

REPORT



Ethiopia National Logistics Masterplan Diagnostics Study
NKE12: Warehousing and Logistics Systems Expert - Draft
June 2023



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1 Objectives

The warehousing and Logistics Systems Expert (NKE12) will be one of the non-key experts in charge of conducting the Diagnostic Study for the Ethiopia National Logistics Masterplan.

The primary objective of the overall diagnostic study is to provide information and statistics on surface-based freight logistics in Ethiopia that can be used by the team of experts who will do the Logistics Masterplan and Implementation Plan. The plan is to study and gather information about the main trades of the country so recommendation could be made for the development of the sector. In this regard, the Warehousing and Logistics Systems expert will provide a deep understanding on the Inland Container Depots (ICD) and warehouse market in Ethiopia as well as a strategy for the development of the sector based on main opportunities and involving both private and public sectors.

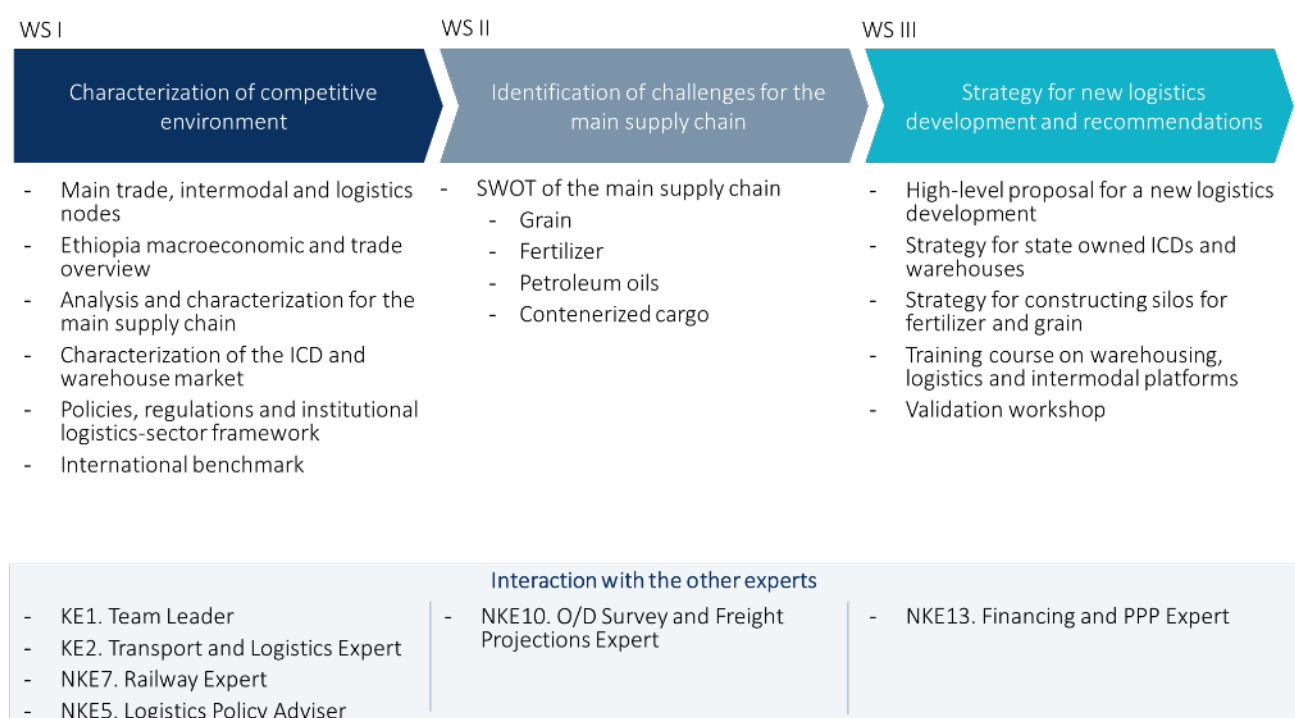


Figure 1. Working methodology for the Logistics System Expert (NKE12)

Work stream I focuses on the characterization of the competitive environment, highlighting the main trade, intermodal, and logistics nodes. Additionally, it examines the ICD (Inland Container Depot) and warehouse market, surface-based freight logistics projects, policies, regulations, and the institutional logistics-sector framework. Moreover, this work stream includes mapping of the different supply chains, offering insights into their structure and dynamics.

In work stream II, the document delves into the identification of challenges faced by the main supply chain, specifically addressing the Grain, Fertilizer, Petroleum oils, and Containerized cargo segments. A SWOT analysis is conducted, providing a comprehensive understanding of the strengths, weaknesses,

opportunities, and threats associated with each sector. By assessing these factors, the document aims to uncover potential areas for improvement and highlight key considerations for enhancing the efficiency and effectiveness of the main supply chain.

Finally, work stream III focuses on formulating a strategy for new logistics development and providing relevant recommendations. This work stream encompasses a high-level proposal for a new logistics development, with a particular emphasis on state-owned ICDs and warehouses. Additionally, it outlines a strategy for constructing silos dedicated to storing fertilizer and grain, aiming to optimize storage capacity and enhance supply chain resilience. Furthermore, this work stream proposes a training course on warehousing, logistics, and intermodal platforms to develop the necessary skills and knowledge within the workforce. Lastly, a validation workshop is suggested, allowing stakeholders to review and provide feedback on the proposed strategies and recommendations.

By addressing these three work streams, this document seeks to provide a comprehensive analysis of the competitive environment, identify challenges within the main supply chain, and offer strategic recommendations for new logistics development. This holistic approach aims to support informed decision-making and foster sustainable growth in the logistics sector.

2 Characterization of competitive environment

2.1 Ethiopia macroeconomic and trade overview

Ethiopia is a landlocked country located in the Horn of Africa with a population of 120 million people in 2021 and a GDP of 111 Bn USD in 2021, with low GDP per capita (925 USD) compared to the Sub-Saharan Africa average (1,663 USD)¹.

Addis Ababa is the capital and largest city of Ethiopia, but rural population accounts for 78% of total population. Most of the Ethiopia's population is concentrated in Central and Northern of Ethiopia, particularly in areas such as the Oromia region and the city of Addis Ababa, as shown in the figure below. Moreover, Addis Ababa boasts a higher GDP per capita compared to other regions, resulting in a greater consumption rate and a wider range of available products. In contrast, rural regions situated farther from the capital tend to have a higher proportion of people living below the poverty line. consequently, consumption patterns in these regions primarily revolve around basic commodities, reflecting lower levels of economic prosperity.

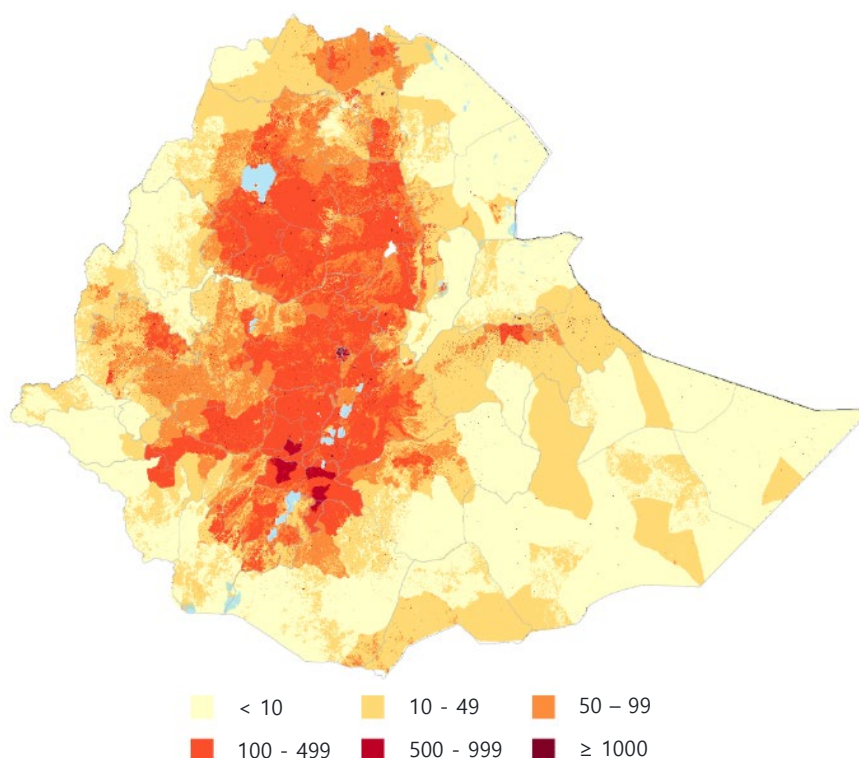


Figure 2. Population density in Ethiopia in inhabitants per square kilometre (Source: AfriPop)

Moreover, Ethiopia's economy is mainly based on agriculture, which accounts for 46% of GDP and 85% of total employment. The agricultural sector is organized through smallholder farmer agriculture.

¹ World Bank

Agriculture serves as the primary economic activity in Ethiopia, primarily concentrated in the northern and central regions, with a notable presence in the Oromia region. The country's agricultural sector produces a wide range of products, including grains (particularly wheat), oil seeds, coffee, cotton, sugarcane, and vegetables. While most of these products are intended for export markets, wheat production is fully focused on meeting domestic consumption needs for flour production.

It is worth noting that the flour milling industry in Ethiopia is currently operating at less than 50% of its capacity. Additionally, approximately one third of the existing flour mills are located in Addis Ababa, to cater to the high demand within the region. These mills play a crucial role in processing wheat into flour for local consumption.

The textile industry is also important because several foreign clothing brands manufacture their products in Ethiopia, especially around Addis Ababa. However, textile production is mainly export-oriented. The same applies to mining, which is also gaining importance in Ethiopia. The following figure shows the distribution of national production.

As shown in the following figure, the Amhara and Oromia regions account for around 93% of the total wheat production in the country (34% in the Amhara region and 59% in the Oromia region in 2014 Ethiopian Calendar, 2021-2022 Gregorian Calendar). The consumption of wheat is also concentrated in these regions due to the highest population. Regarding coffee, the Oromia region accounted for around 72% of the total production in 2014 Ethiopian Calendar.

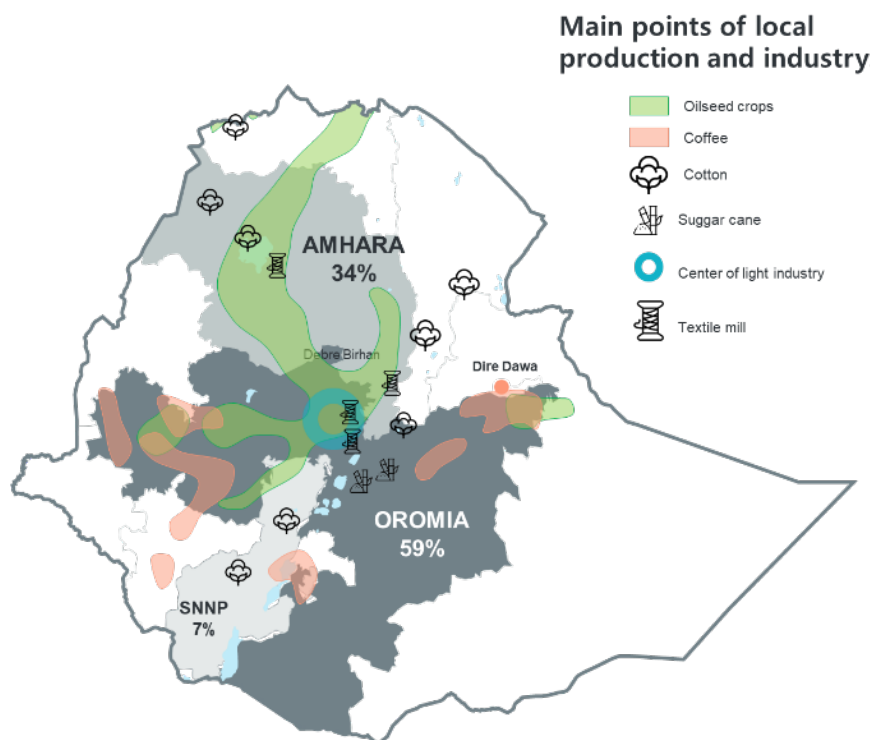


Figure 3. Distribution of domestic production in Ethiopia

Inside Ethiopia there is a significant flow of agricultural products (and mining products but to a lesser extent) from the rural Northern and Central regions towards the capital. Most of the cotton is used in the textile industry around Addis Ababa. There is also a flow of basic commodities, such as food, wheat, and fertilizers, from the capital (as intermediate stop from international markets) towards the rural regions.

Ethiopian trade is characterized by an imbalance towards imports, with low export volumes per capita compared to the Sub-Saharan Africa average. In 2021, Ethiopia exported 4.62 Bn USD (1.49 Mn tons) in products while it imported 13.44 Bn USD (8.08 Mn tons) in products². Nevertheless, Ethiopia has abundant natural resources which represent great future opportunities for trade, especially as regards the agricultural and mining industry.

It is worth noting that Ethiopia is part of the African Continental Free Trade Area (AfCFTA), which promotes intra-Africa trade. Moreover, Ethiopia is at the final stages of negotiations to join the World Trade Organization (WTO), which would allow to implement a clear export and import policy to boost international trade.

Nevertheless, in 2022 Ethiopia was removed by the US government from the AGOA (African Growth and Opportunity Act), which is a program that provides several sub-Saharan African countries with duty-free access to the US market. This has led to a reduction of the production of several Ethiopian industries which benefited from this program, reducing trade with the United States.

In 2021, the top imports of Ethiopia in value were machinery, wheat and mineral fuels, while in volume they were mainly wheat and mineral fuels. This is due to the difference in the price per ton of each product, especially regarding machinery.

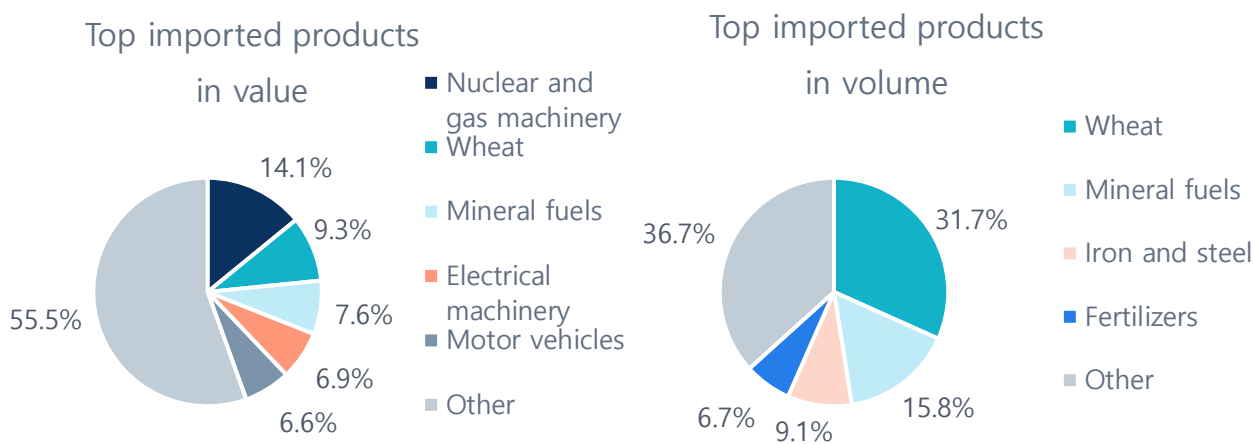


Figure 4. Main imported products in Ethiopia in 2021 (Source: UN Comtrade)

The main origins in value were China and India, while in volume they were Ukraine and the United States². This disparity is mainly because China and India are the main origins of machinery and cars, while Ukraine and the United States are the main origins of wheat, which has a much lower price per ton than other commodities.

² UN Comtrade

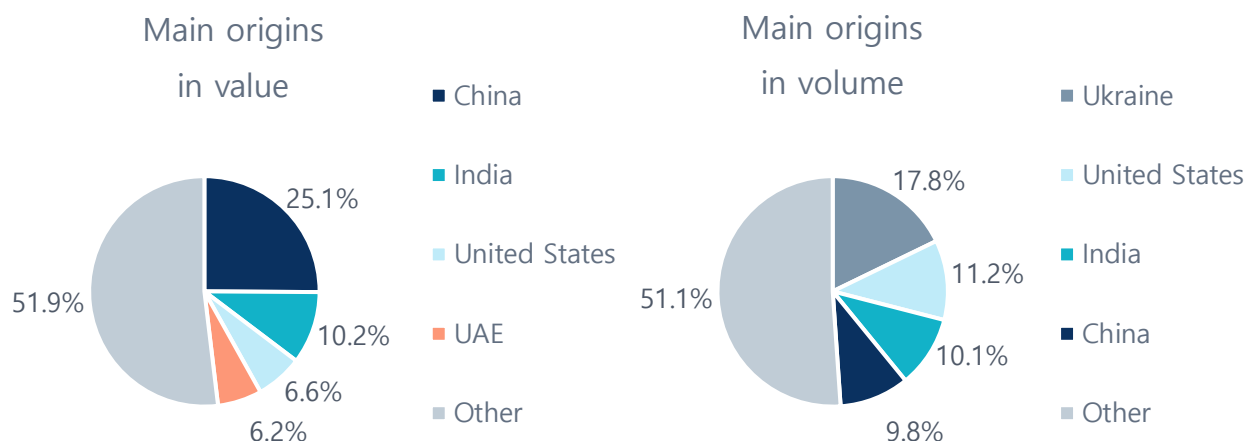


Figure 5. Main origins of Ethiopian imports in 2021 (Source: UN Comtrade)

The following figure shows the evolution of imports in Ethiopia during the 2015-2021 period. They reached a peak in 2016 and have steadily decreased ever since at an average CAGR of 9.5% due to the depreciation of the local currency against the dollar and to the restrictions imposed by the government to deny foreign currency to businesses importing non-priority goods. The lack of foreign currency hinders the purchase of foreign products.



Figure 6. Imports evolution in million tons (Source: UN Comtrade)

Regarding exports, the top exports of Ethiopia in 2021 in value were coffee and gold, while in volume they were vegetables, oil seeds and coffee². This is due to the difference in the price per ton of each product, especially regarding gold.

