHSS/10-23-03
Publication date: December 31st 2020

1. Introduction

In Ethiopia, the market potential for malt barley is directly correlated to the market demand for beer, which is growing significantly. Beer production increased from 1 million hectoliters to roughly 4 million hectoliters from 2003 to 2010 (Access Capital, 2010). The increase in beer production is through demand-driven by increased beer consumption due to increased urbanization, population growth, and rising incomes. However; beer production increase is noticed, the country's per capita beer consumption still lags well behind other African countries. The market for malt barley is estimated to grow at an annual growth rate of 15% to 20% in the next five years, and the beer market and demand for malt barley is projected to reach 110,000 to 130,000 metric tons in 2016 from 58,000 metric tons in 2011 (Ethiopia-Barley-Business-Case presentation (2012).

Malt barley is used to produce malt, the key input for brewing beer. About 90% of the total raw material cost for beer production is malt and the material used for malt production in Ethiopia is malt barley (Tadesse, 2012). Malt barley, at the present time, is considered as one of the cash crops produced in the highlands and its demand by malt factory has increased due to its increased capacity of malt barley processing and the expansion of breweries and beer consumption levels in the country.

In contrary to the growing demand, however, different studies state that the presence of favorable agro-ecologies for production of malt barley that could meet domestic malt demand. Ethiopia has a shortage of malt barley to meet the demand of the local breweries (Mohammed and Getachew, 2003).Given the limitations of domestic malt supply, most of the demand for malt is met through imports, which account for 69% of the total annual requirement (ORDA, 2008a). In 2011, similarly, breweries in Ethiopia imported 60% of the malt primarily from international producers (Ethiopia-Barley-Business-Case presentation, 2012).

Assela Malt Factory (AMF), the only malt factory in the country, recently undertook expansion and increased malt production capacity from 25,000MT to 36,000MT to meet some of the growing malt demand of the brewers in the country. To manufacture the intended malt, the factory lacks continuous and reliable malt barley supply and forced sometimes to import it whereby its impact is directly connected with national economy when the factory and brewers import malt barley and malt respectively from abroad with high hard currency. The production of required quality malt barley benefits our smallholder producers by creating sustainable markets. On the other hand, processing it within our country improves value addition and agri-business which bridges agricultural products to industry by supporting the national motto "Agriculture leads Industrial Development" which is currently adapted in the Growth and Transformation Plans (GTP I & II) (2010/11-2019/20). Different agricultural experts stressed that the malt barley produced only in Arsi and West Arsi highlands is big enough to satisfy AMF's malt barley

demand if properly produced and channeled to the factory.

To overview and examine the issue of malt barley scarcity in satisfying the created domestic malt demand, systematic investigation of the malt barley production and marketing systems is indispensable. Hence, identification of the root causes of malt barley shortage for the factory and understanding the place where the problems attributing to the scarcity of the crop is vital. Accordingly, the study employed a value chain concept to identify the constraints and opportunities for increasing the production (supply) and productivity of malt barley at each node along the value chain, and suggest suitable value chain up-grading strategies to improve malt barley supply chains.

2. Methodology

2.1 Description of the study areas

The survey was conducted in south eastern highlands of Arsi and West Arsi zones in March and April, 2013. Arsi zone is divided into 24 rural administrative districts. Arsi and West Arsi zones are characterized by crop livestock mixed farming in which both crop production and livestock rearing practiced simultaneously side by side. The major food crops produced in the Arsi and West Arsi zones are cereals, pulses, oil seeds, vegetables and others. Among cereals barley and wheat are the pre-dominant and among pulses faba bean and field pea are grown widely. Potato is also the dominant crop grown widely in West Arsi highlands. It also plays important role for malt barley production and productivity while using it in crop rotation in the belg season.

According to the information from Arsi zone Bureau of Agriculture, malt barley is produced in 16 districts of the zone. Among which 10 (Digalutijo, Lemubibilo, Honkolowabe, Munessa,Shirka, Tiyo, Guna, Chole, Lode hetosa and Hetosa) are the potential malt barley producing districts. Similarly, West Arsi zone is composed of 12 administrative districts. Out of the districts in the zone 10 of them are producing malt barley whereby seven districts (Kofale, Qore, Shashamane, Arsinagele, Kokkosa, Doddola and Wando) are potential producers of malt barley. The study was undertaken in four districts of Arsi and West Arsi zones where malt barley is potentially produced. These districts were Lemubilbilo, and Chole from Arsi administrative zone and similarly, Kofale and Shashamane were selected for the survey from West-Arsi zone.

2.2 Sampling technique

The study areas were selected purposively based on their production potential and capacity in supplying malt barley to AMF. AMF obtains the majority of malt barley from farmers in Arsi and West Arsi highlands. In order to conduct the informal interviews and field visits, potential four districts in malt barley production were purposely selected among the districts in Arsi and West Arsi zones in Oromia Regional State. From each selected districts two *kebeles*[1] were selected on the bases of malt barley production potential and accessibility. Markets (local or district) closer to the farmers in the selected *kebeles*[1] were visited and discussions were held with key informant with potential market actors such as traders, retailors and farmers. Furthermore, major market places and stakeholders within each district were visited and interviewed respectively.

2.3 Data collection and data sources

The study relies on both primary and secondary data. The primary data were collected through a combination of different participatory rapid appraisal (PRA) tools. PRA is the most advisable method for conducting quick value chain analysis (VCA) study. It is a method that offers a quick, reliable and cost-effective means for understanding and identifying the main marketing actors, channels, geographical locations and volume of the product flow from the inception of the product to the final consumption and disposal. Moreover, it helps to identify the major constraints and opportunities at each core functions of the value chain. The secondary data collection or review process undertook both before and after completion of the survey. Secondary data were obtained through offices, libraries, websites and review of literature. The key data collection tools used for malt barley VCA are briefly described below.

