

Review of Barley Value Chain Management in Ethiopia

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Abstract

Barley is cultivated by small holders in every region of Ethiopia, since 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. Barley is a major staple food crop in the highlands of Ethiopia. The crop is used for preparing various types of traditional foods such as Kita, Kolo, Beso, Enjera, Giat, cuko (shakeka) and many others. Although the day to day survival is linked to barley, little focus has been given to improve the productivity of the crop in the dry land. The market potential for malt barley is directly dependent on the market for beer; as such, its potential can best be assessed by looking at the evolving dynamics of Ethiopia's growing brewery sector. Much of Ethiopia's beer demand is currently being met by domestic brands. BGI Castel is the largest operator in the market, with production capacity of roughly 2 million hectoliters per year (out of a total market production of ~4 million hectoliters per year). The major players in the barley value chain are the input suppliers, smallholders, state and commercial farms, rural assemblers, cooperative unions, grain wholesalers, flourmills, processed food wholesalers, grain retailers, bakeries and pastries, and retailers of processed food. Donors and NGOs also play some role in procuring barley locally for their relief and development activities. To balance the demand and supply of barley the country have to be increase the productivity of the barley by using modern technology, high-yield varieties for specific location based on end user needs, with varieties to include characteristics such as resistance to drought and diseases.

1. INTRODUCTION

Value-added agriculture has attracted considerable attention in recent years as a means to increase and/or stabilize farm incomes and to rejuvenate primary agriculture and the rural economy. The move to value-added agriculture is fundamentally market-driven. Value-added activities are born from the necessity to adapt to the wide-ranging changes affecting the agriculture and agri-food industry. These changes stem from many interacting factors: the quick expansion of agricultural trade and the resulting concentration in the agri-food industry, an increasingly segmented consumer base, shifting consumer preferences, changing demographics and income profiles, innovation in food and non-food uses of agricultural products and trade related issues, including border closures, in an increasingly integrated global market (AAFC, 2004).

Increased competition as a result of globalization has resulted in lower returns for actors in African agriculture, including farmers and agro-processors, as they have continued to lag behind their competitors in innovation and the ability to set their products apart. With globalization, product distinction and branding are becoming increasingly important ingredients for market differentiation and upgrading strategies. This is especially due to greater consumer awareness, with demand for superior and differentiated products (FAO, 2003).

Cereals are the most important food crops of the world and they provide the world with a majority of its food calories and about half its protein. They are staple foods in the diets of most population. In the year 2011, 2352.9 million metric tons of cereals were produced globally from 658.5 million hectares of land with an average productivity of 30.83 quintals per hectares (FAO, 2011). According to FAO (2011), the world cereal production in the year 2011, was increased by more than 5% from previous year production. In the same year, Africa's contribution to the world output was 6.35% (about 133.1 million tons).

In Ethiopia, Cereal production and marketing is the means of livelihood for millions of smallholder households and it constitutes the single largest sub-sector in economy. Cereal accounts for roughly 60% of rural employment, 80% of total cultivated land, more than 40% of a typical household's food expenditure, and more than 60% of total caloric intake. The contribution of cereals to national income is also large. According to available estimates, cereal production represents about 30% of gross domestic product (GDP). This calculation follows from the fact that agriculture is 48% of the nation's GDP (World Bank, 2007), and that cereals' contribute to agricultural GDP is 65% (Diao et al, 2007)

In the country, cereals are also the major stable food crops taking a significant share of area cultivated and volume of production obtained. Out of the total grain crop area, 79.69% (8.7 million hectares) was covered

by cereals.

Barley (*Hordeum vulgare* L.) is an annual cereal crop, which belongs to the tribe Triticeae of family Poaceae (Harlan, 1976; Martin *et al.*, 2006). It is a diploid ($2n=14$) plant with high degree of self fertilization.

Barley is the most widely grown crop over broad environmental conditions. It has persisted as a major cereal crop through many centuries and it is the world's fourth important cereal crop after wheat maize and rice (Martin *et al.*, 2006). Barley has a long history of cultivation in Ethiopia and it is reported to have coincided with the beginning of plow culture (Zemedu, 2000). It is the most important crop with total area coverage of 1,129,112 hectares and total annual production of about 1.7 million tons in main season (CSA, 2010). Barley is also a principal *Belg* season crop second to maize in area coverage and production (Birhanu *et al.*, 2005; CSA, 2008). In the highland of the country barley can be grown in Oromia, Amhara, Tigray Regional States and part of SNNP in the altitude range of 1500 and 3500 m, but it is predominantly cultivated between 2000 and 3000 masl (Berhane *et al.*, 1996). Under extreme marginal conditions of drought, frost and poor soil fertility, barely is the most dependable cereal and is cultivated on highly degraded mountain slopes better than other cereal crops in the highland of Ethiopia (Ceccarelli *et al.*, 1999). As barley is early harvested crop, it is popular hunger breaker or relief crop during season of food shortage in some parts of the country (Baye and Berhane, 2006).

In Ethiopia, barley types are predominantly categorized as food and malting barley based on their uses while the highest proportion of barley production area is allocated for food barley. Food barley is principally cultivated in the highland where the highest consumption in the form of various traditional foods and local beverages from different barley types (Zemedu, 2000). Ceccarelli *et al.* (1999) also indicated that barley grain accounts for over 60% of food for the highland in Ethiopia, for which it is the main source of calories. According to Birhanu *et al.* (2005) barley is used in diversity of recipes and deep rooted in the culture of people's diets. Besides its grain value, barley straw is an indispensable component of animal feed especially during the dry season in the highland where feed shortage is prevalent (Girma *et al.*, 1996). Barley straw is also used in the construction of traditional huts and grain stores as thatching or as a mud plaster, as well as for use as bedding in the rural area (Zemedu, 2000).

After wheat, teff and maize, barley (*Hordeum vulgare* L.) is the most important small grain in Ethiopia. It is mainly used for consumption, production of malt (which is used for brewing of beer), animal feed and pearl barley. A very small part of the Ethiopian barley crop is generally less suitable for malting purposes and as such is used for human consumption. On average the annual commercial production in Ethiopia is about 220 000 tons while the local consumption requirements for barley are around 265 987 ton per year (CSA, 2010).

Barley contains about 75% carbohydrate, 9% protein and 2% fat. In energy terms, each gram provides about 3.3 calories. Barley grain is rich in zinc (up to 50 PPM), iron (up to 60 ppm) and soluble fibers, and has a higher content of Vitamins A and E than other major cereals.

During the last decade there has been increasing interest in barley to improve human health, mainly in industrialized countries and major urban areas of developing countries. This is boosting barley food-products and consumer interest in such products. The effectiveness of barley beta-glucans in lowering blood cholesterol and barley's low glycemic index in diets for people with Type II diabetes is widely accepted. Barley is a rich source of tocopherols, which are known to be capable of reducing serum LDL cholesterol through their antioxidant action. Barley bran flour accelerates gastrointestinal transit time, and is therefore said to reduce the incidence of colon cancer. In North and East Africa, producing and marketing such processed foods is becoming a common source of income for women (USDA, 2012).

There is production, productivity and marketing problems of several barley farmers in the country, which needs the specific focus of authors' to conduct review of barley value chain analysis in these specific areas as it incorporates factors influencing production, productivity and others. Cognizant of these facts, the objective of this review was Barley production and consumption in the country; Marketing channels of barley; participants in the barley value chain and its map; Opportunities and constraints of barley value chain in Ethiopia.

2. Barley Value Chain Management in Ethiopia

2.1. Barley Production in Ethiopia

Barley is the fifth most important cereal crop after teff, wheat, corn, and sorghum. It is the staple food grain especially for Ethiopian highlanders who produce the crop with indigenous technologies. It is cultivated by small holders in every region of Ethiopia, since 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 (www.daff.gov.za ,2012)¹.

