



# Malt Barley Value Chain Analysis in Ethiopia: The Case of North Shewa Central Highland in Amhara Region Ethiopia

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## Abstract:

Ethiopia is the center diversity for barley production which is an important crop produced in the study areas for the purpose of home consumption and income generation purposes. Various value chain actors are involved in the production and marketing process of malt barley. The actors are governed from input supply up to final consumption through various value addition processes. Farmers have a basic role in the production and marketing of malt barley. The area allocation for malt barley production and volume of supply increased from time to time because of market demand improvement. Low investment in the production of malt barley contributed to low productivity and poor quality of the produces. Quality and quantity of supply are the most important challenges to satisfy the required demand. Price fluctuation in the market varied from the immediate harvest to the rainy seasons which influence the value chain process with inconsistent supply. Improving farmers' awareness is very important to reduce the production related challenges and to improve the volume of production to the market.

*Keywords: Analysis, Barley, Malt and Value chain*

## INTRODUCTION

In Ethiopia, smallholder commercialization and integration into the market has been one of the policy directions (Ali, 2018). Commercialization of the agricultural sector in Ethiopia is one of the biggest observed changes. Agricultural production in many developing countries is subsistence where products are used for consumption with few surpluses for market (World Bank, 2004). Many theoretical literature and practical works indicated that having an efficient domestic agricultural commodity marketing system plays a major role in accelerating the growth and development of the agriculture sector. Besides, it makes the market participants such as producers, traders, and consumers beneficiaries as per their role and efforts exerted in the system (Mohammed and Muhamed., 2015).

In developing countries, farmers face incomplete transition and inefficient suppliers of agricultural products. This inefficient and low supply of agricultural products creates the new driver of consumer demand, as mediated by the large scale downstream of buyers and retailers. There is an emergency phenomenon of market concentration, in the input supply industry, agro-processing, and in the retail, market segments while the agriculture market is fragmented. There is also the risk of supermarket chains progressively "crowding out" the informal agricultural markets that need to be acknowledged and mitigated (Christy, 2009).

Ethiopia is the second largest barley producer in Africa, next to Morocco, accounting for about 25 percent of the total barley production in the continent (FAO, 2014). Ethiopia is also recognized as a center of diversity, as its barley germplasms have global significance because of useful traits,

including disease resistance (Vavilov, 1951, Qualset, 1975, and Bonman *et al.*, 2005). Unlike in industrialized countries where barley is mainly used for animal feed and malting, it is one of the staple food crops in Ethiopia, which accounts for 6 percent (129.48 kg) of the per capita calorie consumption (Berhane *et al.*, 2011). It is also important in terms of the lives and livelihood of small-scale farmers.

There are two types of barley that farmers grow in Ethiopia which are food and malt barley. Most of the barley produced is used for food and it is the main ingredient for several staple dishes such as *injera*, porridge, roasted barley (*Kollo*) and bread. Food Barely is a cheaper cereal than teff and is often used as a substitute for lower-income families.

In North Shewa, barely is the main food security crop, especially in the highland areas which are highly affected by frost. North Shewa is one of the largest barley-growing areas in the Amhara region having increasing trends of barley area coverage. The national barely area covered 959,273.36 ha of land with a productivity of 2.11 tons per ha. The Amhara region is the second producer of barley covering 323,655.73 ha with a productivity of 1.9 t ha<sup>-1</sup> and production of 614,942 tons. From the Amhara region, North Shewa covered 65,380.84 ha and produce 145,145.47 tons with an average productivity of 2.22 tons per ha which is larger than the national and regional average (CSA, 2016).

The marketing of agricultural commodities differs according to the type of commodity, the system of production, the culture and traditions of producers and traders, and the level of development of the country and the respective sector within the country (Georgy, 1997). Therefore, studying agricultural marketing systems concerning the commodity calls for an understanding of the commodity's peculiar marketing system and to take some measures in a way that improves its efficiency.

A well-developed market for commercial crops like malt barley in developing countries like Ethiopia provides access to producers who depend on the market for their food supplies and to farmers, who need to shift from subsistence to market-oriented production (Lutez, 1994). The transformation of the production system for agricultural commodities requires the existence of an efficient marketing system that can transfer the produced agricultural commodities from the point of production to the required market with the least possible costs.

The domestic demand for malt barley is alarmingly increasing both in quantity and quality. This is due to the increase in the number of breweries (>9), the capacity expansion of existing breweries, and the new breweries also operating at their full capacity. The outcome of these brings an opportunity for the barley growers on the demand side and a huge expenditure of foreign exchange on the supply side.

