

ETHIOPIA MALT BARLEY SECTOR EVIDENCE BASED ASSESMENT AND RECOMMENDATION

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Acronyms and Abbreviations

ATI	Agricultural Transformation Institute
CBO	Cooperative Bank of Oromia
CF	Contract Farming
CREATE	Community Revenue Enhancement through Agricultural Technology Extension
CSA	Central Statistical Authority
EFDA	Ethiopian Food and Drug Administration
EIAR	Ethiopian Institute of Agricultural Research
ERCA	Ethiopia Revenue and Customs Authority
ETB	Ethiopian Birr
EUCORD	European Cooperative for Rural Development
FAO	Food and Agricultural Organization of the United Nation
FAO STAT	FAO Statistics
FCU	Farmers' Cooperative Union
GDP	Growth Domestic Production
GERD	Great Ethiopian Renaissance Dam
GIS	Geographical Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Ha	Hactare
HI	Hecto Liter
HUNDEE	Oromo Grassroots Organization
ICARDA	International Center for Agriculture Research in the Dry Areas
ICCO	Interchurch Organization for Development Cooperation
IFC	International Finance Corporation
IFDC	International Fertilizer Development Center
MFI	Micro Finance Institution
MOA	Ministry of Agriculture
OIAR	Oromia Institute of Agricultural Research
ONRS	Oromia National Regional State
OSSCCO	Oromia Credit and Saving Share Company
PCC	Producers Commercialization Cluster
PCU	Primary Cooperative Union
QSAE	Quality Standard Authority of Ethiopia
SHA	Self Help Africa
SNNPRS	Southern Nations Nationalities and Peoples Regional State
SNV	Netherland Development Organization
Tn	Tn
\$	US Dollar
WB	World Bank

Executive Summary

Ethiopia is one of the leading producers of malt barley in Africa. Our GIS suitability mapping reveals that over 15 million ha of land is suitable for barley production compared to the current actual coverage of less than 1 million ha of land. The current annual industry demand for malt barley is estimated to be 230,000 Tn. Our projections reveal that annual demand can go beyond 1 million Tn by 2033.

Companies engaged in the sector currently are working with over 180,000 smallholder farmers through contract farming. The sector has created over 137,000 full-time jobs in aggregation, transport, processing, marketing and distribution stages. An expert analysis indicated that the sector, malting and brewing, contributed over 30 billion ETB in tax revenue in 2023. By sourcing barley locally, the country saved over 1.01 billion \$ in import substitution. Discussion with key government officials at different levels indicated that malt barley-based contract farming and the associated packages have brought a meaningful impact on rural household income (up to 150% marginal income increase). Indirectly the knowledge and skills inherited by farmers have enabled them to utilize other crops and farming activities.

The current annual demand for malt barley seed is estimated to be over 20,000 Tn; of this roughly 50% is served with certified improved seed while the remaining is farmer saved seed. Our forecast for the next ten years indicated that seed demand could surpass 66,000 Tn in 2033. The seed sector is mired with a number of issues such as inadequate legal enforcement framework of breeders' rights, over-reliance on imported varieties, lack of locally released varieties that suits the purpose of all parties, absence of sound co-breeding initiatives and dominance of

government enterprises and farmer organizations in the production, processing and distribution. Unlike the seed sector, private importers and agro-dealers play a crucial role in the agro-chemical sector. According to some unpublished sources, Ethiopia imported \$171 million worth of pesticides, herbicides, and fungicides in 2023, mainly from China, France, India, Kenya, and Germany. Over the last four years, imports of agro-chemicals have increased by over 125%. The price has both local, forex shortage and ETB devaluation, and international factors, freight price increase and Russia-Ukraine war. During the same period the average farm gate price of agro-chemicals has gone up by 113%. Several issues have been identified within the sector; (1) quality and affordability (2) difficult registration procedure (3) shortage and difficulty of getting forex to import and bureaucracy (4) limited knowledge and (5) lack of locally released varieties satisfying the malting industry and awareness of farmers on safe use of pesticides.

Fertilizer is an important input for malt barley growers. Our crop-soil analyses indicated that malt barley requires optimal (1) Nitrogen (2) Potassium (3) Phosphorus (4) Boron (5) Magnesium (6) Sulfur (7) Zinc. Farmers currently use imported fertilizers namely NPS-B and UREA. The absence of comprehensive soil fertility strategy and extension package, no/limited use of rapid soil testing technologies, legal framework for locally made organic and bio-fertilizers, dominance of the sector by state enterprises and cooperatives and operational issues such as inappropriate dosage and product assortment are noted key problems.

Finance, extension service and mechanization are another critical component within the malting sector. Currently extension service to farmers is provided by the government, companies and project agents. The private sector/projects often play the role of

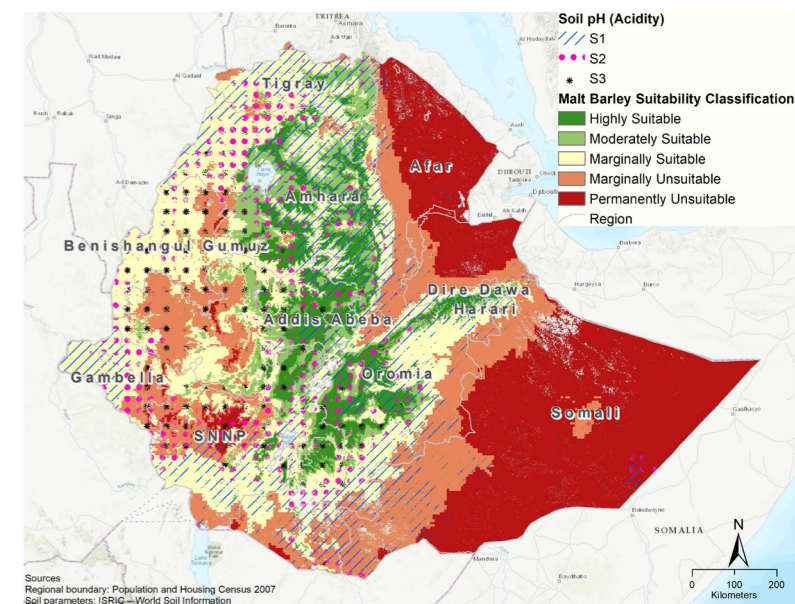
backstopping and capacitating the government extension workers. The major malting and brewing companies offer full extension packages that include support and advisories going through site selection, land preparation, input application, Crop Protection Products (CPP) application, harvesting, transportation, storage and post-harvest handling. Though there are promising initiatives, the use of digital extension service is limited. Access to mechanization technology is another challenge barley producing farmers are facing. Making farm machineries affordable and accessible by farmers has significant impact in addressing farmers' mechanization related challenges. Introducing different ICT and financial solutions into this space will also unlock challenges related to demand - supply linkage and service affordability. Access to financial services for extension, input and output is vital for successful operation of the malt barley value chain. Currently the companies are taking the burden of financing most of the extension and output components.

Looking at the total annual purchase, the malting and brewing companies absorb about 45% of the malt barley produced. From the remaining produce, commercial food and drink sector absorbs 22.5% while rural and urban households consume 27.5% and the remaining 5% is used as seed. Malting and brewing companies' source 80% of their barley through contract farming. There are two pricing structures in the malt barley sector-floor and market price. The floor price is set up by a committee to establish the bottom farm gate price. It is determined by accounting a set of factors such as (1) cost of production (2) yield (3) last year's price (4) import price. On the other hand, market price is mainly determined by supply and demand factors that account for quality. The absence of well-established production data, high inter and intra industry competition and regulated floor price

are some of the major problems in relation to value chain and pricing.

Ethiopia does not have a legal framework to govern contract farming. However, a new contract farming proclamation is in the process of ratification by the parliament. Currently companies arrange their contract farming through intermediaries/interfaces. There are five types of interfaces: model farmers, primary cooperatives, unions, traders and Micro Finance Institutions' (MFIs) credit groups.

In order to address some of the issues identified throughout this study, recommendations related to policy and strategy are highlighted. Among others the study proposed (1) expanding production to new-agro-ecology frontiers (2) liberalizing the seed and other input sector (3) easing the registration procedures for agro-chemicals, (4) allocating forex for import (5) strategic push for contract and warehouse financing structures (6) developing strategies and extension packages for sustainable soil and land management (7) deregulating floor price (8) establishing national malt barley statistics (9) harmonized and coordinated extension and (8) incentivize the malt and brewing industries that are investing in the value chain development.



1 BARLEY PRODUCTION

1.1 Ethiopia Position

As per the data from FAOSTAT 2021, Ethiopia is the 2nd largest producer of barley in Africa and the 17th largest producer in the world. The country is believed to be the origin and center of diversity (has a greater amount of germplasm) for barley with 2,500 accessions reported. According to CSA (2021/22), over near 0.8 million ha of land was covered by barley resulting in the production of over 2 million Tn. Smallholder farmers account for more than 96% of barley production, while the remaining 4% are cropped by State farms and private commercial farmers. In 2021/22, there were nearly 4 million smallholder farmers across the highlands of Ethiopia engaged in the production of barley. The national average barley plot per household is less than 0.25 ha. Farmers grow barley for food, feed, and cash crop for the emerging malting and brewing industries. The crop is used to make several meals and local drinks including prestigious cultural meals. Its by-products are crucial for livestock feed, housing, firewood, and making mattresses in rural areas. Barley is becoming a prominent cash crop with the growing beer and beverage industry in the highlands of Ethiopia. This is highly valuable for highland farmers where cold temperature limits the range of cash crops that can be grown (Birehan et'al 2015).

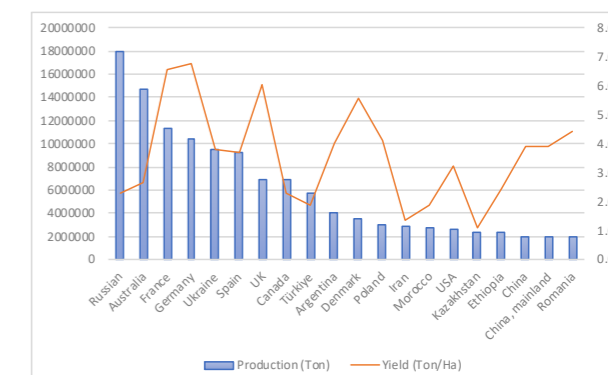


Figure 1.1 Global Overview of Barley Production (FAOSTAT 2021)

1.2 Barley Production Trends in Ethiopia

Despite some fluctuations over the years, barley production has increased by over 160% from 1 million Tn in 2001 to 2.6 million Tn in 2023. The crop covers about 8% (0.9 million ha) of the total cultivated land with grain and 10% of the area covered by cereals. Over the last five years, total area coverage for barley has shown a decrease of 25% on average as opposed to a production increase of 25%. Even though there is no clear justification for the decline in spite of all the efforts and picking up of malt barley market, experts indicated that the decline is in less potential malt barley areas where farmers are shifted to wheat production due to the supports and push from government. of course, in high potential areas like Arsi and West Arsi, the land allocated for malt barley and the yield has increased over years due to the intensive intervention by breweries like Heineken and malting companies.

The current production and coverage seem to be far less than the potential. Several studies indicate that the country can easily double or triple production. Our GIS mapping adjusted to settlements, water bodies, and forest coverages found a highly suitable area of 7 million ha and a moderately suitable area of 8 million ha. A similar study by Nigussie et' al (2019) supports this hypothesis (seed section under malt barley). Production is currently concentrated in the highland areas of mostly 2100 m asl elevations and above. However, barley production can be scaled-up to mid or lower- altitude areas with appropriate varieties.

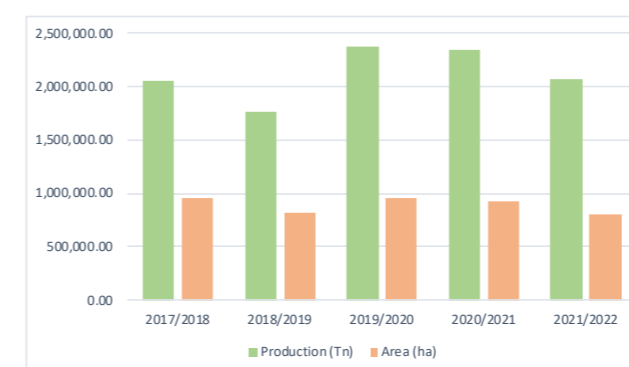


Figure 1.2 Five years barley production trends (CSA)

1.3 Barley Productivity in Ethiopia

Over the last ten years, barley yield per hectare has shown over 68% growth. The growth in yield per hectare was driven by significant investment in breeding and extension programs primarily targeting the malting industry and increasing market demand for barley making it competitive against alternative crops such as wheat. Despite the profound growth over the last decade, Ethiopia's barley yield per hectare falls short of the major producers. The FAOSTAT data shows that the national average yield per ha in 2020 was 2.52 Tn: the lowest among the top 20 global producers. Several reasons can be highlighted behind the relatively low yield per hectare of barley in Ethiopia, but the most important constraints are limited availability of improved seed, inadequate soil fertility and plant nutrition (high soil acidity), limited availability of quality agrochemicals, wide occurrences of different biotic stress (like weeds, disease and insect etc.), lack of appropriate extension services, and high harvesting and post-harvest losses.

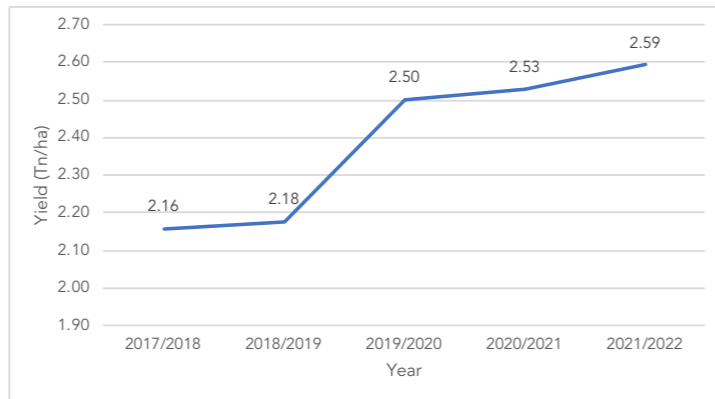


Figure 1.3 National Barley productivity trend (Tn/ha) (CSA)

1.4 Malt Barley Production in Ethiopia

Malt barley production in Ethiopia was started in the 1980s following the establishment of Assela Malt Factory. Until the early 2000's production was limited within the Arsi -Bale/South-Eastern highlands. Over the last two decades, production expanded to central and northern highlands with new investments from the brewing and malting industry. Data on annual production and trend for malt barley production is hard to retrieve as the CSA report does not differentiate between malt and food barley.

Some researchers and experts estimate the total volume of malt barley to be 15-20% of the national barley production; implying higher production as compared to the data above. However, the same industry experts indicated that less or about 50% of the malt barley (225 – 250,000 Tn) is coming to the maltsters and breweries, and the other is believed to be either consumed by farmers or sold to other channels (see value chain section).

On the other hand, our estimates based on current purchasing trends of maltsters and breweries reveal that the overall demand for malt barley including local and import is estimated to be 243,000 Tn for the year 2023. The table below provides estimated malt barley production based on the three-background information stated above. Accordingly, one can estimate the total malt barley production in the country to be 450,000-500,000 Tn per year.