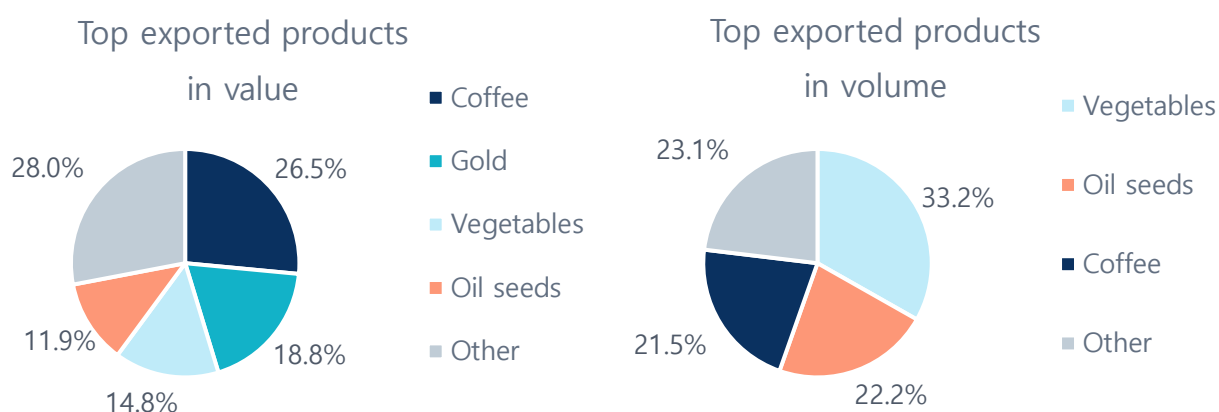


Figure 7. Main exported products in Ethiopia in 2021 (Source: UN Comtrade)

The main destinations in value were the United Arab Emirates and the United States, while in volume they were Somalia, India, and Djibouti, among others². This disparity is mainly since the United Arab Emirates is the main destination of Ethiopian gold, which has a much higher price per ton than agricultural products.

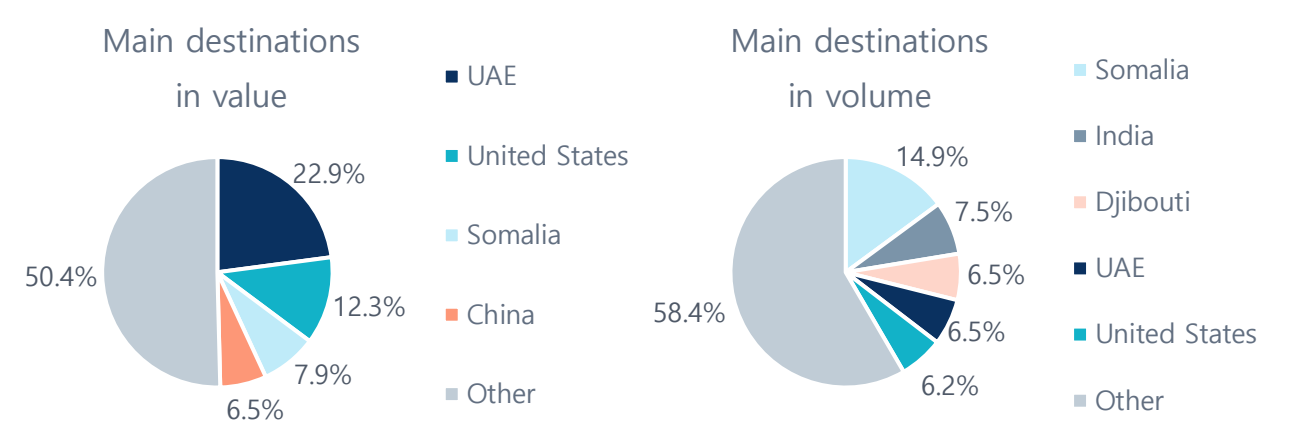


Figure 8. Main destinations of Ethiopian exports in 2021 (Source: UN Comtrade)

The following figure shows the evolution of exports in Ethiopia during the 2015-2021 period. They have increased at an average CAGR of 3%, although they reached a peak in 2019 and dropped in 2020 due to the pandemic and are still recovering.

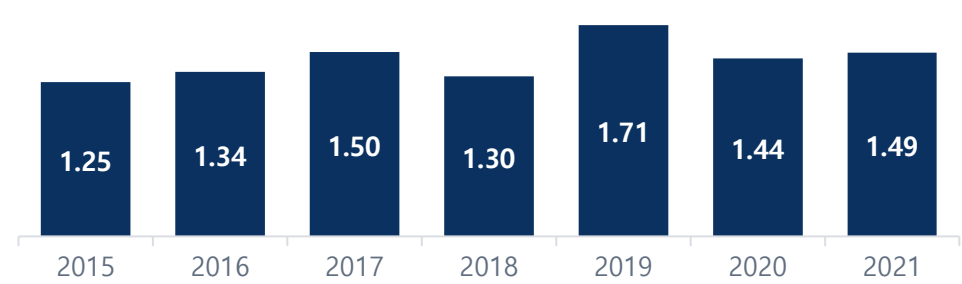


Figure 9. Exports evolution in million tons (Source: UN Comtrade)

2.2 Analysis and characterization of the main supply chains

The most relevant supply chains for the country’s trade have been analysed in detail. These include the grain, fertilizers, liquid bulk and the containerized cargo. For these supply chains the main processes, stakeholders as well as the key challenges have been identified below.

2.2.1 Grain supply chain assessment

2.2.1.1 Grain foreign trade

Ethiopia is highly dependent on imported grain, especially wheat, meeting just over 70% of demand with domestic production in 2021 and importing about 30%³. In fact, in volume, wheat was the most imported product in Ethiopia in 2021; the third most imported product in 2020 after mineral fuels and fertilizers; and the third most imported product in 2019 after mineral fuels and iron and steel².

However, grain imported volumes have little consistency from year to year as they depend on domestic crop productivity, as well as on natural disasters, war conflicts or other emergencies which lead to famine conditions. As shown in the figure below, wheat imports doubled in 2016 and 2021 compared to the average volumes of other years. In 2021 this increase was stimulated by several factors:

- **Removal of all the related taxes on imported wheat** by the Ethiopian government in 2021, which caused informal wheat imports to become legal (which were not previously counted)
- **Civil war from November 2020 to November 2022** in the Northern part of Ethiopia (Tigray, Amhara and Afar regions), which affected wheat production in the concerned regions and resulted in several million Internally Displaced People (IDP) who required food aid. Farm tools were destroyed, oxen used to plow farmlands were killed and it was very hard to obtain seed and fertilizer. Consequently, farmers lost many of their assets and the affected regions fell into emergency and famine conditions. This led to a peak of over 5 million conflict induced internally displaced people (IDP) in Northern Ethiopia requiring wheat supplies
- **Future price uncertainty** due to rising wheat prices (39% increase between 2021 and 2020) and foreign currency shortage (ETB depreciation), which stimulated storage policies

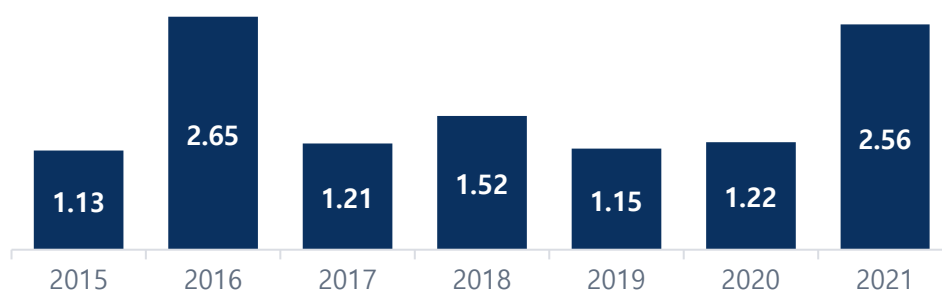


Figure 10. Wheat imports evolution in million tons (Source: UN Comtrade)

Ukraine's war is currently affecting wheat supplies (with logistical disruptions) because Ethiopia depends on Russia and Ukraine for commercial wheat purchases due to their low prices and transportation costs compared to other countries such as the United States. Nevertheless, wheat imports volumes are expected to stabilize in 2022 and 2023 due to the end of the Tigray civil war and the stabilisation of wheat prices.

There are signs that the wheat sector in Ethiopia is undergoing a significant transformation and that production is increasing. More and more hectares of land are put under wheat cultivation each year and overall productivity is increasing. In 2014 in the Ethiopian Calendar (September 2021 to September 2022

³ Global Agricultural Information Network (GAIN)

in the Gregorian Calendar), wheat production in Ethiopia was of 5.66 Mn tons (with 1.95 million hectares of wheat harvested area), which represented a 2% increase over the 2013 Ethiopian year (5.55 Mn tons), which in turn represented a 11% increase over the 2012 Ethiopian year (4.99 Mn tons). Moreover, wheat production is expected to reach a record level in 2015 in the Ethiopian Calendar (September 2022 to September 2023 in the Gregorian Calendar).

This transformation is being encouraged by the Ethiopian government, who has dedicated more resources to the production of wheat, such as intensive extension support, irrigation development, and partly mechanized farming systems. In addition, a Wheat Sector Development Strategy has been adopted to improve the production and productivity of wheat, promoting improved high yielding and disease-resistant wheat varieties.

The Ethiopian government is also trying to add a third crop production season during the summer by utilizing new agricultural machines and new irrigation schemes. This new season will be added to the short crop production season from February to May (Belg season) and to the main crop production season from May to September (Meher season).

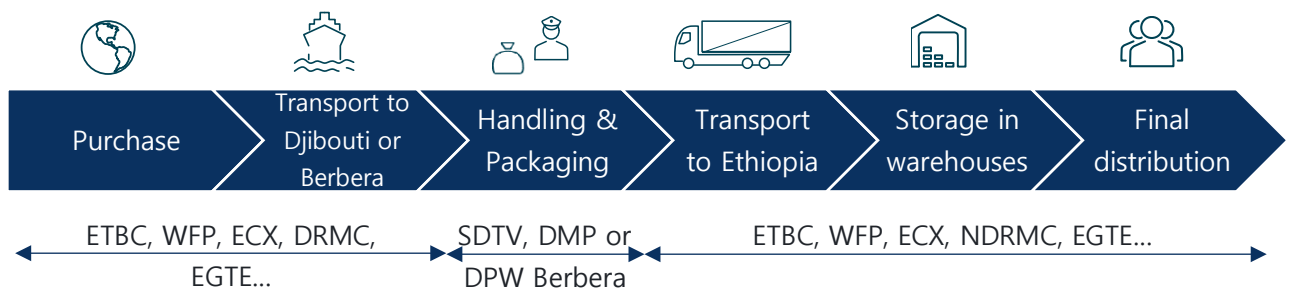
As regards wheat consumption, according to the Global Agricultural Information Network, it was of 7.17 Mn tons in 2014 Ethiopian year and of 7.08 Mn tons in 2013 Ethiopian year. This consumption growth is caused by population growth, urbanization, internal displaced population, and increasing household income, among others.

The Ethiopian government plans to reduce reliance on food imports and to stop importing wheat in the short-term. In fact, they aim to export wheat thanks to the new summer crop production season. The government has already reached an official agreement with Kenya to export wheat, and another agreement with Djibouti is in progress. Nevertheless, this is still unrealistic because Ethiopian wheat production is still below domestic consumption and because production costs remain relatively high by global standards.

In terms of countries, wheat was mostly imported from Ukraine (47%) and the United States (28%) in 2021, from the United States (61%) in 2020 and equally distributed among the United States, Ukraine, Romania, and Russia before 2020⁴. Ukraine is gaining importance as origin of wheat imports because their prices and transportation costs are increasingly lower than those of the United States.

2.2.1.2 Grain supply chain characterization

⁴ Observatory of Economic Complexity (OEC)



The grain consumed in the country can be divided in two main categories: local production and imports. The grain produced in Ethiopia is aggregated by farmers at cooperative societies, local markets, and other designated locations. The quality of wheat is assessed through various tests, and afterwards it is packed in sacks or bags. It is then transported and stored in warehouses because Ethiopia does not have a proper network of silos.

As for the grain imported into Ethiopia, demand is forecasted and aggregated independently by different organs, such as the state-owned Ethiopian Trading Businesses Corporation (ETBC), or several food-aid organizations like the World Food Programme (WFP), and the National Disaster Risk Management Commission (NDRMC), among others. Their lack of coordination and integration, as well as the highly manual system for forecasting demand, lead to inaccurate stock management. These organs are responsible for the procurement and distribution of grain throughout Ethiopia.

The imported grain arrives mainly through the Port of Djibouti, both at the SDTV Terminal and the Doraleh Multi-purpose Terminal (operated by DMP), but also, to a much lesser extent, through the Port of Berbera in Somalia (operated by DP World) (mainly the WFP). Vessels are unloaded with suction machines, and the bulk grain is then stored in the port warehouses. Officials inspect the imported grain to verify the quantity, quality, and compliance with regulatory requirements. This involves examining shipping documents, conducting physical inspections, and collecting samples for laboratory analysis if necessary.

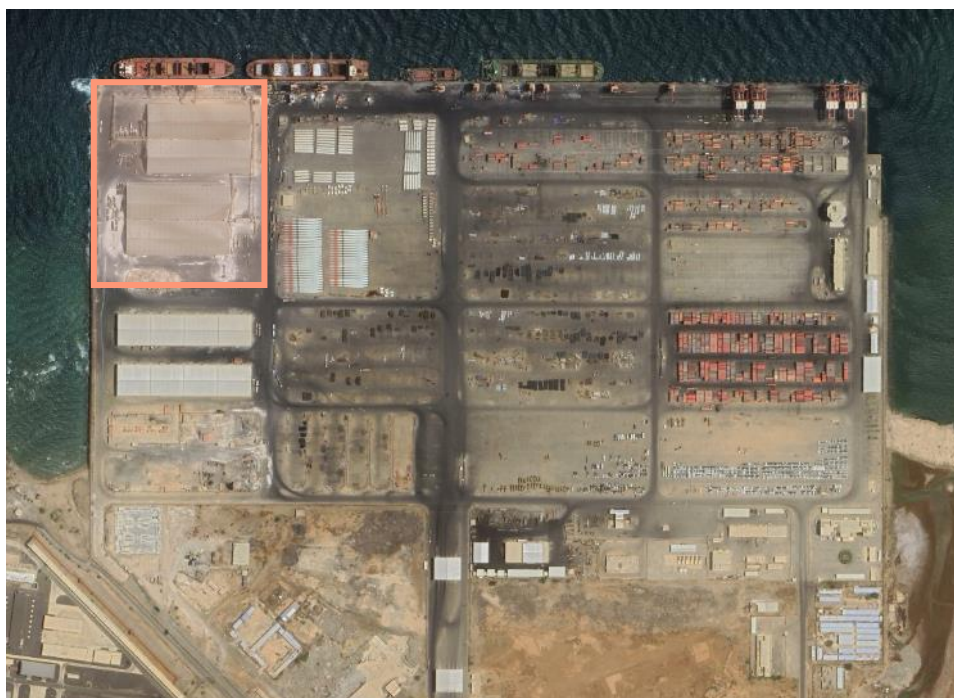


Figure 12. Doraleh Multi-purpose Terminal at the Djibouti Port (grain warehouses in the top-left part)



Figure 13. SDTV Terminal at the Djibouti Port (grain warehouses in the top-right part)



Figure 14. Berbera Port in Somalia (grain warehouse in the top-right part)

The grain is packed in sacks or bags at the port facilities before being transported to Ethiopia. The sacks are loaded onto the trucks from the bagging area. It is worth noting that the Ethio-Djibouti Railway is far from the grain terminals and, therefore, it would be necessary to load the sacks onto the trucks, transport them to the railway station, and move them again from the trucks onto the trains. This is one of the reasons why currently the grain transport both from Djibouti and Berbera to Ethiopia is fully carried out by trucks.

The trip is very long and expensive due to the general poor condition of the road, especially along Djibouti, and several informal checkpoints can also be found. Furthermore, most of the trucks are in poor condition due to the high cost of maintenance and the difficulty of obtaining spare parts due to the lack of foreign currency in Ethiopia. According to the World Food Programme (WFP), a truck can only make a maximum of 2.7 roundtrips per month between Djibouti and Addis Ababa (900 km). Once in Ethiopia, the imported sacks of grain are stored in warehouses.

The lack of qualified personnel in Ethiopia's warehouse system is noteworthy because it leads to long loading/unloading and shifting times. Most warehouses are not specialized in grain and are at an advanced stage of their useful life. Their overall security is fair, and their management systems are still manual in most cases, without IT systems. This leads to serious planning issues, resulting in poor stock management and long storage, dwell, and turnaround times. It can also lead to the contamination of grains stored for long periods of time. The general lack of coordination and integration between all procurement bodies makes it difficult to find available warehouses and leads to poor control of warehouses prices. In addition, the seasonality of grain production causes warehouses to be under-utilized during some months of the year.

The distribution of wheat from warehouses to final destinations (retailers, flour mills, food processing companies or refugee camps, among others) is typically carried out by multiple entities, such as wholesalers or NGOs. At the final destinations, the wheat or wheat-based products are made available to end customers.

The Ethiopian government plans to stop importing wheat in the short-term and even to export it. They have already reached an agreement with Kenya to export wheat, and another agreement with Djibouti is in progress. Nevertheless, this is still unrealistic because Ethiopian wheat production is still below domestic consumption and because production costs remain relatively high by global standards.

2.2.2 Fertilizers supply chain assessment

2.2.2.1 Fertilizers foreign trade

Ethiopia is also highly dependent on imported fertilizer for their crops. In fact, in volume, fertilizers were the fourth most imported product in Ethiopia in 2021 after wheat, mineral fuels and iron and steel; the second most imported product in 2020 after mineral fuels; and the fourth most imported product in 2019 after mineral fuels, iron and steel and wheat².

However, imported volumes have little consistency from year to year because they depend on domestic crop productivity, as well as on natural disasters, war conflicts or other emergencies which affect crops. As shown in the figure below, fertilizers imports halved in 2021 compared to the annual volumes of the previous years, stimulated by the rising prices (124% increase between 2021 and 2020) and the civil war, which made it very hard for the Tigray, Amhara and Afar regions to obtain fertilizers.