Desk review: Prior to conducting the field survey, desk reviews were made to know previous work on malt barley production and marketing studies in Ethiopia and elsewhere as well as to know the existing information gap.
Moreover, secondary data were collected from reports of different organizations including government institutions such as agricultural offices (zonal and district), and AMF. To supplement the information gathered through PRA, relevant quantitative data such as time series malt barley supply (production), productivity, allocation of cultivated land area, demand of malt factory and breweries, and farm gate prices from selected districts as well as consumer prices were collected and described.

Key Informant Interviews (KII): Key informants like managers, officers and agents in agricultural development, cooperatives/unions, malt factory, and other governmental and non-governmental organizations that have direct or indirect impacts in malt barley value chains have been interviewed with the help of checklists (semi-structured informal interview guidelines) developed prior to the inception of the study. Key informant interviews were used to cross-check/validate the information gathered from farmers' discussion and secondary sources.

Focused Group Discussions (FGD): FGDs were held with 10-15 malt barley producer farmers in each selected PAs in the selected districts. Checklists were used in order to guide the FGD with farmers. FGD is important practical tool to collect opinions, ideas, constraints and solutions with major actors (farmers) in the value chain. Issues related to malt barley production starting from input supply till marketing were raised and discussed in detail among the farmers embraced in FGD.

Observations: Field visits of production areas and marketing sites (markets, retailors, traders) and observations of marketing functions (handling, transportation and transaction activities) were the major observations made during the study. Observations were used to grasp information about production practices and transactions in malt barley value chain of the study areas. During the field observations, discussions were made with malt barley retailors/collectors and traders.

3. Results and discussion

3.1 Overview of malt barley VCA

Five core functions (value adding activities) have been identified in malt barley VCA from its conception of production to sale of final product. Input supply, malt barley production, marketing, processing and consumption are the core functions identified in the VCA. In each core functions, there are different actors who perform variety of activities in the value chain as depicted in Figure 1 below.

3.2 Input supply and sources

3.2.1 Improved seeds supply

Farmers stated that AMF, Kulumsa Agricultural Research center (KARC), District Bureau of Agriculture (BoA), farmers to farmers improved seed exchange, and NGOs (Self Help Africa (SHA), Rift Valley, and FAO) are the major sources of improved seeds of malt barley in the study districts. However, adequate quality of improved seeds availability on time remains farmers' complain.

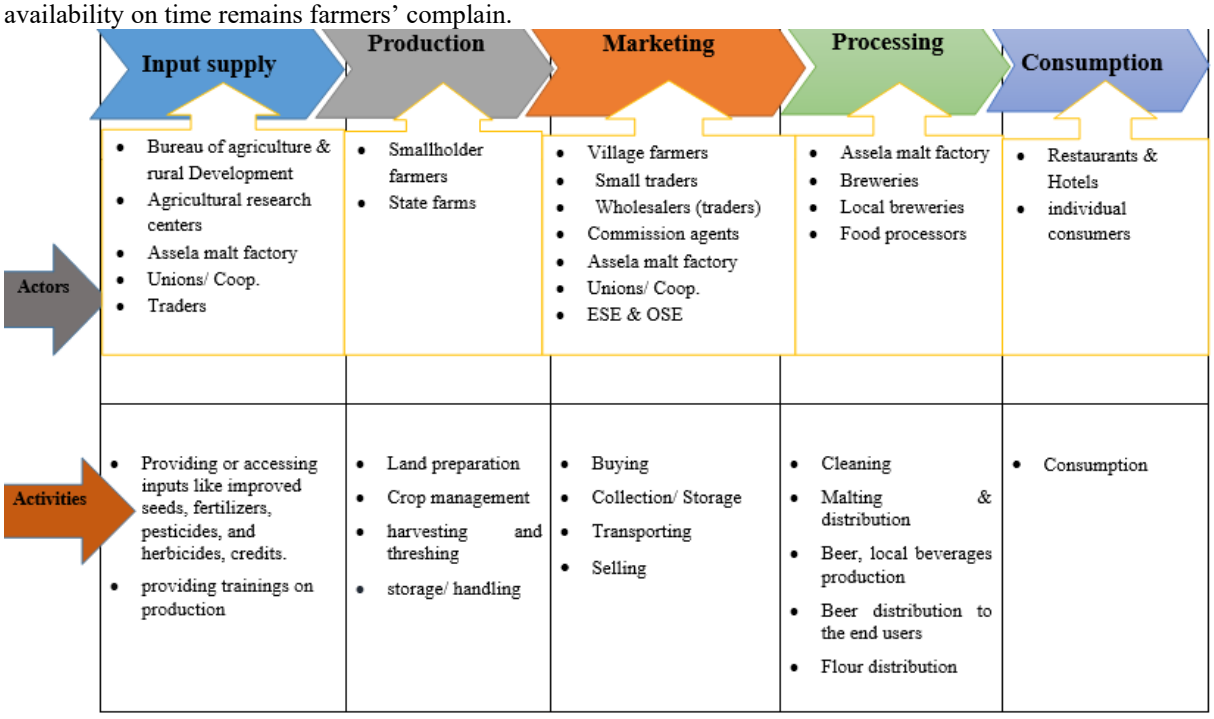

Figure 1. Core functions (value adding activities) in malt barley value chain analysis

SHA supplies improved malt barley seed to farmers in 50% cash of the seed price (down payment) during seed delivery and the remaining 50% is paid after production. With the money collected from farmers from the sale of improved seeds, the organization will re-access improved malt barley seeds to provide to other farmers in the project areas on revolving bases. Malt barley producers benefited from SHA services quite differently from other organizations i.e. farmers accessed to improved seeds through down payments and they will pay only the price of the improved seeds without any interest rate. Microfinances also accessed improved seeds to farmers through down payments and the farmers repay the price with the interest rate after production. Galama union provides improved malt barley seeds on cash bases.