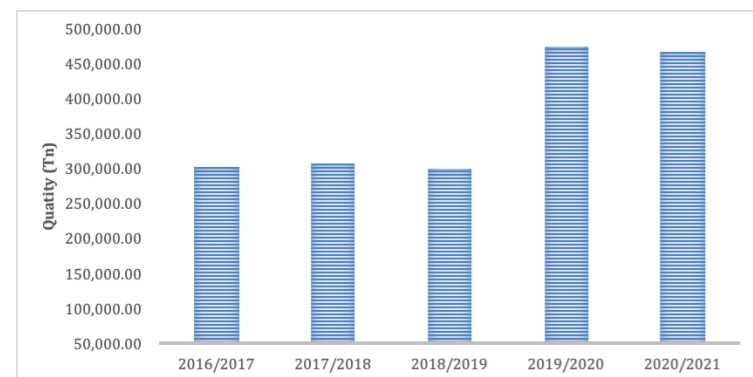


Figure 1.4 Five-year malt production trend estimation (Tn) (CSA, 2016-2021)

1.5 Malt Barley Production Areas in Ethiopia

Currently, production is concentrated in the southeastern highlands and a few areas in the central highlands. The high concentration of production in those areas mainly has to do with proximity to the malting factories where Assela Malt factory was the sole maltster in the country for over three decades. In recent years, production has expanded to central highlands, northwestern highlands, and northern highlands due to the entry of multinational companies (malting and brewing) and their subsequent investment in access to improved seed, extension services, and market access. Though there is no formal data showing malt barley production by region, our team of experts has identified the following top ten malt barley producing zones with corresponding estimated volumes.

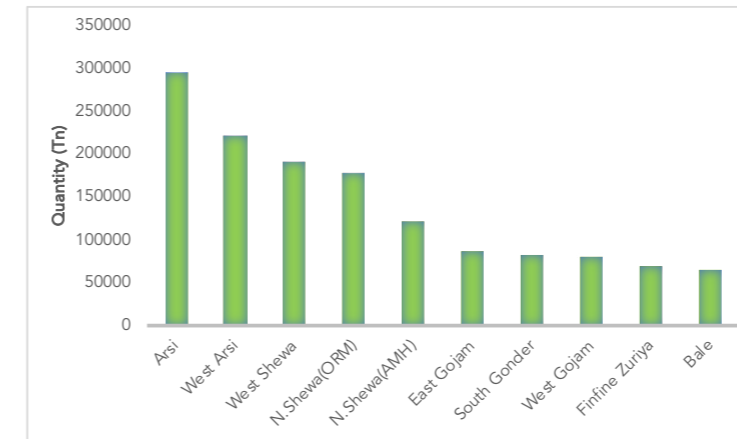


Figure 1.5 Malt barley production estimation for the top producing zones (CSA 2022)

An overview of a GIS map based on sets of parameters that includes (1) altitude (2) temperature (3) rainfall (4) soil pH (5) soil texture reveal that over 15 million ha of land is suitable for growing malt barley. It is to be noted that this suitability mapping is based on the existing available varieties stocks that are meant for highland areas.

Though malt barley production is currently popular in the highland areas, the crop can thrive in wider agro-ecologies. Experiences from other countries such as Egypt indicate possibilities of production in the lowland areas with the appropriate varieties. Studies reveal that varieties such as Marnie, Scarlett, and Fortuna can thrive well in the lowlands with irrigation plans. (Muzammil S. et al 2018, Arifuzzaman M et al 2016) This in combination with the recent national strategy of the lowland wheat program by Ethiopia implies that malt barley production in those areas could be an alternative opportunity.

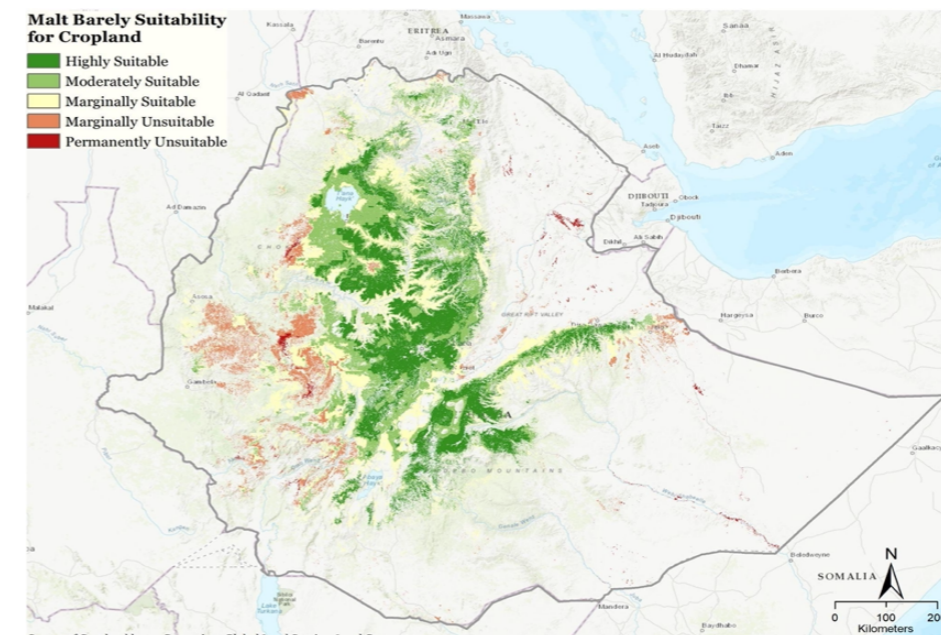


Figure 1.6 Malt barley suitability for crop land

1.6 Production System and Practice

Malt barley production in Ethiopia is dominated by smallholder farmers which account for over 96% of the total coverage. According to CSA, the average land holding of smallholder farmers is 0.76 ha. Our previous studies in 15 weredas across Oromia and SNNPR indicated that growers allocate about 25% for malt barley. Currently, the production of barley by commercial farmers is limited to a few pocket areas in Bale and Arsi. However, with possible development of varieties suitable for low land areas, one can anticipate an increased involvement of commercial farmers because of the availability of wide unoccupied land and opportunity for irrigation within the low land areas.

In most cases, farmers grow malt barley in rotation with other crops such as wheat, potato, canola, and pulses. A study conducted on seven zones below showed that the majority of farmers follow barley-wheat as the most prominent rotation practice. However, in the central highlands' rotation with pulses (faba beans, oil crops, and potato) is reported by a sizable number of farmers. Notable serial mono-cropping is reported in Bale, Gurage, and North Shewa zones. One can note the absence of profitable rotational alternatives, mechanization, lack of reliable market and lack of awareness as the main reasons for serial mono-cropping practices.

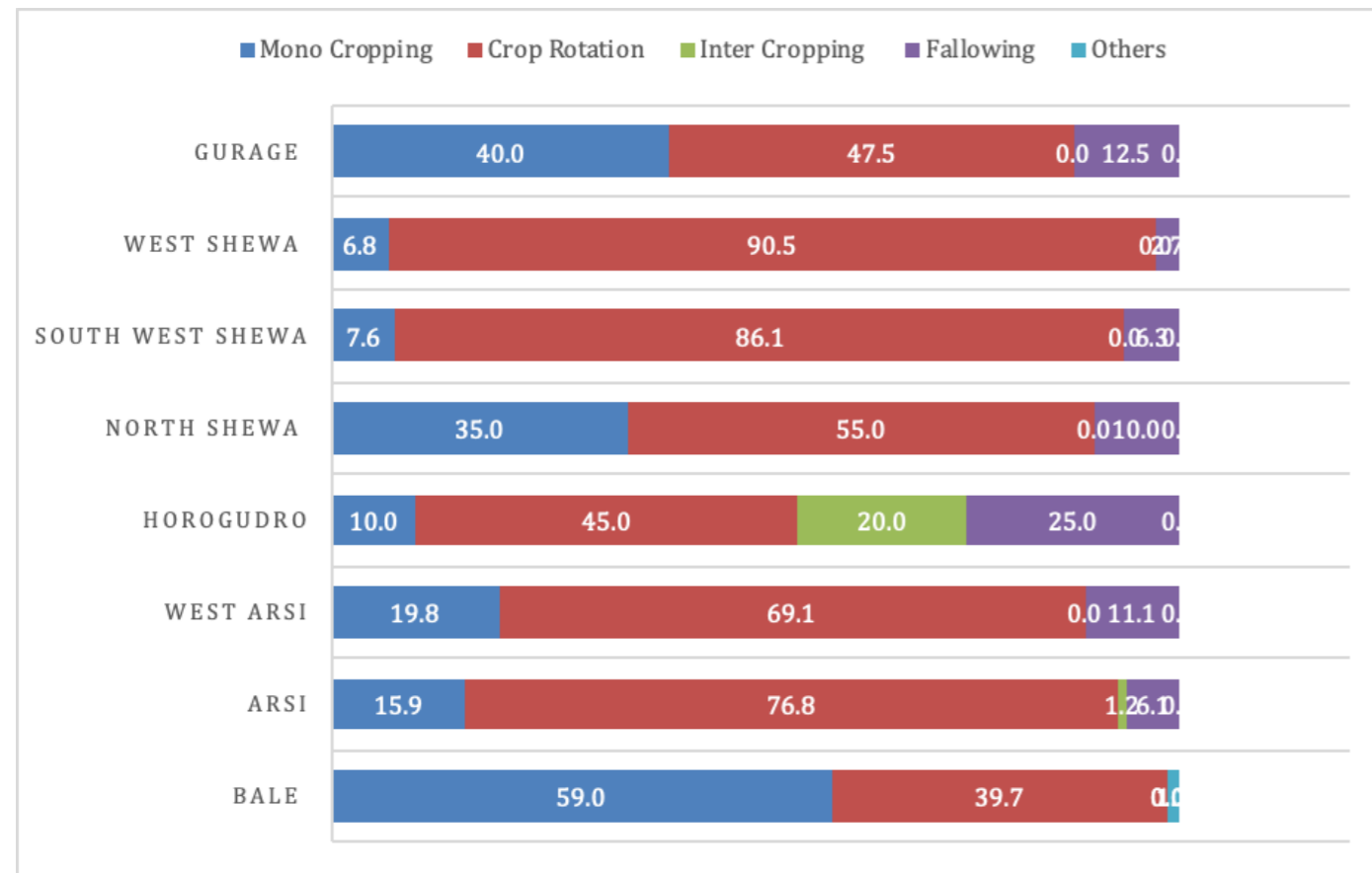


Figure 1.7 Crop rotation practices of selected zones (SYS Field Data, 2022)

1.7 Productivity of Malt Barley in Ethiopia

There are no separate data on yield per ha for malt barley, information gathered from the field indicated that the average yield is less than 2.5 Tn/ha. Significant variations are reported across weredas in different zones; the traditional malt barley growing areas of Southeastern highlands show the highest yield per ha. Information from CREATE project experts indicated that some model farmers managed to produce 7.2 Tn/ha in Bokoji areas while farmers who adopted the full input and extension package managed to get 5 Tn/ha. Data gathered from research institutes and major producing countries reveal that malt barley productivity can reach up to 6 Tn/ha. The graph below summarizes the potential yield per hectare and estimated production for the major producing zones based on current production vs potential production. By bringing productivity to the potential level, Ethiopia can increase its stock of production to 5.75 million Tn.

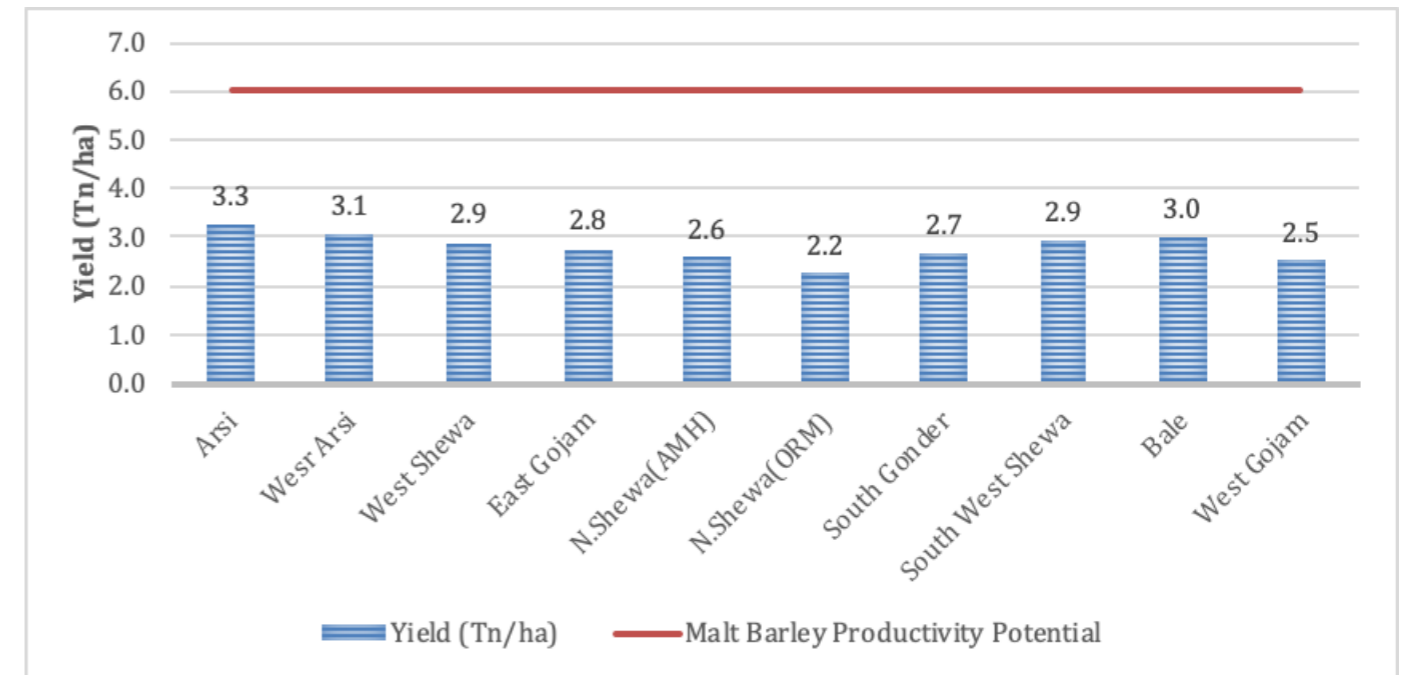


Figure 1.8 Actual vs potential productivity for key producing zones

Shortage of improved seed, quality extension service, and other inputs such as agrochemicals and mechanization equipment are mentioned by farmers as key constraints inhibiting productivity improvement. At a bigger level, one can also argue the absence of a harmonized yield enhancement strategy substantiated with appropriate resources is a key major barrier.

2 MALTING & BREWING SECTOR

2.1 Malting Factories

There are four major malting factories in Ethiopia: Soufflet Malting Ethiopia, Boortmalt Ethiopia, Assela Malt Factory and Gonder Malt Factory. The four malting companies have a combined annual capacity of 172,000 Tn. Over the last five years, the national malting capacity has increased from 52,000 Tn to 172,000 Tn per year. The major jump came with the entry of Soufflet and Boortmalt; which brought an additional 70% malting capacity. Experts indicate that the capacity utilization of the malting industry is over 85%. Based on an estimation of 1.3 Tn of barley gives 1 Tn of malt, the aggregate annual demand for malt barley by the maltsters is estimated to be close to 230 thousand Tn of barley per year. Some brewing companies often use raw barley of up to 15%; bringing the total demand for malt barley by the malting and brewing sector to over 265 thousand Tn per year. Recently some breweries are piloting to use maize grits as an adjunct and there is a tendency to increase the use of maize in the coming years due to (1) price competitiveness, (2) wider availability/access (3) easy during brewing as compared to using raw barley and (4) availability of maize processing companies. It is to be noted that both Soufflet and Boortmalt have planned to double their capacities within 2-3 years i.e., the total demand by then will become close to 400 thousand Tn.

Company	Malting Capacity (Tn)	Major Sourcing Area
Soufflet Malting Ethiopia	78,000	Oromia (Arsi, West Arsi, Bale and Shewa zones)
Boortmalt Ethiopia	78,000	Oromia (Arsi, West Arsi, Bale and Shewa zones) and Amhara (North Shewa Zone)
Assela Malt Factory	46,800	Oromia (Arsi, West Arsi, Bale and Shewa zones)
Gonder Malt Factory	20,800	Oromia (Arsi, West Arsi, Bale and Shewa zones) and Amhara (South Gonder and North Shewa Zone)

Table 2.1 Malting factories overview

2.2 Malt Barley Supply

Currently, demand for malt barley is met from local and imported sources. Local sources account for over 95% of the demand until end of 2023. Some breweries are importing small volumes of specialty malts like roasted malt, caramel, wheat malt and crystal malts. Local sourcing of malt barley comes from open-sourcing and contract farming. The latter account for about 80% of the barley supply. As can be seen in the graph below, the import of malt barley has shown a radical decline from 123,000 Tn in 2018 to 27,000 Tn in 2021; partly due to an increasing shortage of forex access but importantly due to significant investment in the local supply chain by the different maltsters and brewers and excise tax regulation since 2019.