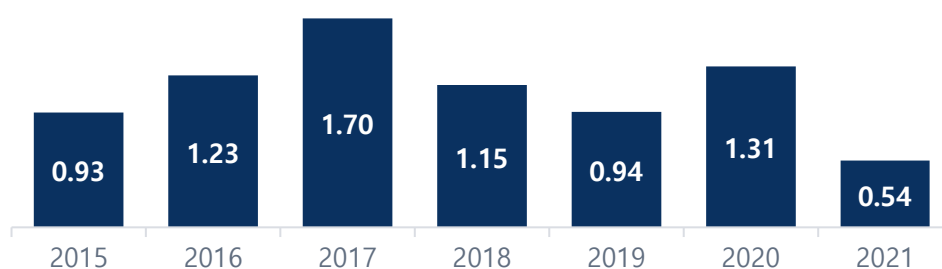
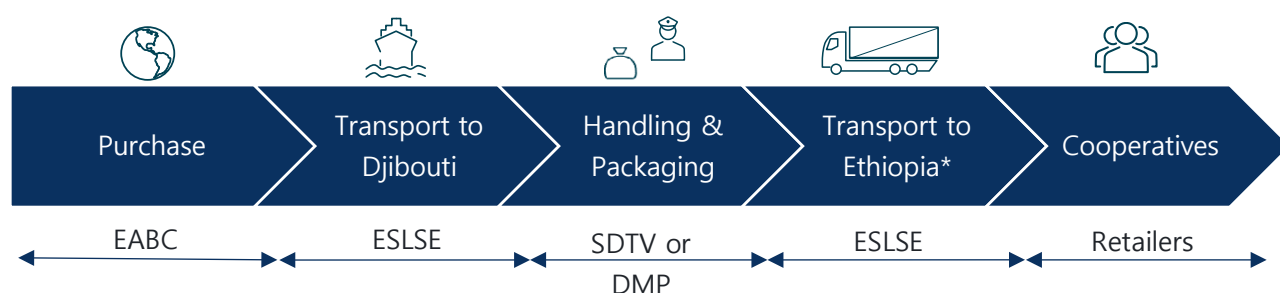


Figure 15. Fertilizers imports evolution in million tons (Source: UN Comtrade)

Fertilizers imports volumes are expected to stabilize in 2022 and 2023 due to the end of the civil war and the stabilisation of prices. Furthermore, the expected increase in wheat production will require larger volumes of fertilizers.

In terms of countries, fertilizers were mostly imported from Egypt (40%), Morocco (32%), the United Arab Emirates (11%) and Saudi Arabia (7%) in 2021. Mineral and chemical fertilizers were mostly imported from Morocco (84%), while nitrogenous ones mostly from Egypt (59%) and the Middle East⁴. The trend was similar in previous years.

2.2.2.2 Fertilizers supply chain characterization



**The Modjo Dry Port warehouses are used in case of emergency*

Figure 16. Fertilizer supply chain and stakeholders involved

Ethiopia has made efforts to develop its domestic fertilizer production capabilities in order to support its agricultural sector. Several fertilizer production plants have been established and the government has implemented policies and initiatives to encourage investment in the fertilizer sector, including providing incentives and facilitating partnerships with both local and international companies. The primary goal is to reduce reliance on imports and ensure a stable supply of fertilizers for farmers, making them more affordable and accessible. After production, the fertilizers are packaged and labeled and afterwards stored in warehouses.

Despite the efforts, Ethiopian fertilizer production is still at infancy level and most fertilizers consumed in Ethiopia are still imported. The demand forecast starts at local kebele level, and Development Agents (DA) collect farmers' requirements, which are then gradually aggregated at woreda, zone and region levels by the respective cooperatives. The final aggregation at national level is carried out by the Ministry of Agriculture (MoA) for procurement by the Ethiopian Agricultural Businesses Corporation (EABC). Just like for the grain, the demand forecast is inaccurate because it follows a traditional manual system.

After the purchase by EABC, fertilizer transport to Ethiopia via Djibouti is handled by the Ethiopian Shipping and Logistics Services Enterprise (ESLSE). ESLSE offers both multimodal and unimodal transport services. The multimodal transport service is a door-to-door cargo service from the port of origin to Modjo Dry Port via Djibouti port and ESLSE acts as multimodal operator. The unimodal transport service by contrast involves only one mode of transportation and services are disintegrated, with many operators and agreements involved. Fertilizer imports generally correspond to unimodal transport service.

They arrive through the Port of Djibouti, both at the SDTV Terminal and at the Doraleh Multi-purpose Terminal (operated by DMP). Vessels are unloaded with grabbing machines, and the fertilizers are then stored in the port warehouses for customs clearance inspection, which tends to be a slow process. As the arrival of shipments is not planned, warehouses stock cannot be properly organized.

Officials inspect the imported fertilizers to verify their quantity, quality, and compliance with regulatory requirements. This involves examining shipping documents, conducting physical inspections, and collecting samples for laboratory analysis if necessary.

The fertilizer is packed in sacks or bags at the port facilities before being transported to Ethiopia. The sacks are loaded onto the trucks from the bagging machines. As the Ethio-Djibouti Railway is far from the fertilizer terminals, currently the fertilizer transport from Djibouti to Ethiopia is fully carried out by trucks. Just like for the grain, the trip is very long and expensive due to the general poor condition of the road, especially along Djibouti.

Once in Ethiopia, the imported sacks of fertilizer are directly transported to various cooperatives across the country, where fertilizers are sold to farmers. In some of the cases the cooperatives don't have the warehouses ready to host the product and they need to find alternative solutions. The retailers provide little guidance and recommendations to farmers regarding the appropriate use of fertilizers for specific crops and soil conditions. The fertilizers provide essential nutrients to the soil, promoting healthy plant growth, increased yields, and improved agricultural productivity.

Nevertheless, when there is an emergency or when the cooperatives do not want more fertilizer or don't have the capabilities to store more product, the sacks are stored at the ESLSE-managed Modjo Dry Port, which has two warehouses specialized in fertilizer that act as buffers. Overall, there are planning issues in the supply chain, resulting in poor stock management and long storage, dwell, and turnaround times. In addition, the seasonality of fertilizer consumption causes warehouses to be under-utilized during some months of the year.



Figure 17. Fertilizer warehouses at the Modjo Dry Port

2.2.3 Petroleum oils supply chain assessment

2.2.3.1 Petroleum oils foreign trade

Ethiopia is also highly dependent on imported petroleum oils. In fact, in volume, petroleum oils were the second most imported product in Ethiopia in 2021 after wheat and the first most imported product in 2020 and 2019. However, petroleum oils imports have decreased over the 2015-2021 period due to the depreciation of the local currency against the dollar and to the difficulty to obtain foreign currency. Furthermore, petroleum prices have increased significantly over the last years, especially between 2019 and 2021 (95% increase), leading to an 80% decrease of imports during that period.

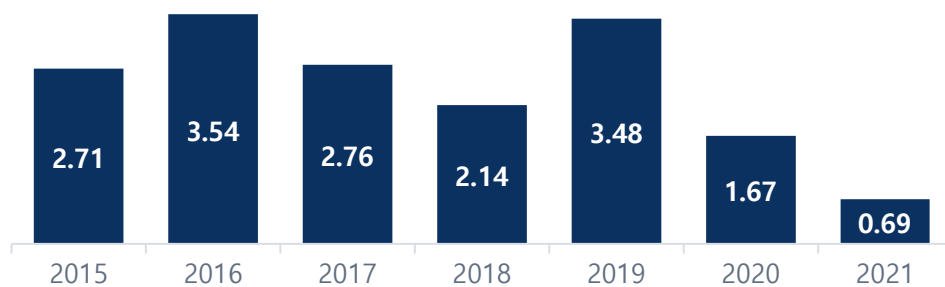


Figure 18. Petroleum oils imports evolution in million tons (Source: UN Comtrade)

In terms of countries, Kuwait is the main importer of petroleum oils in Ethiopia (59% in 2021, 43% in 2020 and 78% in 2019), followed by other Middle East countries such as the United Arab Emirates or Saudi Arabia⁴.

2.2.3.2 Petroleum oils supply chain characterization

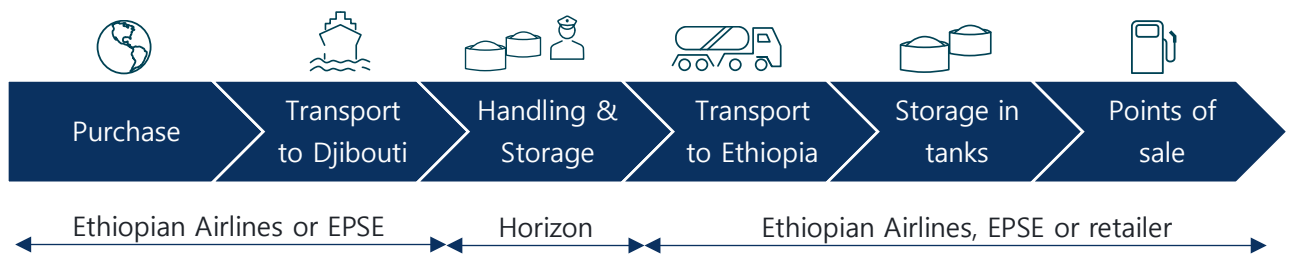


Figure 19. Petroleum oils supply chain and stakeholders involved

All the consumed petroleum oils in Ethiopia, including crude oil and refined petroleum, are imported. Ethiopian Airlines directly imports its own part, while Ethiopian Petroleum Supply Enterprise (EPSE) imports the rest. Most of these petroleum oils arrive through the Port of Djibouti, at the Horizon Terminal.

It is worth noting that Ethiopia and Djibouti have signed a MOU in 2022 to explore opportunities to develop a new oil terminal in Damerjog Industrial Park in Djibouti to provide storage for oil and petroleum products destined for markets in both countries, as well as for transshipment. However, this new terminal has not been constructed yet.

All vessels undergo port clearance procedures and customs officials inspect them and their cargo, verify the imported petroleum oils against shipping documents, and collect samples for quality analysis if necessary. Customs duties, taxes, and other import fees are assessed and settled. Afterwards, the petroleum oils are unloaded from the vessel into storage facilities (mainly tanks at the Horizon Terminal). Strict safety measures are followed during the unloading and storage process.



Figure 20. Horizon Terminal at the Djibouti Port

After storage at the terminal, petroleum oils are transported to Ethiopia. The distribution is carried out using tanker trucks because the Ethio-Djibouti Railway is not connected with the Horizon Terminal. A project is being planned to enable this connection, but the stakeholders involved have not yet reached an agreement. Just like for the grain, the trip is very long and expensive due to the general poor condition of the road, especially along Djibouti.

Ethiopian Airlines transports its petroleum oils using its own fleet. On the other hand, EPSE sells a part of its petroleum oils to retailers directly in Djibouti and transports the rest to Ethiopia. Once in Ethiopia, the petroleum oils are stored at the EPSE’s network of tanks. It is worth noting that EPSE is constructing its largest oil and gas storage terminal at Dukem, in Oromia, with a storage capacity of 240,000 cubic metres. It is expected to start operations in 2024.

Finally, petroleum oils are distributed to the points of sale (such as distribution centers or fuel stations), and they are sold to end consumers, including individuals, businesses, industries, and transportation companies.

2.2.4 Containerizable cargo supply chain assessment

2.2.4.1 Containerizable cargo foreign trade

Excluding grain, fertilizer and petroleum oils, the rest of imports are considered as containerized cargo. It accounts for around 50% of total imports. Containerized cargo imports increased during the 2015-2017 period at an average CAGR of 4.3% but have afterwards decreased during the 2017-2021 period at an average CAGR of 8.2%. This decline has been stimulated not only by the difficulty of obtaining foreign currency in Ethiopia, but also by the growth of domestic production, which is steadily reducing Ethiopia’s reliance on imports. In terms of countries, the main origins are traditionally China and India⁴.

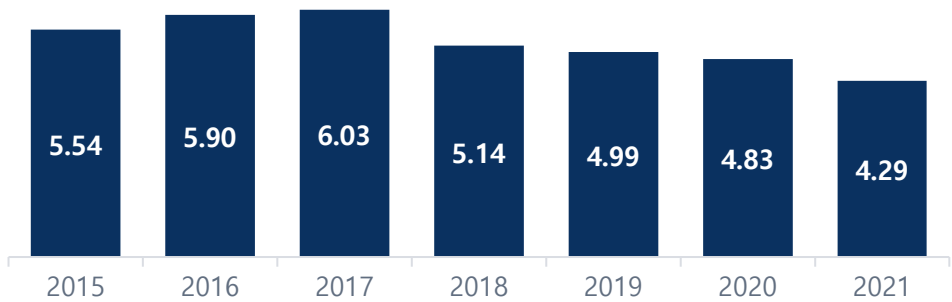


Figure 21. Containerized cargo imports evolution in million tons (Source: UN Comtrade)

2.2.4.2 Containerizable cargo supply chain characterization

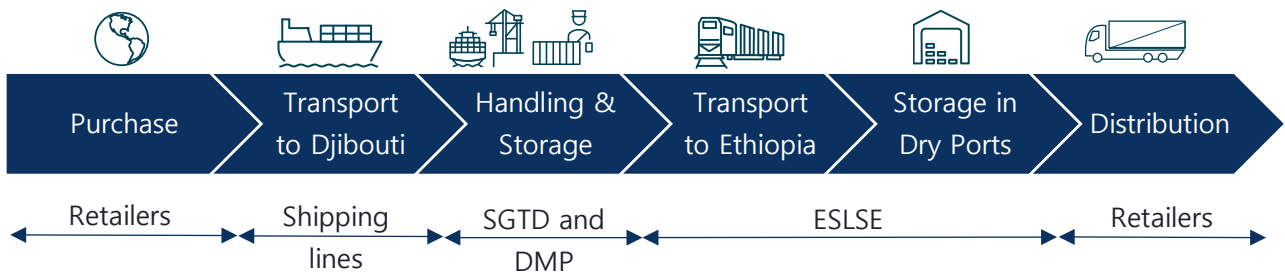


Figure 22. Containerized cargo supply chain and stakeholders involved

Most of the containerized products imported into Ethiopia and exported from Ethiopia pass through the Port of Djibouti, mainly at the Doraleh Container Terminal (operated by SGTD) but also at the Doraleh Multi-purpose Terminal (operated by DMP). All goods are subject to customs clearance procedures at the

port. Customs officials inspect the goods, verify the accompanying documentation, and assess applicable duties and taxes. To facilitate customs clearance, it is essential to ensure that all required documents are complete and accurate.



Figure 23. Doraleh Container Terminal at the Djibouti Port



Figure 24. Doraleh Multi-purpose Terminal at the Djibouti Port (general cargo in the right part)

After storage at the port, containers are transported to Ethiopia. Unlike grain or petroleum oils, containers are transported by train because the Ethio-Djibouti Railway is well connected with the Doraleh Container Terminal. Nevertheless, there are only 1.5 trips per day in average, while the facility has the potential for four.

Once in Ethiopia, containers are directly transported to inland ports, mainly to the Modjo Dry Port, which is the largest operational Dry Port in Ethiopia and is well connected with the Ethio-Djibouti Railway. Modjo

Dry Port has three warehouses where containers are emptied, and their contents are subject to customs inspection, which is a slow process very restrictive and expensive.

Modjo Dry Port has disposal issues because empty containers accumulate and there are no government policies to remove them. Furthermore, the loading and unloading of containers is inefficient because in most cases it is carried out with reach stackers instead of gantry cranes. All these issues have led to the approval of an expansion project, aiming to build two new warehouses, extend the train loading/unloading area, install gantry cranes and prepare a new storage area for reefer containers, among others.

On top of the previous, it has been identified that there is not a proper supply of warehouse as a service in the country. Although there are warehouses, most of them belong to public entities or to the final clients. A description of the warehousing system is provided below.

2.3 Characterization of the existing ICD and warehouse market

2.3.1 Characterization of warehouses

The warehouse system in Ethiopia operates in a decentralized manner and involves various organizations, both public and private. Warehouses in Ethiopia are used for the storage of various types of products, including industrial goods, consumer goods, pharmaceutical supplies, or cold stores. However, Ethiopia being an agrarian country, most warehouses are used for storing agricultural commodities such as grains, oilseeds, coffee, and other non-perishable agricultural products.

Key public entities involved in warehouse management include the Ethiopian Trading Businesses Corporation (ETBC), the National Disaster Risk Management Commission (NDRMC), the Ethiopia Commodity Exchange (ECX), the Ethiopian Agricultural Businesses Corporation (EABC), and the Ethio-Djibouti Railway (EDR). Due to the numerous entities involved, accurately accounting for the total number and capacity of warehouses, especially the private ones, can be challenging. However, the combined warehouse capacity of the main public entities is estimated to be around 1,685,784 tons. As shown in the following figure, ETBC takes the largest share.

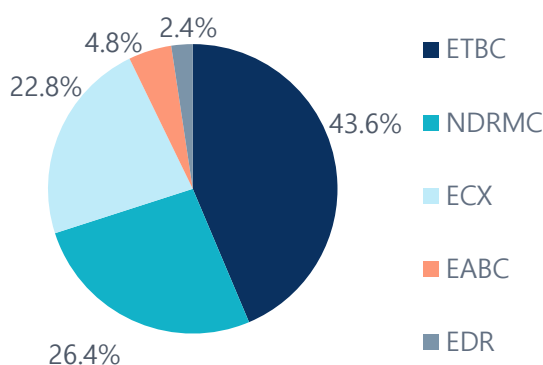


Figure 25. Share of Ethiopian warehouse capacity among the main public entities

The availability of warehouses in Ethiopia is currently limited because most warehouses are already used by the main entities mentioned above. The few available options often come with high costs. Additionally,

most of the warehouses are independent scattered facilities and the concept of logistics park is not existent in the country.

Moreover, there is a notable lack of coordination and integration among entities involved in the warehouse system, resulting in inadequate stock management and ineffective price control. This issue is further compounded by the seasonality of many stored products, particularly agricultural commodities like wheat, leading to periods of under-utilization in warehouses during certain months each year.

Most warehouses in Ethiopia typically lack value-added services and often operate with limited personnel. The available workforce is often characterized by low qualifications and strong unionization, resulting in lower productivity rates.

The table below highlights the key features of the Ethiopian warehouse system. While the overall condition of the warehouses is generally satisfactory according to the University of Addis Abbeba, many of them are at an advanced stage of their useful life. In most cases, management systems are still manual, without the support of IT systems. Notably, the warehouses operated by the ETBC have minimal machinery and rely heavily on manual operations. As a consequence of all these factors, the dwell and turnaround times tend to be very long, with, for example, 24 hours of average truck turnaround time according to the ECX. This leads to prolonged storage times, which increases the risk of potential product contamination due to humidity and high temperatures.