Those potential crops predominantly shared a high rate of farmlands and production volume with the rural farmers that have not studied yet, the value chain, and the market governance of malt barley in the study areas. Based on these reasons and the suitable agroecology of the areas, farmers allocated their farmlands to produce malt barley. There are few malt barley value chain studies in Ethiopia but, not enough studies found in the North Shewa areas.

## METHODOLOGY

### Area Description

The study was conducted at Bassona woreda and Tamaber districts of the North Shewa Zone of the Amhara Region (Fig 1). The districts are located around 130 km and 190 km Northeast of Addis Ababa the capital city of Ethiopia. These districts are characterized as highlands with moist climate, cold temperatures with moderate rainfall distribution with semi-bimodal rainfall patterns, receiving an average annual rainfall of 929 mm. The area's average annual maximum and minimum temperatures were 21.4 and 9.0 °C, respectively. Light soils are the dominant soil type in the area (District Office of Agriculture unpublished and undated document). The crops widely grown in the study area include teff (in Tarimaber), barely, faba bean, wheat, and field pea, whereas chickpea and grass pea, grown in some pocket areas, and sorghum and others with low area coverage mostly grown in lowland kebeles (ibid). The altitudes of the districts are relatively similar and ranged from 2800 up to 3100 masl (ibid). Little irrigation is practiced in the lowland areas of the districts and is used for vegetable crops and barely production purposes.

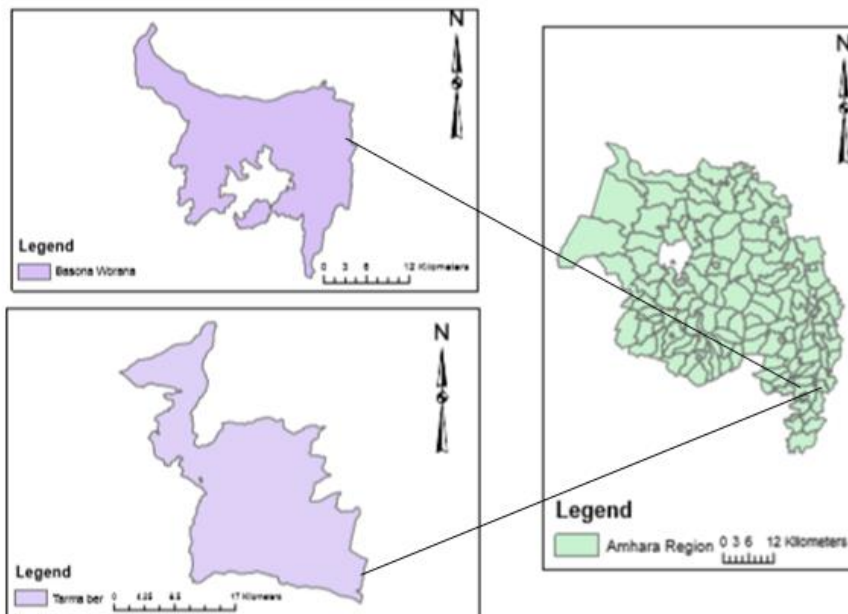


Figure 1: Maps of the study area.

### Data Collection and Sampling Procedure

The study areas were selected purposively in which the land allocated for barley production is in high proportion. Based on the production capacity and potential, primary data were collected from twelve selected kebeles on 550 randomly selected producer farmers. Based on the cross-sectional data of six potential kebeles, three kebeles from each district were selected systematically based on the level of production for the target commodity to conduct a value chain survey.

A workshop was organized by identifying 30 key informant farmers who have experience in the production of barley and represent all economic classes, ages wealth, gender, and other social classifications were selected. Moreover, other value chain actors like 12 small grain traders, processors, and retailers were selected with the help of districts agricultural experts and 12 extension workers from offices of agriculture and NGOs involved in the workshop.

### Data Analysis

Descriptive statistics were employed to describe the socioeconomic variables, as well as production and market transaction. Value chain mapping, actors and activity mapping matrix and market governance methods were used to identify the actors' involvement in crops value chains.

## RESULTS AND DISCUSSION

### Area Coverage of Malt Barley

Food barley, wheat, and faba bean had a large share of area coverage than malt barley due to high priority for human food and the straw for livestock feed. The average area of farmland covered by different crops and malt barley was 0.17 ha and 0.002ha, respectively (Table 1).

**Table 1: Average area coverage of crops (ha) per household in the study areas**

Area coverage	Mean	Std. Dev	Min	Max
All crops	1.05	1.92	0.25	4
Malt barley	0.002	0.01	0.01	0.125
Other crops	0.17	0.27	0.15	3.83

Source own survey data.