Barley is grown as a 'meher' (main season) crop in the higher altitudes of Dega regions. It is grown mainly in Arssi, Bale, Shoa, Welo, Gojam and Gonder. It is also widely cultivated as a 'belg' crop in many areas. The annual cultivated area is estimated at 881,680 hectares and production at 999,610 tons, representing 18.7 per cent of the cultivated area and 18.3 per cent of the total cereal production. Average yield varies between 10 and

¹ Available at www.daff.gov.za, 2012

13 quintals per hectare.

Barley is used as food and raw material for brewing home-made alcoholic drinks. Beverage industries also use some 10,000 tons of barley per annum to prepare malt for breweries (Kuma and Mekonnen, 1994).

Table 1. Barley area harvested (2008-2013)

Market year	Area harvested	Unit measure	Growth rate
2008	951	(1000HA)	-3.35%
2009	975	(1000HA)	2.52%
2010	1046	(1000HA)	7.28%
2011	1013	(1000HA)	-3.5%
2012	1020	(1000HA)	0.69%
2013	1020	(1000HA)	0.00%

Source: USAID, 2012

Barley is a major staple food crop in the highlands of Ethiopia. The crop is used for preparing various types of traditional foods such as Kita, Kolo, Beso, Enjera, Giat, caccabsa and many others. Although the day to day survival is linked to barley, little focus has been given to improve the productivity of the crop in the dry land area (Berhan, et al, 1996).

Table 2. Barley production (2008-2013)

Market year (MY)	Production	Unit of measure	Growth rate
2008	1484	(1000MT)	9.52%
2009	1569	(1000MT)	5.73%
2010	1525	(1000MT)	-2.8%
2011	1592	(1000MT)	4.39%
2012	1620	(1000MT)	1.76%
2013	1632	(1000MT)	0.74%

Source :(USAID, 2012)

Barley production has been growing in Ethiopia as both the number of barley farmers and barley yields increase, linked to growth in demand for food and malt barley. It is among the top 5 crops grown in Ethiopia along with teff, wheat, maize and sorghum. Very well suited to growing in temperate climates especially 2,000 meters above sea level, ideal for Ethiopia, 80% of production is in the Oromia and Amhara regions, increasing numbers of farmers, yields and production of barley in Ethiopia as demand for malt and food barley grows. (ERLI, 2010).

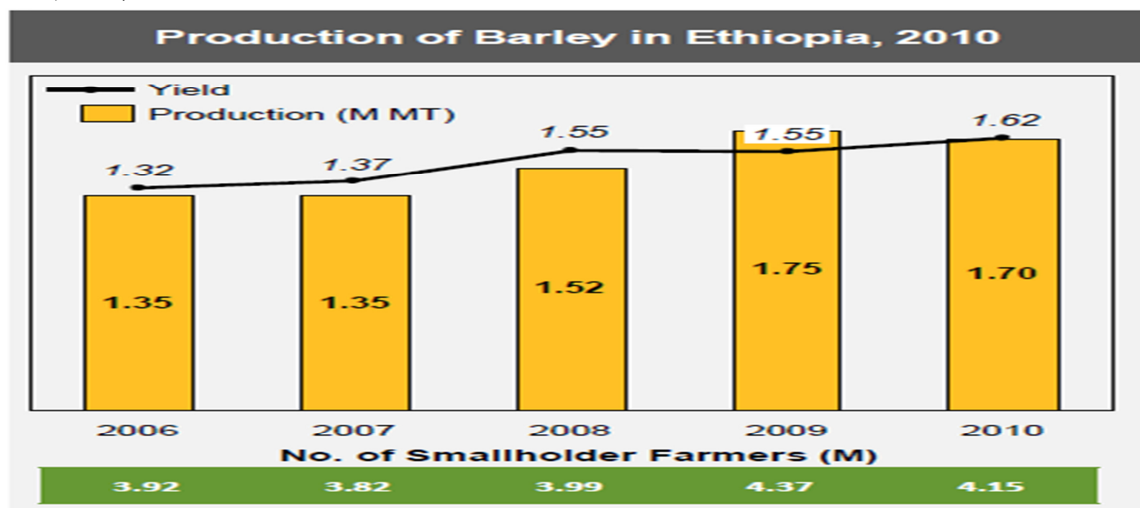


Figure 1. Production of barley in Ethiopia

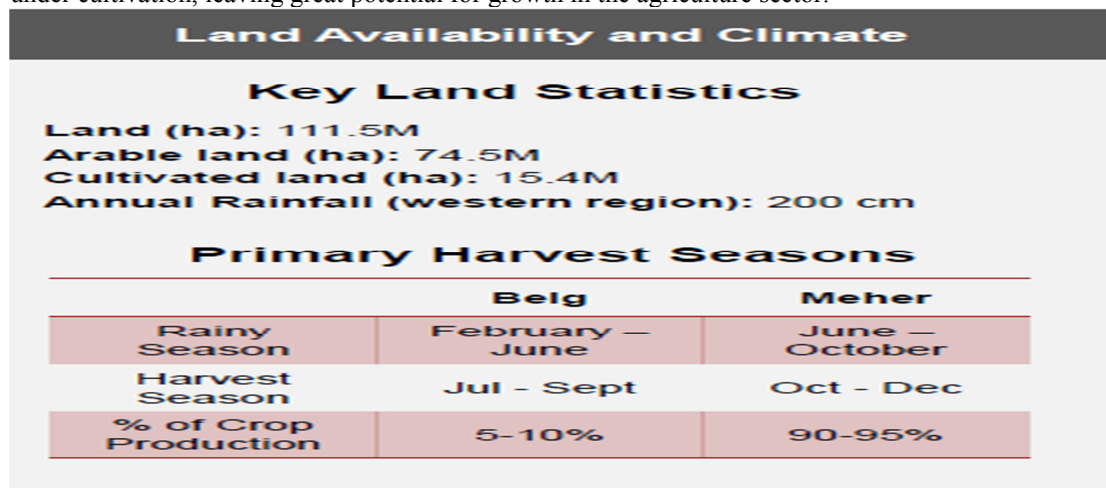
Source: Central Statistical Authority of Ethiopia (2011)

According to CSA, 2011, Barley producers, especially, do not benefit from improved inputs like seed and fertilizer, and productivity is stagnant for a long time due to high soil degradation. In addition, the problem of soil erosion in the highlands contributes to low productivity. As a highland crop, there is little increase in the area planted to barley; the small increases in MY 2011/12 and forecast for MY 2012/13 are due to heightened interest by local breweries and the local malt producer. However, the good rains in the highlands resulted in an increase in production in MY 2011/12.

2.1.1. Agro climatic conditions for barley production

Ethiopia possesses favorable agro-climatic conditions for a range of crops including malt barley, as well as abundant land for agricultural activities. It is home to 18 major agro-ecological zones and 49 agro-ecological

sub-zones. The country has the soils and climate suitable for growing over ~150 types of crops, including high value commodities such as coffee, sesame and other oilseeds, cereals, spices, fruits and vegetables. Ethiopia has two main harvest seasons, which are heavily reliant on annual rainfall. The bulk of harvesting is completed from October to December following the Meher growing season. Just 21% of arable land is currently under cultivation, leaving great potential for growth in the agriculture sector.