From data below, before excise tax consideration, local barley/adjunct and malt are 22% and 25% expensive than imported barley/adjunct and malt respectively and does not make business sense to use local materials. However, after considering excise tax deductions, local barley/adjunct and malt are 10% and 2% cheaper than imported barley/adjunct and malt respectively. Moreover, this is also influenced by the devaluation of the local currency as compared to foreign currencies.

Companies indicated that even before the excise tax proclamation, despite the relatively cheaper malt barley prices from international suppliers, companies rarely consider imported barley partly due to increasing freight charges and importantly due to challenges related to access to forex.

Description	Imported		Domestic	
	Adjunct (ETB/MT)	Malt (ETB/MT)	Adjunct (ETB/MT)	Malt (ETB/MT)
Raw Barley Landed Cost	61,799	61,799	55,885	55,885
Conversion Factor	1.00	1.23	1.15	1.33
Packaging and Service Cost	-	16,178	9,257	36,178
EXW Price	61,799	92,191	73,525	110,505
Transport to the Brewery of Ocean Freight for Barley	902	902	793	341
Fumigation	-	-	767	-
Sell of Waste (Waste from 1MT)	-	-	400	-
Other	-	-	1,250	850
Landed Cost	62,702	93,094	76,735	111,696
Executive Duties Benefit	-	-	20,037	20,037
DDP Price with Excise Duties Rebate	62,702	93,094	56,698	91,659
Extract Yield - %	65%	78%	65%	78%
Landed Costs Before Excise Duties Rebate	96,464	119,351	118,054	143,200
DDP Price with Excise Duties Rebate	96,464	119,351	87,228	117,512

Table 2.2 Barley cost comparison - import vs local

Four important factors are mentioned as key reasons for the low competitiveness of the local supply in the global market (1) relatively low yield per hectare (2) fragmented production system that drives cost (3) high cost of factors of production-chemicals, fertilizer, and seed (4) market irregularity and (5) relatively poor quality and less conversion factors as indicated above.

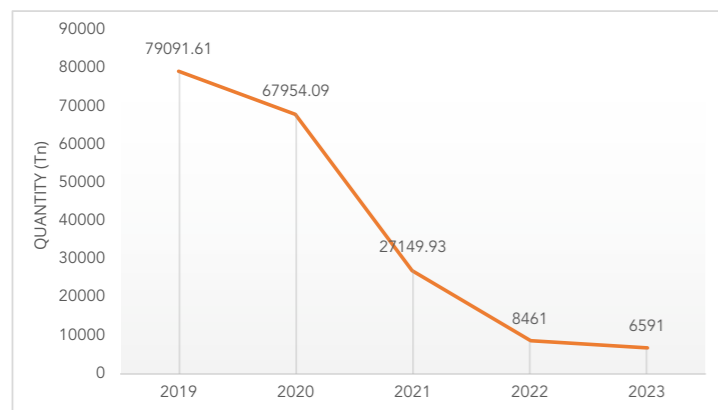


Fig 2.3 Malt and malt barley import trend

2.3 Malt Barley Projected Demand

Despite recent slowdown in growth, evidence indicates that the beer market in Ethiopia still has a profound growth prospect. The current per capita beer consumption of 12 liters per person per year is one of the lowest in Africa. Historical industrial data showed that there has been a solid increase in beer volume for the last seven years except for a decline in 2019 and 2020. The reasons for the decline are COVID-19, the promotion ban on alcoholic products, political instability, and the implementation of excise tax proclamations. Experts predict that the Ethiopian beer and non-alcoholic beverage market is expected to grow by 15% over the next ten years.

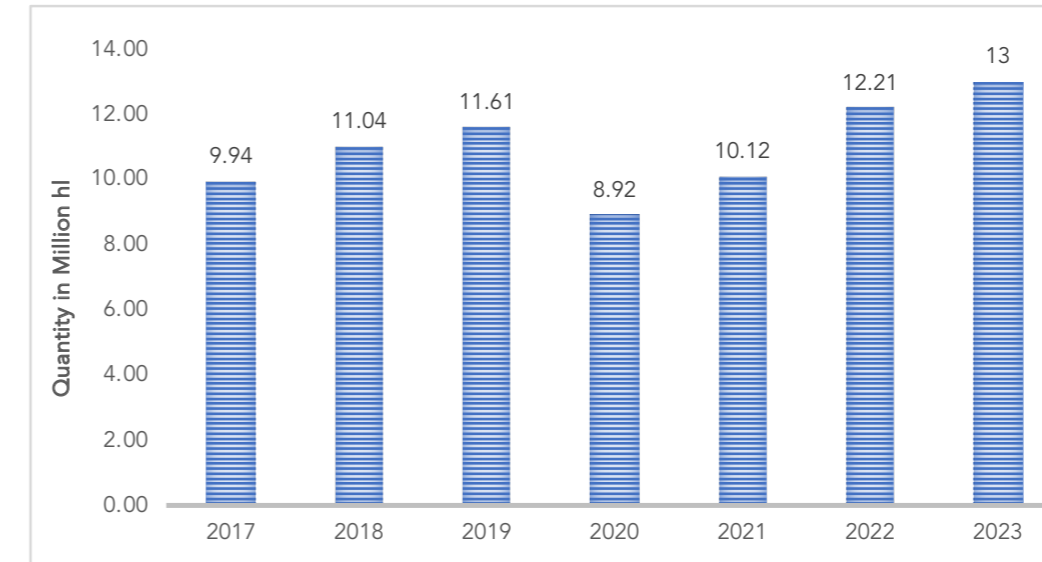


Figure 2.1 Seven-year beer production trend

The chart below provides the current and forecasted demand for malt barley accounting for the domestic market only. As one of the leading producers of barley in Africa, Ethiopia also has the potential to export to the regional market; notably to Kenya and South Sudan. Annual malt barley demand increases from 254 thousand Tn in 2023 to 524 thousand Tn in 2033.

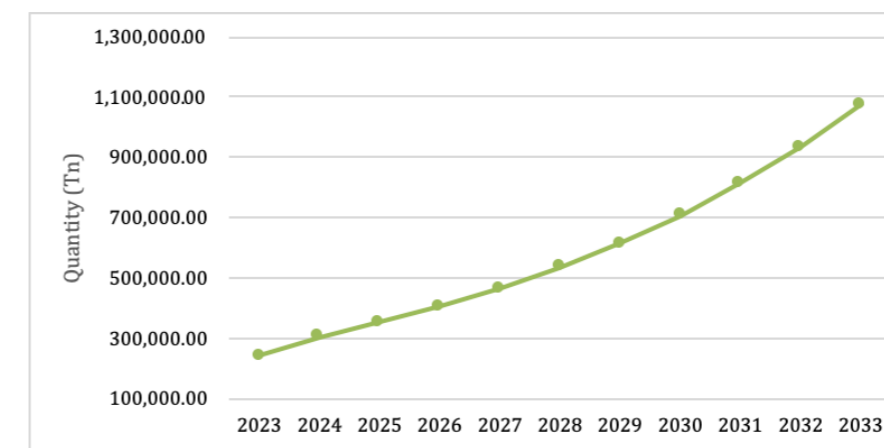


Figure 2.2 10 Years malt barley projected demand by the brewing industry

Looking at the malt demand projections above and the local malt production capacities, starting from 2026 there will be malting capacity limitation (shortage of about 10,000 Tn of malt in 2026). Hence, there will be a need additional malting capacity or capacity extension starting from 2026 and beyond. If additional malting capacity is not realized by 2026, breweries might shift to the use of other starch sources like maize, rice and sorghum.

2.4 Economic contributions of Malt Barley Sector Household Income

Analyzing the profitability of malt barley compared to other alternatives is difficult as farmers do not keep records. The top three alternative crops to Malt Barley are (1) wheat (2) potato (3) faba beans. Information from the field research substantiated with subject matter experts show that malt barley holds a profound competitive position with wheat and faba beans, but it is less profitable compared to potato. Farmers have a trend of allocating/rent the most fertile land for malt barley. It is to be noted that the price of barley, in general, is at an all-time high for the last couple of years. In the past, wheat used to excel in terms of price and yield, but recently the yield gap with wheat is being bridged while at the same time, barley price has shown a radical increase due to high demand from multiple industries: Malteries, breweries, commercial food, and household consumption.

Discussion with key government officials at different levels indicated that malt barley-based contract farming and the associated packages have brought a meaningful impact on rural household income (up to 150% marginal income increase). Indirectly the knowledge and skills inherited by farmers have enabled them to utilize other crops and farming activities.

Below is a summary of costs of production, yield and competitiveness of competing crops. All units are calculated for a hectare of land considering a medium farmer. Farmers indicated that costs of land vary depending on the types crops in the sense that malt barley (especially foreign varieties) needs relatively better and fertile land.

Cost headings	Malt Barley	Wheat	Faba Bean	Potato	Food Barley
Land Cost (rental)	35,000.00	30,000.00	24,000.00	25,000.00	25,000.00
Land Preparation Cost	9,800.00	9,500.00	6,200.00	12,000.00	9,500.00
Input Cost	18,865.00	13,130.00	8,140.00	51,330.00	18,865.00
CPP Cost	10,700.00	14,600.00	11,660.00	36,200.00	13,100.00
Cost of Farm Management	3,450.00	3,450.00	1,950.00	1,050.00	3,450.00
Harvesting & Transport Cost	6,440.00	5,880.00	4,800.00	30,000.00	5,600.00
Marketing Cost	2,070.00	1,890.00	900.00	7,500.00	1,800.00
Total Cost	86,325.00	78,450.00	57,650.00	163,080.00	77,315.00
Yield (Tn/ha)	3.1	3.00	2.00	25.00	3.00
Unit Sales Price (ETB/Tn)	44,000.00	37,500.00	45,000.00	12,000.00	36,000.00
Total Revenue	136,400.00	112,500.00	90,000.00	300,000.00	108,000.00
Profit	50,075.00	34,050.00	32,350.00	136,920.00	30,685.00
Margin as % of Revenue	37%	30%	36%	46%	28%

Table 2.4 Comparative economics of malt barley (Field Data)

Employment Opportunity

The Malt barley sector has spurred new job opportunities at various levels, notably in factory, aggregation, farming, and transport sectors. The beer and malting industry currently have created over 137,327 jobs/employments at sourcing, logistics, processing, and marketing level. This is based on experts' estimates for farmers engaged in full-contract farming, aggregators, maltsters, and breweries. Jobs are created in production, aggregation, malting, processing, and marketing. According to our expert estimates and discussion with actors for every 1000 farmers engaged in malt barley contract farming at least 3 jobs are created for training, monitoring, and backstopping. Currently, there are about 900 malt barley aggregators that have created jobs for 9900 persons. On the other end of the value chain, beer marketing, and distribution evidences suggest that for every 100hecto liter beer distributed there is 1 full-time job opportunity created; implying over 122,000 people are involved to sell and distribute the 12 million hecto liter beer processed in the country.

S/N	Levels	Types	# Jobs	Assumptions
1	Producers Level	Direct	182	3 FTE per 1,000 farmers
2	Interface/Aggregators Level	Direct	9,900	11 Person/aggregator
3	Malting Companies	Direct	1,075	1 FTE per 160 Tn of malt.
4	Breweries	Direct	4,070	1 FTE per 3k hl
5	Beer Marketing & Distr.	Direct	122,100	1 job per 100hl
	Total		137,327	

Table 2.5 Malt Barley Sector Employment Analyses including daily labourers.

Import Substitution

Ten years ago, the proportion of imported malt barley was 60% of the domestic malt barley total supply but as of 2020/21, imported barley accounts for less than 15%. Due to the extensive interventions made in malt barley value chain, significant forex has been saved for the country. Based on estimates from breweries and maltsters, between 2016-2023 a total of 44.64 billion ETB worth of local sourcing was made by the brewing industry. Calculated at the exchange rate every year, it is a total saving of 1.01 billion \$ for the country. Given the severe shortage of forex in the country and the fact that malt barley constitutes over 75% of raw material cost for breweries; reliance on imported raw material would have a serious investment risk at the individual company level and hence the beer sector would have not been attractive for the major players.

Years	HI (Millions)	% Local Sourcing	Estimated malt used in Tn	Estimated Barley used)	Malt - Value in ETB (Billion)	Exchange Rates	Total \$ (Billion)
2016	8.28	22%	29,131.03	37,870.34	0.6	24.16	24.96
2017	9.94	38%	60,740.37	78,962.48	1.61	26.98	59.55
2018	11.04	40%	70,144.79	91,188.22	2.18	27.38	79.55
2019	11.61	45%	84,170.32	109,421.42	2.9	28.64	101.39
2020	8.92	47%	67,672.62	87,974.40	2.45	35.07	69.9
2021	10.12	56%	90,699.39	117,909.20	7.3	43.75	166.89
2022	12.21	89%	173,914.75	226,089.18	15	52.43	286.1
2023	13	95%	185,167.22	240,717.39	12.6	56	224.85
Total	85.12		761,640.49	990,132.63	44.64		1.01

Table 2.6 Estimated Forex Saving from Local Sourcing (2017-2022)

Tax and Revenue

The beer and malting sector contribute close to 23.08 billion ETB in 2023 (3% of the 2023/24 national budget) in tax revenue. This includes profit, employee income tax, VAT and withholding taxes but excludes pension contribution and dividend payments. In addition, the companies are actively engaged in contract farming that enhances formal business transactions and stimulates local businesses that pay tax to authorities at different levels. One can understand the significance of this by highlighting that withholding tax of 2% from the value of barley supplied by the interfaces/aggregators is estimated to be in the hundreds of million ETB. The government also collects profit taxes from the businesses engaged in the marketing and distribution of beer products on different sides of the contract farming (though this is hard to retrieve).

S/N	Tax Categories	Tax in Billions (ETB)				
		2020	2021	2022	2023	Total
1	VAT	3.1	2.9	3.5	3.73	13.23
2	Excise tax	9.5	10.82	13.06	13.9	47.28
3	Local WHT (2%)	0.2	0.33	0.4	0.42	1.35
4	WTH on Interest (5%)	0.04	0.08	0.09	0.1	0.31
5	Profit tax	1.93	1.37	1.65	1.75	6.7
6	Payroll	0.58	0.61	0.73	0.78	2.7
7	WHT (15%)	0.12	0.22	0.26	0.28	0.88
8	Tax on imports	1.22	1.65	1.99	2.12	6.98
	Total tax contribution	16.69	17.98	21.68	23.08	79.43

Table 2.7 Brewery sector tax contribution

Stimulate Local Businesses

Beer and Malt barley contract farming has created several business opportunities for those engaged in aggregations, transport, quality assurance services, warehousing, farm machineries, agro-input supply, and MFIs. Evidence suggests that for a scale of contract that involves a volume of 4,000 Tn a business of ETB 250 million financial transaction takes place within the local economy. On the end product (beer chain), thousands of bars, restaurants, hotels, and other recreational businesses heavily rely on the malt barley sector.



3 INPUT SYSTEM

3.1 Land and Soil System

The current land policy of Ethiopia states that land both urban or rural, is the property of the public (state), hence, it cannot be sold or be exchanged. The only transferable proprietary right on land is infrastructure. For land use, farmers are taxed ETB 10 for the first hectare and ETB 7.5 for each additional half hectare.

Land Allocation

Land is an important resource for malt barley. A review of CSA data showed that nationally, the average land allocated for barley has declined by 3% over the last ten years despite a yield increase of 59%. Through there is no clear justification for the decline in spite of all the efforts and picking up of malt barley market, experts indicated that the decline is in less potential malt barley areas where farmers are shifted to wheat production due to the supports and push from government of course, in high potential areas like Arsi and West Arsi, the land allocated for malt barley has increased over years.