### Production and Productivity

#### **Area Coverage and Production:**

Currently, the area coverage and production with malt barley have increased resulting in farmers being convinced to grow it for cash-earning purposes (Table 2).

**Table 2: Area coverage and grain yield of malt barley by district 2016 production year**

Districts	Area in ha	Production (t)	Grain yield (t/ha)
Tarimaber	360	684	1.9
Bassona werana	906.7	1632.6	1.8

Availability of training, monitoring, technical support and feedback contributed to improving the productivity of malt barley. Farmers benefited from access to seeds of improved varieties, support of extension services, and improved management practices like the application of broad bed farrow (BBF) system, herbicides, and chemical fertilizer together with suitable environment and weather conditions contributed to increase malt barley production.

### Purpose of Production and Utilization

From the focus group and key informant interviews malt barley was produced for various purposes. Farmers use it for consumption and marketing purposes. Farmers confirmed that malt barley is produced mainly for market purposes to generate cash income (Table 3).

**Table 3: Purpose of production and utilization of target commodities in the study areas**

District	Product Distribution (%)	
	Home consumption	Market
Bassona werana	10	90
Tarimaber	10	90

### Production Costs

The costs of production of inputs along the different districts are relatively similar. The costs of production include seed costs, fertilizer costs, labor costs, and chemicals for disease and pest control (Table 4).

**Table 4: Average cost of production of malt barley**

Cost items	ETB per ha
Seed	1560
NPS	1340
UREA	600
Labor	3400
Chemicals	100
Baggage	190
Draft power	1800
Total cost/ha	8990

Source own survey data.

### Market Price of Malt Barley

The market prices varied depending on the production and supply trends. Malt barley has relatively low market price fluctuations. This is because malt barley has a well-organized value chain among the actors and the grain of malt barley is collected within a similar month from year to year. The high-price period for malt barley was between March to May and its low-price period was between December and February. The price difference in the high and low-price period is not significant.

### Farm-Level Cost-Benefit Analysis

Farmers in Tarimaber district generated higher benefits than their counterparts from malt barley production. This was due to the high productivity of malt barley in the district (Table 5).

**Table 5: Cost-benefit analysis of malt barley production**

Districts	Yield t/ha	Price Birr/t	Gross benefit Birr/ha	Net benefit Birr/ha
Tarimaber	1.9	13000	24700	17510
Bassonawerana	1.8	13000	23400	16210

The study found the major malt barley value chain actors participated in input supply, production, distribution, marketing and consumption. Figure 2 indicated the value chain activities, actors, and enablers. The activities included input supply, production, marketing such as collection, processing and distribution and consumption. The actors are farmers cooperatives, agro-dealers, individual farmers, assemblers, processors, retailers, and consumers. The enablers included input suppliers, technology, market, transport, infrastructures, and traders.