Entity	Total warehouse capacity (tons)	Number of warehouses	Volume dispatched in 2014 Ethiopian year (tons)	Main products	Warehouse management system	Overall security
ETBC	735,677	235	205,895	Coffee, wheat, teff and maize	Manual	Fair
NDRMC	445,000	60	445,000	Food (wheat) and non-food (basic commodities)	Manual, computerized in progress	Fair
ECX	383,827	64	187,345	Coffee and sesame	Computerized	Good
EABC	81,100	19	44,560	Fertilizer	Computerized	Fair
EDR	40,180	7	N/A	Grain	Manual	Good

Table 1. Warehouse characteristics of main public entities

The distribution of warehouses in Ethiopia is geographically uneven, as depicted in the following figure. Warehouses are primarily concentrated in the central and northern regions of the country, with a notable concentration around the city of Addis Ababa. This distribution pattern aligns with the population density and agricultural production centers in those areas.

Most of these warehouses enjoy good accessibility, as they are located in proximity to major road networks that traverse the country. Additionally, some warehouses have the added advantage of being accessible via the Ethio-Djibouti railway line, which further facilitates the transportation and movement of goods.

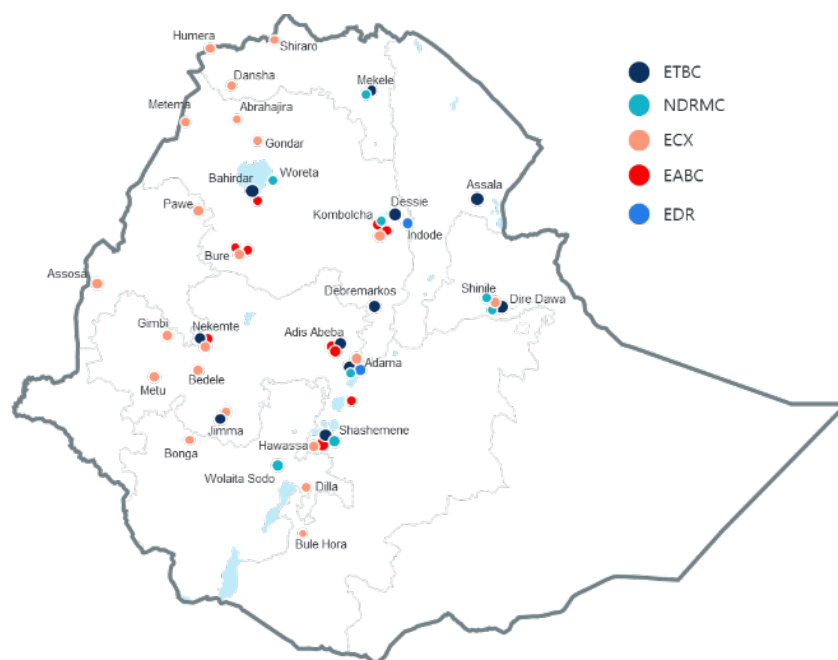


Figure 26. Geographic distribution of warehouses in Ethiopia

2.3.2 Warehouses by entity

Ethiopian Trading Businesses Corporation (ETBC)

The Ethiopian Trading Businesses Corporation (ETBC) is a federal government public enterprise established through amalgamation of the Ethiopian Grain Trade Enterprise, the Ethiopian Fruits and Vegetable Marketing S.C., the Ethiopian Trading Enterprise and the Procurement Services Enterprise.

The ETBC has a multi-faceted objective that includes maintaining a stable domestic market by procuring and selling agricultural and industrial products, as well as basic consumer commodities from both local and foreign markets at prevailing market prices. In addition to this, the ETBC aims to offer support and encouragement to farmers, introduce new trading systems, develop a skilled workforce, and provide consultancy services related to procurement, among other initiatives.

The ETBC possesses the highest quantity of warehouses in Ethiopia, although many of them are relatively small. These warehouses are occasionally lent to other entities like the World Food Programme (WFP) or the National Disaster Risk Management Commission (NDRMC). On average, ETBC's warehouses have been in operation for around 30 years, with some of them in need of urgent renovation or refurbishment. It is important to mention that while ETBC warehouses store grain and coffee, the storage of wheat has been stopped recently in adherence to the government's policy of ceasing wheat imports.

The 235 warehouses of ETBC are segmented into thirteen business centres as shown in the following table.

Business Centers	Number of warehouses
Addis Ababa	19
Nekemte	25
Adama	30

Shashamene	15
Dire Dawa	15
Assala	13
Mekelle	7
Bahirdar	35
Debreworkos	29
Dessie	8
Jimma	6
Addis Ababa for cereals	26
Addis Ababa for coffee	7
Total	235 (735,677 Tons)

Table 2. Characteristics of ETBC warehouses

National Disaster Risk Management Commission (NDRMC)

The National Disaster Risk Management Commission (NDRMC), also known as Ethiopian Disaster Risk Management Commission (EDRMC), is an autonomous Federal Government office responsible for disaster prevention and response coordination. The commission plays a crucial role in distributing substantial amounts of food and non-food items each year.

By facilitating the flow and storage of goods and materials, the NDRMC aims to alleviate the suffering of vulnerable individuals across the country. Its wide-ranging functions encompass preparedness, planning, procurement, transportation, tracing, and last-mile delivery.

The NDRMC oversees a network of 8 logistics plants, comprising a total of 60 warehouses. These warehouses are primarily owned by the Ministry of Finance. The distribution of goods is demand-driven, and the allocation is carried out on a zonal basis, ensuring efficient and effective distribution. The warehouses are strategically located in major cities and are well-connected to the country's main road networks. Among the logistics plants, the Adama plant boasts the highest warehouse capacity.

Logistics plants	Number of warehouses	Capacity in Tons
Adama	20	120,000
Kombolcha	15	100,000
Diredawa	3	22,000
Welaita sodo	5	55,000

Shashemene	3	23,000
Mekele	5	47,000
Shinile	5	35,000
Woreta	4	43,000
Total	60	445,000

Table 3. Characteristics of NDRMC warehouses



Figure 27. NDRMC Warehouses, for non-food products (left) and for grain (right)

Ethiopia Commodity Exchanges (ECX)

The Ethiopia Commodity Exchange (ECX) is a centralized marketplace in Ethiopia for trading agricultural commodities. It was established in 2008 with the aim of providing a transparent and efficient platform for buying and selling various agricultural products. The ECX facilitates trade in commodities such as coffee, sesame seeds, maize, wheat, and other agricultural products.

The exchange operates through a trading system that allows registered market participants, including farmers, cooperatives, traders, and exporters, to engage in buying and selling commodities. It provides standardized grading, quality certification, warehousing, and settlement services to ensure fair and transparent trading practices.

The ECX plays a significant role in promoting fair pricing, reducing transaction costs, improving market efficiency, and ensuring quality standards in Ethiopia's agricultural commodity trade. It has contributed to the growth and development of the agricultural sector by providing a reliable and transparent market platform for market participants.

ECX warehouses have a computerized management system and provide several value-add-services such as the issuing of an Electronic Goods Received Note of each product. Moreover, they have a recording system for incoming and outgoing commodities to ensure the control of daily stock, as well as exchange of information between ECX and the area warehouses. ECX maintains the quality of received products through continuous quality control procedures. The ECX Inventory Management system guarantees the quality and quantity of the commodity throughout the pre-determined period of storage. Further, ECX warehouses are insured at maximum coverage to protect against loss and damage of deposits.

The ECX is operating 64 warehouses located in 23 delivery locations in the country. These warehouses cover an area of 142 thousand square meters with a capacity of storing about 400 thousand metric tons of commodities at a time. All warehouses are operated by ECX, which owns some of the warehouses and leases out others. All warehouses are electronically connected to the main office system to manage day-to-day operation and to exchange information instantly, efficiently and securely in an automated fashion.

Locations	Capacity in Quintals	Locations	Capacity in Quintals
Abrha jira	186,240	Hawassa	203,700
Adama	80,676	Humera	289,356
Assossa	47,153	Jimma	141,458
Bedelle	94,306	Kombolcha	131,624
Bonga	188,611	Metema	236,741
Bulehora	161,667	Metu	47,153
Bure	470,181	Nekemte	141,458
Dansha	95,282	Pawe	336,806
Dilla	107,993	Saris	282,917
Dire Dawa	54,697	Shiraro	46,560
Gimbi	161,667	Sodo	103,736
Gonder	228,284	Total	3,838,265 (383,827 Tons)

Table 4. Characteristics of ECX warehouses

Ethiopian Agricultural Businesses Corporation (EABC)

The Ethiopian Agricultural Businesses Corporation (EABC) is a state-owned enterprise in Ethiopia. It operates as a central procurement entity for various agricultural products and commodities in the country. The EABC plays a crucial role in facilitating the procurement, distribution, and marketing of agricultural goods, ensuring fair prices and market stability.

The corporation supplies agricultural inputs (improved seeds, fertilizers & agrochemicals), agricultural machineries and spare parts, construction equipment and chemical spraying equipment at affordable price. Besides, the corporation offers consultancy and technical training services. Since its establishment in December 2015, the corporation has played an important role in modernizing agriculture, boosting production and productivity at the national level.

The EABC administers a total of 19 warehouses dedicated to storing fertilizer, with a combined capacity of 81,100 Tons. Notably, the management system employed by the EABC for these warehouses is computerized, ensuring efficient inventory tracking and logistics management.

EDR

The Ethio-Djibouti Railway (EDR) was established as a result of a Bilateral Agreement between Ethiopia and Djibouti to construct and operate a railway connecting Addis Ababa and Djibouti. The railway project was commissioned in 2018, marking an important milestone in enhancing transportation and connectivity between the two countries.

The Ethio-Djibouti Railway manages a total of seven grain warehouses, collectively capable of carrying 40,180 tons of grain. Among these warehouses, the facility in Adama stands out with a significant capacity of 6,300 tons. Additionally, the warehouse in Indode is another noteworthy facility within the network.

World Food Programme (WFP)

The World Food Programme (WFP) stands as the largest humanitarian organization globally, dedicated to saving lives during emergencies and utilizing food assistance to foster peace, stability, and prosperity. It extends its support to individuals and communities affected by conflicts, disasters, and the adverse consequences of climate change.

The WFP provides unconditional food and cash transfers to the most vulnerable families across Ethiopia, including refugees. Ethiopia hosts one of WFP's largest supply chain operations, managing the movement of over 600,000 Tons of food per year to 3,000 distribution points and 27 refugee camps.

The World Food Programme (WFP) operates 10 leased warehouses in Ethiopia to store both food, primarily wheat, and non-food items. While these warehouses are not specifically designed for grain storage, they serve as crucial storage facilities for WFP's operations.

Additionally, the World Food Programme (WFP) operates a logistics plant in Djibouti that serves as a buffer for their operations. This facility includes four silos with a combined capacity of 40,000 tons, which are primarily used for storing food items. Moreover, there are closed warehouses available within the logistics plant specifically designated for non-food products. The WFP possesses a significant fleet of trucks that enables them to conduct a maximum of 2.7 roundtrips per month between Djibouti and Ethiopia.

Other warehouses facilities

- The Strategic Grain Reserve Agency (SGRA) is an organization dedicated to ensuring food security and addressing food price hikes by maintaining strategic grain reserves. SGRA manages seven grain warehouses in Sodo, Shashemene, Shenele, Adama, Wereta, Kombolcha and Meqelle;
- The Ethiopian Grain Trade Enterprise (EGTE) purchases grain, oilseeds, coffee, and pulses both for local wholesale and export. Its head office is in Addis Ababa, but it has 10 branch offices and 91 trade centers throughout the country. Moreover, it has two warehouses at Adama, each with a storage capacity of 5,000 Tons;
- The Ethiopian Sugar Industry Group (ESIG) (previously known as Ethiopian Sugar Corporation (ESC)) serves as the centralized entity responsible for all sugar development activities in Ethiopia. It manages eight producing factories and multiple warehouses across the country. Notably, the Addis Ababa warehouse holds a carrying capacity of 6,000 Tons, while other notable warehouses are in Wonji Shoa, Kesseme and Metehara;
- The Ethiopian Pharmaceutical Supply Agency (EPSA) owns 20 warehouses with a combined capacity of over 34,125 pallets, specially designed to handle pharmaceutical products, with a sophisticated computerized information system to facilitate efficient inventory management;
- The Adigrat Catholic Secretariat has 8 warehouses in Tigray with carrying capacity of 4,818 Tons;

- The Catholic Relief Services has 15 warehouses in Dire Dawa with carrying capacity of 6,000 Tons, 6 warehouses in Amhara with carrying capacity of 2,000 Tons; and 12 warehouses in Oromia with carrying capacity of 13,437 Tons;
- Save the Children has 2 warehouses in Amhara with carrying capacity of 1,800 Tons;
- The Industrial Inputs Corporation has 1 warehouse at Amhara region with carrying capacity of 5,240 Tons.

2.3.3 Dry Ports and Industrial Parks

Given that Ethiopia is a landlocked country, **Dry Ports** have a great importance as inland intermodal terminals directly connected by road or rail to foreign seaports (especially Djibouti's Ports) which provide access to international markets. All the Ethiopian Dry Ports are managed by the **Ethiopian Shipping and Logistics Services Enterprise (ESLSE)**, which is the result of the merger of four enterprises which were working independently in the sea transport sector: Ethiopian Shipping Lines Share Company, Ethiopian Maritime and Transit Service Enterprise, Dry Port Enterprise, and Comet Transport Share Company.

Dry Ports are mainly focused on **container trade**, but some of them also offer services for fertilizer or grain trade. The main Dry Ports in Ethiopia are presented in the following table.

Dry Port	Start of operations	Surface (hectare)	Container storage surface (hectare)	Storage capacity (TEU)	Container handling capacity (TEU/year)	Tons received in 2021	TEUs received in 2021
Modjo	2009	150	31.7	17,539	136,038	32,770	91,230
Kality	2014	37	3	1,241	23,131	8,507	9,952
Gelan*	2014	23	N/A	N/A	N/A	2,279	N/A
Semera	2010	160	2.5	1,180	2,378	808	1,058
Dire Dawa	2013	0.78	0.78	368	3,852	2,713	2,122
Kombolcha	2013	15	4	1,888	4,891	456	1,097
Mekelle	2013	3	3	1,440	7,789	N/A	N/A
Woreta	2019	20	3	900	N/A	1,300	432

*Gelan Dry Port is specialised in RoRo

Table 5. Main characteristics of Ethiopian Dry Ports (Source: ESLSE)

As shown in the figure below, all Dry Ports are concentrated in Central and Northern Ethiopia. Kality and Gelan Dry Ports are the closest to Addis Ababa; Semera Dry Port is the closest to the border with Djibouti; and Dire Dawa Dry Port is the closest to the border with Somalia. Only the Dry Ports of Dire Dawa and Modjo have direct railway access.

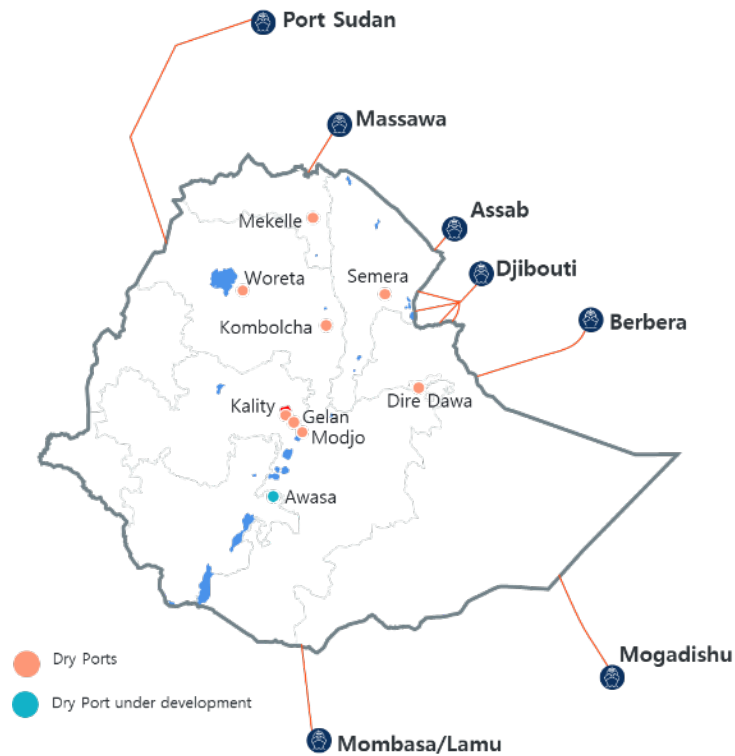


Figure 28. Ethiopian Dry Ports

The **Modjo Dry Port** is the largest operational Dry Port in Ethiopia and handled around 67% of the total tons and 86% of the total TEUs traded by Ethiopian Dry Ports in 2021. Apart from the container storage area, it has six closed warehouses (three of 5,400 sqm for customs inspection, another one of 5,400 sqm rented to the shipping lines and two of 1,600 sqm for fertilizer). As mentioned before, two more warehouses of 5,400 sqm are expected to be built. As shown in the figure below, the Modjo Dry Port has direct access to the Ethio-Djibouti Railway.



Figure 29. Modjo Dry Port

Although Ethiopian Dry Ports are generally in good condition and the overall security is good, the global storage capacity is limited by global standards. Therefore, the Ethiopian Transport Master Plan 2022-2052 proposes several new dry ports, mainly along the corridors connecting Addis Ababa with Eritrea, Sudan, Kenya and Somalia, given that the Ethiopia-Djibouti corridor is already well served by the Modjo Dry Port, which is currently being upgraded. Of particular interest is the Dry Port being built in Hawassa, which will serve a major Industrial Park along the Ethiopia-Kenya corridor.

Apart from Dry Ports, Ethiopia places high importance on **Industrial Parks** development. Currently, there are the following Industrial Parks operating in Ethiopia:

- **13 Federal Government owned Industrial Parks**, which are administered by the Industrial Parks Development Corporation (IPDC)
- **4 Regional Government owned Integrated Agro-Industrial Parks (IAIPs)**, which are Special Economic Zones established for agricultural modernization and agribusiness development; they are connected with farms and communities through the Rural Transformation Centers (RTC)
- Several **private Industrial Parks**

The main Industrial Parks in Ethiopia are presented in the following table.