Our previous study on malt barley indicated that farmers allocate the most fertile plot for malt barley and ploughed properly as compared to land allocated for beans or oil crops . They also revealed that the proportion of land they allocate for malt barley depends on (1) total acreage (2) returns per ha for barley vs alternative crops (3) associated investment and risk with barley vs other crops. The table below provides a summary of average land allocation per household from our previous studies across 15 weredas in seven zones. It can be inferred from the table that 28% of the total land is allocated for malt barley. However, it is to be noted that with more risk and investment leverage opportunities, farmers are willing to allocate additional land.

Zone	Average land holding (ha)	Average farm land (ha)	Average land for malt barley (ha)	%
Bale	4.235	4.235	0.675	16%
Arsi	2.835	2.91	1	34%
West Arsi	2.675	2.52	1	40%
Horo Gudru	2.25	2.45	0.585	24%
North Shewa	2.96	2.465	0.64	26%
West Shewa	2.35	1.97	0.59	30%
S. West Shewa	2.275	1.99	0.5	25%
Gurage	1.77	1.34	0.44	33%

Table 3.1 Average Land Allocation Per Household (Field Data)

Soil Fertility Requirement

Soil fertility is an important parameter that determines production, productivity and cost of production for malt barley. Malt barley requires a number of key soil nutrients and micro-nutrients. The most important ones are (1) Nitrogen (2) Potassium (3) Soil pH (4) Magnesium (5) Sulfur (6) Zinc. The full details of the different nutrients and their recommended dosage is available on the table below.

Parameter	Symbol	Unit	Guide Low	Guide High
Nitrogen	N	%	20	24
Calcium	Ca%	%	50	70
Magnesium	Mg%	%	10	20
Potassium	K%	%	3	8
Sodium (ESP)	Na%	%	0	5
Other Bases	OB%	%	3	10
Hydrogen	H%	%	10	15
Ca:Mg Ratio	Ca:Mg		4	7
pH	pH	(H2O)	5.8	6.8

Table 3.2 Nutrient Requirement for Malt Barley (Expert recommendation)

3.2 Seed System

3.2.1 Varieties

One of the main reasons for the dramatic progress of the Ethiopian malt barley sector over the last decade is the introduction of new varieties like Traveler and IBON. This testifies to the importance of having an appropriate variety to boost productivity and quality. Overall, in Ethiopia, there are about 16 malt and 36 food barley varieties released by the National Agricultural Research Centers. Of the varieties released through the national research centers, only a few (IBON, HB1963, Misikal, Sabini and Holker) are widely adopted by farmers. Currently, Sabini and Holker are almost outdated and pushed out of the market. Through a government claim, IBON is a national variety, it is normally adopted and popularized from a foreign variety (ICARDA lines).

A discussion with farmers in this study area reveals that Traveler and IBON are prominent varieties. Traveler is preferred for its high yield, good quality for malt and strong tillering; a feature key to suppressing weed. On the other hand, IBON grows longer making its byproduct suitable for housing and less requirements of inputs. New varieties registered by Soufflet and Boortmalt (Planet, Fatima, Explorer, and Henrike) has the potential to take up and can substitute traveler in the coming years if the companies continue to promote. The table below provides the productivity of different varieties available to farmers as reported in this study from different locations.

Variety	Average Yield (t/ha)	Ownership/Exclusive right
Traveler	3.324	Heineken
IBON	3.214	National variety/ICARDA
Fatima	3.096	Soufflet
HB1963	2.743	National variety
Holker	2.815	National variety
Sabin	2.202	National variety
Miskal	2.442	National variety
Explorer	3.04	Boortmalt
Henrike	3.15	Boortmalt

Table 3.3 Malt barley varieties in the study zones

Evidence from the farmers reveals that access to high yielding proprietary seed such as Traveler, Fatima, Explorer, Henrike, and Planet has been a major challenge. As such more and more companies are investing in their own breeding and registration program. For example, Habesha Brewery finished the registration of a new variety called Focus Habesha in June 2022, and Dashen Brewery is in the process of registering another one. Moreover, a new malt barley variety called Derartu is under registration process by Boortmalt Ethiopia. Crossbreed varieties between traveler and local gens named HBMB 18-1566 and HBMB 18-1288 are candidate varieties under the registration process. These crossbreed varieties are under development by a joint project between Holeta Agricultural Research Center, GIZ, Assela Malt Factory, Gondar Malt Factory and Boortmalt Ethiopia.

3.2.2 Seed Production

The current national annual supply of certified seed is estimated to be 10,000 Tn. It is to be noted this accounts for less than 40% of the seed demand while the remaining is covered by farmers' saved seed. There are four certified seed production groups: public seed enterprises, seed producer cooperatives, seed producer clusters and commercial farmers. The federal and regional seed enterprises contribute to over 80% of malt barley seed multiplied and distributed to the different channels stated in the sections below. The enterprises acquire their basic seed from research centers and malt factories/breweries, mainly Soufflet and Boortmalt. In many cases, seed enterprises give more attention to food security crops as instructed by the government. As such there are challenges for companies to secure their plots regularly for malt barley seed multiplication. Cooperatives contribute 5% of the seed multiplication. They are often specialized farmer organizations with the sole purpose of the seed business. The commercial seed producers and producer clusters contribute a respective share of 10% and 5% of the seed multiplied.

For instance, the BOOST project is using all possible seed multiplication approaches. It is working with 8 seed multiplying cooperatives (5 in Oromia and 3 in Amhara), 14 seed clusters, 16 commercial farms, and OSE farms. Below is an estimate of certified malt barley seed injected to the market by major actors over the last five years (HEINKEN, SOUFFLET, OSE, OACF, Boortmalt, AMF and Unions). There is significant increase of seed volumes over years. Over 60% of these volume was contributed from Heineken (before 2019) and Soufflet (after 2019) and the role of other actors like OSE, Boortmalt, OACF, AMF and unions have also increased over time. In 2023, the total seed sold out was reduced due to the decision made regional agricultural office on seed COC transfer between OSE and Soufflet. Over 5,000 Tn of seed are left unsold during the year due to these changes in approach. Added to this, the demand of farmers and aggregators for fresh seed purchase has decreased compared to the previous years due to the stable grain price in 2022/2023 throughout the year (low future price increase expectation), the high price of wheat (encourages farmers to produce wheat), the price gap between barley grain and seed and high rain in some area.

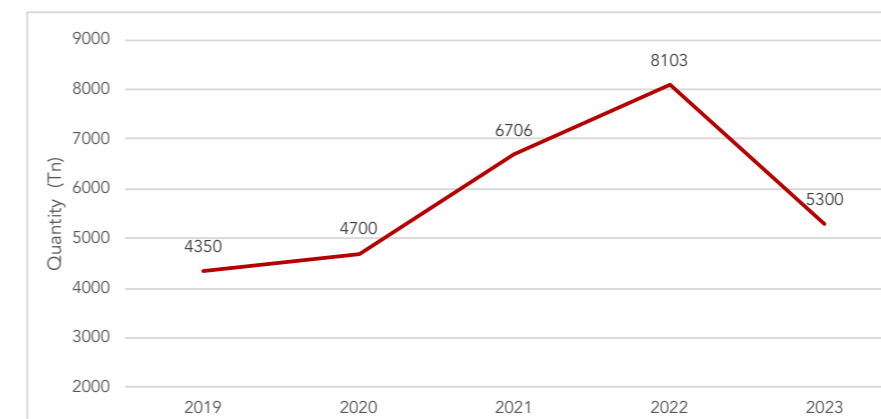


Figure 3.1 Certified seed sold (Tn)

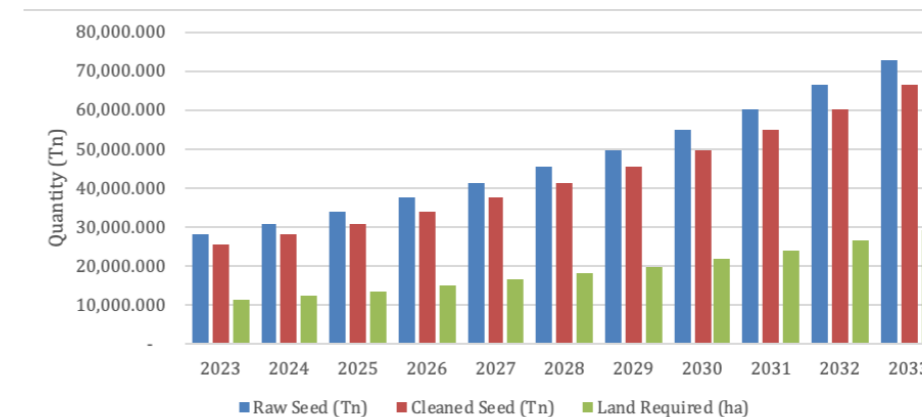


Figure 3.2 Ten years' malt barley seed demand projection

The seed demand projection is made based on the ten-year malt barley projection in the second chapter of this document (fig 2.2). The agronomic recommendation of malt barley seed application is 0.125Tn/ha. If for instance, we take year 2023 the malt barley production land required is 240,000 ha. For this amount of land 25,500 Tn of improved seed is required. Raw seeds are the fresh harvested seed which needs manual cleaning for higher quality, the raw seed to cleaned being 90%.

Seed Distribution and Pricing

Seed produced by the different groups above goes through cleaning and packaging before dispatching. The seed enterprises have their own cleaning and packaging facilities whereas the seed cooperatives, cluster producers and private companies use either the facilities of the seed enterprises or deliver the uncleaned seed to the companies with a seed multiplication license (Soufflet and Boortmalt). Few unions and seed multiplying cooperatives have seed cleaning facilities which were granted from FAO or other development organizations.

There are four seed distribution channels: union/cooperative, model farmers, MFI groups, and Direct Seed Marketing (farm service centers and youth groups). Of these groups, the union-cooperative channel accounts for the biggest share (52.8%). In terms of reaching large number of farmers and having required infrastructures in place, union/cooperative and the Direct Seed Marketing (farm service centers) stood at the top. However, in terms of delivering seeds to a targeted/specified farmers on time, the model farmers and MFI groups stood on the top. Hence, it is good to strategically target these groups for seed distribution. For instance, one can use the union/coops and farm service centers for widely popularized and abundantly available varieties like traveler to address large number of farmers and use the model farmers and MFI groups to distribute new and scarce varieties like Planet, Fatima, Explorer to specifically reach targeted farmers.

Details of the percentage estimate of improved seed distributed by the different group are provided in the chart below.

Seed Distributor Group	Estimated % Share of Improved Seed Distributed
Unions-Cooperatives	58.8%
Model Farmers/Traders	35%
Farm Service Centers	1.7%
Youth Group	1%
Research	1.5%
MFI Groups and NGO	2%

Table 3.4 Seed distribution channels

Price for malt barley seed is determined by the market price of the grain marked-up by 30%-35% premium. However, the fragility of the grain price which serves as a benchmark for seed pricing has affected the seed price. In most cases, the grain price regularly changes whereas the seed price established on a price at a point in time remains static for a while. This results in a situation in which grain prices are higher than seed price. Seed prices are determined by negotiation between companies and seed enterprises while setting up the contract. Over the last four years, seed price has increased by over 195%, mainly due to the increasing grain price.

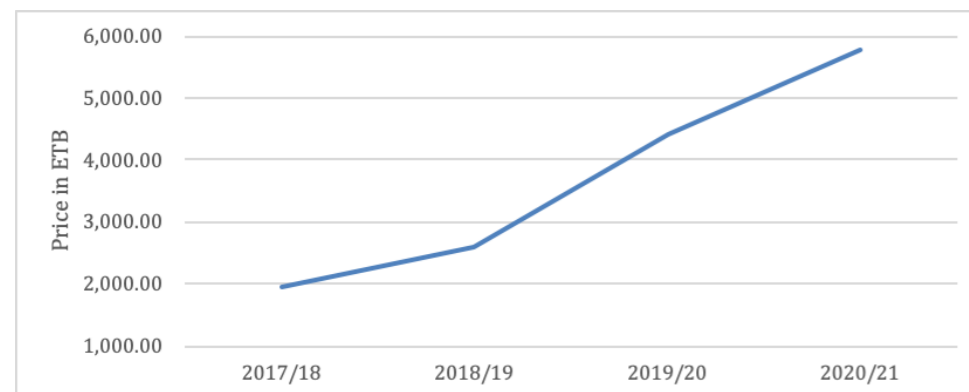


Table 3.5 Seed price trend increase of the study zones (ETB)

3.2.3 Key Issues within the Seed Sector

Imported varieties and Local Breeding Breeding is primarily undertaken by public research institutes. However, Heineken pioneered in financing and supporting the development of imported varieties namely Traveler and Grace which are locally called "Walia varieties". These varieties (especially Traveler) relieved the country from importing huge amount of malt from abroad every year. Recently, Soufflet and Boortmalt are popularizing four new imported varieties namely planet, Fatima, Explorer and Henrike. While the imported varieties give quick wins in terms of yield, such a move stifles local breeding efforts and makes the country over-reliant on imported basic seeds, which in turn refutes one of the key rationales for import substitution. On the other hand, the local breeding programs are mired with a number of problems (1) weak market and demand orientation of breeders (2) limited focus on cash crops as compared to food security crops (3) a tendency to follow government priorities over market needs (4) shortage of resources (5) lack of a clear strategic roadmap for serving sectors.

Breeders Right

Variety development is solely done by public seed enterprises and there is no legal framework to enable private breeders. Though Ethiopia recently enacted breeders' rights, the enforcement mechanisms are not in place yet. At the institutional level, the research institutes that developed the varieties are entitled to sell their breeding rights to private companies but to what extent this could work for low-value crops with significant farmer-saved seed utilization practices is questionable.

Co-Breeding Initiatives

There are individual initiatives on private-public breeding programs. Currently, Holeta ARC and Boortmalt have an active co-breeding program. In the past Heineken sponsored Holeta Agricultural Research Center to push for cross-breeding of imported germplasms with local ones in collaboration with Gent University in Belgium. However, the results have not been profound

mainly because of the limited commitment and persistency of the research institute. Moreover, factors like lack of focus by the research institutes, lack of budget to practically undertake the intended activities, staff reshuffling/turnover looking for better payments and hence lack of experienced and dedicated staff for these activities seriously challenges the efforts of breeding and variety release.

If done properly, co-breeding programs will have a number of benefits such as (1) pulling resources from the private sector (2) bringing demand side need to the breeding program (3) addressing issues of inefficiencies and lack of focus on breeding works. However, given the fact that seed is partially a public property such co-breeding initiative is ideally be led at sector level programs.

Seed Multiplication

Shortage of sufficient and suitable land for seed multiplication is a major problem. Barley is a highland crop and the most suitable arable land in the highland areas is densely occupied by smallholder farmers. Despite the fact that some companies (Soufflet and Boortmalt) secured a license they cannot get land for multiplication. The unavailability of land has made the companies dependent on public seed enterprises and seed-growing cooperatives. The public seed enterprises often focus on food security crops and demand a high price and pre-financing to grow malt barley. The cooperatives on the other hand have weak quality management systems in place, slow in decision making and less efficient under the current cooperative practices in Ethiopia that need quick improvement. Besides land aggregation and management, certification is another serious issue for companies entering seed production contracts with cooperatives. The certification process which undergoes every stage of the production process (land selection to storage) lacks transparency and has a bureaucratic complaint handling approach.

Seed Distribution

The seed distribution channel was highly reliant on public channels that use cooperatives as last mile retail points. However, this channel is lacking efficiency, flexibility and drive. They lack the capacity to deliver the right seeds at the right time and at the right price. In some cases, the seed spends months at a cooperative warehouse and planting seasons pass. Recently, the government

has introduced Seed Agents (Youth Associations) and Farm Service Centers as additional retail points. Though these points increase farmers' seed access points, they have serious liquidity challenges to buy and stock as per the local demand. MFIs, though they have the potential to increase the assortment of seed distribution, they are legally restricted to dealing with operations other than financial services. There should be a system in place to capacitate seed distribution channels to make them efficient in terms of leadership and human skills, financial capacity, storage and logistic capacities. For instance, seed multiplying companies could provide the seeds on credit/advance basis to these channels and collect back their money once the seed is fully sold. There could be some form of commission/fee and government should play facilitative and regulatory roles.