In Shashamane district, the existing farming system contributing to maintain quality seeds for longer periods and even to produce pure quality malt barley in the area. Crop rotation is common cropping system in which all farmers cultivate potato in belg season (February to June) and malt barley in summer (July to December) on the

same land via rotation. This farming system reduces the proliferation of grass weeds development through reducing the seed bank. Further seed cleaning helps farmers to maintain quality seeds.

3.2.2 Chemical inputs supply

Fertilizers and pesticides (herbicides and fungicides) are the chemical inputs used for malt barley production by farmers in the area. Fertilizers and herbicides are accessed to farmers by the help of the district Bureau of Agriculture (BoA) through unions and farmers' primary cooperatives situated in the farmers' village on cash bases. In the past years, farmers use small quantity of fertilizer by mixing with seeds during sowing, but this time most farmers use more fertilizer (DAP) for malt barley production than previous years as a result of progress in agricultural extension activities. The quantity of fertilizers used for malt barley production varies among areas and farmers.

3.2.3 Extension services

Trainings, demonstrations and farmers' field days and field tours are important extension tools used to disseminate malt barley technologies. Most farmers in Arsi zone obtain relatively adequate trainings on malt production than in West Arsi areas. Trainings were offered to the farmers by AMF, NGOs (SHA and FAO), ESE and KARC together with district BoA. KARC use demonstrations, trainings and field days for the popularization and dissemination of malt barley technologies among farmers in different districts of Arsi zone. AMF also plays important role in accessing technologies in malt barley producing districts of Arsi and West Arsi zones. Furthermore, farmers are supported in close by the Development Agents (Das) assigned to the *kebeles*.

3.2.4 Credit services

There are credit service providing institutions such as BusaGonofa Micro-finance Institution (BGMF) and Oromia Credit and Saving Institution (OCSI) and farmers have the opportunity to use credit services in most parts of the study areas. There are farmers who benefited from credit services accessed through proper utilization; however, some were harmed through miss utilization of the credit services.

Farmers used the credits to rent farming lands, buy improved seeds, fertilizes and other inputs. In addition to financial credits, farmers were accessed to material (fertilizers) in credits before 2010. In order to use credit from credit providers farmers are required to form group of farmers (six or more). Farmers have to know each other and if a member of the group misused the credit and unable to pay back, the other members are forced to pay by sharing it among the members and this is the point where farmers are complaining about and it is also the place where the farmers need to be well aware of the positive impacts of credit.

3.3 Production

Tadesse (2012) indicated that Arsi and Bale state farms were responsible for malt barley production that supplied to AMF until the declaration of mixed economy in 1989 when they stopped malt barley production and shifted to wheat production due to its low productivity. Then after the factory tried to negotiate with the state farms for the supply of malt barley; however, it was fruitless due to its less profitability than wheat. Currently, smallholder farmers are the only malt barley producers in the country. More than 80,000ha of land per year is used for malt barley production which is cultivated by smallholder farmers in Arsi and West Arsi highlands (Table 1 below). The malt produced by AMF which covers 40% of the country's demand is prepared from malt barley produced by smallholders in Arsi and West Arsi highlands.

According to the information obtained from the respective zones Bureau of Agriculture and Rural Development (BoARD), the land used for malt barley production is slightly increasing in both Arsi and West Arsi zones. More than 100,000 tons of malt barley (per year) has been produced in each zone almost in the past three years as indicated in Table 1 below. The increase in production of malt barley is correlated with the increase of land for its cultivation and also productivity because of improvements in utilization of improved technologies (improved seeds and fertilizers).

Table 1. Trends of malt barley production and productivity

Year	Arsi			West Arsi		
	Land (ha)	Production (tons.)	Productivity (tons/ha)	Land (ha)	Production (tons)	Productivity (tons/ha)
2008	29,223	63,562.7	2.18	-	-	
2009	28,747	67,192.5	2.34	21,936	58,877.6	2.68
2010	51,957	132,885.0	2.56	43,522.61	123,646.8	2.84
2011	41,451	119,224.3	2.88	39,934.1	98,921.4.6	2.48
2012	42,124	101.697.7	2.41	42,405.4	119,094.9	2.81

Source: BoARD

According to malt barley area coverage evaluation report (2012) conducted in six potential districts in Arsi zone, Holker and Misical-21 malt barley varieties were grown dominantly on 61.53% and 29.73% of total land used for malt barley production respectively. Similarly, Misical-21 and Sabini were the major malt barley varieties cultivated on 51.32% and 32.47% of total land covered by the crop in West Arsi zone (Table 2 below). In West

Arsi, farmers explained in FGD they prefer to grow Musical-21 due its higher productivity, adaptation to grow on wide range soils, resistance to scald and net blotch diseases, and its flour quality for various foods preparation. Similarly farmers in Arsi also have great interest in production of Misical-21 due to the same reasons mentioned by farmers in West Arsi**.** With regards to Misical-21 production, farmers continued in cultivation of the variety even though AMF thought repeatedly about its quality problem for malt preparation in all the study areas.