Industrial Park	Owner	Start of operations	Associated Dry Port	Number of factory sheds	Surface (hectare)	Main production
Bole Lemi Phase I	Federal Government	2014	No	20*	172	Apparel and Textile

Industrial Park	Owner	Start of operations	Associated Dry Port	Number of factory sheds	Surface (hectare)	Main production
Bole Lemi Phase II	Federal Government	In development	No	2	181	Apparel and Textile
Kilinto	Federal Government	2019	No	N/A	279	Pharmaceutical products
Hawassa	Federal Government	2016	In construction	52*	140	Apparel, Textile and Garment
Mekelle	Federal Government	2017	Yes	15*	75	Apparel and Textile
Kombolcha	Federal Government	2017	Yes	9*	75	Apparel and Textile
Adama	Federal Government	2018	No	19*	365	Machinery, Apparel and Garment
Jimma	Federal Government	2019	No	9*	75	Apparel and Garment
Debre Birhan	Federal Government	2019	No	8	100	Apparel and Garment
Dire Dawa	Federal Government	2018	Yes	15	150	Garment, Apparel and Textile
Bahir Dar	Federal Government	2020	No	8	75	Apparel and Garment
Semera	Federal Government	2021	Yes	8	50	Multipurpose
Addis Industrial Village	Federal Government	1980s	No	N/A*	88	Multipurpose
ICT Park	Federal Government	2015	No	N/A	200	IT manufacturing
Bure IAIP	Regional Government	2021	No	N/A	260	Agro-processing
Bulbula IAIP	Regional Government	2021	No	N/A	271	Agro-processing
Yirgalem IAIP	Regional Government	2021	No	N/A	294	Agro-processing
Baeker IAIP	Regional Government	2021	No	N/A	151	Agro-processing

Industrial Park	Owner	Start of operations	Associated Dry Port	Number of factory sheds	Surface (hectare)	Main production
Eastern Industry Zone	Private	2007	No	N/A	N/A	Multipurpose

*Sheds fully occupied

Table 6. Main characteristics of Ethiopian Industrial Parks (Sources: IPDC and IAIP)

Hawassa Industrial Park is the largest Industrial Park in Ethiopia because the government has funded several development projects to improve its overall performance. As mentioned before, a new Dry Port is being built in the immediate vicinity of Hawassa Industrial Park.

As shown in the figure below, all Industrial Parks are concentrated in Central and Northern Ethiopia, just like Dry Ports. Adama Industrial Park is the closest to the Modjo Dry Port. It is worth noting that Bole Lemi Phase II and Kilinto Industrial Parks are very close to the Bole International Airport. Other Industrial Parks have also access to airports or railways.

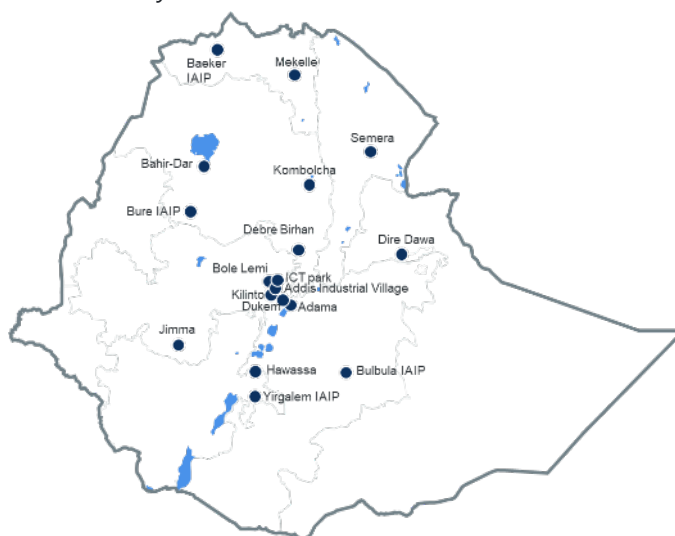


Figure 30. Ethiopian Industrial Parks

Most factory sheds of Industrial Parks are rented to foreign investors, and they produce mainly products to be exported. In general, Ethiopian Industrial Parks have low land rental prices by global standards (2.50 USD/sqm/month in Hawassa and 2.75 USD/sqm/month in Dire Dawa).

After the government of Ethiopia approved the establishment of national **Special Economic Zones (SEZ)** in 2022, only one Free Trade Zone (FTZ) has been established, in Dire Dawa. However, it continues to function as an Industrial Park for the moment.

It is worth noting that the removal of Ethiopia from the AGOA (African Growth and Opportunity Act) by the US government has affected international trade with the United States and has consequently led to a reduction of the production of main Industrial Parks.

Furthermore, most Industrial Parks have expressed concerns about difficulties in receiving empty containers for their exports, as well as about long import and export lead times, which reduce the competitiveness

of Ethiopian Industry. Other problems are the lack of housing for workers in Hawassa or the poor water supply in Dire Dawa.

On top of the previous, the Industrial Parks don't have a focus on logistics although sometimes the clients are using them for this activity due the lack of proper facilities. However, the design and characteristics of the facilities is not adequate for these purposes resulting in lower efficiencies and higher costs.

2.4 Policies, regulation and institutional logistics-sector framework

The logistics sector in Ethiopia is governed by various laws, regulations, and licensing procedures. Moreover, Ethiopia has a **National Logistics Strategy** which aims to enhance the country's logistics sector and improve overall supply chain efficiency. By solving several infrastructure gaps, improving trade facilitation, enhancing logistics services, and promoting collaboration, the National Logistics Strategy wants to transform the country into a regional logistics hub and improve its competitiveness in global trade

Despite these efforts of the Ethiopian government to promote the logistics sector, the **establishment of new logistics land presents serious difficulties**, according to the Ethio Logistics Sectorial Association (ELSA). One of the main challenges is acquiring suitable land because the obtention of permits can suffer bureaucratic hurdles and delays. The government has been actively working on initiatives to address these difficulties, including infrastructure development projects, policy reforms, and efforts to streamline administrative processes.

The **Industrial Parks Proclamation** is the primary legislation that governs the establishment, development, and management of industrial parks in Ethiopia. It provides the legal framework for the creation of industrial parks, including their operation, administration, and incentives provided to investors.

Regarding national **Special Economic Zones** (SEZ), it was not until August 2022 that the government of Ethiopia allowed their establishment aiming to improve the export system of the country, increase Foreign Direct Investment (FDI), and create wide employment opportunities in the sector.

It should be noted that Ethiopia does not have specific regulations dedicated to Dry Ports or warehouses. Despite the enactment of the Warehouse Receipt System Proclamation in 2003, until 2021 there has been a notable absence of an active supervisory/regulatory body overseeing the warehouse system in Ethiopia, as well as a lack of specific legislation addressing this issue.

Finally, in November 2021 the Ministry of Trade and Regional Integration launched the national **Warehouse Receipt System** (WRS), a legal regulatory framework for licensing and overseeing warehouses that can store the product of farmers and other value chain actors. The selected agricultural products are mainly wheat, maize, teff and beer barley. In the beginning five cooperatives were selected from Amhara and Oromia regions for the pilot project and two agricultural producers participated in the test. In 2022, the system was fully operationalized.

As the experience of many African and international countries (such as South Africa, Malawi, Tanzania, India, China, and the United States of America) shows, the WRS allows to modernize the marketing system in the agricultural sector, improving product quality and reducing waste as well as improving access to finance for farmers. The final goal is to increase productivity.

This regulatory body issues a certificate of competence to warehouse operators, inspectors, and agricultural product certifiers. Furthermore, farmers can preserve their production from the high levels of post-harvest loss that Ethiopian agriculture currently suffers from, apart from improving the quality and safety of the stored production.

In order to facilitate this work, stakeholders have implemented supportive regulations, collaborated with the Ethiopian Standards Agency to establish a national agricultural warehouse standard, liberalized the warehousing sector in collaboration with the Ethiopian Investment Commission to attract Foreign Direct Investment, and conducted capacity-building initiatives for farmers, cooperatives, agro-processors, and financial institutions along the value chain.

2.5 International benchmark

In order to identify the best practices in warehousing, a specific benchmark for the key supply chains has been carried out. The main results are shown below.

2.5.1 Grain

Assuring food security of population is a key challenge worldwide. It is for this reason that many countries have nationalized or centralized the import and distribution of many food products, such as grain.

For instance, in **Egypt**, the government has implemented a **centralized** system for procurement, warehousing and distribution of four selected strategic dry bulk goods: wheat, sugar, tea, and edible oil. The central focal organization in charge is a public enterprise named General Authority for Supply Commodities (GASC). GASC has entrusted the Egyptian Holding Company for Silos and Storage (EHCSS) to perform all the tasks relating to customs clearance, unloading, and loading to storage.

The private sector primarily dominates cereals such as maize, rice, and soybeans, whereas the public sector exerts more control over wheat. As shown in the following figure, in 2018, 43% of the imported wheat and 37% of the local production were purchased by the government to produce Baladi Bread, while the rest was directly consumed by the farmers or was purchased by the private sector to produce consumer products.

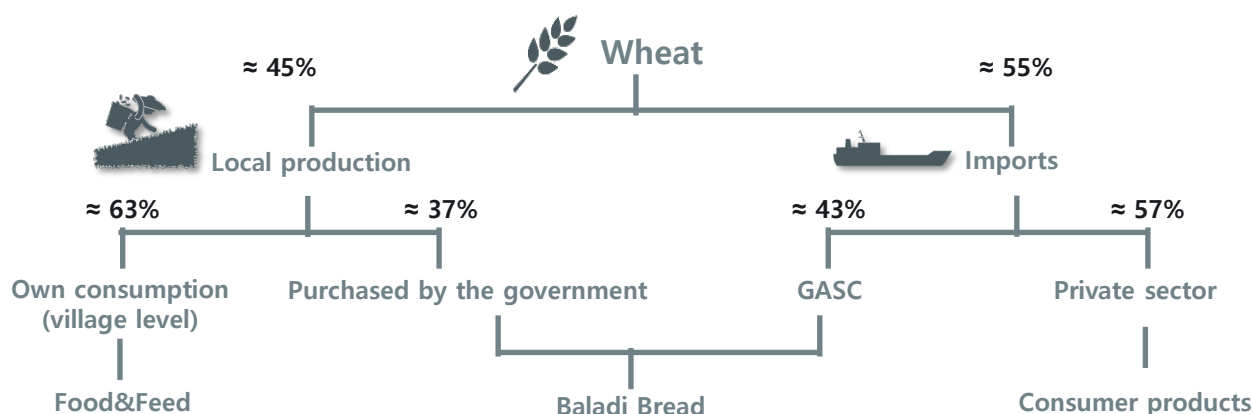
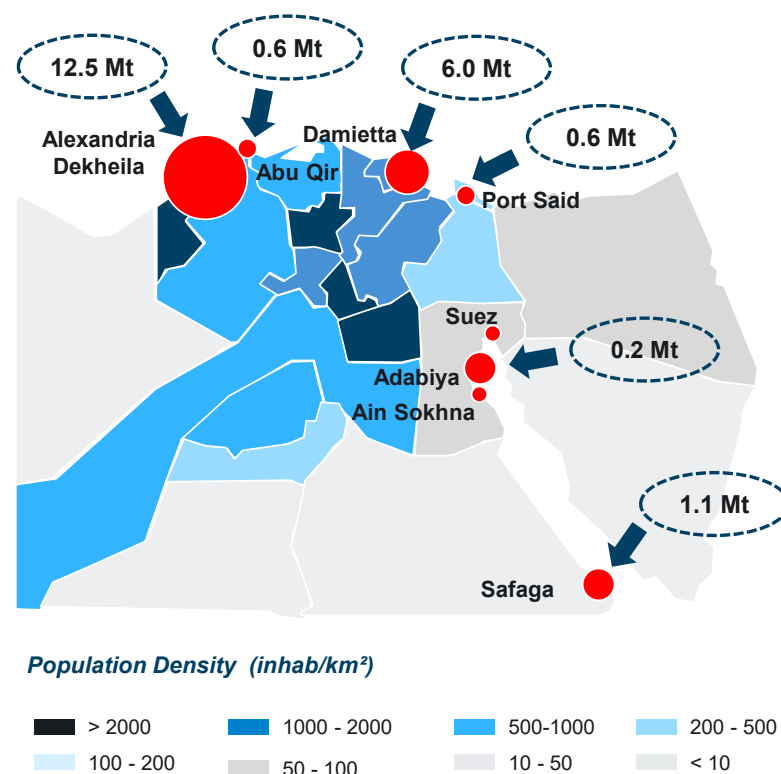


Figure 31. Wheat market dynamics in Egypt (Source: ALG analysis in 2018)

The Egyptian government operates all large-scale inland storage for grain, including both traditional flat storage (*Shona*) (similar to the Ethiopian warehouses) and silos. However, it aims to upgrade and expand the silo network throughout the country, with the goal of eliminating traditional grain preservation and storage methods and to reduce the significant waste of wheat that occurs during storage, particularly when grains are stored in open barns. *Shonas* are highly inefficient and are estimated to be responsible for a 10-20% loss on the wheat they store. In pursuit of this objective, the **National Project of Silos** was initiated in 2014 aiming to modernize existing silos and construct 50 new silos, each equipped with multiple storage units.

In 2023, the Egyptian government has already established 35 new silos for storing wheat since 2014, bringing the total number of silos to 75. The storage capacity of silos has reached 3.6 Mn tons in 2023, compared to 1.2 Mn tons in 2014. Furthermore, the scope of the project has been extended and up to 60 silos with a capacity of 10,000 tons each are currently under construction, as well as 7 strategic warehouses, with the aim to increase the commodity stock to 8-9 months.

As shown in the following figure, the port of Alexandria is the main entry point for cereal imports in Egypt due to its good location in relation to the most important consumption areas (Cairo and Alexandria), its nearest location to the main importers (Eastern Europe) avoiding the Suez Canal fee, and its biggest storage capacity in the country. The largest silos in Egypt are located near Egypt's Northern ports.



Port	Port storage	Traffic
Alex&Dekh	2,033 kt	12.5 Mt
Damietta	700 kt	6.0 Mt
Adabiya	150 kt	0.2 Mt
Safaga	250 kt	1.1 Mt
Port Said	85 kt	0.6 Mt
Abu Qir	80 kt	0.6 Mt

Figure 32. Distribution of cereal imports between Egyptian ports (Source: ALG analysis in 2018)

In addition, the Ministry of Supply and Internal Trade, in collaboration with IBM and ACME SAICO, is currently **automatizing wheat silos** processes. By the end of 2021, 22 wheat silos across Egypt were already automatized. The primary goal is to establish a robust system for efficient management of the country's wheat supply, allowing full automation and governance of all the steps of shipping, transport, storage, and distribution processes within the wheat silos. The automated platform is engineered to gather data from different sensors that are embedded in the silos and that send real-time quantitative analytics of the wheat supply and stock status. This enables the EHCSS to monitor all information regarding incoming shipments, quality standards and stock in silos, as well as address issues such as weak leakage. Additionally, the system is designed to facilitate improved communication and coordination between different storage points and mills.

The implementation of this automation system will play a crucial role in ensuring an adequate supply of strategic foods. By providing accurate information on the demand-supply gap and the current stock levels at any given time, the Egyptian government can make informed decisions regarding import requirements.

This enables them to stabilize or even reduce imports over time, thereby contributing to greater stability in the food supply chain.

In addition to these enhancements, it is noteworthy that the Egyptian government is actively working to improve the river Nile and railway transportation systems in both new and existing silos. The aim is to alleviate the burden on roads by utilizing alternative modes of transportation.

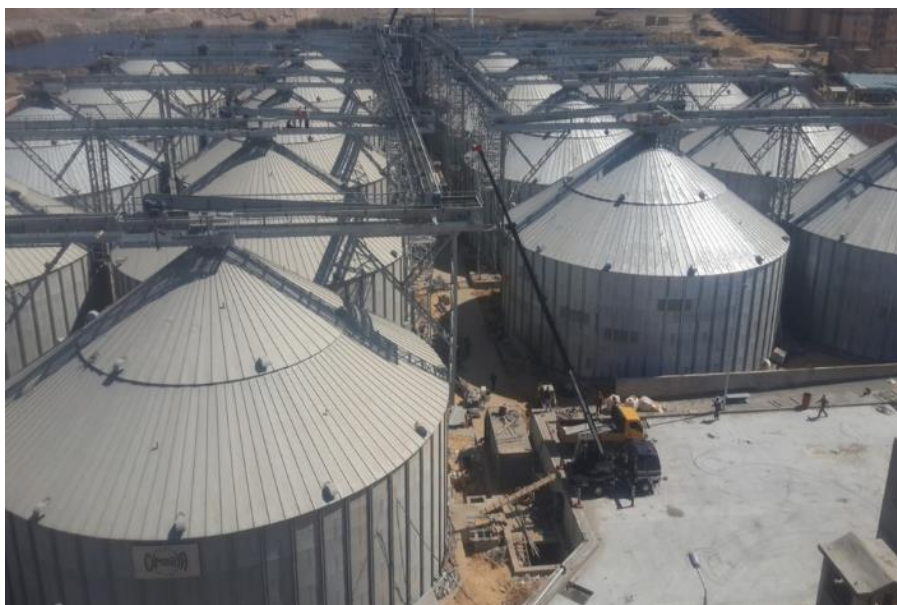


Figure 33. New grain silos established in Egypt (Source: The Arab Contractors)

Another good example is **India**, where two public enterprises (Food Corporation of India (FCI) and Minerals and Metals Trading Corporation (MMTC)) are responsible for the procurement and distribution of food grains (mainly wheat, rice, sugar, edible oil, and fertilizer).

Although the grain procurement and distribution systems are **decentralized**, all government institutions use the same **e-procurement platform** known as the e-NAM portal (electronic National Agriculture Market), which was created in the wake of the Covid-19 pandemic. This platform seeks to link the existing APMC (Agricultural Produce Market Commodities) and create a unified national market for agricultural commodities. Currently, more than 80% of farmers in India are registered on this portal.

The final goal of the e-NAM portal is to ensure a Minimum Support Price (MSP) for farmers, guaranteeing them a minimum level of income, as well as to ensure the availability of food grains in economically disadvantaged regions at affordable prices. By providing effective market intervention, the platform helps regulate prices and contributes to overall food security in the country. To facilitate the procurement of food grains, the Food Corporation of India (FCI) and various State Agencies establish numerous purchase centers across various marketplaces. These centers serve as crucial points for acquiring agricultural produce and maintaining the smooth functioning of the procurement process.