3.3 Agrochemicals/Crop Protection Products

Depending on the amount of rainfall, land preparation, seed quality etc. various barley pests and diseases are common in most barley growing areas. The severity is high in the case of foreign varieties as compared to local varieties. Some of the common barley pests are barley shoot fly, barley aphid, cut worm, Chafer Grub and weevils and the major barley diseases are scald, Net Blotch, Spot Blotch, Barley stripe, rust and Leaf smut. Farmers need various types of crop protection products to protect or manage these barley pests and diseases.

3.3.1 Import

The agro-chemical sector is dominated by private players and cooperative federations. According to information from the Ministry of Agriculture, there are 135 approved importers of agro-chemicals as of December 2021. Data from the ministry also indicated that there are over 96 agro-chemicals (42 Pesticide/ Insecticide, 28 Herbicide and 26 Fungicide) registered. Chemtex, Makamba, Makobu, Markos, Oromia Cooperative Federation, Tiret, Adami Tulu are some of the major players.

The Ethiopian Customs data does not differentiate pesticide, herbicide and fungicide import by brands and types. However, an overview of the aggregate import of products under the three categories reveal that the country imported over 20 thousand Tn of agro-chemicals in 2021. The volume of agro-chemicals imported has increased by over 125% during the last four years. The volume of imported pesticide, herbicide and fungicide is presented below. It is to be noted that the below customs data does not differentiate between chemicals imported for agriculture and other uses. However, our experts estimate that over 90% of the above chemicals imported are meant for agriculture.

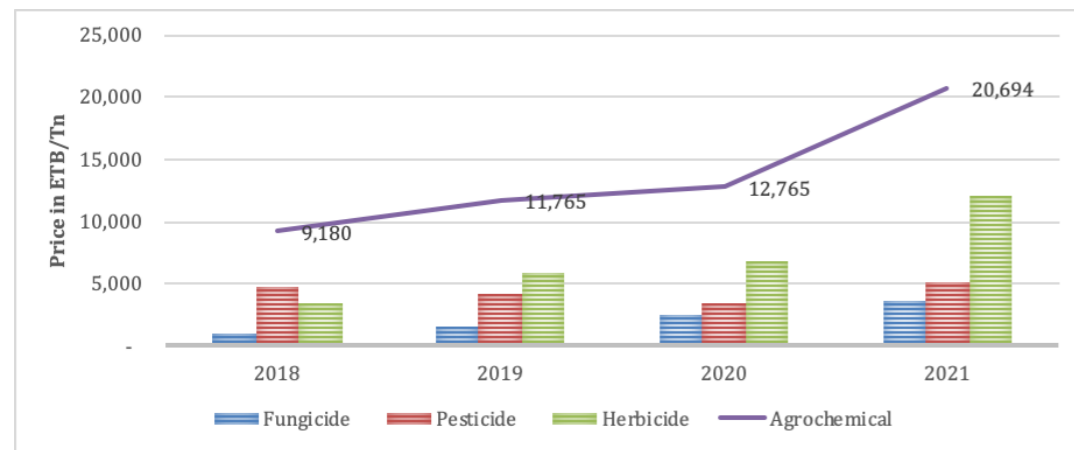


Figure 3.3 Agro-Chemical Import Trend (2018-2021)

*Crop protection products are substances used to control, manage, or eliminate pests, diseases, and weeds that can harm crops. These products include insecticides, herbicides, fungicides, and other chemicals or biological agents designed to protect crops from damage and ensure optimal growth and yield.

3.3.2 Distribution

Agrochemicals distribution is mainly handled by cooperative unions, private traders, and farm service centers. Farmers buy regular agrochemicals such as glyphosate or 24D from the above sources. But special chemicals that are not available on the market are supplied by the companies mostly on a cash basis. Some of these specialized agrochemicals that are not readily available in the market and facilitated by companies are for insect pest control (Apron Star, Imidalm 450TS and Gaucho 70% WS), for diseases control (Tilt 250 EC, Rex Duo, Zantara, Comet) and herbicides (Axial® 045 EC, Axial® One 050 EC and Ralon Super 144 EW). Note that these pesticides change over time due to the registration of new and better effective chemicals.

An overview of agro-chemical distribution chain is provided in the chart below. While the agro-dealers and farm service centers often get products from private importers, the cooperatives usually get products from Oromia Agricultural Cooperatives Federation (OACF).

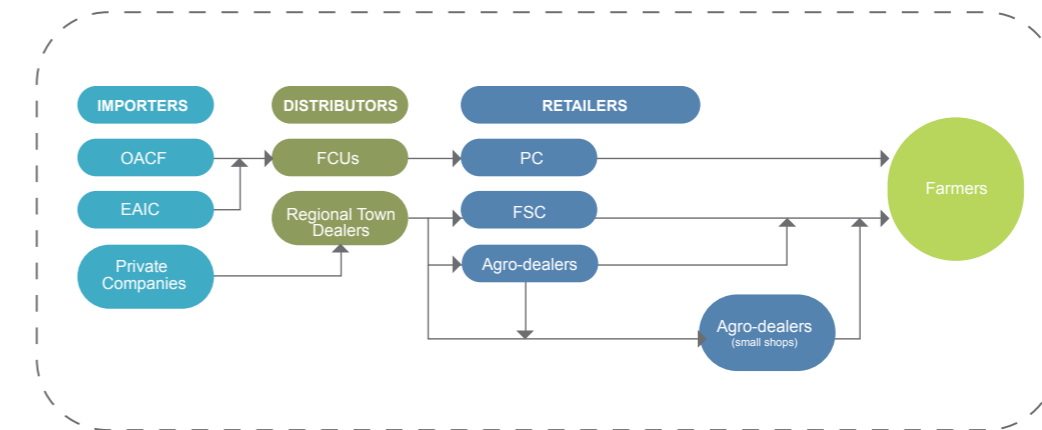


Figure 3.4 Agrochemical supply chain

3.3.3 Pricing

Agro-chemicals pricing is often determined by supply availability. Interviews of farmers in the field revealed price and availability of agrochemicals is a major problem. The graph below provides the price trend of selected agro-chemicals at farm gate. It can be noted that prices have shown a sharp increase in recent years due to a number of factors- increasing global supply chain cost, devaluation of ETB and lack of sufficient forex allocation.

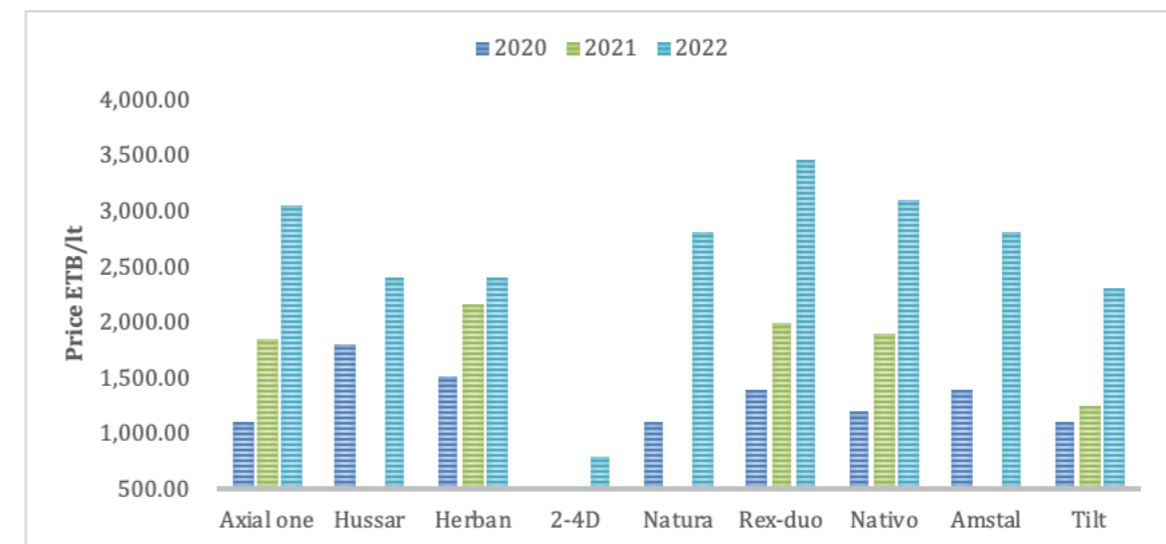


Figure 3.5 Selected agro-chemical 3 years price trend in the study area

3.3.4 Key Issues related to Agro-Chemicals

Quality and Efficacy

There is a serious complaint about the ineffectiveness of crop protection products in the market. Quality issues can broadly be categorized as a source and local related. Farmers noted that some pesticides often labeled with an open brand are less effective as compared to others with genuine brand labeling. Notably chemicals vulnerable to this issue are products such as 24D, glyphosate and rex-duo. At the local level there are two major issues: adulteration and expired products. Adulteration is particularly common for liquid and bulk products that come without a ceiling. The issue of expired chemicals is another critical problem. In many cases agro-dealers, wholesalers and even importers keep left over products for the next harvest season. There are indications from farmers that the carryover products are re-label while in another case dispatched as they are and in rare cases mixed with non-expired products.

Knowledge and Awareness

Farmers have limited knowledge on the application of pesticides. Key issues in relation to lack of knowledge and awareness include (1) inappropriate dose rate (over or under dose) (2) limited use of personal protective equipment during pesticide use (3) lack of awareness in detecting expired pesticides/inability to read pesticide label. Evidence from the field indicated that agro-dealers often do not provide sufficient application guidelines to farmers upon selling pesticides. Though application and use are labeled on the products in local languages, farmers have difficulty reading it.

Import Challenges

Importers noted three key challenges in relation to the import of agro-chemicals: limited access to foreign currency, restrictive supply and distribution chain and lack of reliable data about effective demand. There is a serious shortage of forex and companies have to wait for months after blocking in local currency or buy the currency at a black-market rate which is currently 60% higher than the official exchange rate. This makes the cost of import high and possibly leads to high price as the importers need to compensate for the long nonperforming

finance blocked or paid to secure forex access. The input supply and distribution system as of now is highly dominated by cooperatives and unions. These organizations have complex purchasing and procurement procedures that are restrictive to purchase from private organizations without tendering. In Ethiopia, traders have limited understanding of effective demand for agricultural inputs due to the isolation of farmers in rural areas and lack of a clear communication pathway between farmers, traders, and extension workers.

Available Product Assortments

Most of the pesticides supplied are single or limited purpose. This particularly is applicable to herbicides. Farmers indicated that, selectivity of herbicide is another challenge. Some herbicides are effective only with broad or narrow leaf weeds are farmers are forced to apply more than one type of herbicides. It is also noted that pre-emergence chemicals such as glyphosate substantially suppress weed but their efficacy varies from weed to weed. The study team did not come across any significant biological, cultural, and mechanical methods of control.

Regulatory Issues

Three important regulatory barriers are noted by importers (1) long registration procedure (2) multiple agent registration (3) procedure for representation and license to import. It is noted that registration procedure often takes 1-2 years. The time and documentation requirements in case when the active ingredients are not previously registered is usually cumbersome and long. Though the regulation recently has been amended to allow multinational companies with local office to assign multiple agents, international suppliers who do not have local presence are required to operate through a single agent. The agent often charges labeling fees for other importers. The fact that most chemical agents are individuals with limited financial and forex capacity means that the above issues exacerbate both shortage and price for agro-chemicals. Pertinent to this, the preference of big international companies such as Dow Chemicals to work through a single agent has undermined possible competition.

3.4 Inorganic and Organic Fertilizers

3.4.1 Import

Ethiopia imported over 1.1 million Tn of fertilizer in 2021. Over the last four years, fertilizer import has more than doubled. For years Ethiopia was dependent on imported fertilizer. Ethiopian Agricultural Business Corporation (EABC) is the sole importer of fertilizer in Ethiopia. Large-scale farms owned and operated by domestic and foreign investors can import fertilizer for their own use but are prohibited to sell to a third party, including smallholder farmers. Recently, the government has also opened up import and distribution to farm service centers though the systemic barriers such as lack of foreign currency allocation and price manipulation by the state enterprise. According to the United Nations COMTRADE database on international trade, Ethiopia imports of fertilizers was \$1.3 billion during 2022. Ethiopia has recently secured 2.3 million Tn of fertilizer supply deal with the Moroccan state-owned firm OCP, which is expected to meet the demand for the new 2023/24 farming season. The first batch of the urea fertilizer has already arrived in the country, and the dispatch operation started soon after. The Ethiopian government hopes that the timely and adequate supply of fertilizers will boost agricultural productivity and ensure food security in the country.

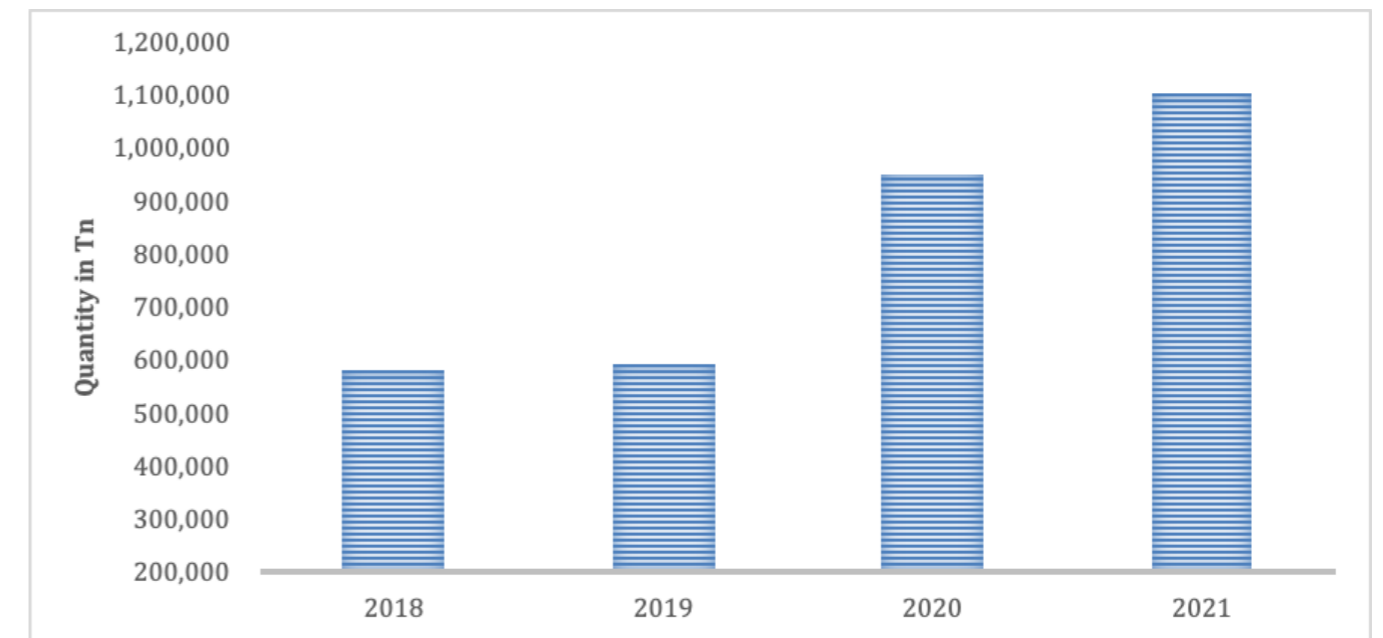


Figure 3.6 Fertilizer import trend – Quantity in Tn

Until recently, Ethiopia has been using a blanket fertilizer assortment: Nitrogen and Phosphorus regardless of differences in crop need, soil types and agro-ecology. In order to develop a tailored fertilizer recommendation, Ethiopian Soil Information System project led by ATI and commissioned by several partners conducted a national soil mapping in 2012. The new study indicated that there are 12 key deficient nutrients in most parts of the country. Sulfur, Potassium, Boron and Zinc are some of the key missing nutrients in addition to Nitrogen and Phosphorus. In response to this finding, there have been initiatives to blend the above critically deficient nutrients, namely Sulfur, Boron and Zinc. The initial move for local blending on selected unions sites failed and currently government is importing blended fertilizer from abroad.