Table 2. Malt barley varieties area coverage, 2011/12 production year

Malt barley variety	Arsi		West Arsi	
	Area (ha)	Percent (%)	Area (ha)	Percent (%)
Holker	13,927	61.53	230	1.27
Sabini	1,306	5.77	5,898	32.47
Beka	672	2.97	2,714	14.94
Misicale-21	6,728	29.73	9,322	51.32
Total	22,633	100	20,234	100

Note: data from six districts of Arsi and seven districts of West Arsi (potential districts only)
Source: AMF

3.4 *Marketing system*

In the past years, farmers produced malt barley for family consumption as any other crops. But, recently since two years farmers have produce it with the objective of marketing purposes. Even though they start its production for marketing, farmers are not equally aware about the differences between food barley and malt barley. Malt barley is used for preparation local foods like *qinche, marqa, Qorso, shorba, tela, beso, injera* and bread in the area as well in other parts of the country.

The purpose of malt barley production vary among farmers in Arsi zone. Farmers in center of the zone, closer to AMF (Lemubilbilo), used about 75% of malt barley they produce for marketing and the remaining 25% for food and seeds. Farmers in the eastern district (Chole), due to lack of awareness, majority of them use it almost equally for family consumption and marketing. Out of malt barley produced by farmers in this area, about 45% used in their home for family consumption due to low market price and market absorbs 55% of the produce as shown in Figure 2 below. Farmers in the area produce both food and malt barley, without clear understanding on the purposes of varieties, and they used them similarly.

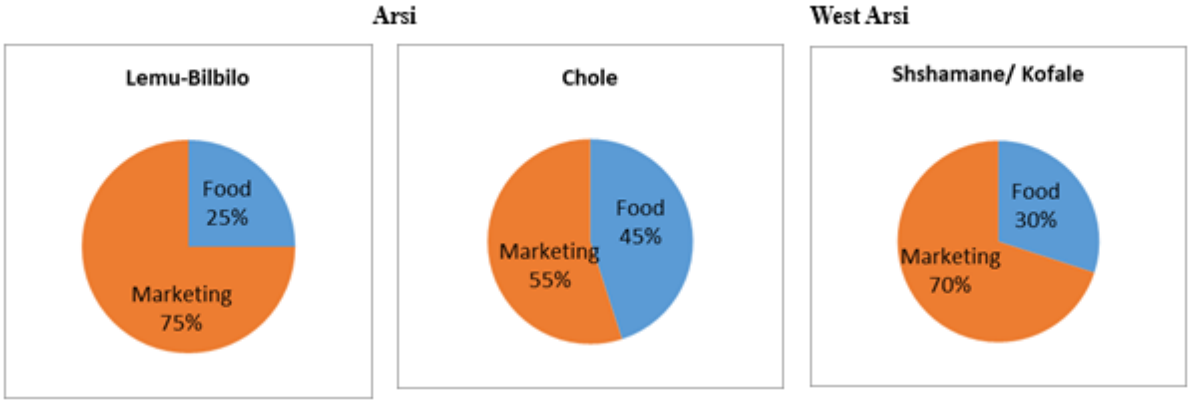

Figure 2. Farmers' malt barley production purposes as emanated from FGD

3.4.1 Malt barley demand and supply

AMF's demand for malt barley increases in accordance with the expansions made in different times which further connected with rising beer consumption and demand in the country. Based on the explanation of experts, the factory undertook expansion three times since its establishment. The third expansion which was completed in 2012 increased the factory's malt production capacity from 22,000t to 36,000t. In line to this, the malt barley demand of the factory increased from time to time as indicated in Table 3 below. As per increase of the factory's malt barley demand, production and supply of the crop by the surrounding farmers was also increased due to the efforts exerted in promotion and extension by respective stakeholders (Table 3 below). However, production and supply of malt barley is increasing in the past six years, the supply in the country is not in a position to satisfy the breweries malt demand. Due to this shortage, the factory forced to import more than 13,000t in 2012/13 by about $ 7,268,189.76. The surplus (20%) production and supply was observed only in 2009/10 in the past six years.

Table 3. AMF's malt barley demand and supply trend

Year	Demand (t)	Supply/ Access		
		In the country (t)	Accessed (%)	Imported (t)
2007/08	25,944.2	21,707.688	83.67	0
2008/09	28,067.2	23,718.687	84.51	0
2009/10	29,245.4	34,861.507	119.20	0
2010/11	39,750.0	20,244.300	50.92	0
2011/12	31,566.0	27,820.700	88.14	0
2012/13	59,682.5	45,138.165	75.63	13,153.86

Source: AMF

3.4.2 Market actors

Malt barley marketing has dynamic feature in which its demand and supply varies over time from year to year and complex phenomenon where a great number of actors involved in its marketing. Village farmers (local traders), retailors, small traders, brokers, cart drivers, larger traders, primary farmers' cooperatives and AMF are the market actors playing significant roles in the marketing of malt barley. The malt barley VCA identified the important market actors attributed to the marketing of malt barley.

Village farmers (local traders): these are farmers that collect malt barley from respective local farmers when malt barley price gets lower immediately after production. They store the collected malt barley grains until the price rises together with their own production. They exist mainly in Lemubilbilo and Chole districts. They also appear in Kofale district in smaller numbers.

Retailors: They buy malt barley and other grains in smaller quantities (up to 200-500kg of grains per market day). They appear mainly in Chole, Lemubilbilo and Kofale main and local markets. They buy malt barley using small measuring tins through market day to supply it to larger traders on weighing balance in the evening of the market day. The retailors in Chole local market buy barley using larger measuring tins and take it to Chole main market to sell it by different smaller tins to consumers.