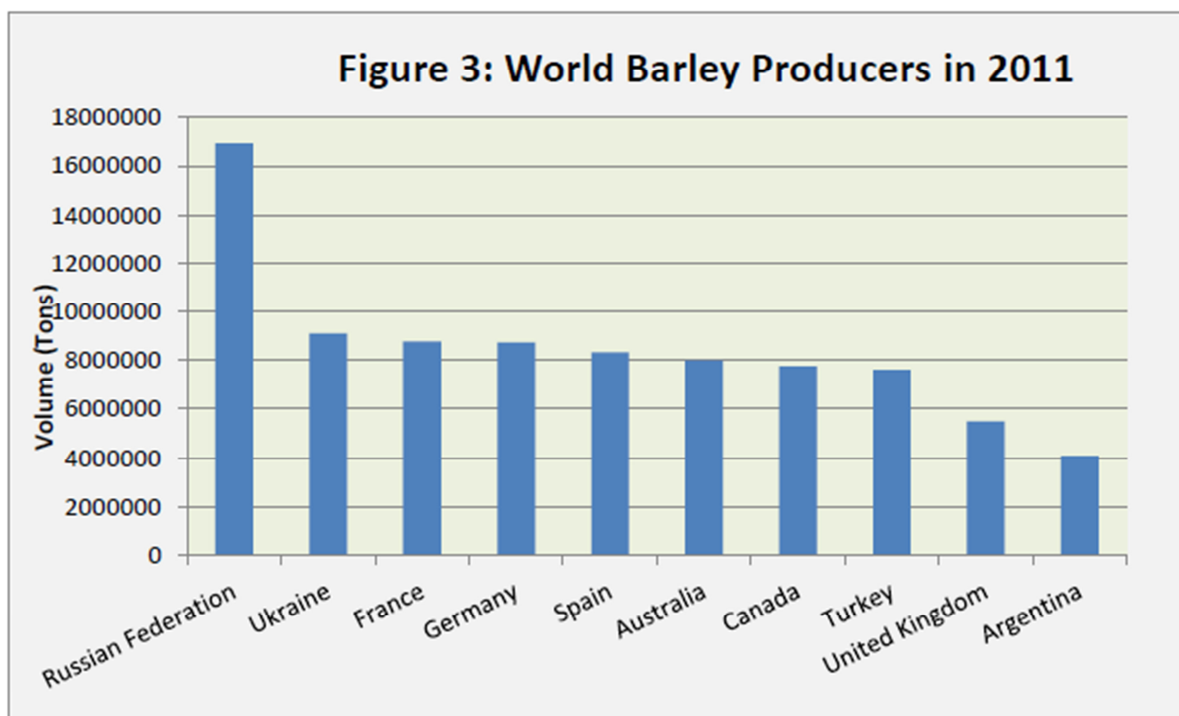


Source: USAID (2012)

Figure 2. Agro climatic conditions for barley production

2.1.2. Production Trends

The major producers of barley in the world during the year 2011 were Russian Federation, Ukraine, France, Germany, Spain, Australia and Canada. Russian Federation produces the greatest quantities of barley with an estimated production of approximately 16.94million tons followed by Ukraine with a production of about 9.1 million tons in 2011. Of all countries that produce barley, the least producer of barley is Bangladesh, which produced only 484 tons of barley in 2011. Ethiopia is the second in the Africa in terms of barley production and produced only 1.7million tons of barley during the year 2011(Verm .V eta al., 1996).

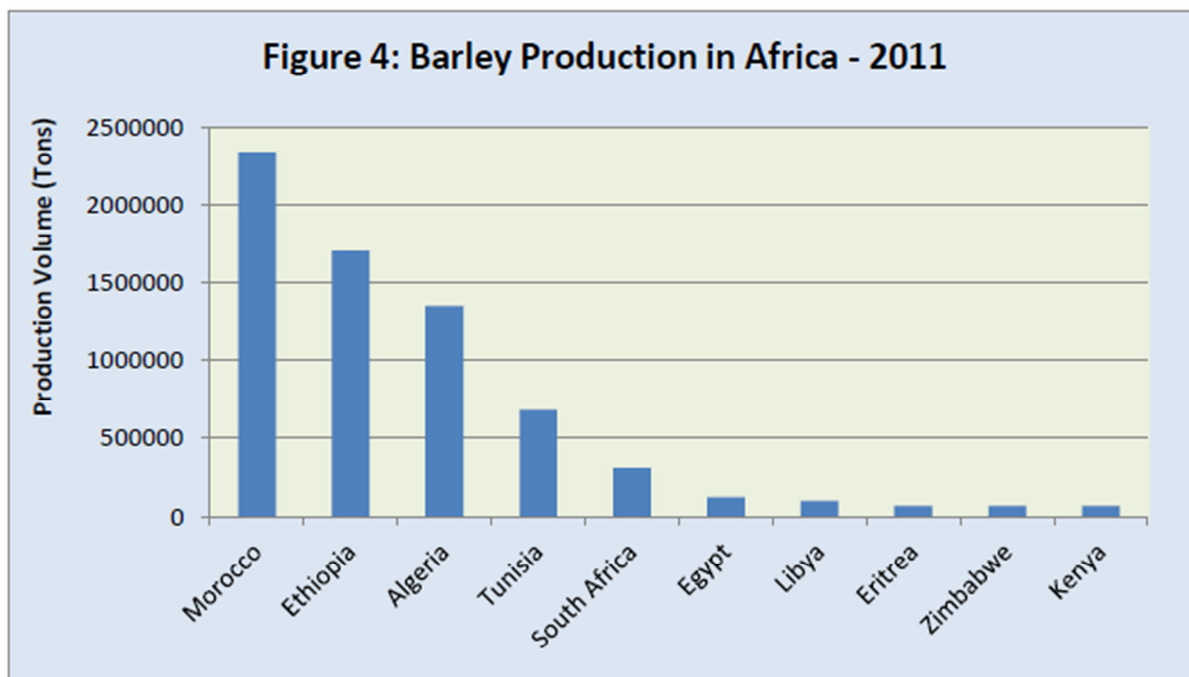


Source: FAOSTAT

Figure 3. World barley production in 2011

On the African continent, the top barley producers for the year 2011 were Morocco, Ethiopia and Algeria having produced 2.3 million, 1.7 million and 1.4 million tons respectively in 2011 (see Figure 4). These countries are followed by Tunisia and South Africa who produced about 680 thousand tons and 312 thousand

tons respectively, during the same period. Of all countries that produce barley on the African continent, Lesotho is the least producer after producing only 588 tons in 201(FAOSTAT, 2011).



Source: FAOSTAT

Figure 4. Barley production in Africa in 2011

2.2. Consumption

Barley is a staple food crop for many Ethiopians, and is substituted for wheat when wheat prices are high. It is consumed in the Ethiopian fermented bread injera in the highlands, as porridge, as a roasted snack, and in homemade beer. For millennia, barley has been supplying the basic necessities of life (food, feed, beverages and roof thatch) for many in the Ethiopian highlands. However, the ever-increasing human and livestock populations are placing increasing pressure on the land normally used for barley production. Because of its wide range of uses, barley is considered the “king of grains” in much of the country and low farm input supplies such as fertilizer and improved seed (FAO, 2006).

Malt barley is the major raw material (about 90% of the total raw material cost) for beer production. Malt barley grain is mainly produced in the south eastern parts of Ethiopia in Arsi and Bale administrative zones. The total estimated demand for malt barley in 2012/13 is around 72,000 tons of which 35 percent can be supplied from local barley farms. The remaining amount of malt barley is imported from Belgium and France. The interesting aspect of malt barley production in Ethiopia is that the crop can have dual purposes: it can be used for food (bread and several traditional dishes) and also for malting (AMF, 2012).

Established in 1984, Asella Malt Factory (AMF), a state-owned facility, is the only malt processing factory in the country and supplies malt to four local breweries. In 2012, a private company started construction of a new malt factory in the northern part of the country, and it should be operational within two years. There are also two more breweries under construction which should increase demand for malt barley in the near future.