3.4.2 Distribution and Pricing

The overall fertilizer penetration rate is 63% (CSA 2021). Consumption is still far behind the recommended application rate. The national average fertilizer consumption remains at 73.2 kg/ha. 415.3 kg/ha – Egypt has the highest penetration rate in Africa (Statista, 2022). The data from ERCA shows there is 100% increase in imported volume of fertilizer. In the case of malt barley our previous studies showed that 88.9 % of the 520 farmers use fertilizer though the application rate varies from place to place.

Fertilizer distribution is dominated by farmer organizations - unions and primary cooperatives (currently supply over 97%) though recently the government has opened the distribution to farm service centers. Evidence from farmers reveals that there is a high degree of irregularity in serving the demand for the existing products both in terms of timeliness and fertilizer blends. The areas that are Boron deficient often receives Zinc blended fertilizer and vice versa.

Fertilizer prices are determined by the government on a cost basis. As indicated in the chart below, the price margin between import and farm gate are only 15%. Overall prices have shown an increase of 155% over a period of three years; notable increase is observed this year mainly due to the Ukraine-Russia war. Because of escalated prices and unreliable supply, the government is orienting farmers to prepare and use organic fertilizers like compost and bio-slurry which are splendid and friendlier for the environment.

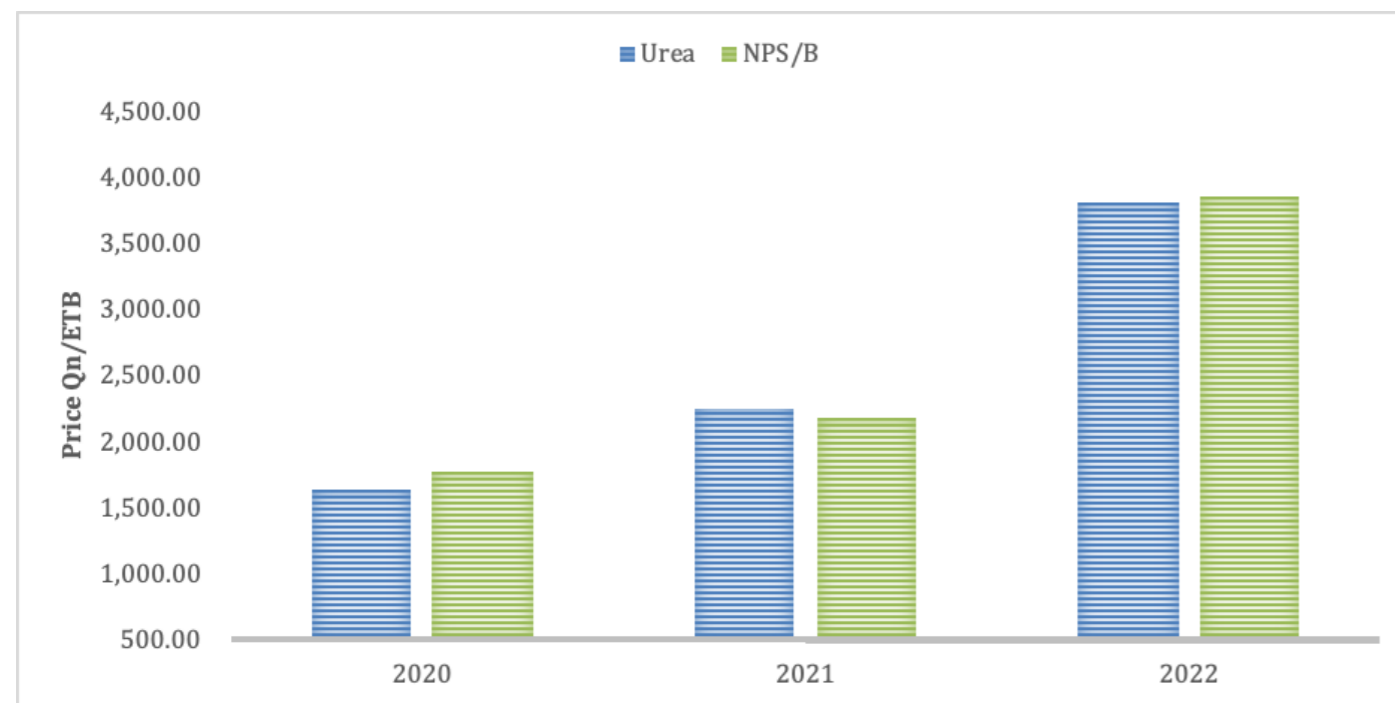


Figure 3.7 Fertilizer price trend of the study areas (Zone BoA)

3.4.3 Key Issues in Relation to Fertilizer

Lack of Policy for Organic and Bio-Fertilizers

The government has been primarily focusing on imported fertilizer until recently. As result there was hardly any effort in the promotion of organic or bio-fertilizers and other soil health and soil fertility improvement inputs. There is no coherent quality standard, extension package, and options for mass production even for industrial level products. The recent increasing market penetration and appetite for products of eco-green reveals the urgency of addressing the legal, regulatory and handling procedures for such products. Other than organic fertilizers, there has been a limited effort in promoting and incorporating bio-fertilizer in the extension system. The latter is particularly important in cereal-legume rotation belt where bio-fertilizers strains for legumes play invaluable role in nitrogen fixation.

Entry Barriers

As stated above, import and distribution of fertilizer is heavily controlled by government enterprises and cooperatives. Until recently the government was justifying such a position as an issue of affordability and equitable distribution. However, one can argue the monopolistic position of fertilizer has three major problems. First it undermines possibilities for different types of fertilizer products that could address the varying soil nutrient requirement of the country. Second it stifles opportunities for local industry development as the supply chain is heavily controlled and prices are suppressed. Third, it misses the opportunity to leverage entrepreneurial efficiencies in distribution and trade in general as opposed to slow and inefficient cooperative-union systems.

Range and Dose

Following the national soil mapping survey, fertilizer recommendations have shifted to NPS/B-Z and UREA, though there are still a number of controversies regarding the reliability of the recommendation for most areas. The new package has led to an overdose of nitrogen as both types of fertilizers have nitrogen compounds, implying high protein accumulation and possibility of greenhouse gases emissions). This particularly has become the main issue for malting factories where the lower amino-acid level is an important index for quality.

Input Voucher System

Farmers are complaining about the current coupon systems of getting inputs. In order to get the input from cooperatives, farmers are required to deposit payment for the coupons at different banks-part at commercial bank and remaining at other banks. Beyond exposing farmers to cash carrying risks the process takes a lot of time moving from one bank to the other.

4 EXTENSION & FINANCIAL SERVICES

4.1 Extension Service

Company Backstopped Extension

Extension services are delivered through interfaces, the bureau of agriculture, NGO (project partners) and companies. The companies invest in training trainers to interfaces and government extension workers. In most cases, the companies have NGO partners. Some companies have staff at zonal or sub regional level (agronomists, plant scientists, and socio-economists) to provide full extension packages and back stopping. The companies train and coach the extension service providers on different topics. Farmers strongly appreciate the company backstopped extension service and extension package. Unlike other value chains, there have been regular refresher training, onsite monitoring and advisory to farmers of malt barley. Extension services are provided free of charge.

Extension Package

Under the current malt barley contract farming practice, companies offer partial or full extension packages. The full extension package covers support and advisories going through land selection, land preparation, input application, CPP application, harvesting, transportation, storage and post-harvest handling. In addition, companies like Heineken, Soufflet and Boortmalt hired quality assurance companies that assigned staff at the village level to train, coach, monitor and test products on site. As part of the extension package, a number of demonstration plots on farmers' field or FTCs are organized. In most cases, companies finance all input and management costs in relation to the demos.

Digital Extension

Generally, the use of digital extension tools in Ethiopia is at an infant stage. The ATI has established a call center (8028 toll free) where farmers request information on what, where, when and how to grow different crops. At the early stage a large number of farmers sought information through this hotline. Other than this some NGOs such Digital Green produced videos on a given extension topic and disseminate them using mobile phones to farmers and extension workers.

Within the malt barley sector, Heineken/Soufflet and IFC have been working on a GIS based farm management in partnership with Microsoft. Other than this development, the companies and project partner NGOs are currently sending SMS messages through short codes at each critical stage of the farming process. These messages are intended to serve farmers with information on what and when to do depending on the farming calendar.

4.2 Financial Service

Extension Finance

The malt barley extension service is financed by three parties: government, companies and PPP projects. The government, alike any other extension service, pays the regular salaries of staff. The companies often cover costs of value chain specific training and top-up for advising farmers. In some cases, the companies have their own extension supervisors. Companies usually work under Public-Private partnership projects to support the costs of field staff, training and extension services stated above. Most projects are matching grants and hence the company still is needed to pull some of its internal resources as a contribution.

Input Finance

This is a critical component of malt barley extension system. The responsibility to arrange input finance in the form of own cash or arrangement with financial institutes has mainly been left to companies. Most of the companies provide input credits (mostly in-kind in the form of seeds and CPPs) free of interest charge. Recently, Micro Finances (HARBU, Busa Gonofa, WASASA and Metememen) and commercial banks like CBO started to provide input finances through collateral groups and unions respectively. Experts estimated that over 11,700 farmers benefited from this MFI input financing program.

Output Finance

Contract financing strategies are not common in Ethiopia except in export sector. As such the companies pre-finance 15-20% of value of target volume to the interfaces upfront. However, there were exceptions among companies like DIAGEO that used to provide up to 100% aggregation capital to the unions in advance. Pre-financing of aggregation capital is made with proper legal agreement specifically on the money transferred. The companies also require the interfaces to provide postdated cheque as guarantee and sign credit agreements in front of the zonal or woreda attorney.

4.3 Key Extension and Finance Issues

Contract Financing or Output Warehouse Receipt Systems

Contract financing strategies are not common in Ethiopia; partly because of the absence of a legal framework but importantly the banks tend to focus more on collateral-based financing. In the case of merchandize based or warehouse receipt financing, banks require complex control and monitoring system including their own warehouse management or certified warehouse service providers' setup. For banks to invest in such new product types, there is little push factor from the market as the demand for financial products with less risk portfolio remains high. The absence of appropriate aggregation finance products has forced the companies to pre-finance aggregators with no or minimal interest rate and take the risk and associated management in the process.

MFIs as Input and Output Facilitators

Experience over the last couple of years indicated that MFIs can play valuable roles in input and output financing of the malt barley value chain. Farmers also indicated that MFIs are easily accessible, involves less bureaucracy and enquires less requirements (like collateral, audited accounts etc.) to process credits as compared to banks. MFIs like Busa Gonofa has very strong local connection

and this reduces risk of farmers defaulting on input credit. Practically speaking, MFIs do not involve in physical handling and ownership of the inputs, rather they facilitate the availability of inputs by dealing with input suppliers and financing the costs on credit bases. Their role is wrongly understood by some government official and therefore MFIs are restricted from involving in any input facilitation in some Woredas. These MFIs (especially Busa Gonofa MFI) have also developed financial products for aggregators (short term loans on relatively less interest rate) for output marketing which plays key role in filling the gaps of liquidity problems during pick collection season of barley. Besides MFIs can play a crucial role in facilitating a sustainable relationship between farmers and contractors (Maltsters and breweries) without directly engaging in output marketing.

Insurance Products

There is no feasible crop insurance system in place for farmers. Over the past years, there were some trials of availing crop insurances to farmers but there is not strong and aligned programs in place. Currently insurance companies such as Nyala insurance are offering such services through local agents-MFIs and cooperatives. However, there are no legal guidelines for insurance reselling. In addition, farmers have limited awareness about insurance premiums and are often hesitant to buy such products. Recently, Habesha Brewery and Nyala insurance are trying a scheme in which the brewery pays the insurance premium on behalf of farmers. However, such process management at company level seems less sustainable and requires intensive ground level risk management processes for successful claims.

Looking forward, the risks associated with climate, disease etc. are increasing and it is inevitable to look for professional and sustainable insurance programs. Nyala Insurance and Oromia Insurance have pilot initiatives with farmers that could be scaled up. Two types of index insurance services have traditionally been available to smallholder farmers: area-yield index (AYII) and weather index insurance (WII). Area-yield index insurance services are similar to indemnity-based services, with assessments made at one farm against a predetermined index for a given area. It is good to consult with farmers and development organization

as to what types of insurances are feasible and applicable for malt barley growers. The actual role of offering insurance service should be played by professional insurance companies and other actors (like malting companies, breweries and development partners) should play a facilitation role and raising the awareness of farmers about using Insurance products.

Dynamic Extension Packages

The malt barley extension packages should account for changing agr-climate, soil health and farm input dynamics. In addition, the extension service should focus on capacitating farmers for ultimate graduation and self-sufficiency in terms of skills needed to grow barley. Issues like proper evaluation of the efficacy of the extension investment, streamlining operations to reduce redundancies and crowding out farmers with different initiatives/projects should be seriously addressed. Even though it is encouraging to see companies like Heineken, Soufflet and Boortmalt are currently heavily investing in malt barley development, most of the extension services used to be subsidized by government and development organizations for the last many decades. Looking forward, who is going to pay for the services is a major issue. Do companies continue to finance the malt barley value chain? Is it feasible for them to finance issues such as digital extension, farmers field school with appropriate demonstration standards and protocols; and public-private extension service? Is this feasible to include these extension costs in the pricing of malt barley (intangible or tangible pricing)? With the emergence of digital extension, key issues such as data security, data infrastructure and data analytics and feed to extension system are worth thinking ahead.

Mechanization Services

These includes facilitation of farm machineries and tools such as tractors, Knapsack sprayer and threshers/combiners. Generally, the companies do not provide machinery, but they often facilitate access to rental services. They temporarily organize farmers into groups and link them with rental companies to get the best offers and coordinated services. Facilitating access to mechanization service is a free service offered

by companies or their partner NGOs. A number of problems have been noted by farmers regarding mechanization and related services. Among others (1) affordability and accessibility of farm machinery - most farm equipment and machines are Imported. Though Its tax exempted the forex access and logistical challenges has made the purchasing value expensive. Even for those who can afford the market availability is rare or has to pre-pay for Importers (2) Middle men dominated service delivery - It is believed and proven that mechanization service model is economically viable for smallholder farmer dominated countries like Ethiopia. However, in malt barley producing areas the mechanization service is facilitated and highly influenced by brokers. Farmers in our study zones had mentioned this system is abusive where farmers with low sociopolitical and economic influence has limited or no bargaining power in terms of price and service delivery schedules (3) limited financial products addressing the sector - In recent years some commercial and lease financing banks have floated financial products, 30 - 70% matching for tractors and combine harvester purchases. These products lack addressing small machineries that are appropriate and locally manufactured. Besides, mechanization service doesn't have pre-financing option like the other agricultural inputs (4) poor quality of mechanization services - lack of mechanization specific extension and training and weak link between the public and private partners, trained operators and auto service providers. As a result, the quality of service farmers get from service providers is deteriorating.

To minimize the aforementioned bottlenecks, there is a need for planned intervention by any of the actors in the value chain. Some of the proposed interventions could be facilitating access to credit for farmers to purchase range of machineries (local manufactured and/or imported), strengthening local manufacturing capacity of medium and big duty farm machines, introducing different ICT and financial solutions into this space to unlock challenges related to demand - supply linkage and service affordability. Facilitating linkages between farmers, farmers' organizations with companies and Institutions working in the sector (Kulumsa ARC, Kaleb Engineering etc.)

5 VALUE CHAIN ANALYSES & PRICING STRUCTURE



5.1 Value Chain Analysis

The below value chain map is designed based on the information from study areas. It shows a significant proportion of the produce (about 45%) is sold to the malting and brewing industries to be delivered through contract farming and open market. From the remaining produce, commercial food and drink sector absorbs 22.5% while rural and urban households consume 27.5% and the remaining 5% is used as seed. The input side of the value chain is dominated by cooperative unions which supply 97% of fertilizer, 53% of the seed, and 21% of agro-chemicals. A review of data from our study indicated that only 23% of the farmers have access to input pre-finance.