Small traders: do not have their own stores and have trading license. These are of three types: (1) Small trader who has his own weighing balance and buy by his own money to sell it immediately to larger traders in the evening of the market day, (2) Small trader who has his own weighing balance but buy malt barley by money from larger traders and (3) Small trader (commission agent) who used the larger traders balance and buys with the money from the trader. Generally, most small malt barley traders got benefits through balance adjustment cheating. Small traders were common through the markets the study areas. In some cases, two or three small traders supply directly to the factory by bringing together the grain they bought separately. But, sometimes the factory payment might delay and they prefer to supply to larger traders for their immediate payment. '

Commission agents: many larger traders have commission agents who help them to collect more malt barley grain. The commission agents appear commonly in Kofale and Shashamane markets than in Lemubilbilo and Chole. The commission agents are of different types. Some small traders are commission agents for larger traders and they usually use larger traders' money and weighing balance to buy malt barley. Cart drivers transport malt barley grains to markets for farmers. Traders pay commission to the cart owner/driver when he brought malt barley grains to the trader. They are common in Kofale and Shashamane markets and they play a significant role in malt barley marketing.

Larger traders: larger traders are the main market actors who buy large amounts of malt barley majorly to supply it to the factory. Larger traders collect malt barley from traders, retailors, small traders and commission agents. They collect and store up to 1000qt of malt barley in their storage until they supply it to the factory or to wholesalers/processors in other big cities.

Most of the large buyers have very good experience in purchasing quality barley. They easily identify malt and food barley level of mixture more accurately. They buy best quality malt barley at relatively higher prices and at the same time they buy malt barley with lower quality at low prices according to its quality level. Traders use malt barley with better quality either sells it to consumers or use it to reduce the percentage of mixture of the grain with high level of mixture.

Larger traders identify malt barley quality on the bases of location of its sourcing. Further they know farmers who supply quality grains. Traders buy both malt barley with good and low qualities so as to blend them together since they know the quality standards demanded by the factory.

Unions or primary farmers' cooperatives: are established to serve farmers in close to supply agricultural inputs and to facilitate marketing of their produce so as to improve the farm communities' advantage. In the past years unions/ farmers' cooperatives were serving the farmers in supplying inputs and marketing agricultural produces; however, they were less effective and efficient. But currently unions/ farmers' cooperatives are involved only in supply of inputs in the majority of the study areas by giving less emphasis on marketing aspects.

Financial scarcity and lack of store are the main problems inhibiting cooperatives to function properly. Further, lack of experience and knowledge in buying quality malt barley enhanced the inefficiency and ineffectiveness of

the cooperatives.

Malt barley produced by smallholders was channeled either to AMF or consumers mainly by traders, cooperatives and farmers of in certain areas. In this section, to understand the malt barley marketing channels, we differentiated two major end users i.e. AMF and consumers. In the study, six channels that fed to these final end users were identified. The other competitor malt barley consumers are individual consumers and processors for consumption as food in different forms. The quantity of malt barley conveyed to these end users varies from time to time based on the production status and price paid by the end users.

Assela Malt Factory (AMF): the sole malt producer in Ethiopia till 2012. The factory was established in 1984 in Arsi zone on the main road of Addis Ababa-Assela on 14.7 ha of land near Kulumsa Agricultural Research Centre at about 8km distance from Assela town. During the establishment, the factory was planned to manufacture 10,000t of malt per annum which was nearly compromised with the malt demand of breweries existing in the country at a time. Following the adoption of market liberalization in 1991, the factory undertook expansion three times to satisfy malt demands of the newly established breweries and the expansion of the existing plants. In the first expansion, the factory raised its malt production capacity from 10,000t to 15,000t in 1995 and similarly, with the aim of satisfying domestic malt demand the factory had been implemented its second and third expansion projects in 2010-2012 to increase its production capacity from 15,000-36,000t of malt per annum and begin its production on full capacity from May, 2012. The same report indicated the requirement of more than 60,000t of raw malt barley annually to produce 36,000t of malt in a year and getting the required raw malt barley with required quantity and quality from the surrounding producers was a challenging factor (General manager of AMF, Arsi, Assela, personal communication).

The factory plays a key role in malt barley marketing specifically in setting its market price and the other actors in malt barley marketing use the factory's price as a reference. It absorbs large amounts of malt barley and it creates sustainability for its marketing as well its production. In order to improve malt barley production, the factory has been providing technical supports to the producers since 2007. The factory has taken different measures in collaboration with various stakeholders to minimize the existing malt barley shortage. The factory supports malt barley improvement research programs conducted under EIAR financially and the factory is the pioneer in using its own public extension services by using its own extension wing.

3.4.3 Marketing routes

The marketing routes of malt barley differ in accordance with the location of production among Arsi and West Arsi highlands. The marketing route of malt barley produced in West Arsi highlands (Shashamane and Kofale) was found to be similar. The majority of malt barley was supplied to AMF after its collection in respective districts and local markets from the smallholders in the surrounding. Malt barley with lower qualities that expected to be rejected by AMF is sold in Dilla and Addis Ababa markets. Traders sell it in Addis Ababa and Dilla when AMF price falls below these markets. In southern direction, Moyale and Yirga chafe were malt barley market outlets where it is used for consumption in the form of '*beso*', '*borde*', '*shorba*', and '*qinche*'. Further, malt barley were processed and consumed locally and further it was supplied to Kenya in the form of '*beso*' according to the information gathered from the key informants in Kofale and Shashamane districts.

The malt barley produced in Lemubilbilo and closer districts was mainly supplied to AMF and further malt barley with lower quality was sold in Adama and Addis Ababa for human consumption together with food barley. Similarly, from Lemubilbilo area traders supplied it to Dilla when high demand existed. Malt barley produced by farmers in Chole totally used for human food as food barley in the production area and sold in Addis Ababa and to Eastern parts through Adama as shown Figure 3 below. Even though large quantity of malt barley was produced in Chole district, it was not supplied to AMF due to limitations of awareness and experience among the producer farmers and even traders. Limited amount of malt barley produced in Chole was also supplied to Mechara and Gelemso on animals back by small traders and retailors. The channels conveying malt barley to the end users are shown below.