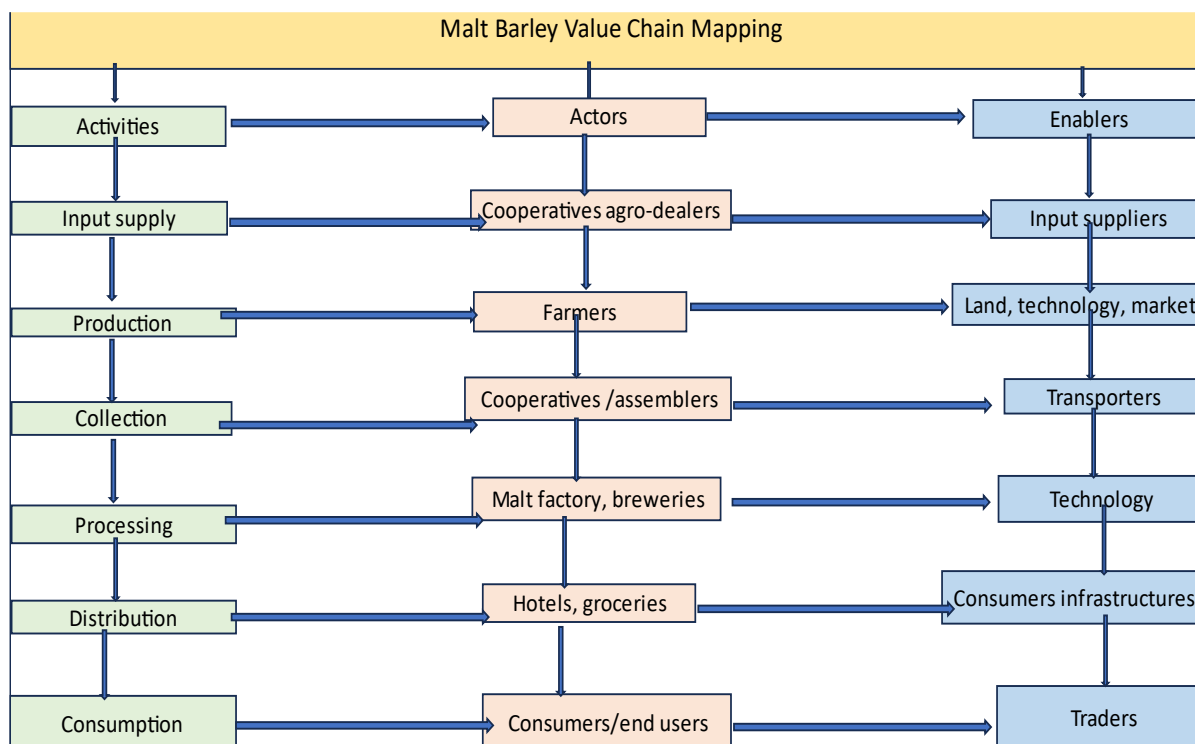


Figure 2: Malt barley value chain components

**Value Chain Actors’ Relationship in Malt Barley Production and Marketing Processes**

Different actors were involved in distinct functions in the value chain processes. Private sectors like individual farmers, famers’ cooperatives and unions, traders, processors, retailers, agro dealers and consumers involved in production, value addition, transportation, input supply, product distribution and consumption of the commodities. The public sectors of extension workers, seed enterprises, research institutes, agricultural transformation agency and offices of agriculture are involved in seed supply, training and facilitation roles in the value chain. NGOs are also involved in both input supply and facilitation activities in some interesting areas (Table 6).

Table 1: Activities and actors analysis matrix

Actors	Activities	Limitations	Existing challenges
Farmers	Production of crops	Low quality and productivity	Disease and pest in faba bean, grass weeds in barley
Cooperatives and unions	Input supply, marketing on faba bean and malt barley	Low capacity to finance and no involvement in food barley marketing activities	Low attention to marketing intervention
Traders	Marketing, input supply and transportation	Dis organized	Adulteration, not trust by farmers, low price
processors	Marketing, malting of malt barley, roasting of barley and faba bean, splinting of faba bean	Low attention for production improvement	Not interested to involve in partnership linkages except malt factory
Consumers	Consumption of the produce	Needs direct market from the producers	Low interest to value added produce
Seed enterprise	Seed supply and seed marketing	Only malt barley	Low attention for other crops

Extension workers	Facilitation, awareness of farmers	Low capacity, many task burdens	Low attention for market linkages
Research institutes (DBARC, ICARDA)	Capacity building, input supply, facilitation, technical support	Limited area visits, low exposures,	Dis organized interventions
NGOs (SUNARMA, Adhino, CCF)	Input supply, market linkages, technical support	Limited area coverage, specific interest	Dis organized from other actors
GOs (ATA, AGP)	Facilitation, technical support and input supply	Limited intervention	Dis organized

### Major Malt Barley Value Chain Actors and Market Shares

Different actors played different roles in the marketing and processing of malt barley into different products. Producer farmers transferred the malt barley produce to market for the purposes of grain processing and consumption and seed purposes. Urban and rural households consumed the larger (59%) share of malt barley grain in various forms through different market channels of traders, local processors, and direct marketing from producers to consumers. The main value chain actors in the malt barley sector included farmers’ cooperative, retailers, local processors, industries, local traders, consumers, and seed sectors. From the total malt barley produced by farmers 30% of the grain was transferred to the brewery sector through farmers’ cooperatives. Local processors shared the largest portion of the malt barley produced by the farmers. The local processors used the malt barley to produce roasted barley locally known as “Kolo”, flour for soup, porridge, and local drinks (Fig 3).