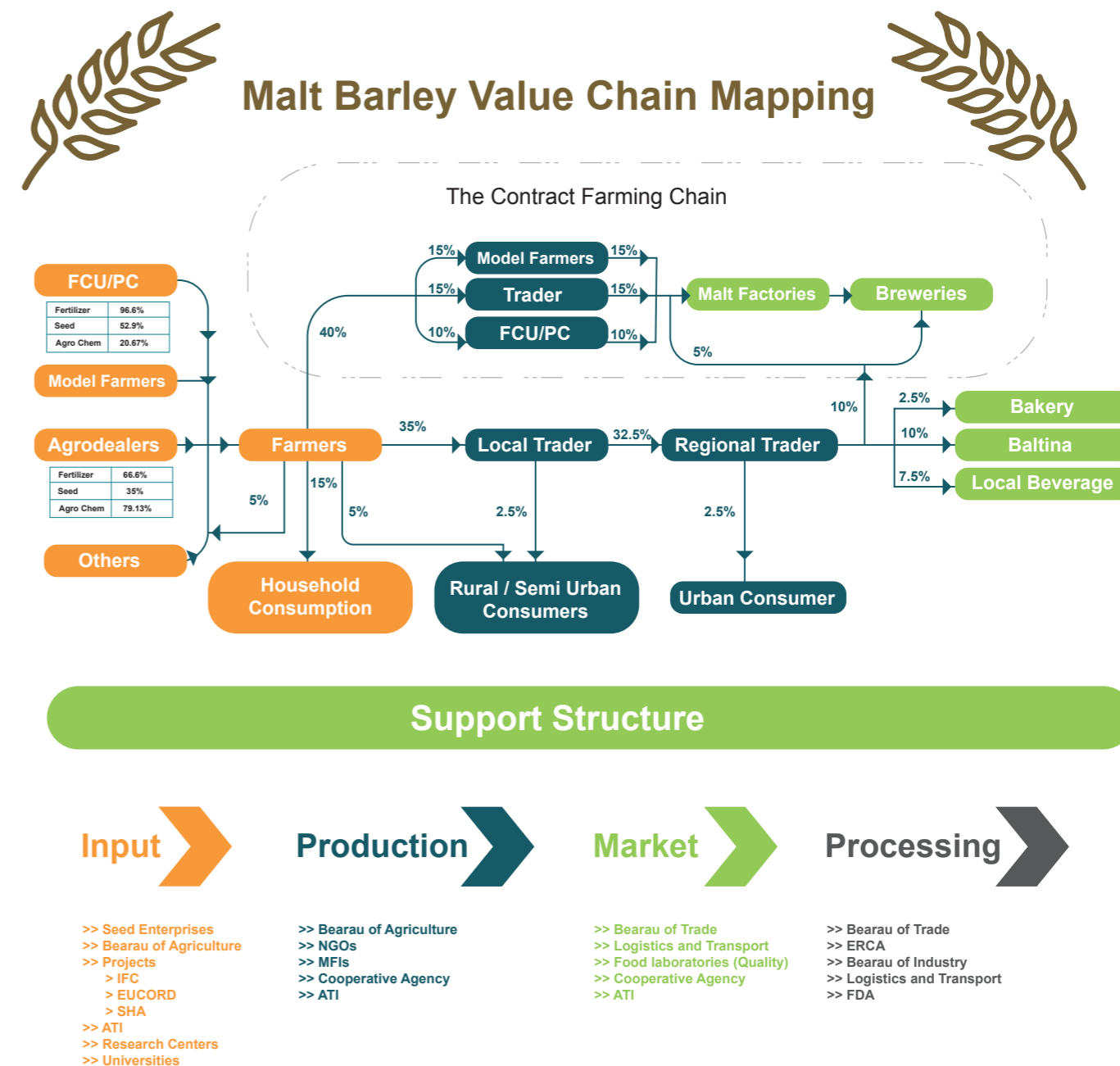


Figure 5.1 Value chain mapping

5.2 Market Channels

Malting and Breweries

Approximately 45% of the total malt barley produced goes to this channel. As noted above, the malting and brewing industry requires more than 265 thousand Tn of barley per year, of which more than 95% is met from domestic sources especially in 2023 purchase season. Contract farming channels supply over 80% of the products to the malting and breweries, while the remaining 20% is sourced from the open market. Experiences from other companies and information from weredas with contract farming experience reveal that traders and model farmers supply up to 75% of the supply to maltsters and breweries.

Commercial Food and Drink

The commercial food industry buys grain from traders (chain that extend from district to national level). This chain includes: baltina, bakery, local beverages including microbreweries. Baltina refers to sets of cereals, pulses, spices and other food ingredients doing businesses. Baltinas produce flaked barley (kinche), roasted barley snack, roasted or raw powder barley that has a wide house application. It has become an industry that includes both household businesses and larger companies, spreading from rural towns to major cities. Our estimations indicate that the baltina chain absorbs up to 10% of the barley production within the country.

The commercial local beverage channel includes local drinks such as tela/ferso, areke, borde, keribo/keneto, soup and microbreweries. These are small enterprises that make drinks for local consumers. Similar to the baltina, this segment is growing in different parts of the country. It absorbs roughly 7.5% of the malt barley produced. On the other hand, the bakery industry is popular in major cities. In the past wheat bread has been the sole assortment but recently barley and teff are getting strong acceptance by health-conscious consumers. In principle this industry takes more of food barley. The bakery industry absorbs about 5% of the malt barley produced.

Urban Consumption

This chain refers to individual consumers based in urban areas who buy malt barley for home consumption. This is common in major upcountry towns. The urban consumers often buy from the local market/directly from farmers or local millers in smaller quantities, mostly about 100kg in one. An estimated 7.5% of the malt barley produced goes to this chain. Barley/malt barley is an important household food security as well as a cash crop. Evidence suggests that rural households keep at least 15% of the produce for their consumption. Families with children keep malt barley for a snack which is believed to give nutrition and reduce food intake intervals. Moreover, it is one of the highly preferred foods to serve mothers who have given birth/breast feeding and persons who are sick.

Farmer Saved Seed

Farmers save seed/also sell or lend to their neighbors for the following year. Farmer saved seed generally loses up to 10% of its yield potential every year and becomes highly vulnerable to disease and pests, which has serious quality and yield problems. Most of the time, farmers keep the best quality (clean and high yielding) grain for seed. Of the total barley produced, about 5% is utilized as seed.

5.3 Pricing Structures

Floor Price

This is the minimum price to be paid to farmers at ex-farm and established by representatives of government, cooperatives, industries, seed enterprises, and regional research institutions. It is determined based on (1) cost of production and yield data (2) market price of alternative products, specifically wheat (3) previous year barley and malt prices, (4) import prices of barley and malt, (5) demand and supply comparison. There are serious complaints by the factories on the need/logic for such committee-led price regulation practice. On the other side of the government, floor price is seen as a mechanism to protect farmers' negotiation position and encourage continuous production by offering them something above their cost of production. The same floor price is set for all quality grades and companies differentiate landed cost prices of the different grades by commissions/bonuses and other packages they offer.

Evidence from the field revealed that the major companies do not start procurement until the floor price is established. In many cases the committee setting the floor price disclose the decision late after/in the middle of harvest. The number of parties involved, and the area coverage are mentioned as key reasons for the delay. On the other hand, farmers need cash right upon harvest and this situation forces the farmers to sell the produce to the aggregators and other private traders at the prevailing price, which is often lower as compared to market prices after the establishment of floor price.



Figure 5.2 Summary of key floor price determinants

Market Price

The market price is determined by supply and demand factors though it does not fall below the floor price. In many cases, market prices are 20% above the floor price mainly because of a big perceived shortage for the malting industries and competition from alternative industries. There are 5 quality grades of malt barley. Different prices are given for the different grades based on the major quality parameters. There are many cases where buyers reject barley that does not fulfill their quality specifications. Though major quality parameters are similar among all buyers, the boundaries/value are mostly different. Some companies accept under sieve up to 20% while others accept only up to 14%. The same is true for all other quality parameters.

Evidence from the field indicated that the purchasing window for most maltsters and breweries is between December and April for a period of four months. The price offered from the alternative industry (commercial food and drink or urban consumers) is often 15% higher than the one offered by the malting/brewing factories. Through this channel is short period purchase, not structured, relatively smaller and do not make any investment to the value chain development. This has encouraged more side selling and hence low performance in contracts. The graph below provides a summary of malt barley prices for the last ten years as reported by malt and brewing companies.



Figure 5.3 Key determinants of market price

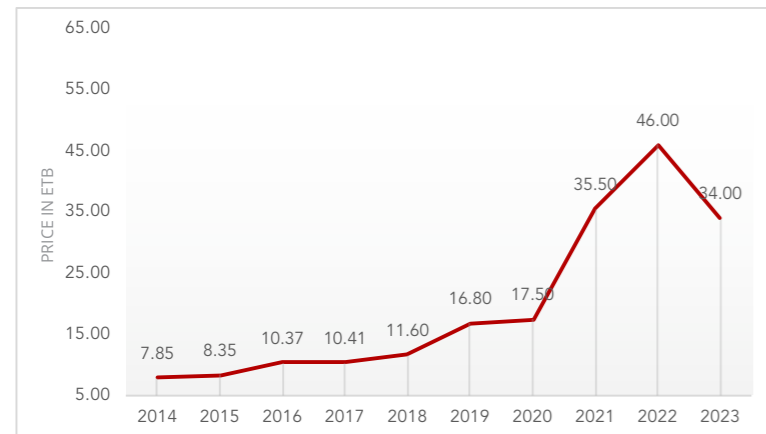


Figure 5.4 10 years Barley price trend (ETB/Kg)

As per info from experts of malting companies and breweries, price of malt barley in 2022 is relatively stable as compared to 2021. In 2021, prices used to be changed/increased almost every week throughout December to July. Some of the factors that triggered price hikes especially in 2022 are hoarding of barley by aggregators and farmers, escalated prices of all other commodities related to national macro-economic issues, competition among major buyers, fear of shortage of barley to fill annual barley demand by factories, previous year experiences and expectation of higher prices at the end of the year, wrong price signals made by the government during the early harvest period, and escalated prices of inputs (higher production costs) and all other consumable goods. For the first time in history, prices remain stable throughout the year in 2023. Major buyers like SME, BME, AMF, and Heineken finished their purchases with one price throughout the year. This is mainly due to the good harvest in the year and good alignment between the actors.

Price Variation

In the year 2022 purchase season, AMF was accused of increasing prices every week and hence led the price escalations. Since suppliers easily shift for a very minimal price differences, other buyers were also forced to follow the price increments of AMF. This is driven by fear of shortage of barley in the market and since no one clearly knows how much malt barley is there in the market and at what trend it is supplied to the market. The development projects or the malting companies need to put in place data collection and management systems that inform how much malt barley is produced, how much volume could go to the brewing industry and how much goes to the food chain. This gives confidence to all buyers not to simply follow the price increments of a few companies.

Seasons	Malt Barley prices (ETB/Tn)				
	2019	2020	2021	2022	2022
Harvesting Season (Dec)	16,000	16,300	19,230	35,500	34,000
Mid-Season (March)	16,300	17,000	25,100	43,700	43,700
Lean Season (June)	16,800	17,500	35,500	46,000	46,000

Table 5.1 Malt barley price 3 years seasonal variation

5.4 Key Value Chain & Pricing Issues

Production Statistics

Organized Malt barley production data is not available. Most of the data for the malt barley sector is based on individual company estimations or derivations from barley statistics reports by the CSA. The absence of well-established data for malt barley is negatively affecting the input, production and market dynamics. Some input decisions such as seed multiplication require years of preparation; implying the strong need for profound data to forecast planned area coverage to prepare the right volume of seed needed. On the output market side, the companies do not have accurate information about volume harvested and the location to plan their sourcing schedules and arrange finances ahead. This often leads to erratic over competition right after the harvesting season to stock the available product; usually deemed as insufficient to cater for the demand. This has created price unpredictability in the short term and long-term planning inaccuracies.

Intra and Inter Industry Competition

The market for malt barley seems highly competitive both from companies within the malting sector and others in the food sector. Most of the time the companies' source from same farmers where farmers supply some quality to meet their contract relationship with the contracting company and the rest to other companies offering a higher price.

Due to fear of supply shortage, the companies often raise prices to lure farmers to them, resulting in unnecessary price hikes and a declining trend off season. The early stock accumulation by the companies creates heavy stress on their cash position and sometimes they face challenges from the authorities who consider such stock as hoarding. Beyond the intra sector competition, there is high competition for malt barley from other food industries and household consumption. The price offered by this channel is often 10-15% higher than one offered by the malting and brewing sectors.

Regulated Floor Price

A number of issues have been raised by the industry operators on the rationale, transparency and relevance of the floor price determination. The price of most agricultural products, including competitive crops, is determined solely by demand and supply factors. As such the need for government to regulate malt barley price is unnecessary and only creates speculation among actors. Actors underlined that the floor price determination process is not transparent and does not follow business logic. The key determinants, corresponding weights and why those determinants are included in the establishment of the floor price is not clear. Moreover, the floor price establishing committee often discloses price after most of the product is harvested and farmers already sold sizable chunks of their produce. The big companies tend to wait until the declaration of floor price. This lead time for floor price is pushing the product to channels outside the malting and brewery industry; despite the big sectoral investment by the latter.

6 MALT BARLEY CONTRACT FARMING PRACTICES

6.1 Contract Farming Proclamation

Contract farming in Ethiopia has been practiced since 1975/76. Though the practice has existed for a long time, there has not been a legal and regulatory framework that governs contract farming. Companies were engaging in contract farming with available commercial law that doesn't provide a proper legal and regulatory framework, notably in case of disagreement. A draft contract farming proclamation "Agricultural Production Contract Proclamation" has been approved by the councils of ministers and directed to the parliament for ratification. The overall intention for the bill is to establish a binding framework that governs the contractual relationship between producer with buyers. The new proclamation is anticipated to increase backward investment by the private sector as they are legally protected for the produce at the harvest stage. On the other hand, it also expects to push farmers toward a market-oriented production. However, review of the draft document of the proclamation reveals shortcomings and gaps herein under.

- It does not clearly address the interfaces/contracting parties as core actors. It exhibits smallholder farmers as a contracting party which is not true in the case of malt barley.
- There is no clear article that shows farmers' responsibilities and obligations if they default on the contract. Rather it puts much emphasis and obligations on the side of the buyers if they default on the contract.
- It overemphasizes the role of the contractors in supplying inputs and providing technical support while undermining their role as market guarantors.
- There seems to be some ambiguity in relation to the need for clear pricing mechanisms vs establishing prices upfront.
- There is a general feeling that the proclamation is centered around control and administration by the government agencies rather than putting emphasis on facilitation and coordination.
- It does not give focus to the local customary arbitration and conflict resolution in case of disagreements among the parties. It purely focuses on the formal legal means to address conflicts.
- The proclamation needs to give direction or clue on how to address the current pressing issues of pricing, grading, quality standardization, etc. These elements are very crucial for the smooth operation or under performance of the value chain.

6.2 Contract Farming Practices

Contract farming within the malt barley sector is practiced for seed multiplication and output collection. There are four contracting agents for seed multiplication (1) seed enterprises (2) commercial seed producers (3) seed producer cooperatives (4) producer commercialization clusters. Details of seed multiplication contract farming are addressed in chapter 3. In this section the major emphasis will be on output contract farming practices.

Output contract farming is organized through interfaces (1) model farmers (2) primary cooperatives (3) farmers' unions (4) traders (5) micro-finance groups (6) producer commercialization clusters. There are two levels of contract under current practices: between company and interfaces and between interfaces and farmers. The contract between the company and interfaces is a formal agreement with details on (1) volume (2) price (3) quality (4) services (5) point of delivery. On the other hand, the contract between interfaces and the farmers follows a hybrid of formal and informal practices. There is no meaningful difference in performance between informal and formal agreements. Experience of companies who attempted to push the interfaces for a formal contract with farmers showed that the farmers often do not keep the paper, and, in many cases, they do not want to sign.