Table 3. Ethiopian barley domestic consumption

Market year	Domestic consumption	Unit of measure	Growth rate (%)
2006	1350	(1000MT)	8.00
2007	1350	(1000MT)	0.00
2008	1500	(1000MT)	11.11
2009	1550	(1000MT)	3.33
2010	1525	(1000MT)	-1.61
2011	1535	(1000MT)	0.66
2012	1432	(1000MT)	-6.71
2013	1650	(1000MT)	15.22

Source: <http://www.indexmundi.com/agriculture/?country=et&commodity=barley&graph=domestic-consumption>

2.3. Barley Marketing in Ethiopia

The market for grain is the largest of all markets in Ethiopia in terms of the volume of output handled the number of producers, consumers and other market participants involved, and the vastness of the geographical area of operation. Million of farmers and consumers as well as a number of marketing agents are engaged in the production and consumption of grain and in the provision of diverse marketing services, namely, buying, selling, transporting, storing, processing, retailing, etc(Rozelle S. 1991). The main features of the Ethiopian grain marketing systems are highlighted as following:

2.3.1. Marketed Volumes through Alternative Channels

It is difficult to determine precisely the volume of grain marketed annually, because it fluctuates from year to year depending on weather and rainfall conditions. According to the preliminary findings of the Household Survey conducted in 1996, a relatively good crop year, it is estimated that the proportion of output marketed by farmers is about 27% (Gebremeskel *et al* 1966).

The marketed quantity flows from producers to consumers through a number of channels. Figure 5 below depicts the various market participants, their inter-relationships, the options available for the different market participants for buying or selling barley, and an estimate of the volume of grain passing through the alternative channels. Producers of barley consist of small farmers, and commercial and state farms, which account for more than 95% and 5% of the total marketed quantity respectively. Producers' market outlets include:

- (a) Direct sales to rural and urban consumers
- (b) Direct sales to rural assemblers/farmer-traders,
- (c) Sales to retailers and,
- (d) Direct sales to inter-regional traders, and direct sales to multi-factory.

The rural assemblers, mainly consisting of farmer-traders, buy barley from farmers at rural markets with the purpose of reselling it to consumers and/or regional wholesalers. They are mostly independent operators, but sometimes they are temporarily hired by the regional wholesalers as agents for a fixed fee or on commission basis. As shown in the figure, these assemblers sell most of the grain they buy from farmers to inter-regional grain traders. The inter-regional traders consisting of wholesale trades, EGTE, and private companies are the principal actors in inter-regional grain movement

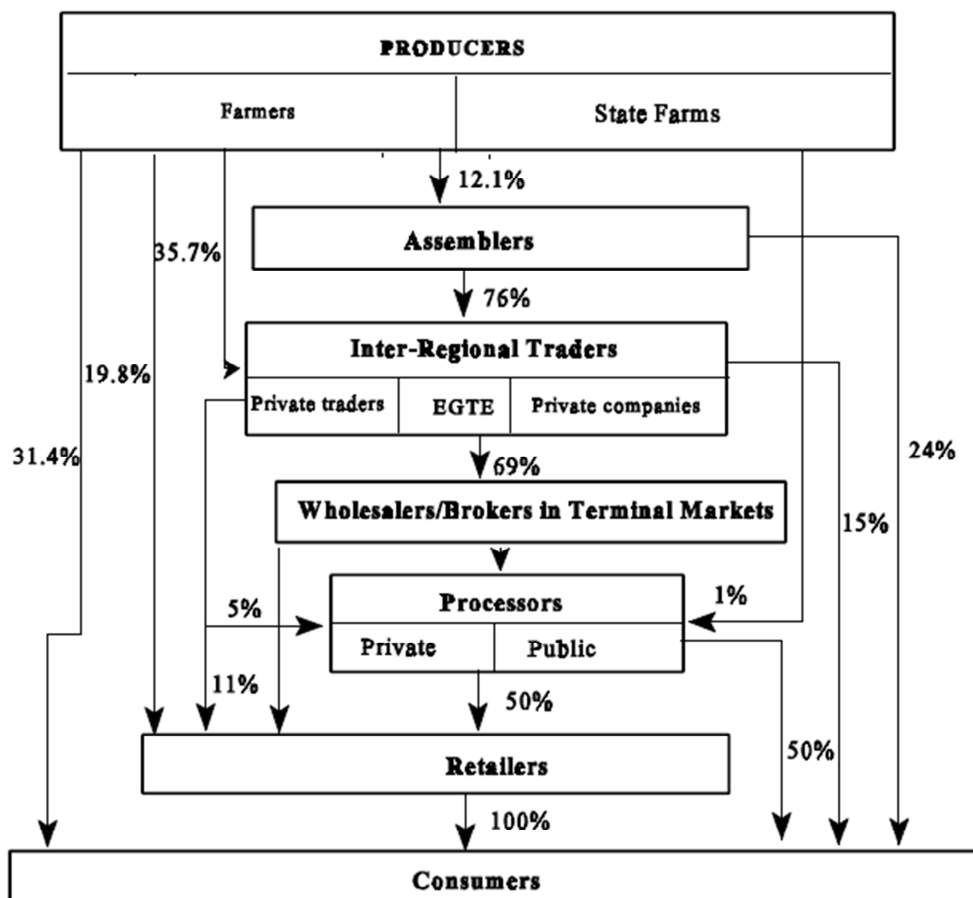


Figure 5. Alternative Marketing channels
 Source: Gebremeskel *et al.*, (1966)

2.3.2. Market Concentration

Market concentration refers to the number and relative size distribution of buyers/sellers in a market. Many studies indicate the existence of some degree of positive relationship between market concentration and gross marketing margins. It is generally believed that higher market concentration implies a non-competitive behavior and thus inefficiency. But, the studies also warn against the interpretation of such relationships in isolation from other determinant factors like barriers to entry and scale economies (Scott 1995).

There are a number of measures of market concentration, but the most commonly used is the market concentration index, which measures the percent of traded volume accounted for by a given number of participants. Empirical studies in the fields of industrial organization suggest certain levels of concentration at which non-competitive behavior of market participants begin in different industries. For example, Kohls and Uhl (1985) suggest that a four-firm concentration ratio (CR4), that is, the market share of the largest four firms, of less than or equal to 33% is generally indicative of a competitive market structure, while a concentration ratio of 33% to 50% and above 50% may indicate a weak and strongly oligopsonist market structures, respectively.

However, the CR4 is best regarded as a “rule of thumb,” and as mentioned previously, there are reasons why high concentration levels may be reasonable in light of small potential volumes traded. Producers in Ethiopia sell about half their marketed grain to retailers and direct to end users, bypassing the barley wholesalers that are the focus of this analysis. Concentration ratios at the wholesale level may exaggerate the degree of market power that may be exerted by large traders due to the existence of alternative channels for grain distribution in many areas. Notwithstanding these caveats, the concentration of the wholesale barley trade is clearly important information in Ethiopia. This was computed using annual volume of purchase both at national and local market levels.