Channel 1-Producers → Traders → AMF
Channel 2-Producers → Cooperatives → AMF
Channel 3- Producers → AMF
Channel 4 - Producers → Traders → Wholesalers → Retailers → Consumers
Channel 5- Producers → Consumers
Channel 6- Producers → Traders → Consumers

The malt barley marketing route is dynamic in nature and it varies from time to time depending on production and the price. For instance, when AMF pays higher price all traders in production area supply malt barley to the factory, on contrary if the factory pays lesser price, the traders look for the other outlets/ alternatives.

Malt barley market channels connect producers, cooperatives, and traders (wholesalers and retailers) to consumers as shown in Figure 3 below. All malt barley market channels identified in the value chain originated from the producers. The final users of the commodity were AMF and the consumers (within the production sites and other parts of the country).

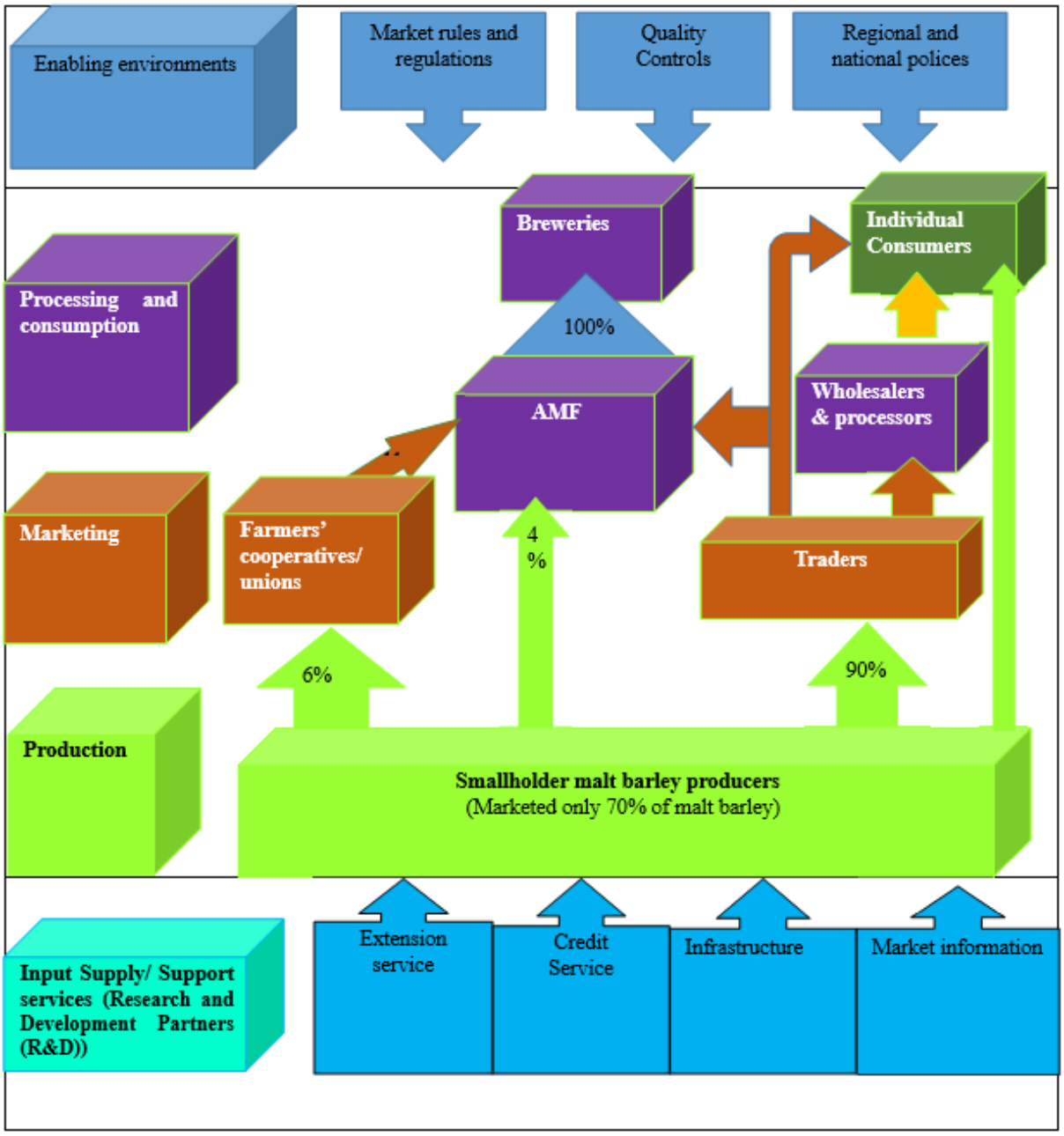

Figure 3. Malt barley marketing channels

4. Constraints and opportunities of malt barley production

4.1 Constraints

4.1.1 Constraints at input supply and possible interventions

Unavailability of quality improved seeds on time: The improvement of production and productivity of malt barley can be maintained through utilization of quality improved seeds among producers. The majority of the farmers in the study areas accessed improved seeds occasionally in longer periods specifically farmers in Shashamene district. Due to the unavailability of improved seeds on time as per required, farmers forced to use their own saved seeds for longer periods. Unavailability of improved malt barley seeds can be expressed in three ways (unavailability on time, required quantity and quality seeds).

Fertilizer price: In FGD farmers raised the importance of fertilizers for malt barley production and they are aware of the advantages of fertilizer but due to high price farmers' fertilizer utilization is below the recommended rate in most of the study areas. Even though farmers complained for fertilizer price, the economic evaluation analysis showed that the farmers were economically profitable from malt barley production business. Indeed fertilizer price increases from time to time and more farmers focused on the price increase with less attention to the economic profitability analysis.