In terms of storage, four warehousing corporations control all the warehouse operations of the country: Central Warehousing Corporation (CWC), State Warehousing Corporations (SWCs), Central Railside

Warehouse Company Limited (CRWC), and Hindustan Vegetable Oils Corporation Limited (HVOC). These corporations are well organized and integrated and are under the surveillance of a regulatory authority called **Warehousing Development and Regulatory Authority (WDRA)**, which was created to regulate and promote orderly growth of the warehousing business. All warehouses in India must be registered by the WDRA. In May 2021, a total 3,769 warehouses had been registered across the country.

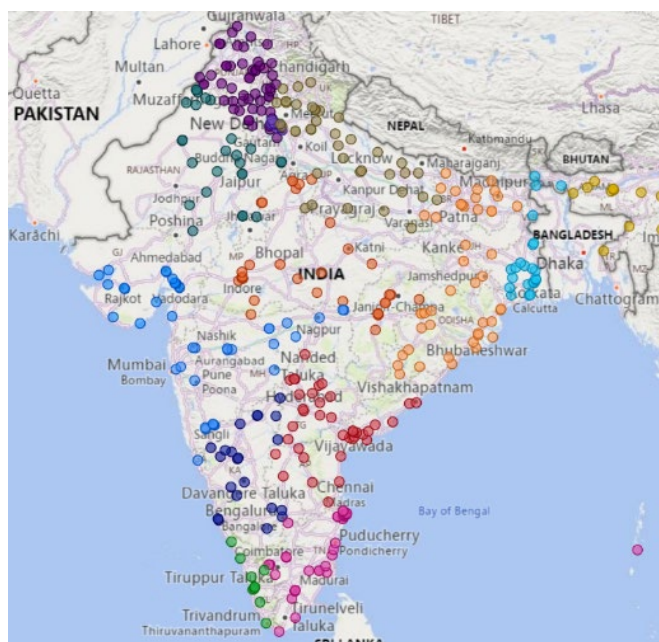


Figure 34. Warehouses operated by the Central Warehousing Corporation in India (Source: CWC)

Finally, it is worth mentioning the notable case of **Saudi Arabia**, where the Saudi Grains Organization (SAGO) plays a crucial role in providing essential food commodities within the country. SAGO is a state-owned institution responsible for procuring all imported grains and maintaining an appropriate reserve stock to address emergency situations. It not only operates flour mills and animal feed factories but also establishes associated food industries and sells related products domestically.

While some milling operations have been privatized, SAGO holds the monopoly on grain procurement to produce state-subsidized flour. These **centralized** procurement and distribution systems help ensure strategic food security and allow for effective management of the grain supply chain in Saudi Arabia.

An important agreement has been established between Saudi Arabia Railways and SAGO to streamline the transportation of grain from the port of Dammam (primary entry point for agricultural bulk imports in Saudi Arabia) to Riyadh. This agreement facilitates the annual transportation of around 300,000 tonnes of wheat grains via rail. SAGO operates several grain plants across the country and has recently commissioned in 2023 a new storage facility, expanding Saudi Arabia's storage capacity to 3.5 Mn tons from 2.6 Mn tons in 2016 (40% increase).



Figure 35. Grain plants of Saudi Grains Organization (SAGO)

2.5.2 Fertilizer

In both India and Saudi Arabia, similar approaches are taken for the procurement of fertilizers. Both countries prioritize the availability and affordability of fertilizers for their farmers. They have implemented strategies such as direct importation, subsidy schemes, soil testing, strategic reserves, and local production to ensure a stable supply of fertilizers, support agricultural productivity, and contribute to the overall development of the agricultural sector.

In **India**, the e-procurement platform e-NAM is utilized not only for agricultural commodities but also for the procurement of fertilizers. Government of India directly imports fertilizers to ensure a steady supply and control pricing. Public agencies such as the Indian Potash Limited (IPL) and National Fertilizers Limited (NFL) are involved in the importation and distribution of fertilizers, ensuring accessibility and affordability for farmers.

Moreover, the Soil Health Card scheme in India aims to provide farmers with personalized information on nutrient levels in their soil and the appropriate types and quantities of fertilizers to use, leading to more efficient and targeted fertilizer application. It is also noteworthy that India has implemented the Nutrient-Based Subsidy (NBS) scheme, which provides subsidies to farmers based on the nutrient content of fertilizers rather than a fixed subsidy. This approach encourages balanced fertilizer use, reduces overuse of certain nutrients, and promotes soil health.

In **Saudi Arabia**, the Saudi Grains Organization (SAGO) also assumes the responsibility of importing and distributing fertilizers within the country. Alongside its role in grain procurement, SAGO also plays a crucial part in procuring fertilizers from international markets and distributing them to farmers and agricultural cooperatives throughout Saudi Arabia.

Saudi Arabia maintains strategic reserves of fertilizers to ensure a stable supply during peak demand periods. This helps address any potential disruptions in the global fertilizer market and ensures a reliable supply for farmers. In addition, Saudi Arabia is trying to promote local production of fertilizers to reduce dependence on imports, by investing in fertilizer manufacturing facilities. For instance, Ma'aden (Saudi Arabian Mining Company) plays a significant role in the production of fertilizers. It is a state-owned company that is involved in the extraction and processing of phosphate and other raw materials used in fertilizer production.

Nevertheless, in most countries the distribution of fertilizers is handled by private entities. For example, in the **United States**, there are numerous private fertilizer distributors, and retailers that supply and distribute fertilizer products to farmers and agricultural businesses across the country.

2.5.3 Petroleum oils

The distribution of petroleum oils is predominantly handled by private entities in most countries worldwide. For instance, in the **United States** there are multiple private entities responsible for different aspects of transportation, storage, and distribution within the petroleum industry throughout the country, given the vast size of the market. Major oil companies like ExxonMobil, Chevron, BP, and others operate extensive networks of fuel stations and distribution facilities to supply petroleum products to consumers and businesses.

However, some countries have a predominantly public distribution system for petroleum. For example, in **Saudi Arabia**, the state-owned Saudi Arabian Oil Company, commonly known as Saudi Aramco, is responsible for the exploration, production, refining, and distribution of petroleum products within the country, as well as export operations. Saudi Aramco is the world's largest oil exporter.

It is important to note that many countries have a mix of public and private entities involved in the distribution sector. The case of **Spain** is interesting because the main distributor of petroleum Exolum (formerly known as CLH) used to be a state-owned company that had the monopoly of the sector, but since 1992 the oil sector was liberalized letting third party access. Nevertheless, Exolum is still the main responsible for the storage, transportation, and delivery of fuels to retail fuel stations, airports, industries, and other customers in Spain.

Exolum has a pipeline network of over 4,000 kilometres in Spain and 39 storage terminals with a capacity of almost 8 million cubic metres. Thirteen of these facilities are connected to major seaports that import and export oil products, and the company also operates 37 airport facilities. Exolum provides logistical services for the movement of petroleum products within Spain but do not directly engage in the distribution of these products to end consumers or fuel stations. The actual distribution of petroleum products to consumers in Spain is primarily carried out by private companies.

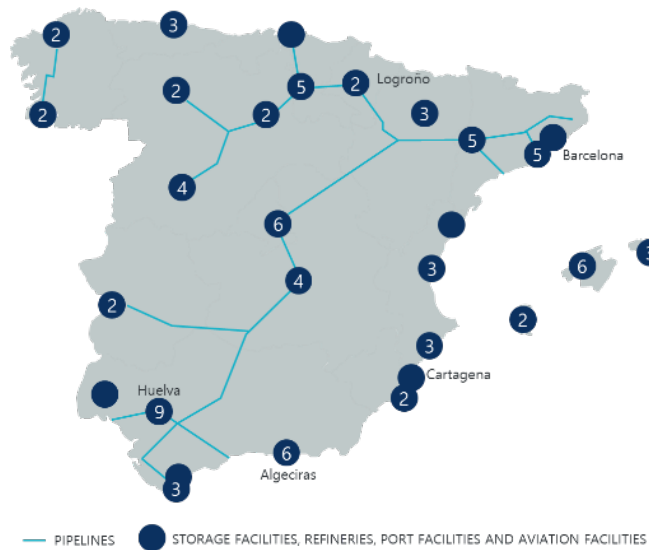


Figure 36. Exolum facilities in Spain

2.5.4 Containerizable cargo

The most outstanding fact internationally is the existence of logistics parks and the warehousing as a system. These can either be provided by the public or the private sector.

For example, in **Catalonia**, region of Spain, the Regional Government of Catalonia established a public company named CIMALSA to develop and manage new intermodal logistics platforms in underserved areas. These logistics parks offer services to the cargo, the trucks and the people including warehouse for rent, land to build warehouses, offices, ICDs, truck parks or petrol stations among others. The rest of the geographical areas are covered by the private sector. This a good example of integration between the public and private sectors, aiming to ensure comprehensive coverage of the whole region, regardless of the socio-economic attributes of each area.



Figure 37. CIMALSA intermodal logistics platforms in Catalonia

Another noteworthy example is **Saudi Arabia**, which has a well-developed logistics and transportation industry, with private companies playing a significant role in container shipping and distribution.

MODON (Saudi Industrial Property Authority) is a government agency responsible for the development and supervision of industrial and logistics lands and integrated infrastructure. In 2023, it oversees 36 existing and under development industrial cities across Saudi Arabia, in addition to private industrial cities and complexes. It is not directly involved in container storage, but industrial parks are strategically planned to facilitate the movement of goods and are typically equipped with transportation and logistics infrastructure, such as nearby ports, container terminals, warehouses, and logistics centers. These facilities enable the efficient handling, storage, and distribution of containerized goods within and outside the industrial park.

In the beginning these facilities were planned for industrial purposes only, but the government has shifted its approach to also include logistics after realizing the demand for this service and the value added generated. On top of the previous, MODON is also now planning to integrate the main parks with the railway and is assessing the option to privatize some of the areas.



Figure 38. MODON industrial cities in Saudi Arabia

3 Main challenges and areas for improvement

3.1 Grain

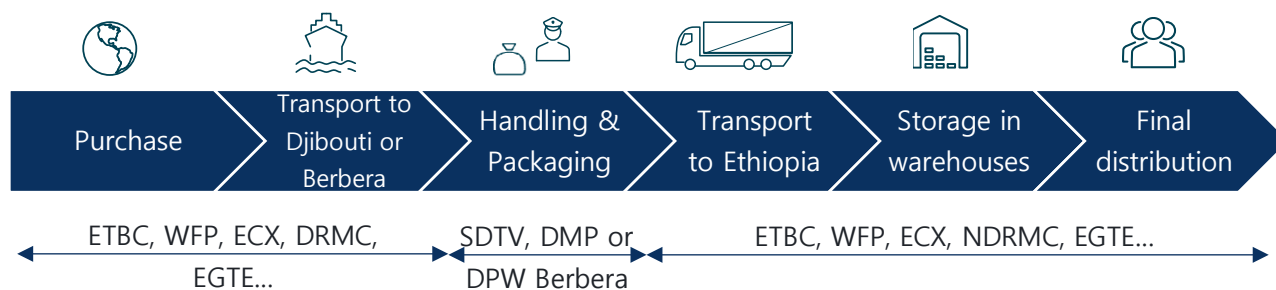
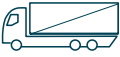


Figure 39. Grain supply chain and stakeholders involved

Stages of the supply chain	Challenges
Purchase 	• Weak coordination and integration among procurement organs • Shortage of hard currency: high cost of procurement • Inaccurate demand forecast: • Manual aggregation of data • Dependent on local production • Dependent on emergencies and famine conditions
Transport to Djibouti or Berbera 	• Weak planification regarding the arrival of shipments
Handling and Packaging 	• Packaging in sacks or bags: Inefficient for transportation and handling
Transport to Ethiopia 	• Existing railway not connected to the grain terminals: transport using trucks • Long and expensive trip: • Poor condition of the road, especially along Djibouti • Several informal checkpoints along the road • Outdated trucks due to the high maintenance cost • Limited truck fleet
Storage in warehouses	• Lack of specialized warehouses: lack of silos

Stages of the supply chain

Challenges



- Most warehouses at an advanced stage of their useful life, with fair overall security
- Manual management systems, without IT systems: planning issues, poor stock management and long storage times: risk of potential product contamination
- Limited personnel and poorly qualified: low productivity rates and issues with unloading of cargo
- Limited machineries: manual loading and unloading in most cases
- Lack of value-added services
- Uneven distribution of warehouses throughout the country
- Difficulty to find available warehouses and poor control of warehouses prices: difficulty to establish new logistics land
- Seasonality of grain: warehouses under-utilized during some months of the year
- Absence of an active supervisory/regulatory body overseeing the warehouse system in Ethiopia

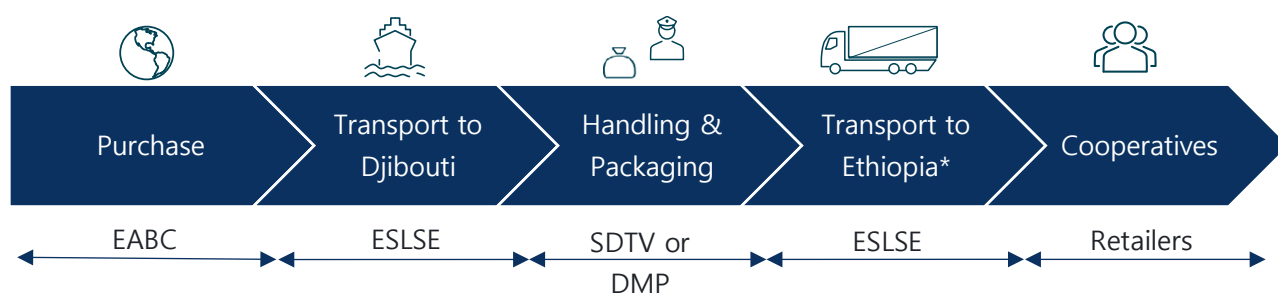
Final distribution



- No challenges identified

Table 7. Main challenges along the grain supply chain in Ethiopia

3.2 Fertilizer



*The Modjo Dry Port warehouses are used in case of emergency

Figure 40. Fertilizer supply chain and stakeholders involved

Stages of the supply chain

Challenges

Purchase



- Shortage of hard currency: high cost of procurement
- Inaccurate demand forecast: manual aggregation of data

Stages of the supply chain	Challenges
Transport to Djibouti 	• Weak planification regarding the arrival of shipments
Handling and Packaging 	• Slow customs clearance inspection: long documentation process • Packaging in sacks or bags: Inefficient for transportation and handling
Transport to Ethiopia 	• Existing railway not connected to the fertilizer terminals: transport using trucks • Long and expensive trip: • Poor condition of the road, especially along Djibouti • Risk of robberies along the road • Several informal checkpoints along the road
Cooperatives 	• Limited storage capacity of cooperatives, accentuated by poor planning in terms of arrival of shipments • Modjo Dry Port used as a buffer: long storage times, seasonality of fertilizer, planning issues... • Poor knowledge regarding the appropriate use of fertilizers for specific crops and soil conditions

Table 8. Main challenges along the fertilizer supply chain in Ethiopia

3.3 Petroleum oils

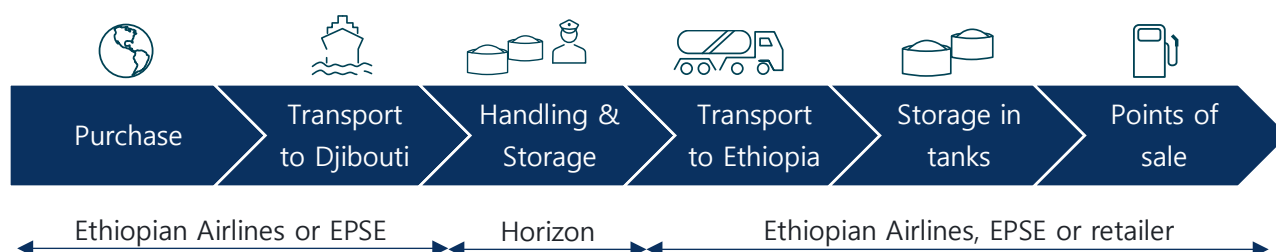


Figure 41. Petroleum oils supply chain and stakeholders involved

Stages of the supply chain	Challenges
Purchase 	• Shortage of hard currency: high cost of procurement
Transport to Djibouti 	• Only one oil terminal available in Djibouti
Handling and Storage 	• No challenges identified
Transport to Ethiopia 	• Existing railway not connected to the Horizon terminal: transport using tanker trucks • Long and expensive trip: • Poor condition of the road, especially along Djibouti • Several informal checkpoints along the road
Storage in tanks 	• No challenges identified
Points of sale 	• No challenges identified

Table 9. Main challenges along the petroleum oils supply chain in Ethiopia

3.4 Containerizable cargo

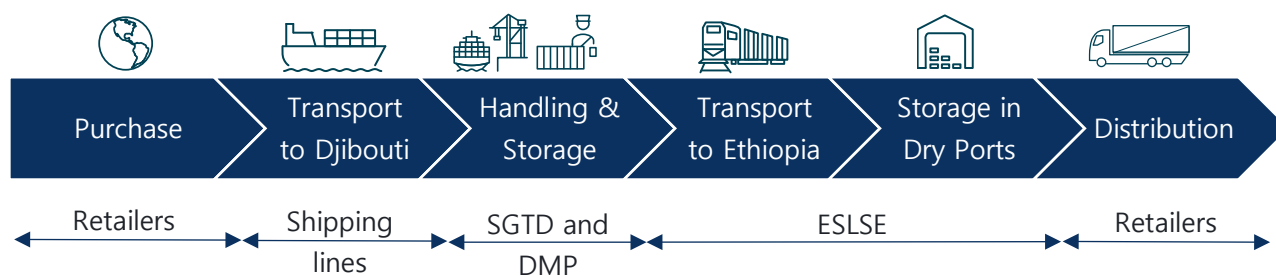


Figure 42. Containerized cargo supply chain and stakeholders involved

Stages of the supply chain	Challenges
Purchase 	• Shortage of hard currency: high cost of procurement
Transport to Djibouti 	• No challenges identified
Handling and Storage 	• Slow customs clearance inspection: long documentation process
Transport to Ethiopia 	• Ethio-Djibouti Railway working below its capacity
Storage in Dry Ports / warehouses 	• Difficulty to find available warehouses and poor control of warehouses prices: difficulty to establish new logistics land • Available facilities not adapted to the needs of clients • No logistics parks with additional services • Limited global storage capacity in Ethiopian Dry Ports • Regulation not encouraging logistics developments • Inefficient customs clearance inspection • Lack of government policies to remove empty containers: disposal issues • Inefficient loading and unloading of cargo • Limited storage areas specialised on reefer containers
Distribution 	• No challenges identified

Table 10. Main challenges along the containerized cargo supply chain in Ethiopia

4 Recommendations

4.1 Grain

4.1.1 Potential infrastructure to be developed

Based on the international benchmark vertical silos seems to be the most appropriate solution for the storage of grains in Ethiopia substituting or complementing the horizontal warehouses. The main reasons for this are higher control on the stocks, the increased quality and lower product losses as well as the efficiencies and lower costs in the long run. These large cylindrical structures that serve as storage could

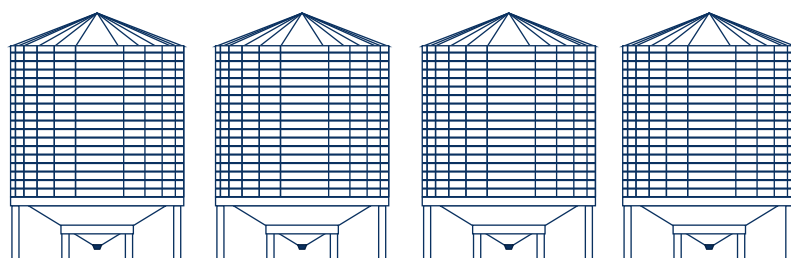


Figure 1. Illustrative view of a group of silos

When considering the choice between steel and concrete silos, it's important to weigh the advantages and disadvantages of each option.

be used in different configurations, but typically they can be arranged in groups of either four or eight, forming a robust storage system. Their design and capacity make them indispensable for industries that require substantial storage capabilities while maintaining efficient material handling.