The question of the relevant market hinges on the geographic scope of traders’ business and barriers to trading in several different grains or market places. Entry barriers may be caused by the costs of transportation or lack of timely information. There is some evidence of this based upon differences in prices among markets. The issue of market concentration and competition is clearly related to the high costs of transportation and small market volumes among some markets. There are well-established economies of scale in grain trading. If the potential marketed volumes from farmers in a particular area are very small, unit costs may rise as the number of traders increase. This would tend to limit the number of traders operating in isolated areas with low trade volumes. However, these considerations do not rule out problems of market conduct and/or serious barriers to entry influencing market performance (GMRP, 1996)

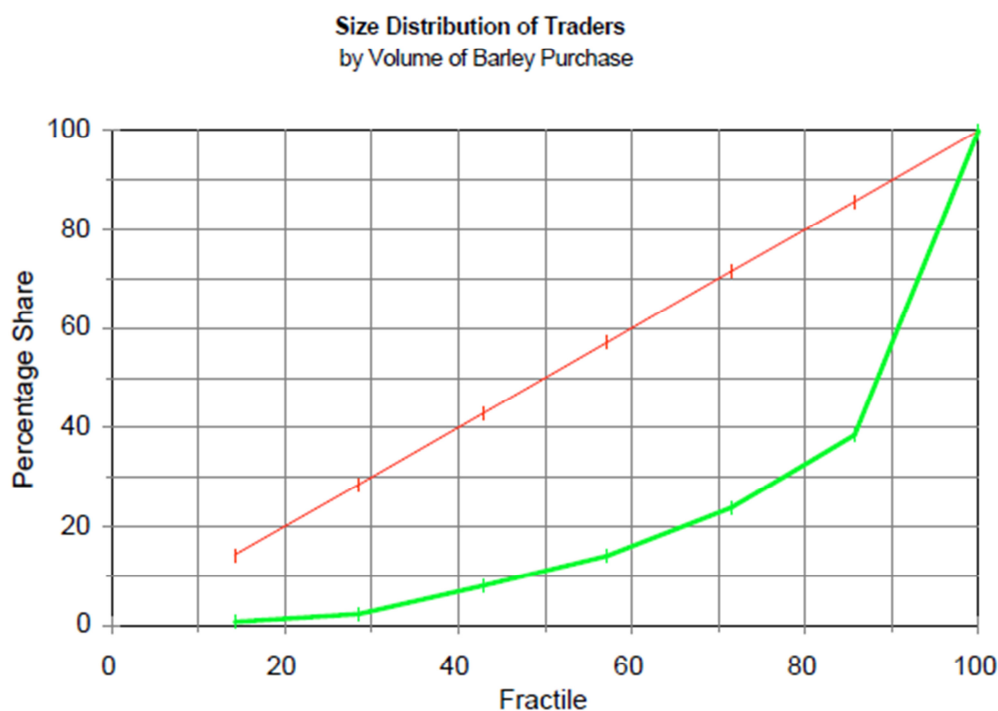


Figure 6. Market concentration
Source: GMRP, 1996

2.3.3. Market Conduct

Farmers normally bring their barley to markets that are 5 to 20 km away from their villages by carrying it or using pack animals. Barley sales by farmers in markets beyond 20 km distance are infrequent. Most of the barley is sold between January and March. Barley sales by farmers during the above mentioned period represents 79% of their annual sales; and the remaining 21% is sold during June - December (GMRP Rural Household Survey 1996)

Farmers are forced to sell their grain immediately after harvest, when prices are generally low, because of fear of storage loss and also in order to meet their cash needs for the purchase of food, for covering wedding expenses, and for repaying loans and taxes. Because of their large number compared to the wholesalers, lack of direct access to other markets or alternative channels and absence of any market extension service, farmers' bargaining power is generally weak.

Similarly, the main barley buying season of wholesale traders is between January and March in which they buy about 51% of their yearly supplies. The volume purchased during the periods October-December, April-June, and July-September gradually declines to 26%, 15% and 8%, respectively. The difference in the sales pattern of farmers and the purchase patterns of wholesalers is due to the fact that about half of farmer sales are directly to consumers or retailers, not to the wholesale trader.

Even though the wholesale merchants collect grain from different places, they normally purchase about 60% of their grain supplies at their own warehouses. The traders do not provide advance payment, credit, or any incentive other than a price to farmers as a means of encouraging them to bring the grain to their stores. Nationally, 97% of the farmers reported that they did not get any price offer before harvest. Grain prices were not fixed in advance and less than 5% of farmers took loans from merchants during the 1995/96 season. Farmers' decisions regarding grain sales to merchants were not influenced by such factors as blood, ethnic, or religious relationships according to the survey results. Traders indicated that the price at which they buy grain at the local markets is determined by deducting miscellaneous costs and a net profit margin from the prevailing wholesale price in Addis Ababa which they get from the brokers. This indicates that the local market prices are largely determined in relation to Addis Ababa prices. However, the margin between regional market prices and Addis prices may fluctuate if the merchant, who has already purchased grain in the regional market, cannot secure transport quickly and prices either decline or rise meanwhile in Addis Abeba.

In this way, problems in securing transport in a timely way introduce substantial risk into the operations of grain wholesalers. It has been reported that prices in Addis Ababa change rapidly and enormously between the time they inquire about wholesale prices in Addis Ababa and the time they transport and sell their grain in the terminal markets. As a results of these risks, wholesalers may incorporate an added "risk premium" into their marketing margins, which may account for why margins appear higher than costs in some cases (% (Gebremeskel *et al.*, 1966).

On the sales side, the wholesale merchants' strategy is mainly focused on the terminal markets and deficit areas of the country rather than on the smaller local markets. Some 69% of the grain purchased by wholesalers is transported and sold in the terminal markets and deficit areas. Of the total quantity shipped out by traders, nearly 35% and 31% went to Addis Ababa and the deficit areas, respectively (% (Gebremeskel *et al.*, 1966).

In Addis Ababa, in particular, inter-market grain flow is coordinated by the brokers operating in the main terminal markets. There are more than 200 brokers/wholesalers in Addis Ababa, but the most important are not more than 50. The brokers are specialized by route and coordinate grain buying, selling, transporting and pricing activities. The brokers generally do not compete aggressively for regional wholesalers' business and most of the regional traders are loyal to their respective "client" broker. This situation indicates generally long-term relationships between brokers and regional traders based on trust.

Most wholesalers (about 66%) carry out their local barley sales by directly selling to clients, but barley sales in the terminal markets and other deficit areas are mostly carried out using the services of commission agents and sometimes by directly selling to buyers.

2.3.4. Barriers to Entry

Many of the institutional barriers to barley trade, such as the enforcement of the quota system, price control, preferential treatment given to state enterprises and cooperatives in the allocation of bank credit, limitations imposed on capital ceilings for wholesale and retail trade, restrictions on the number of merchants in a particular market, etc., have been abolished since the liberalization of markets in 1990.

Even though such barriers are no longer obstacles to private participation in grain trade, there are still other barriers that require serious attention. The most important of these is the large amount of start-up capital required for financing not only barley but also grain trade operations. Taking the average annual volume of purchase by the lowest quartile, i.e., 1,014 quintals as the minimum scale of operation, an average procurement price of Birr 150 per quintal, and based on the assumption that this volume is in 2 discrete purchase/sale cycles per year, the minimum financial outlay needed for purchasing, storing and transporting grain would be about

Birr 75,000 (roughly US\$11,538). Allocating such an amount of capital from personal savings or obtaining bank loan by presenting collateral of equivalent value is difficult for most potential entrants. As mentioned earlier, the already established wholesale merchants, particularly the relatively big ones, carry out other business activities such as providing freight service, grain milling, etc., in addition to grain trade. This gives them an additional advantage compared to small merchants and potential entrants; because their unit cost would be relatively lower than that of others (FAO, 2011).

2.4. Market Potential for Malt Barley

There are two varieties of barley: food barley and malt barley. In Ethiopia, roughly 15% of barley production is in the form of malt barley. Food barley is grown primarily for human consumption, with smallholder farmers consuming upwards of 60% of the food barley they produce. In Ethiopia, the market potential for malt barley is directly dependent on the market for beer; as such, its potential can best be assessed by looking at the evolving dynamics of Ethiopia's growing brewery sector (USAID, 2012).