Extension services: The use of FTCs' for demonstration and farmers' training is not commonly observed in both Arsi and West Arsi zones. Furthermore, using readable extension materials like manuals of production, leaflets, brochures, and magazines in relation to malt barley production are limited and less commonly used.

Absence of inputs credit through down payment: In Lemubilbilo district, BGCSMF practice inputs (improved seeds) credit through down payments in which farmers pay 50% of the input price during planting and the remaining 50% of the seeds price will be paid after production together with the interest rate. On one side it may reduce credit miss utilization by farmers.

Production constraints

Low productivity: malt barley varieties low productivity remains a problem for producer farmers. Inability of the varieties to be grown on wide range of soils was also important traits that reduced the farmers' preference to adopt the varieties as required. Misicale-21 grows on wide range of soils and its better yielding attracted farmers' interest to be adopted widely. Less productivity and inability of growing on wide range of soils are discouraging farmers to grow malt barley varieties which have good quality for malting in contrast to Misicale-21.

Diseases problem: scald and net blotch were the major problems observed in West Arsi highlands limiting the adoption of different malt barley varieties like Holker, Sabini and Beka except Misicale-21. In addition to the diseases, shoot fly affected the crops in seedling stages although the problem is low as the plant gets adult stage.

Grass weeds due to continuous cultivations and mono-cropping: this problem appeared mainly in Lemubilbilo and Chole areas. However, shifting cultivation and crop rotation were the cropping systems under practice in the areas by limited number of farmers, the continuous cultivation and mono-cropping practice by the majority creates conducive condition for the proliferation of grass weeds development that attributing to low productivity of malt barley.

Constraints at marketing stage

Market information gap: Majority of the farmers obtains market information mainly from each other and utilization of the accessed market information was limited to some farmers only. Price information is the most important of all other market information for market actors. Malt barley price is mainly determined by AMF and the factory's price is compulsory in the malt barley sourcing markets. Once the price is set by the factory, the information is transmitted to the farmers in production areas in relation to its quality through their *kebele*'s office of agriculture according to key informants from the factory. On the other side, farmers complained on the time of the factory's price announcement.

Low quality of malt barley: Traders blend high quality malt barley with less. Furthermore, during production due to poor field managements, careless harvesting and threshing on less cleaned places reduces grain qualities and increases mixture percentages of the commodity. Due to climatic variability grain may fail to fill properly and leads to loss the required grain quality.

Participation of many actors in malt barley marketing: as expressed in portion about market actors, a great number of actors participated in malt barley marketing until it reaches to the terminal markets. The participation of many market actors which lengthens the market channels increases transaction costs which could raise the price of the products on the end users. As it passes through different chains, complex situation exists in malt barley marketing. A variety of cheating activities through balance adjustment cheating (5-10kg/ 100kg) were commonly appeared in malt barley marketing. Besides, the participation of many actors in the marketing reduced the margins obtained by the producers.

4.1.2 Legal and Institutional Constraints

Absence of market monitoring: In all markets we visited during the study, key informants and farmers expressed traders commonly cheat farmers 5-10kg/100kg of malt barley and also other crop grains by weighing balance adjustment. In the past 10 years, key informants mentioned that absence of market monitoring specifically the proper functioning of measuring tools (weighing balance) and grain marketing condition. This gap helped traders especially small traders to eat the farmers' sweat and to collect unreasonable profit.

Weak coordination among unions, farmers' cooperatives, farmers and AMF: Improper functioning of unions and farmers' cooperatives make the platform comfortable for traders to use the farmers' sweat unreasonably. In line to this, the situation is discouraging farmers to limit malt barley production which could magnify the scarcity. In recent past years, some unions and farmers' cooperatives were engaged in malt barley marketing to limited extent, but due to limitation in marketing knowhow, less commitment and lack of experience and skill to collect quality grain, they withdrew malt barley marketing at the time of the study. Due to quality issue, the factory rejected malt barley supplied by these unions (Galama in Lemubilbilo and Utawayu in Shashamane) and as a result they abstain from malt barley aggregation.

Delay in malt barley price setting: Farmers begin malt barley selling at early of January, but AMF set price at the end of January and in this period farmers sold their malt barley to traders at lower price. Then traders supplied it at an attractive price on behalf of farmers. In all study areas farmers were mainly complaining at the time the factory set price for malt barley.

4.2 Opportunities

In spite of the above mentioned challenges in malt barley production and marketing, there are ample opportunities that enable the improvements of malt barley production and productivity. The available opportunities contributing for the future improvement of malt barley production in the country are described below as follows:

The presence of favorable agro-ecology for malt barley production: Out of 12 districts in West Arsi zone, 10 are producing malt barley among which seven districts are potential producers. Similarly out of 24 rural districts in Arsi zone, malt barley is produced in 16 of them and out of which 10 are potential producers. Majority of these districts are not producing malt barley to their optimum potential. Widening malt barley production in all potential areas is the opportunity at hand to limit the malt barley scarcity.

The existing farming system: Potato cultivation in belg season in West Arsi helps to cultivate malt barley by rotation and the excessive fertilizers used for potato production helps for better productivity of malt barley in the area. The ownership of ample land helped farmers in Lemubilbilo to use shifting cultivation that is important for soil restoration which is in turn important for improving productivity. Pulse and barley rotation system in Chole area ensures the sustainability of malt barley production in the area.

The presence of model farmers who obtained high yields/ha: some model farmers produced up to seven tons of malt barley from a hectare of land. These farmers' yield indicates potentials for malt barley production improvement to satisfy malt barley market demand by capacitating other farmers to produce as model farmers.