Silos characteristics	Value
Diameter	25 m
Capacity	10,000 Tn
Dwelling time	30 days
Yearly rotations	12 times

Type of silo	Advantages	Disadvantages
Steel silo	• They generally have a lower capital expenditure (CAPEX) per ton stored • Easier to construct as they can be prefabricated and easily demolished if necessary • They require less extensive foundations, reducing the overall construction requirements	• May be less resistant to long-term humidity and temperature effects • Less commonly used for height-driven silos
Concrete silo	• Superior isolation and protection against external agents over the long term • Reliable choice when it comes to preserving the quality and integrity of the stored materials	• Tend to have a higher CAPEX per ton stored • Higher foundation requirements, adding to the complexity and cost of construction

- Commonly used for height-driven silos where the height requirements are greater
- On-site construction process makes demolishing concrete silos more challenging

Ultimately, steel vertical silos are the cheapest option and would not involve a loss of product quality, given the expected dwell times. Therefore, they could be the most suitable option for Ethiopia.

The loading and unloading process poses a challenge for silos of this size but there are technical solutions that solve potential issues. Silos with a capacity of 10,000 tons cannot accommodate bottom hoppers, which would facilitate the discharge operation for trucks and rail by utilizing gravity. Instead, flat bottom vertical silos must be used, with mechanical sweepers.

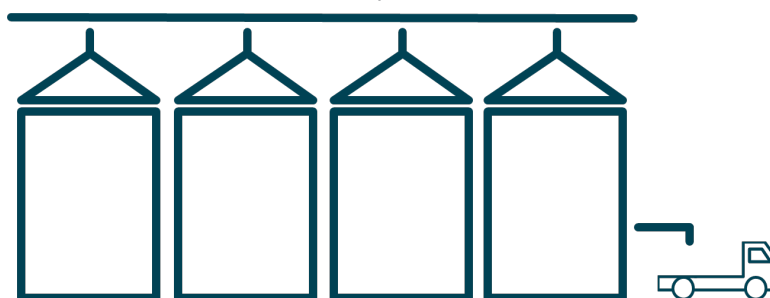


Figure 2. Illustrative view of flat bottom loading process

4.1.2 Potential required CAPEX per complex

After conducting a study on similar projects in neighbouring countries that share similarities with the Ethiopian context, it has been found that the total cost of constructing a complex consisting of four silos ranges between USD 12 million and USD 23 million. This is based on an estimated cost for each individual silo falls within the range of USD 3 million to USD 5.7 million everything included.

Each of these complexes could handle 480,000 Tn of grain per year considering a normal rotation of the grain of one month.

In terms of maintenance costs, the most relevant ones could be the maintenance and the staff. The ongoing maintenance typically ranges between 0.25% and 0.5% per year of the construction cost. The operation of such an asset could require a team of 4 to 10 individuals, with an average annual salary of around USD 10,000 per person. On top of this there are the utilities and other expenses. Therefore, the total maintenance and operational costs for each complex could be from 100k USD to 200k USD but these could vary per location.

4.1.3 Proposed location for silos in Ethiopia

To enhance the grain situation in the country, it is suggested that several silos complexes could be built across various regions to ensure the grain logistics. The recommended approach involves establishing groups of silos comprising either four or eight structures in densely populated areas. Each of these units would have a capacity of 10,000 metric tons of grain and a rotation cycle of approximately one month, resulting in an annual capacity of around 120,000 metric tons and a total of 480,000 tons per complex.

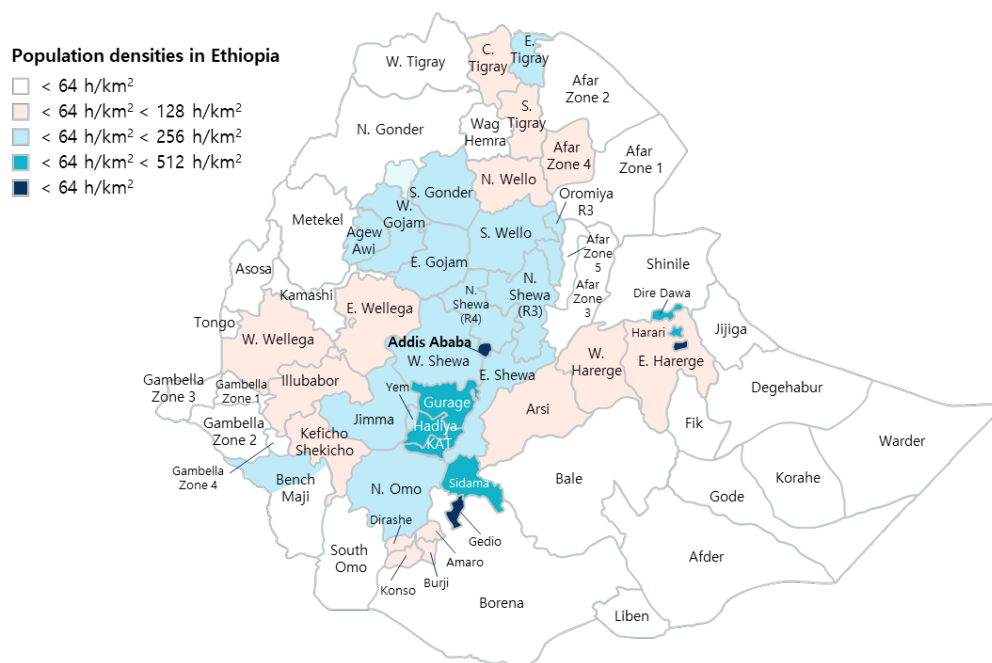


Figure 3. Population densities in Ethiopia

City	Region	Population	Silos	Yearly capacity (Tn/year)
Addis Ababa	Oromia	5.22 Mn	8+4	1.44 Mn
Jimma	Oromia	195,228	4	480,000
Bahir Dar	Amhara	390,429	4	480,000
Dessie	Amhara	257,126	4	480,000
Dire Dawa	Dire Dawa	466,000	4	480,000
Mek'ele	Tigray	587,000	4	480,000
Awasa	Southern Nations Nationalities and People (SNNPR)	335,508	4	480,000

Based on the country population, the proposal is to allocate silos in the following cities or nearby zone:

- Addis Ababa: Being the capital and home to most of the country's population, with over a million inhabitants (and even reaching 5 million), Addis Ababa necessitates two sets of silos—one with four structures and the other with eight. This approach not only supports the city but also provides assistance to Adama, another significant demographic centre located just 92 kilometres away from the capital.

- **Jimma:** Despite being part of the same region as the capital, Addis Ababa, Jimma is a strategically advantageous location for silo construction. The city is situated near sparsely populated areas that hold significance for states like Gambela and the South West Ethiopian People Region (SWEPR). This allows the asset to cater to these smaller regions while being located in a densely populated area. Furthermore, Jimma has already developed warehouses and industrial parks, indicating its suitability as a logistics hub. The proposal is to construct four silos in Jimma.
- **Hawassa:** As the capital of the Southern Nations Nationalities and People (SNNPR) region, Awasa is one of the most densely populated areas in Ethiopia, with a total population of approximately 600,000 people. To cater to the demand of the region, it is proposed to construct four silos in this area. Additionally, the ongoing improvements in the connectivity between Awasa and Addis Ababa further strengthen the case for this investment.
- **Mek'ele:** As the second most populous city in the country and the capital of the Tigray state, Mek'ele holds a strategic position for a silo. Although it may not be centrally located within the state, it is in close proximity to the region's most populated cities and not far from the Massawa port in Eritrea, which serves as a primary receiver of Ethiopian imports. The proposal suggests constructing four silos in Mek'ele.
- **Bahir Dar:** The Amhara state counts with three of the most densely populated cities in the country. To determine the most suitable location for the silo infrastructure, an analysis of the existing logistics assets was conducted. Bahir Dar stood out as it houses one of the few logistics parks in Ethiopia. This existing advantage, coupled with the city's experience in logistics infrastructure, presents an opportunity to leverage best practices and generate synergies between the industrial park and the silos. The proposal is to construct four silos in Bahir Dar.
- **Dessie:** Similar to Bahir Dar, Dessie, also located in the Amhara state, possesses notable logistics assets. It already hosts one of the eight dry ports and an industrial park. Similar to Bahir Dar, establishing silos in Dessie can create synergies between various centres and leverage best practices. The proposal is to construct four silos in Dessie.
- **Dire Dawa:** Although situated in a sparsely populated area, Dire Dawa is one of the most densely populated cities in Ethiopia. Its proximity to the Djibouti port, as well as its status as a stop on the Ethio-Djibouti line, positions the city as an essential corridor for grain imports. Djibouti serves as the primary recipient of imports for the federation. It is recommended to construct four silos in Dire Dawa.



Figure 4. Ethiopian proposed locations for grain silos

4.1.4 Function of the silos

These infrastructures can be in charge or be responsible of various tasks, which are:

1. Reception of international cargo: As mentioned earlier, Ethiopia is mostly dependant on international grain imports, as the country is not capable to meet the demand that it generates. Therefore, it is necessary to establish several complexes with the function of receiving international cargo, which arrives mainly by sea. The main port used by the country, since it is landlocked, is the port of Djibouti. Agreements between countries have allowed the creation of a rail link between the port and Addis Ababa for passenger and freight cargo. It is therefore proposed that the capital should concentrate the silos on this reception of international cargo. Moreover, the proposed complex in the city of Dire Dawa could be added to this as it is part of the Ethio-Djibouti railway line and close to the neighbouring country.
Another potential recipient of international cargo could also be the complex situated in the country of Mek'ele due to the proximity to the port of Mawasa, in Eritrea. However, due to the conflicts between the two countries, imports to this port are not substantial, so these silos could additionally be used for other functions.
2. Procuring of household products: The primary production of these stock in the country is concentrated in the regions of Oromia (57.4%), Amhara (27%), SNNP (8.7%), and Tigray (6.2%).⁵ Given this information, it is suggested that both the Jima and Awasa complexes be utilized for this purpose as well as for the redistribution at local and national level. The Jima complex is located in the region of Oromia, major producer of wheat in the country. Awasa suppose a strategic placement for this function as it is not only located in the state of SNNP, one of the main producers, but also close enough to both the Oromia region and the capital city of Addis Ababa to provide support if needed. Lastly both complex of the state of Amhara, Bahir Dar and Dese, can be used for this function as this region is also a major wheat producer. Additionally, the Mek'ele complex could also be used for this in case the reception of international cargo is insufficient.
3. Distribution of products: For this case there is not a recommended complex in charge of this, but all the constructed silos will be in charge of addressing this function.

4.1.5 Management of the project

4.1.5.1 Grain procurement

Regarding management of the grain market, the country has the option of following different approaches that will have different advantages and disadvantages. The three options are total centralization, partial centralization and total decentralization of the market.

Purchase method	Advantages	Disadvantages
Total centralization	1. Uniformity and standardization in production, storage, and distribution processes.	1. Reduced competition and limited innovation.

⁵ Wheat production and marketing in Ethiopia: Review study ([link](#))

	- Streamlined decision-making and resource allocation. - Regulation of prices to prevent monopolistic practices. - Market stability and reduced-price volatility. - Potential for better coordination and efficiency in the market.	- Potential for bureaucracy and slower decision-making. - Lack of responsiveness to regional or individual farmer needs. - Loss of local autonomy and control. - Risk of mismanagement or corruption within the centralized authority.
Partial centralization (Indian Model)	- Balance between central coordination and local flexibility. - Efficient collaboration and resource sharing between central and local entities. - Promotion of market stability while allowing for regional variations. - Adaptability to changing market conditions and farmer requirements. - Potential for standardized quality standards and fair practices.	- Challenges in striking the right balance between central control and local autonomy. - Potential for conflicts and coordination issues between central and local entities. - Risk of inconsistent decision-making and lack of clear responsibilities. - Difficulty in ensuring fair competition and preventing market fragmentation. - Need for effective communication and coordination mechanisms.
Total decentralization	- Promotion of competition, innovation, and entrepreneurship. - Tailored solutions for specific regions or farmers' needs. - Higher local autonomy and control over market decisions. - Potential for faster decision-making and responsiveness to market changes. - Market diversity and potential for localized market development.	- Market fragmentation and lack of coordination between different entities. - Price volatility and inconsistency in quality standards. - Challenges in coordinating efforts and ensuring fair practices. - Potential for market inefficiencies and duplication of efforts. - Lack of centralized regulation and oversight, which may lead to unfair practices.

4.1.5.2 Silos operation

As well as the grain market, silos have different alternatives of management that has to be analysed. In this case the options are that the asset is 100% private, 100% public or that is managed through a public

and private partnership where the public entity will maintain the silos with a minimum of supply in order to continue with operation.

Management method	Advantages	Disadvantages
Public management	1. Resilience: Public managed silos have shown resilience due to centralized government control, political influence, and the potential for rapid decision-making and effective implementation. 2. Support for economic development: The government's involvement can provide support and resources for economic development initiatives. 3. Centralized coordination: Public management allows for coordination with other government entities, facilitating information sharing and joint efforts.	1. Inadequate coordination: Relations with other organizations may suffer from poor coordination due to communication failures and disputes over funding and jurisdictional responsibilities. 2. Bureaucratic delays: Public management structures may be more prone to bureaucratic delays, which can hinder efficient decision-making and implementation. 3. Lack of flexibility: The decision-making process in public management may be slower and less adaptable to market changes and customer needs. 4. Higher public investment
Private management	1. Increased efficiency and productivity: Private companies driven by profitability often prioritize efficiency and productivity, leading to optimized operations. 2. Flexibility and market responsiveness: Private silos can quickly adapt to market demands and make decisions to meet customer needs. 3. Innovation and technological advancements: Private management allows for easier introduction of innovative technologies and practices to improve operations and storage. 4. Lower Investment from government	1. Profit-driven focus: Private management may prioritize profits over social and environmental considerations. 2. Monopolistic practices: There is a risk of a single company controlling the operation, potentially leading to monopolistic practices. 3. Short-term focus: Private management may prioritize short-term gains, potentially neglecting long-term investments and maintenance needs.
Public – Private management	1. Government control and oversight: The government maintains some level of control over the operation while partnering with a private party.	1. Potential conflicts of interest: Balancing the priorities of profit and government oversight may lead to conflicts of interest between the private party and the public entity.

2. Risk-sharing: The government supplies the asset with a minimum supply, mitigating risks for the private party and ensuring continuity of operations.	2. Dependency on government support: The private party relies on the government's provision of assets and support, which may impact autonomy and decision-making.
3. Horizontal communication: The partnership promotes effective communication between the public and private entities, as well as with external stakeholders.	3. Potential for inefficiencies: The partnership model may introduce complexities in decision-making and coordination, potentially resulting in inefficiencies if not managed effectively.
4. Lower Investment from government	

Some of the countries shown in the analysis have started with a public management of the silos and progressively moved to a PPP or private model.

4.2 Fertilizer

4.2.1 Project proposal and description

Based on the demand and supply in the country, it is proposed to develop a central warehouse that will assume most of the fertilizer cargo, while having few extra warehouses located in strategic areas related to fertilizing production complementing the capacity of the cooperatives. Part of these warehouses could be located in logistics parks (explained later in the document). As for now the import of cargo is stored at the Djibouti port until it is transported to the country where then is relocated to cooperatives along the country for the direct sale of the product. Only in special cases, the cargo is stored in the fertilizer warehouse of the Modjo dry port.

Due to this fact, it is proposed to locate the central warehouse for various reasons:

- The port already handles over 78% of nation's import so there is a constant traffic of freight through the infrastructure, increasing the attractiveness of the strategic location, with the possibility of creating synergies with other products transported to the centre.
- There is already established a specific fertilizer warehouse that is now used for extraordinary cases as it is underemployed and with an inefficient loading/unloading process. The infrastructure counts with two warehouses, each with an area of 1600 square metres and a capacity to store 5000 metric tons of bulk cargoes. This location should be sufficient to handle the vast majority of the country's fertiliser imports.
- The proximity to the capital, Addis Ababa, offers a significant convenience since most of the country's fertilizer plants are located in it.

It could be interesting to locate an extra fertilizer warehouse near a few strategic locations. Some recommendations are made for possible allocation of it:

- Dire Dawa. The OCP Group and the Government of Ethiopia have entered a joint venture with the objective of developing a world class fertilizer plant in Dire Dawa industrial park. The project will cater

to local Ethiopian fertilizers demand while reducing corresponding imports. This way a synergy can be established between the plant and the construction of a new fertilizer warehouse.