Malt is the second largest use of barley after food, and it is an important crop for farmers in the cool highlands of Ethiopia. Beer production in Ethiopia has increased from 1 million hectoliters in 2003 to roughly 4 million HL in 2011, growth of nearly 20% annually. The growth in beer production has led to corresponding growth for malt barley demand, which is the key raw in-put for beer production. At present there are six breweries in Ethiopia, including the global giants Heineken and Diageo, and some new ones are under construction.

This translates to an annual growth rate of ~20% which is high given that it is almost double Ethiopia's real GDP growth rate over the same period. This surge in production due to increasing demand—driven by such factors as increased urbanization, population growth, and rising incomes—is in line with regional trends. While Ethiopia's per capita beer consumption still lags well behind other African countries (see Figure 7), it is expected to more than double to eight to 10 liters per capita in the next five years, at an annual growth rate of 15% to 20%.

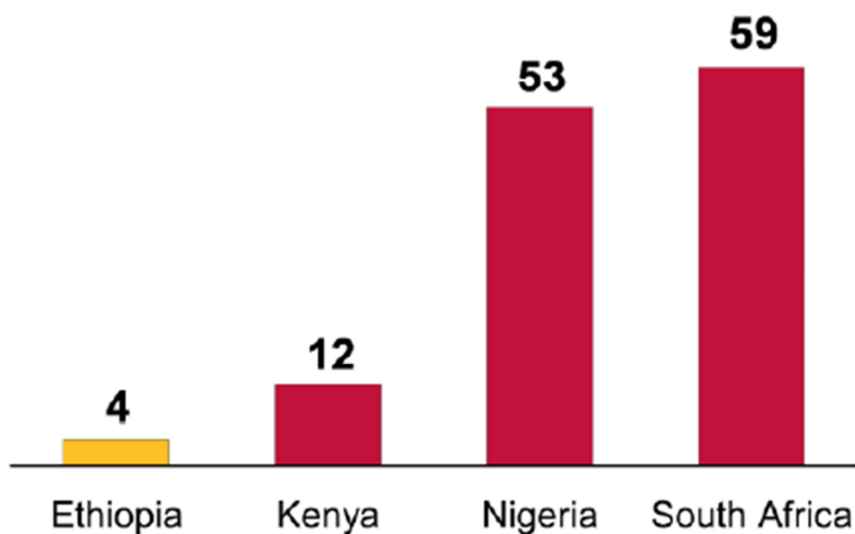


Figure 7. Average per capita consumption of beer in Africa

Source: USAID (2012)

Much of Ethiopia's beer demand is currently being met by domestic brands (see Figure 7). BGI Castel is the largest operator in the market, with production capacity of roughly 2 million hectoliters per year (out of a total market production of ~4 million hectoliters per year). The other dominant domestic operator is Dashen, which is based in the north of the country and caters primarily to the northern market. The country's other major breweries have recently been acquired by international operators. Heineken acquired the Harar and Bedele breweries from the Ethiopian Government in August 2011 for approximately \$160 million; SABMiller, another international player, also bid for these breweries but was unsuccessful. Heineken also announced plans in April 2012 to invest a further \$130 million in establishing another brewery in central Ethiopia. In early 2012, Diageo completed the acquisition of Meta Brewery for \$225 million, seeking to enter the Ethiopian market with an established brand.

Financial investors have also been attracted by the returns with Duet Group, a private equity firm, taking a controlling stake in Dashen Brewery in April 2012. The international brewers have stated, and their investments signal, their view that demand for beer is going to grow very quickly over the next few years. Their presence will also bring forth greater sophistication within the industry and value chain as a whole given the

global experience they are able to leverage. The international brewers’ presence should also give more confidence to financial investors, given that other “brand name” companies have decided to strongly commit to Ethiopia after significant due diligence. Meanwhile, new domestic brewers are also entering the competitive landscape. At least three domestic brewers—Habesha, Raya, and Zebidar—are in the process of constructing new breweries and hope to begin operations in the next one to two years.

As a result of this increased demand, the market for malt barley can be estimated to grow in line with that of the beer market—in other words, at 15% to 20% per year—demand for malt barley is projected to reach 110,000 to 130,000 metric tons in 2016. Given the quantity needed, much of this will be met through imports from international malt suppliers but there is definite opportunity for local malt suppliers to match international quality and provide malt at lower prices than imports. A malting plant of capacity 16,000 MT will be able to capture 11% of the import market share, and 8% of the total (imports + domestic production) market share by 2018.

Table 4. Market share of Ethiopian breweries

Breweries	Brands	Addis Ababa	National
BGI-Castel	St. George Beer	64%	48%
Meta (Diageo)	Meta Beer	12%	16%
Dashen	Dashen Beer	11%	13%
Harar (Heineken)	Harar Beer	5%	11%
Bedele (Heineken)	Bedele Beer	7%	10%

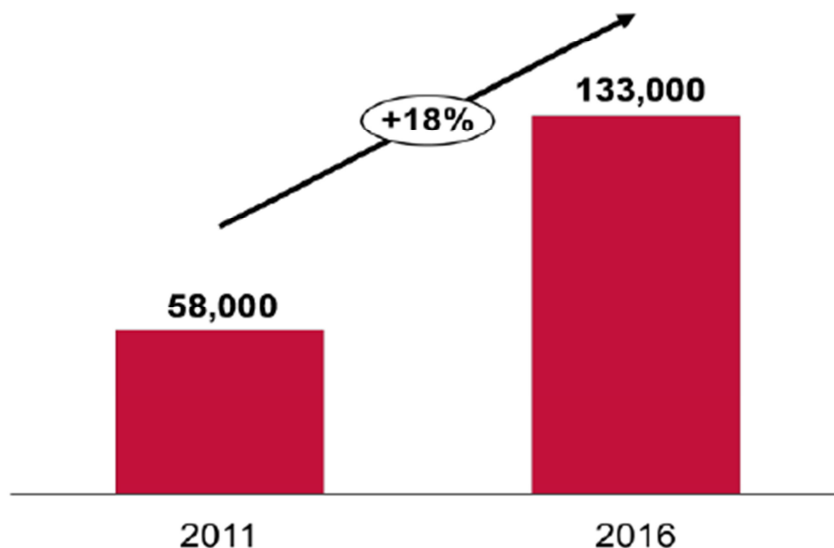


Fig 8. Market potential for malt barley
 Source: USAID (2012)

3. The Barley Value Chain in Ethiopia

3.1. Participants of the barley value chain

A value chain is the full range of activities required to bring a product from conception, through the different phases of production and transformation. A value chain is made up of a series of actors (or stakeholders) from input suppliers, producers and processors, to exporters and buyers engaged in the activities required to bring agricultural product from its conception to its end use (Kaplinsky and Morris, 2001).

Bammann (2007) has identified three important levels of value chain namely; value chain actors, value chain supporters, and value chain influencers.

3.1.1. Barley value chain actors

The major players in the barley value chain are the input suppliers, smallholders, state and commercial farms, rural assemblers, cooperative unions, grain wholesalers, flourmills, processed food wholesalers, grain retailers, bakeries and pastries, and retailers of processed food. Donors and NGOs also play some role in procuring barley locally for their relief and development activities (MAFAP, 2013).

A functional of the different actors in the barley market is shown in table 6 below.