6.3 Assessment of Contract Farming Interfaces

Model Farmers Approach

Model/lead farmers are individual farmers who have (1) a track record in adopting new technology and practices (2) proven success from leveraging those technologies and practices (3) are open to sharing their knowledge with other farmers (4) have social capital within the community to influence and persuade and (5) has the experience and understanding of business dynamics in malt barley. The different companies have different track records in their use of model farmers as an interface. Heineken is a pioneer in conceiving and developing the approach of a model farmer. Heineken/Soufflet addressed over 75% of their contract farmers with over 80% success rate in achieving volume and quality targets respectively via model farmers. The key benefits of working through model farmers are (1) high trust by the community as the interfaces are farmers themselves (2) high commitment towards the contracting companies with less side selling (3) strong adherence to quality parameters since they also supply from their own farms. On the other hand, (1) some model farmers lack business licenses, receipts, and other formalities (2) limited geographic scope (often operate within their villages and neighboring territories) (3) lack of sufficient working capital and (4) limited bankability status is some of the difficulties of engaging with this group.

Primary Cooperatives Approach

Cooperatives as an interface were widely practiced by DIAGEO some years back. The company organized and capacitated 31 cooperatives to engage 6,000 farmers between 2013/14 and 2017/18. The major advantages of working through primary cooperatives are (1) they are owned by farmers (2) present at a ground level unlike unions (3) legal entities that meet formalities for contract (4) highly supported by the government (5) mostly have their own warehouses for output and input storage. However; (1) they have less drive and proactive mindsets compared to model farmers (2) slow decision making that emanates from committee-based management (3) highly influenced by the government bodies (4) high turnover of the committee members (5) lack the knowledge and experience of managing business relationship with giant buyers.

Farmers' Unions Approach

Compared to cooperatives, they have professional management and a bigger asset base. Unions play a crucial role in (1) input distribution (fertilizer, seed, chemicals) (2) providing different services such as agronomic/extension, machinery leasing or warehousing services (3) output marketing with the aim of stabilizing local prices to the benefit of farmers. On the other hand, unions tend to be highly bureaucratic and slow in decision making, lack the agility to cope with highly dynamic market contexts and do not have the local coverage and business focuses that primary cooperatives or model farmers have. However, the performance of unions as contracting units seems less robust; with less than 35% achievement of contract targets.

Traders Approach

These are individual traders based in the district or nearby towns and have direct business relationships with farmers. In many cases, they are grain traders but, in some cases, there are also agro-input dealers who end up as interfaces. Most of the traders are dealing with multiple product assortments-wheat, barley, linseed, or other cereals. They have a profound track record in trading and a well-established relationship with farmers. Traders are the most successful bodies next to model farmers as per evidence from the companies. The key advantages of traders' interface model are (1) dealing with legal business with a proven trading track record (2) already known to farmers (3) offering multiple products and services to farmers (4) better asset base including warehouse and transport (5) highly bankable and can mobilize own capital (6) social capital both with government and local community (7) provide opportunity for the breweries to serve as agents that maximizes the mutual inter dependence. On the other (1) lack of focus and grassroots presence (2) relatively limited experience or even interest in providing agronomic and extension support (3) tricking farmers with weigh scales and calculations (4) adulteration of different grades and therefore accused of quality (5) tendency to maximize their business interest over communal interest are some of the drawbacks of working with traders as interface.

Micro-Finances Approach

The micro-finance acts as intermediary risk mitigation and absorption agent between the companies, model farmers and individual farmers. In many cases, the micro finances are working with model farmers who do not qualify for credit from other sources or are deemed to be too risky for a direct deal with the companies. The model farmer collects the harvest with the support of MFIs in facilitating market day and aggregation spot. MFI model had over 80% achievement in terms of barley collection facilitation and 100% success in terms of repayment of credits. Despite the positive performance, MFIs are not allowed by law to directly collect and deliver grains. The main benefits of contract farming through MFI are (1) receiving interest-free pre-financing from the companies (2) lending the money to the model farmers with smaller interest rate (3) leveraging the platform to provide other financial products to contract farmers. However, the legal complications have limited the scale-up of this interface. In some cases, it is also expensive for the companies to pre-finance the MFI who often need big amounts to stay committed.

Producers Commercialization Clusters Approach

Even though there is no clear guideline or policy on consolidated land use right, the Ethiopian government is currently promoting producers' Commercialization Clusters. Farmers in the neighborhood are encouraged to grow the same crop with a full extension package primarily for the market. The ATI has been piloting and promoting the cluster producers' group for selected value chains including malt barley. Currently, the clusters are loose entities brought together to leverage shared practices. The government supports them to get access to finance and input credit through group collateral. In addition, the clusters are often connected to industrial buyers and key service providers (farm machinery). In the long term, the government is planning to license the commercialization clusters as business entities. However, discussions with the ministry and ATI reveal that there is little clarity on how these entities will be different from the regular cooperatives except for the dynamic vision set. In addition, issues such as shared risk management and mitigation, free riding and collective vs individual decisions are not clearly addressed.

6.4 Key Issues in relation to Contract Farming Practices

Contract Compliance and Enforcement

The current contract farming agreement is signed as per the commercial code of Ethiopia that barely accounts for the complex nature of smallholders as entities. Disagreements among the parties are handled through arbitration and finally civil court. As per the draft contract farming proclamation, the bureau of agriculture is expected to be the contract enforcing government unit. The major gaps on the draft proclamation have been highlighted in the previous section. Though the contract provides room for legal steps, going to court with farmers is practically impossible both for economic and social reasons. As such the companies tend to compromise on many of the contract defaults. Executive directives for the new contract farming proclamation should thoroughly consider the complexities in relation to enforcing law in business deals with farmers.

Contract Management - Coordination and Communication

Three crucial issues are noted in relation to coordination. First there is no harmonization in communication and coordination of efforts on the ground. Often the same farmer ends up engaging with more than one company. Second, the companies sometimes bypass the higher-level government bureaus-example zonal agricultural bureau, which then brings in conflicting priorities. Except for operational level coordination, there is no joint strategic planning and monitoring among key parties. Amongst the companies there is little joint effort to address sectoral issues through association than through ATI which is a government body and often mired with a number of other priorities. The newly established office of contract farming under the Agriculture Investment and Market Department of MoA at the federal level lacks guidelines on relation with regional and zonal offices.



7 KEY POLICY & STRATEGY RECOMMENDATIONS

Alternative Production

There are two pathways to expand production space for malt barley. Within the highland, malt barley production can be scaled up through intensification and extensification. In the traditional malt barley growing areas, intensification using irrigation systems is important to push. Malt barley production currently is concentrated in the southeastern highlands but with appropriate investment in extension and popularization it is possible to scale production within the central and northern highlands.

Mid and low land barley production should be seriously studied and considered in the midterm. For this, low and midland breeding programs for adaptation and development of appropriate varieties is important. The lowland areas offer big opportunity in terms of land availability and irrigation systems. In this regard, putting malt barley next to the national lowland wheat program is an opportunity that needs serious consideration.

Liberalized Seed Sector

The issues of company owned varieties, dominance of state enterprises in multiplication and distribution system has been noted as potential set-back for the seed sector. Three crucial policies and strategic issues are important to highlight. In order to minimize the risks of monopoly of seed by foreign companies, it is advisable to set up a purely commercial and trading systems of seed similar to vegetable and maize sectors. These commercial companies should handle import of basic seeds, development of appropriate local variety and get the right royalty fees from users. In relation to seed multiplication, a more vivid strategic direction on organizing, licensing and incentivizing commercial seed producer clusters is needed. In addition, the double role of multiplication and distribution by public seed enterprises should be reconsidered. The seed enterprises should solely focus on multiplication. It is advisable that the government liberalize the current seed distribution as in the case of agro-chemicals. Cooperatives can play a role but they should compete with the private seed distributors.

Public-Private Partnership for Breeding

While importing pre-basic seed from abroad might generate a quick win, reliance on imported breeds has multiple risks. In this regard, launching a national breeding partnership in collaboration with companies, research institutes and the ministry of agriculture is essential. Ethiopia is believed to be the origin and center of diversity (has a greater number of germplasm) for barley with 2,500 accessions reported. Cross breeding effort with appropriate resourcing, focus and strategic roadmap can deliver the required change.

Sustainable Soil and Land Management Package

The current extension system heavily focuses on yield maximization within the short term than sustainable land and soil management which is crucial for improved yield over a period of time while keeping soil healthy. Sustainable soil and land management packages go beyond promoting certain fertilizer types targeting immediate yield. Issues such as rapid soil testing, packages for organic and inorganic fertilizer, lime treatment, farming practices including crop rotation strategies are essential issues that need to be embedded. In this regard nurturing a national soil-oriented extension is a crucial step for highland farming in the country.

Due to the severity of acidity of soil in most highland the country, government undertook various initiatives like lime application and acidic soil treatments. The necessity of fertilizer increased especially as acidic soil in Ethiopia increases. It is difficult to achieve maximum productivity on this acidic soil, unless it is treated. Three major interventions could be foreseen - liming to treat acidic soil, cultivating acid resisting crops and promoting organic fertilizer to heal the land. Hence, companies and development partners should also join the initiatives to enhance farmers' productivity by promoting lime application and organic amendments (like using crop residues and pulp). All these efforts has to be aligned with the up-to-date soil fertility data based on Ethiopian Soil Information System (EthioSIS).

Legal and Regulatory Landscape for Domestic Fertilizer Production

As stated in the above sections, Ethiopia is solely dependent on imported inorganic fertilizer and did not exploit the local opportunities. The continuous global price increase, the volatility of global political situation, increasing demand of fertilizer and the critical shortage of forex makes it a riskier and burning issue for the country. Hence, it is timely to explore the untapped local opportunities to produce inorganic and organic fertilizers at smaller scale. Moreover, it is sustainable to promote bio fertilizers (inoculants, compost, bio slurry etc.) given the huge potential that the country has. To make this happen, the government has to put in place conducive legal and policy issues to promote organic fertilizers and promote an enterprise business approach. It is important to scale up the initiatives of Yara International and OCP and exploit the country's abundant raw material like potash.

Quality and Availability of Crop Protection Products (CPPs)

The availability of Crop Protection Products is severely hindered due to lack of forex and complex registration procedures. Given the importance of agro-chemicals, timely allocation of forex for these products in due course is essential. A proper dialogue between appropriate government bodies and the private sector is needed to estimate practical demand, plan supply and allocate required forex. The current registration procedure should be shortened particularly for chemicals with known active ingredients and multiple agents should be allowed to import with fast registration trajectory. In relation to quality, it is advisable to promote private sector/company-importer led extension support and quality inspection along the supply chain. The role of the major chemical importers should not be limited to labelling and selling products; proper extension backstopping and compliance towards that is essential. Likewise, the government should have agro-chemical inspection and extension package to ensure safe and appropriate product utilization by farmers.

It is also worthwhile to encourage national/International companies for the production of CPPs locally. For instance, factories like Adami Tulu Pesticides Processing S.C could be encouraged and capacitated to produce some basic CPPs required for malt barley. This has huge contribution for forex Saving and import substitution agenda of the Ethiopian government.

More importantly there should be a serious focus Integrated Pest Management (IPM) as an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. Use comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. Explore and apply cultural and traditional practices available with farmers to control and protect diseases and pests.

Malt Barley National Statistics

The sheer contribution of the malting and beverage industry to the national economy justifies the need to keep proper data on inputs and outputs. The government should start compiling separate data on malt barley production, seed multiplication and distribution. This not only creates market stability and predictability but also enables new investors to grasp the opportunity and the investment requires a reasonable degree of confidence. An important step in this regard is the CSA agricultural sample survey to include separate lines for food barley and malt barley.

Product Market Deregulation

Issues such as floor price setting by the government contradict free market principles. Such step might have a positive impact at the early stage of the extension and popularization, however, with increasing acceptance of the product by farmers and continued investment by the companies, the government should leave that role to the market actors. The same can be said about seed and other inputs market deregulation, which promotes investment that enhances long-term market stability over short term price affordability.

Realistic Contract Farming Enforcements Mechanisms and Mechanization Services

Every year, companies make huge investments to support farmers and thereby enhance production and productivity of malt barley. From current practice, this does not guarantee them to get the barley for commercial purchase. Farmers have a high tendency to sell their barley to anyone who provides a little higher price, Hence, there is high level of contract default and side selling. Recently the government drafted an "Agricultural Production Contract Proclamation" and it is on a table to be endorsed by the parliament. Hence, it is absolutely crucial to put in place appropriate contract enforcement mechanisms that addresses the interest, roles and responsibilities of all parties in the contract.

Moreover, together with contract farming, it is crucial to enforce mechanization services and crop rotations practices as a package. Mechanization services need to be strengthened using the cluster farming approach. Mechanization services need to go beyond the current scattered ways and need to be supported by AgTech using agent model.

Strengthening the Input Distribution Channels

The existing input distribution channels need to be strengthened as most of them are not operating fully and efficiently. Interventions in the form of capacity gap assessment and Interventions to be taken based on the identified gaps. For example, the one stop farm service/farm service centers carry very few and seasonal products/ that do not make them operational throughout the year.

Finance and Insurance Products

Government should have a proper legal and regulatory system that facilitates finance and insurance for farming. In this regard, developing appropriate contract financing structures by banks is essential. The government should give some regulatory backing to banks who finance by taking contracts as guarantee. It is to be noted that the NBE currently requires collateral as a loan guarantee. Likewise, the current regulation that doesn't account for insurance reselling should be revised. At national level allocation and performance evaluation of banks based on their credit allocation to agriculture and agribusiness at different levels should be incentivized by some sort of relaxation of reserve or forex requirements by the national bank. The current policy that prohibits MFIs from facilitating access to inputs should be relaxed as they are crucial grassroot enterprises who bring in finance, input and business development services in one place.

Design Harmonized and Compressive Extension System

Public-Private Extension Partnership should be given an appropriate policy and strategic focus. The private sector brings dynamism to the wider grassroots presence of the public sector. In this regard, sector level harmonized extension package and system is useful to develop by the public and private partners - i.e., extension packages and development trajectory should be designed and implemented based on farmers' capability and skills. The harmonized extension system should be dynamic as per local and farmer context and be able to account for key issues such as data recording, input-service package, offerings and channels, farmers' graduation from extension school and return anticipated should be clearly stipulated in the system. In most cases, the same farmer goes through the same training for decades.

Contract Farming Incentives for Companies

Companies like Heineken put huge investment for malt barley development over the last 10 years and pioneered the local sourcing agenda. This approach significantly supported smallholder producers, aggregators, and other intermediaries in the chain and more importantly the country has saved close to \$ 800 million in import substitution. To make such investments more attractive and sustainable, the Ethiopian government should design and provide various incentives and encouragement mechanisms for these companies. These could be tax incentives, investment security/protection, profit repatriation, access to forex, access to land, recognitions for local sourcing. By introducing such incentives, sustainability of contract farming relationships can be enhanced, and the companies will have more business cases to invest in grassroots initiatives. It is to be noted that this is beyond the excise tax rebate which is given to all companies irrespective of their local sourcing.

Malt Barley Roadmap for Local and Export Market

Considering the potential and the progress of the malt barley sector over the last decade, production and productivity can increase in multiple folds. The recent government wheat program has shown that possibility to not only domestic self-sufficiency but also tapping region export opportunities is viable. In this regard, there should be well designed national malt barley development strategy and implementation roadmap with the aim of domestic self-sufficiency and export target. The poor performance of malt barley in major producing countries like Europe, the Russian-Ukraine war, serious forex demand of the country and export orientation of the government gives more fertile ground for export promotion of malt barley.

As per the malt demand projection in the above sections and the local malt production capacities, there will be malting capacity limitation starting from 2026 (shortage of about 10,000 Tn of malt in 2026). Hence, there should be additional malting capacity or capacity extension starting from 2026 and beyond to be self-sufficient and look for export. Parallel to this, there should be a continuous support to malt barley production and ensure price and quality competitiveness.



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