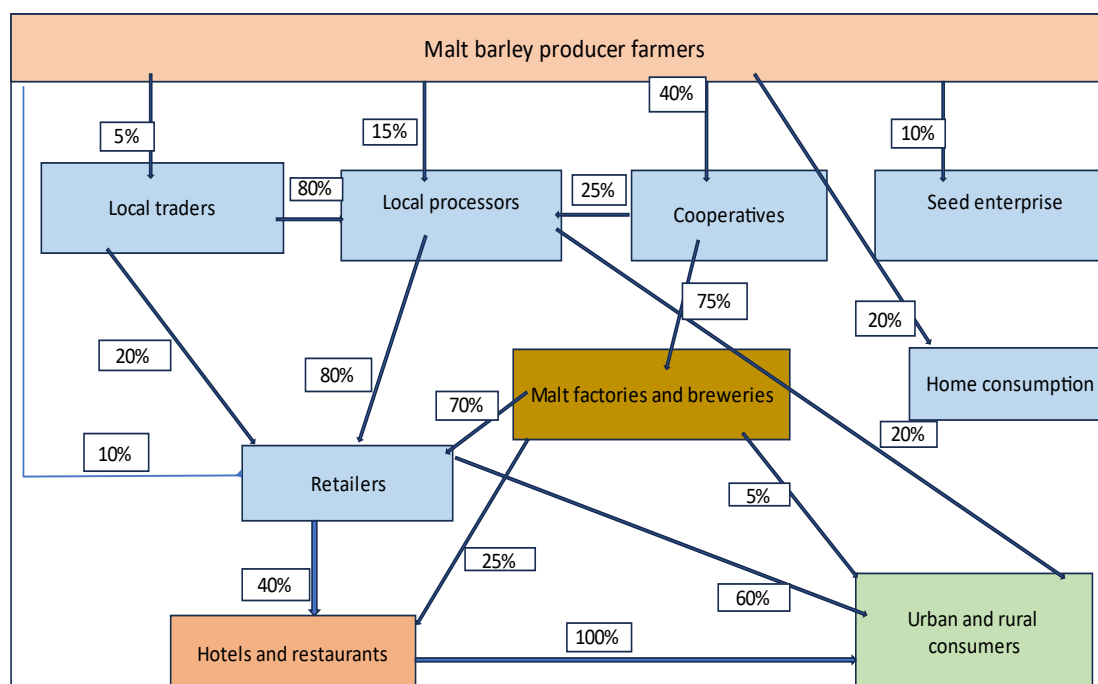


Figure 3: Malt barley value chain actors and market governance

Source: own survey data

### The Yield Gap Sources

About 75% of the areas were applied fertilizers with low rate of application. Most malt barley growers were not interested in applying row planting. There is high grass weed infestation affecting the production and productivity of malt barley. Only broad leaf weeds were managed with the help of herbicide chemicals and low hand weeding practices.

### **Perceptions of the Farmers:**

Over the past 5 years production and productivity status of the target commodities indicated that continuous changes in area coverage, production and productivity of the target commodities. Farmland is shifted from faba bean and wheat to malt barley production then area coverage of malt barley becomes increased. In addition, the volume of product, supply and market prices for malt barley is improved. This further motivated the farmers to produce more. Actors of malt barley interested to strengthen their linkages. Producers' capacity improved through training & experience sharing in the value chain.

### **Challenges in the Value Chain:**

Farmers face some challenges that hinder to improve the quality and quantity of the produce. From both the FGD and household survey a very common set of constraints span the production, aggregation, trading, and demand sinks in malt barley value chain. Various actors faced distinct challenges especially the low supply of malt barley produce to facilitate the value additions and smoothen the production and consumption process.

*Production-related challenge:* Productivity is below the potential due to low input usage, especially chemical fertilizers. There are also poor agronomic practices affecting productivity in a poor state of applying appropriate seed and fertilizer rate, time of planting (early), poor weed managements, and lack of proper drainage practices for excess water from the field.

*Aggregation and trading:* Weak linkages among the value chain actors. The limited involvement of farmers' cooperatives in marketing in the value chain contributed to the difficulties. High proportions of the produce do not reach the brewery industries and allocated for home consumption by the producer farmers and local processors.

## **CONCLUSION AND RECOMMENDATIONS**

Malt barley is the major cash crop grown in the study area and expanding the share of farmlands. Low productivity resulted from low agricultural investment and improper agronomic practices for drainage and weed management practices. The quality of the product was lower to use for local processors particularly for roasted barley (Kollo). A great proportion of malt barley was allocated for home consumption of rural and urban households due to high price paid by the consumers. The volume of production and supply of malt barley improved compared to the previous five years resulted from extension support and seed supply. Increasing the investment for inputs for malt barley production will improve productivity. The need for enhanced partnership linkages between value chain actors will smoothen the value chain processes of malt barley. Providing sustainable and adequate market access and information to the farmers is important to improve the farmers' awareness. Strengthening the linkage of farmers and other value chain actors will contribute full fill actors' interest of benefit maximization. Introducing high yielding and quality malt barley varieties is important for production and productivity improvement.

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