Market opportunities: Different studies indicate the increase of beer consumption in the country in relation high population increase, urbanization and rise of individual's income. Due to high market demand for beer many investors attracted in beer production in different parts of the country and the previously existing breweries are under wide expansion. So, the existence of high market demand for malt barley in the future is an opportunity for its production.

Policy opportunities: Improving malt barley production in the country and supplying it to malt factory highly supports government agriculture transformation strategy as set out in GTP I and II. Malt production bridges agriculture and industry which is incorporated in government policy. So, government policy support to enhance agriculture production in the coming years is an opportunity to enhance malt barley production and also its outputs.

5. Conclusion and policy implications

5.1 Conclusion

Despite the recent increase in malt barley production in Arsi and West Arsi highlands, a large quantity of malt barley produced in the area were not channeling to the factory rather significant amounts were used for food in different forms for consumption in production areas as well in other parts of the country.

Malt barley marketing is complex and dynamic in nature whatsoever a large number of actors involved in its marketing and its marketing route changes over time depending on the demands and prices of the product in the terminal markets or outlets. In its marketing, AMF plays a great role in determining malt barley price while producers were price takers. Five major malt barley marketing channels were identified in the study. Among them, three were channeling it to AMF. However, the others are alternative marketing options for the producers. The channel that supplies malt barley to AMF via traders accessed about 90% of it and malt barley coming to the factory directly by farmers and via cooperatives were not more than 10% in the past years. The channel via cooperatives which is strategic for both producers and the factory is serving below the required potential due to financial constraints among the cooperatives and management skill gaps.

Available evidences suggest that the adequacy of malt barley produced in Arsi and West Arsi highlands for satisfying AMF's demand, the potential is threatened with low on-farm productivity, low malt barley quality, inefficient marketing system and existence of computing channels (dual usage of malt barley).

5.2 Policy implications

Policy implications that could improve constraints in malt barley value chain and enable to exploit the existing malt barley potential in the surrounding study areas as well in the country and to satisfy the highly increasing malt market in our country are briefly summarized in the following section in two major parts.

1. Improving input supply to enhance productivity

Malt barley produced by the smallholders is constrained with lower quality. This is often due to farmers lacking the right inputs (seeds and fertilizers). The inputs that need to be targeted for improving malt barley quality and productivity should be improved seeds, fertilizers, credits and agricultural extension services. The capacity of smallholders to improve productivity as well quality depends on the interactions of factors including the availability of appropriate production technologies, the effectiveness of agricultural extension services and access to credits and finance. The recommended interventions include:

Widening breeding strategies to develop productive varieties: malt barley research and development which is underway by EIAR should strengthen malt barley research or breeding programs so as to generate productive varieties that enable to produce quality malt that could attain the quality standard's required by breweries. In

addition EIAR should carry out adaptation work in order to screen malt barley varieties in other countries to adopt those suitable for different agro-ecological conditions of Ethiopia. Further, ensuring quality seed multiplication and distribution to the producers is also an important issue that needs attention in the future.

Strengthening malt barley production extension: malt barley production extension should be strengthened and it should be well incorporated into agricultural extension services. Farmers should be supported in close by respective experts in malt barley production. Improved malt barley production technologies should be accessed to farmers through demonstrations and good model farmers' experience should be identified and shared to other farmers through field days. Malt barley production should be supported by production manuals and it should be distributed to the experts and producers. Capacitating FTCs is crucial for strengthening the extension of malt barley.

2. Strengthening linkages among farmers, farmers' cooperatives/unions and AMF

Strong linkage among cooperatives, farmers and AMF can dissolve constraints existed due to the ill-marketing of malt barley. Marketing problem is discouraging to farmers and also it contributes for supplying low quality malt barley to the factory due to traders' blending practice. In order to improve the linkages and communications among these bodies, we forwarded the possible intervention areas as follows:

Delivering required inputs to the farmers: accessing required inputs (improved seeds, fertilizers and other inputs) in credits (cash or kind) for malt barley production to increase farmers' malt barley productivity.

Securing contracts with farmers and cooperatives: farmers should be secured for the products; they should not suffer for its outlet. So, securing contract with farmers and cooperatives is important and can reduce marketing risk. Further, it helps to collect more quality products by reducing level of blending practice between producers and the factory. This also improves the producers' benefits from malt barley production business through reduction of exploitation made by the intermediaries especially traders.

Deliver market information on time to respective stakeholders: early inaccessibility of malt barley market information affected farmers to lose their benefits by selling their crop at lower price. Therefore, as much as possible the factory should set malt barley price early in December and all respective stakeholders should be accessed to the market information (price) early on time.

References

Access Capital. (2010), "Sector Report: Beer 2010", May 2010.

Mohammed, H., & Getachew, L. (2003), "An overview of malt barley production and marketing in Arsi. pp. 1-25. Proceedings of the Workshop on Constraints and Prospects of Malt Barley, Production, Supply, and Marketing Organized by Asella Malt Factory and Industrial Projects Service" March 15, 2003.

ORDA (Organization for Rehabilitation and Development in Amhara), (2008a), "Baseline survey of six malt barley potential woredas of north and south Gondar zones of the Amhara region, Ethiopia" Malt barley promotion project of ORDA-Oxfam GB. Draft report, April 2008. Bahir Dar, Ethiopia.

Ethiopia-Barley-Business-Case Investor Presentation, (2012), "The Business Case for Investing in a Malting Plant in Ethiopia" *Investor Presentation June 2012. Addis Ababa, Ethiopia.*

Tadesse, K, (2012), "Malting barley marketing and production in Ethiopia" *Barley Research and Development in Ethiopia,* 28–30 November 2006. Holetta Agricultural Research Centre, Ethiopia.