Table 5. Functions of Actors

Function	Actors
Input supply	Input suppliers, cooperative union ,Agricultural office
Production	Farmers, commercial farms
Storage	Input supplier, state and private farms, cooperative union, wholesaler, processors, processed food whole sellers and retailers.
Assembly/collecting bulking	Assembler, cooperative.
Grain whole selling	Grain whole sellers, cooperative.
Processing	Processors like multifactor
Brewing	Beer factories
Wholesale distribution of processed food	Processed food retailers
Retailing of processed food	Retailers

Source: MAFAP, 2013

Description of the role and significance of each actor is also provided following the visual description

3.1.1.1. Input Suppliers

The major agricultural input suppliers include two government owned organizations: Agricultural Inputs Supply Enterprise (AISCE) and the Ethiopian Seed Enterprise (ESE), two regional government affiliated companies, and nine cooperative unions. With regard to fertilizer, though the private sector handled nearly one-third of the annual volume of fertilizer import in 1995, its role gradually diminished and currently the entire fertilizer importation and the government and farmers' cooperative unions handle distribution.

According to the 2007 FAO/WFP Food Assessment Mission, the farmers' cooperative unions controlled about 56% of the total fertilizer handled in 2005/06, while AISCE and the two government-affiliated companies (Ambassel and Wondo) had 23% and 21% shares. Similarly, the Ethiopian Seed Enterprise (ESE) was the sole supplier of improved barley seeds distributed in 2006/07 (MAFAP, 2013).

Private sector involvement in barley seed markets is very low, and growth in the private seed sector is inhibited by several factors. One is the provision of large government subsidies to the public ESE. Another cited reason is the expansion of the ESE into hybrid seed production despite an existing private seed company with experience in the hybrid maize seed sector. Additionally, most farmers use retained seed for planting, making it difficult to accurately predict demand for seeds (Byerlee et al., 2007).

3.1.1.2. Producers

Barley producers include smallholders and commercial farms. There are some 4.2 million smallholders, two state farms and several private commercial farms that produce and supply the domestic market with wheat. The major producers and suppliers, however, are the smallholders, accounting for more than 89% of the market supply. Barley sales by the state and commercial farms are normally conducted on tender basis or by negotiating with buyers and delivery is at farm-gate. According to data obtained from key informants, nearly 60% of the state and private commercial farms are delivered directly to AMF and the remaining 40% is sold to grain wholesalers.

The smallholder Barley producers also have different market outlets for their produce. Depending on their proximity to the market and prevailing market and price conditions, they directly sell to rural consumers or to rural assemblers or to cooperative unions or to grain wholesalers. It is estimated that about 30% of farmers' produce is directly sold to consumers, 25% to assemblers, 20% to cooperative unions and 25% to grain wholesalers (MAFAP, 2013).

3.1.1.3. Assemblers

Assemblers are traders or farmer/part-time traders who collect grain from small rural markets. They play a crucial role, particularly in collecting and transporting grain from inaccessible or distant markets. Their number is not documented, but it is estimated that they handle about 78,000 metric tons of barley annually, which they sell to consumers directly (40%) or to grain wholesalers (60%). Sales decision by assemblers is influenced by the size of the local market demand and the overall Barley and cereal supply situation.

3.1.1.4. Grain Wholesalers

Grain wholesalers include the Ethiopian Grain Trade Enterprise (EGTE), private companies, and the regional grain merchants in both surplus and deficit areas. Together, these actors handle about 281,982 metric tons or 48.5% of the total barley supply to the domestic market. In some years, however, when the domestic supply of cereals decreases significantly, the Government imports substantial quantities and distributes it to food

processors and the public. Normally, however, the sources of the wholesalers' barley purchase are the smallholders (64%), rural assemblers (16%), cooperative unions (15%) and state and private commercial farms (5%). Although there are about 85 big grain trading companies and individuals (including EGTE), over the past 3 years their role in the purchase of barley from domestic sources has been insignificant. These large merchants have been the major suppliers of wheat, sorghum and maize to WFP and EU for their food security programs in Ethiopia. Currently the most active participants in the domestic barley market are the regional merchants who purchase barley from the surplus growing areas and distribute to deficit areas and major consumption centers directly or indirectly through their brokers (MFAP, 20013)

3.1.1.5. Processors

Barley is the most important crop that is utilized as an industrial input for food processors next to wheat.

3.1.1.6. Processed Food Wholesalers

Wholesalers of processed barley, especially breweries and spaghetti products, obtain their supplies from the multi-factory, flour mills and others; supply the same to retailers and bakeries. They mostly operate in large towns (MAFAP, 2013).

3.1.1.7. Retailers

Barley and barley product retailers include grain retailers and retailers of processed food such as flour, spaghetti and beer products. About 53% of the barley it is supplied to consumers in the form of beer and bakery; while the rest is distributed in the form of whole grain, which is then further processed by the consumers. Retailers include small shops, bakeries, kiosks, restaurants, cafes, and supermarkets.

3.1.2. Barley Value chain supporters

Value chain supporters include all chain-specific actors providing regular support services or representing the common interest of the VC operators. For example, public research and technology development, agreement on professional standards, promotional services, joint marketing or advocacy. Wheat value chain supporters refers to the types of services that support the functioning of the chain, including transportation, packing and handling, business services such as consulting and accounting, quality and process certification, financial support, etc.

A transportation infrastructure is particularly important for wheat due to the concentration of wheat production in the Amhara and Oromia regions, which means that strong distribution channels are necessary to transport wheat to deficit areas that may be hundreds of miles away from surplus production zones. The government controls the supply chain in urban areas through the Ethiopian Grain Enterprise (EGTE) distribution, but transportation in rural areas is decentralized. The Ethiopia Food Security Reserve Administration (EFSRA) for use in emergencies holds Sixty percent of grain stocks; the EGTE, a few mills, and a small amount of private storage hold the rest (USAID, 2011).

3.1.3. Barley Value chain influencers

Barley value chain influencers' refers to the public agencies and institutions constituting the business-enabling environment. Typically, the micro-level of a value chain is made up of national, regional and local government, the judicial system and major providers of public utilities (especially roads, water supply, and policies). They determine the general cost of doing business cutting across different value chains and sectors of the economy. In addition to the regional and federal government, the macro-level operators in case of Barley are MoARD and MoTI (FAO, 2011).

Value chain approach that brings together relevant stakeholders has been employed to address the problems of malt barley supply and production, using high quality seed and improved agronomic practices. To this effect, farmers were organized into local seed business cooperatives while grain producer farmers will be organized to supply adequate quality and quantity of malt grain to the factory (AMF). The Multi-stakeholders platform is organized to improve the malt barley value chain and the participant stakeholders are identified to deliver services such as supply of basic and pre-basic seed, technical support, establishment of proper organization, improving entrepreneurship quality, market orientation and provision of quality product and services.

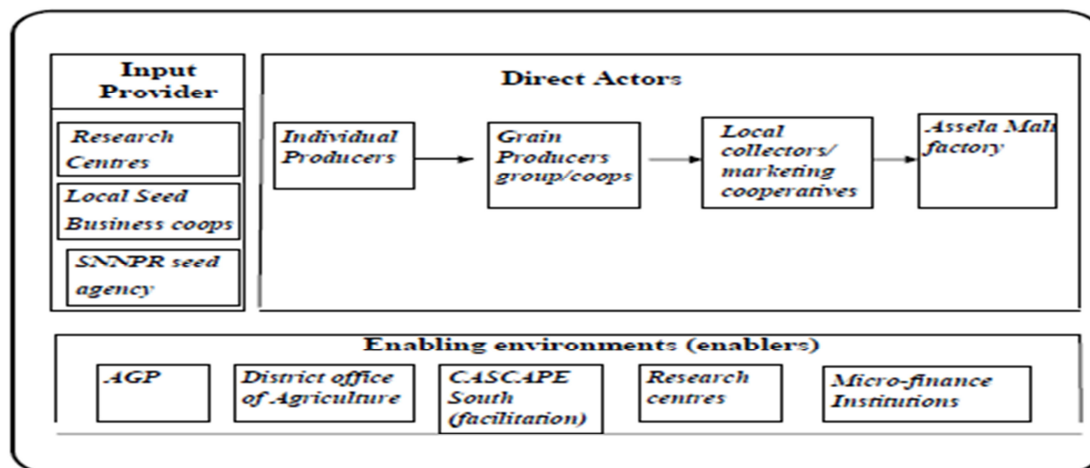


Figure 3: Malt barley value chain developed by CASCAPE South

Figure 5. Malt barley value chain developed by CASCAPE south

4. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

Barley is cultivated by small holders in every region of Ethiopia, since 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. Barley is a major staple food crop in the highlands of Ethiopia. The crop is used for preparing various types of traditional foods such as Kita, Kolo, Beso, Enjera, Giat, cuko (shakeka) and many others. Although the day to day survival is linked to barley, little focus has been given to improve the productivity of the crop in the dry land.

The market potential for malt barley is directly dependent on the market for beer; as such, its potential can best be assessed by looking at the evolving dynamics of Ethiopia's growing brewery sector. Much of Ethiopia's beer demand is currently being met by domestic brands. BGI Castel is the largest operator in the market, with production capacity of roughly 2 million hectoliters per year (out of a total market production of ~4 million hectoliters per year).

The major players in the barley value chain are the input suppliers, smallholders, state and commercial farms, rural assemblers, cooperative unions, grain wholesalers, flourmills, processed food wholesalers, grain retailers, bakeries and pastries, and retailers of processed food. Donors and NGOs also play some role in procuring barley locally for their relief and development activities.

4.2. Recommendation

By reviewing different material, the following policy measures will be recommended. The finding of different authors justifies that barley supply of the country could not meet the demands of the barley. To balance the demand and supply of barley the country have to be increase the productivity of the barley by using modern technology, high-yield varieties for specific location based on end user needs, with varieties to include characteristics such as resistance to drought and diseases.

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. Although, the farmers cooperatives could make producers better off in terms of gross income and producers share, they could not enjoy the returns because of limited working capital and business management skill. Accordingly, cooperative need to be capacitated via business management training and encouraged through long-term credit to compete with the dominant groups like wholesalers.

The malting company may need to convince local breweries that malt produced in Ethiopia can be competitive with internationally produced malt in terms of volume and quality. To meet this objective it is required to upgrade the broader value chain, and on the quality and quantity of the product they require involving breweries in the production end of the malt barley supply chain

Environmental factors such as droughts or excessive rains may adversely affect harvests and lead to insufficient raw malt barley to meet required production volumes. To mitigate these it need Government investments irrigation systems under the Growth and Transformation Plan (GTP), Weather and crop insurance purchased by the malting plant for the farmers, to be co-financed by cooperatives

5. REFERENCES

- Available at www.daff.gov.za, 2012: Statistics and Economic Analysis: Department of Agriculture, Forestry and Fisheries
- Barrett, C. B., 1996. Market analysis methods. *American Journal of Agricultural Economics*.78: 835-829.
- Bekele, Hundie, 2001. Factors Influencing Input Loan Repay Performance of Smallholders in Ethiopia: The case of Oromia and Amhara States, An M.Sc. Thesis Presented to the Alemaya University of Agriculture, Ethiopia. 120p.
- Berhane Lake, Hailu Gebre & Fekadu Alemayehu. 1996. Barley production and research. pp 1–8, in: Hailu Gebre and J. Van Leur (eds.). *Barley Research in Ethiopia: Past Work and Future Prospects. Proceedings of the first Barley Research Review Workshop, 16–19 October 1993. IAR/ICARDA, Addis Ababa, Ethiopia*
- CSA. January 2009. Large and Medium Scale Commercial Farms Sample Survey 2007/2008 (2000 E.C.). Results at Country and Regional Levels: Report on Area and Production of Crops, and Farm Management Practices. *Statistical Bulletin* 443. Addis Ababa: Central Statistical Agency.
- CSA. October 2008. Report on Area and Production of Belg Season Crops for Private Holdings. Ethiopian Agricultural Sample Survey (2007/08 (2000 E.C.)) Volume V. *Statistical Bulletin* 417. Addis Ababa: Central Statistical Agency. [various years and numbers]
- CSA. August 2008. Agricultural Sample Survey 2007/2008 (2000 E.C.): Volume III - Report on Farm Management Practices (Private Peasant Holdings, Meher Season). *Statistical Bulletin* 417. Addis Ababa: Central Statistical Agency.
- CSA. June 2008. Agricultural Sample Survey 2007/2008 (2000 E.C.): Volume I - Report on Area and Production Crops (Private Peasant Holdings, Meher Season). *Statistical Bulletin* 417. Addis Ababa: Central Statistical Agency.
- CSA. May 2007. Household Income, Consumption and Expenditure (HICE) Survey 2004/5: Volume I - Analytical Report. *Statistical Bulletin* 394, Addis Ababa: Central Statistical Agency.
- EEA/EEPRI (Ethiopian Economic Association. Ethiopian Economic Policy Research Institute). 2006. *Evaluation of the Ethiopian Agricultural Extension with Particular Emphasis on the Participatory Demonstration and Training Extension System (PADETES)*. Addis Ababa, Ethiopia.
- Casley D.J. and Kumar, K. 1988. The Collection, Analysis and Use of Monitoring and Evaluation Data. John Hopkins Press. Washington D.C.: World Bank.
- CSA (2010). Central Statistics Authority Report on Area and Production of Crops. *Statistical Bulletin of Agricultural Sample Survey, Volume IV, No. 446*, Addis Ababa, Ethiopia.
- Daniel Tadesse (2010). *Genetic Variation of Malt Barley Genotypes in their Yield and N- use Efficiency*. MSc Thesis, Bahir Dar University, Ethiopia.
- Eleni Gebremedhin, 2001. Market institutions, transaction costs, and social capital in the Ethiopian grain market. Research Report No, 124. International Food Policy Research Institute. USA. 93p.
- Emebiria L, Moodya D, Panozsoa JF, Readb J (2003). Mapping of QTL for malting quality attributes in barley based on a cross of parents with low grain protein.
- Kearle B. 1976. *Field Data Collection in the Social Sciences: Experiences in Africa and the Middle East*. Agricultural Development Council Inc. New York: NY.
- Murphy J., Casley D.J. and Curry J.J. 1991. *Farmers' Estimations as a Source of Production Data: Methodological Guidelines for Cereals in Africa*. Washington D.C.: World Bank.
- Poate C.D. and Casley D.J. 1985. *Estimating Crop Production in Development Projects, Methods and Their Limitations*. Washington D.C.: World Bank.
- Porter, M. *Competitive Advantage*. New York Free Press, 1985; pp.37-43
- Riely F. and Mock N. 1995. *Inventory of Food Security Impact Indicators. In: Food Security Indicators and Framework: A Handbook for Monitoring and Evaluation of Food Aid Programs*. USAID, Food Security and Nutrition Monitoring Project (IMPACT) Publication. Virginia: Arlington.
- Rozelle S. 1991. *Rural Household Data Collecting in Developing Countries: Designing Instruments and Methods for Collection Farm Production Data*. Cornell University, Working Papers in Agricultural Economics. 91-17. New York: Ithaca.
- Verma V., Marchant T. and Scott C. 1988. *Evaluation of Crop-Cut Methods and Farmer Reports for Estimating Crop Production: Results of a Methodological Study in Five African Countries*. London: Longacre Agricultural Centre Ltd. USAID, 2012: The Business Case for Investing in a Malting Plant in Ethiopia June 2012
- Tomek, W. G and Robinson, K. L (1981) *Agricultural Product Prices*. Ithaca, New York, Cornell University Press.
- Wolday Amha, Food grain Marketing Development in Ethiopia after the Market Reform 1990: A Case Study of Alaba Siraro District, Berlin, 1998.

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