- Bahir Dar/Godar: both cities are located in the Amhara region, which is the second most agricultural region in Ethiopia, close to the first which is Oromia, where the centre warehouse of Modjo is located. This location while benefit the agricultural sector thanks to the proximity and accessibility to fertilizer creating synergies with the logistic asset. It is important to find the connexion between the fertilizer storage and the grain producers of the region.
- Mek'ele: As the cases of Bahir Dar and Godar, Mek'ele, while being one of the most populated cities of the country, is part of the region of Tigray which, although being far from the production from Amhara and Oromia, is one of the main agricultural regions of the country. Due to this, again synergies can be created between the agricultural sector and the logistic asset.

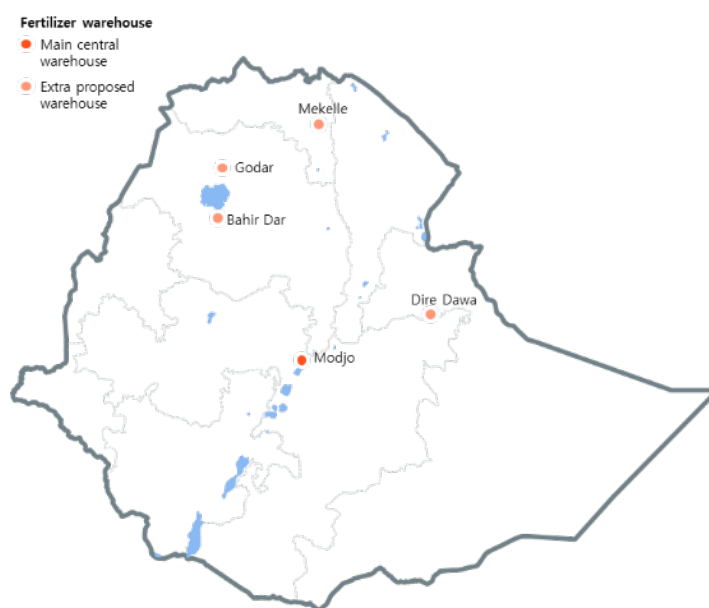


Figure 5: Ethiopian proposed locations for fertilizer warehouses

4.2.2 Management of the project

4.2.2.1 Fertilizer purchase

As for grains, fertilizer purchase can be managed in several ways that would involve more or less parties. The options that the county has to do so are total centralization, partial centralization and total decentralization of the market which advantages and disadvantages will be studied. Similar to other countries, the management of the fertilizer could also be the responsibility of the entities managing the grain.

Purchase method	Advantages	Disadvantages
Total centralization	1. Uniformity and standardization in the distribution and availability of fertilizers. 2. Optimization of marketing and procurement	1. Reduced competition, potentially leading to higher prices and limited choices for consumers.

	- Potential for centralized quality control and regulation. - Centralization encourage restructures fertilizer industry subsidies - Better coordination and monitoring of fertilizer usage and environmental impact.	- Lack of regional adaptability and responsiveness to local agricultural needs. - Potential for monopolistic practices and limited innovation. - Bureaucratic processes and slower decision-making. - Risk of inefficiencies and reduced customer satisfaction.
Partial centralization	- Combination of centralized coordination and regional flexibility. - Efficient collaboration and resource sharing between central and local entities. - Adaptability to regional variations in soil types, crop requirements, and climate. - Potential for standardized quality standards and better monitoring of environmental impact. - Market stability and reduced price volatility.	- Challenges in striking the right balance between central control and local autonomy. - Potential conflicts and coordination issues between central and local entities. - Risk of inconsistent decision-making and lack of clear responsibilities. - Difficulty in ensuring fair competition and preventing market fragmentation. - Need for effective communication and coordination mechanisms.
Total decentralization	- Promotion of competition, innovation, and diversity in fertilizer products. - Tailored solutions to specific regional agricultural needs. - Increased choices and potential for lower prices for consumers. - Local autonomy and responsiveness to farmers' needs and preferences. - Potential for faster decision-making and adaptability to changing market conditions.	- Potential for market fragmentation and lack of coordination between different entities. - Inconsistent quality standards and monitoring of environmental impact. - Challenges in coordinating efforts and ensuring fair practices. - Potential for market inefficiencies and duplication of efforts. - Need for proper regulations and oversight to maintain fair competition and protect consumer interests.

4.2.2.2 Warehouse operation

Currently all operations and maintenance of the infrastructure aimed for fertilizer storage is handled by the Ethiopian Shipping and Logistics Services Enterprise (ESLSE) as the Modjo facilities is controlled by this entity. However, the need for better infrastructure management and the creation of an extra warehouse location opens the door to private companies to take over operations of the facilities or create partnerships with the public entity

Management method	Advantages	Disadvantages
Public management	1. Social Benefit: Public ownership ensures that the warehouses are managed with the primary objective of serving the public interest, prioritizing accessibility and affordability for farmers. 2. Price Regulation: Public ownership allows for government intervention in setting and regulating fertilizer prices, which can help prevent price fluctuations and ensure fair pricing for farmers. 3. Strategic Planning: Public ownership enables the government to align fertilizer storage and distribution with broader agricultural policies and objectives, ensuring a coordinated approach to support the agricultural sector. 4. Accountability: Public ownership ensures that the government is responsible for maintaining transparency, accountability, and quality standards in the operation of the warehouses.	1. Bureaucracy and Inefficiency: Public ownership can be associated with bureaucratic processes, which may lead to inefficiencies and delays in decision-making and operations. 2. Lack of Market-driven Innovation: Public ownership may limit the introduction of market-driven innovations and technologies that could improve warehouse management and operations. 3. Limited Resources: Public ownership relies on government funding, which may lead to budget constraints and limited investment in warehouse infrastructure and technology upgrades. 4. Political Influence: Public ownership may be susceptible to political interference and favoritism, potentially compromising fair market practices.
Private management	1. Efficiency and Innovation: Private ownership fosters competition, incentivizing efficient operations, innovative practices, and investment in advanced technologies for warehouse management. 2. Flexibility and Adaptability: Private ownership allows for quick decision-making, adaptability to market demands, and the ability to	1. Profit Motive: Private ownership prioritizes profit generation, which may result in higher fertilizer prices and reduced accessibility for small-scale farmers. 2. Inequality of Service: Private ownership may lead to an uneven distribution of warehouses, with a focus on commercially viable regions,

	respond rapidly to changes in fertilizer supply and demand. 3. Market-driven Pricing: Private ownership promotes market-driven pricing based on supply and demand dynamics, which can lead to efficient resource allocation and fair prices for farmers. 4. Investment Potential: Private ownership attracts private investment, facilitating the expansion and modernization of warehouse infrastructure and technology.	neglecting rural or remote areas with lower profit potential. 3. Lack of Regulation: Private ownership requires effective regulatory oversight to prevent market abuses, ensure fair competition, and maintain quality standards. 4. Limited Social Focus: Private ownership may prioritize profit over social or environmental considerations, potentially leading to the neglect of sustainability and social welfare concerns.
Public – Private management	1. Synergy of Public and Private Expertise: PPPs combine the strengths of both sectors, leveraging public oversight and private sector efficiency and innovation to achieve effective warehouse management. 2. Enhanced Resource Allocation: PPPs allow for a shared investment in infrastructure, reducing the burden on the government while benefiting from private sector investment and expertise. 3. Improved Service Delivery: PPPs can improve the accessibility and quality of warehouse services by leveraging private sector efficiency, while ensuring public accountability and social objectives. 4. Risk Sharing: PPPs distribute risks between the public and private sectors, enabling a more balanced approach to managing uncertainties and potential financial risks.	1. Complex Contractual Arrangements: PPPs require careful contract design and management, which can be challenging and time-consuming. 2. Potential for Conflicting Interests: Balancing the public interest with private profit motives can lead to conflicts of interest, requiring effective governance mechanisms to protect public welfare. 3. Regulatory Challenges: PPPs necessitate robust regulatory frameworks to ensure fair competition, prevent market abuses, and maintain quality standards. 4. Limited Control: The public sector may have limited control over decision-making and operations in a PPP, which can impact strategic planning and alignment with broader public objectives.

4.3 Petroleum oils

4.3.1 Project proposal and description

Ethiopia until date counts with 13 fuel depots, capable of storing over 420,000 cubic meters of fuel. The country is also in the process of developing oil storage infrastructure alongside Djibouti with projects to improve the storage in the port and by creating oil and gas storage terminals in the country as the one

in Dukem, Oromia. However, the major challenge in the petroleum oil importation is not storage but rather transportation to Ethiopia. The connection between the port of Djibouti and the country is not sufficiently developed, with fuel being transported via tanker trucks on poorly maintained roads.

Based on the benchmark carried out, it is proposed to build a national liquid bulk storage system integrated to the port by railway and if possible, a pipeline. This storage system could cover the main cities and airports.

4.3.2 Petroleum oil tanks and pipelines management

Currently the management of the storage tanks is public as it is controlled by the Ethiopian Petroleum Supply Enterprise (EPSE) and, in special cases, by the Ethiopian Airlines which store the oil in the airport facilities. However, the project allows for the implementation of a private party as a partnership with the public entity or assuming full responsibility.

Management method	Advantages	Disadvantages
Public management	1. Control and accountability: Public ownership allows the government to have direct control over the infrastructure, ensuring transparency, accountability, and adherence to public interest. 2. National security: The government can prioritize the country's energy security by safeguarding the petroleum supply chain, ensuring reliable access to fuel, and mitigating potential risks. 3. Fair pricing and distribution: Public ownership provides an opportunity to regulate pricing and ensure equitable distribution of petroleum products, avoiding potential monopolistic practices. 4. Infrastructure development: Public ownership enables the government to invest in the expansion, maintenance, and modernization of petroleum tanks and pipelines, supporting economic growth and development.	1. Bureaucracy and inefficiency: Public ownership may be prone to bureaucratic procedures, resulting in slower decision-making, potential mismanagement, and inefficiencies in operations. 2. Lack of competition and innovation: State-owned entities may face challenges in introducing innovative practices and technologies due to limited competition and market dynamics. 3. Political interference: Public ownership can be susceptible to political influences, which may impact decision-making processes and undermine operational effectiveness. 4. Financial burden: The government bears the responsibility for funding the infrastructure, maintenance, and potential investment requirements, which can strain public finances.
Private management	1. Efficiency and expertise: Private companies often bring specialized knowledge, technical expertise, and efficiency to	1. Profit-driven focus: Private ownership may prioritize profitability over public interest, potentially leading to higher prices or

	infrastructure management, ensuring optimal operations and maintenance. 2. Competition and market dynamics: Private ownership fosters competition, which can lead to improved service quality, lower prices, and innovation in the petroleum sector. 3. Investment potential: Private ownership encourages private investment, attracting capital for infrastructure expansion, modernization, and technology upgrades. 4. Flexibility and adaptability: Private entities can respond quickly to market demands, adjusting operations and strategies to maximize efficiency and customer satisfaction.	inadequate access to petroleum products in remote areas. 2. Lack of transparency and accountability: Private entities may be less transparent in their operations, making it challenging to ensure adherence to safety, environmental, and quality standards. 3. Inequitable distribution: Market forces and profit motives may result in uneven access to petroleum products, particularly in underserved or less profitable regions. 4. Potential for market concentration: Private ownership can lead to monopolistic practices if a few companies dominate the sector, limiting competition and consumer choice.
Public – Private management	1. Combined strengths: PPP allows leveraging the expertise and resources of both public and private sectors, promoting efficient infrastructure management and service delivery. 2. Risk sharing: PPPs distribute risks and responsibilities between public and private entities, reducing the financial burden on the government and incentivizing private investment. 3. Innovation and efficiency: PPPs can introduce private sector efficiencies, innovation, and technology advancements to enhance infrastructure operations and customer service. 4. Public oversight: PPP agreements can include provisions for public oversight, ensuring accountability, and safeguarding public interest.	1. Complex negotiations and management: PPPs require careful negotiation, monitoring, and management to ensure mutual benefits and prevent conflicts of interest. 2. Balancing public interest and profit motives: Finding the right balance between public interest objectives and private sector profitability can be challenging and may require robust regulatory frameworks. 3. Potential for cost overruns and financial risks: PPPs involve financial commitments from both sectors, and if not well-managed, there is a risk of cost overruns and financial burden for the public sector. 4. Dependency on private sector capabilities: PPPs rely on the capacity and performance of private entities, and any operational or financial issues can impact the

4.4 Containerizable cargo

4.4.1 Description of the project

Based on the challenges identified during the study of the country's situation, it has been seen that the main focus must be put on the development of logistics parks and warehouse as a service. These logistics parks could be located near relevant cities and transport nodes to guarantee a good competitive position. There are three types of logistics parks:

- Monomodal platforms: parks with only one type of access like supply centres, trucking hubs and distribution logistics areas
- Intermodal platforms: parks with two types of accesses like air cargo centres, port logistics activity zones and dry ports
- Multimodal platforms: parks with three or more types of accesses like multimodal logistics zones

The main clients for these developments could be distributors and in the future logistics companies if the existing landscape is changed.

The potential logistics parks to be developed in Ethiopia could include a comprehensive value proposition for the cargo, the trucks and the people:



Figure 6. Aerial view of the CIM Valles logistics park

1. Parking area: destined for trucks out of service or waiting area
2. Service area: In this zone it can be found different restaurants, a hotel for visitors and truck drivers, and the offices of the complex, where the operations of the parks are managed, and certain formalities are carried out. Some of the offices are rented by operators of the warehouses.
3. Warehouse area: warehouse facilities and manoeuvring yards are destined for freight management and storage. From the different complexes observed in the image each one of them can be differentiated depending on the level of involvement of the tenant in its design:

Dedicated warehousing	Multi-Client warehousing	Turnkey warehousing
- Warehouses rented/purchased by a tenant - Interior design adjusted to the needs and desires of the tenants - Integrated offices - Facilities adjusted to the needs of the tenants - Size: 5,000-10,000 square meters	- Warehouses rented/purchased by 2 or more tenants - Standard design for all warehouses - Integrated offices - Common facilities - Size: more than 3,000 square meters	- Plots rented/purchased by a tenant - Design generally developed entirely by the lessee - Warehouse built by the park - Facilities adapted to the needs of the tenants - Size: according to the needs of the tenant

These logistics parks could include different standardize warehousing facilities for rent following the international practices including:

- Inside area: as it can be seen in the figure, normally this zone is divided into different parts in order to find the most efficient storage, handling and preparation of the cargo. It can be found any type of storage, depending on what is the focus of the cargo arriving to the infrastructure. This will also possibly depend on the necessities and characteristics of the region where the asset is located.
- Loading dock: probably the focus the country should have. Loading and unloading docks are of great importance on these structures as they facilitate this operation creating accessible accesses for trucks arriving. In these zones the procedure can be easily achieved and would increase substantially the efficiency, which is one of the most worrying challenges identified.
- Manoeuvring areas + parking: a space inside the limits of each warehouse has to be dedicated for trucks and machinery manoeuvres as well as parking space in case of being necessary during the operations

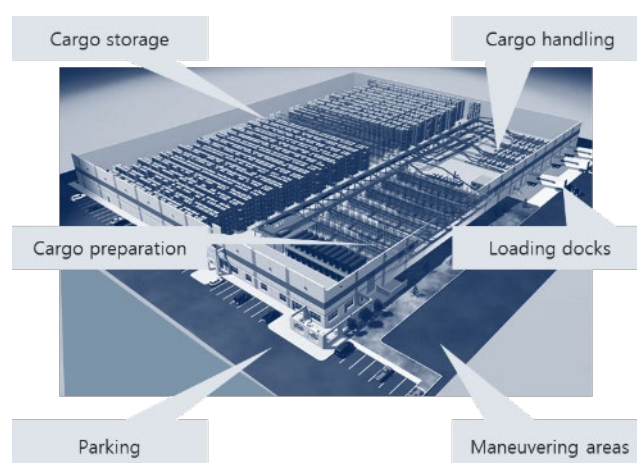


Figure 7. Warehouse illustrative size references

	Minimum	Average	Maximum
Height	6 m	10-11 m	12-14 m
Area	300 sqm	30,000 sqm	100,000 sqm
Standard module	300 – 1,000 sqm	3,000 - 6,000 sqm	40,000 sqm
Loading docks	1 dock every 1,400 sqm	1 dock every 1,450 sqm	1 dock every 1,500 sqm
Manoeuvring areas	1500 sqm	2,000 sqm	4,000 sqm

4.4.2 Potential locations for logistics parks

In order to make a proper selection of the location to implement the project, it is important to address the fact that this logistics parks are normally located near major cities and other logistics centres, connected to major highways, close to major airports and close to main ports. All of these facts would make

Intermodal logistics parks as the ones the project is aiming to construct, needs for an understanding on where the main and accessible trunk roads for trucks are located, and where the freight railway infrastructure is going through.

- Roads: Ethiopia accounts with 10 trunk roads accessible for freight trucks. All of which spread around the country with centre in the capital, Addis Ababa, and connecting with all the major cities in it. It will be recommended to develop these assets in the proximities of this trunk roads as the connection between cities will be more efficient
- Railway: currently there is only one railway line that connects the city of Addis Ababa with the port of Djibouti going through Dire Dawa. For most of the route, the track runs parallel to the A1 Road, which makes this route very attractive for a multimodal

Based on these routes and the location of the different main dry ports, the following locations are proposed for the development of the asset:

- Adama: Being one of the most populated areas and route for the A1 and the Ethio-Djibouti Railway (EDR) line, supposes a strategic location for the asset. The involvement of both transport systems makes the possibility of creating an intermodal park crucial.
- Modjo: The city is home for the biggest dry port of the country as it assumes more than 78% of total imports of the country with an available area for 31.7 hectares for containerized cargo. This option creates big attraction for private investment as synergies can be created between private parties importing cargo to the terminal and management of the new park. This will be added to the fact that it is also route for A1 and the EDR line.
- Dire Dawa: The northern city possesses a significant strategic advantage due to several factors. Firstly, it is home to one of the largest dry ports in the country. Additionally, its proximity to the Djibouti port and its location along the route of the EDR rail and the A1 trunk road further enhance its advantages. By establishing a logistics park in the area, there will be an opportunity to efficiently supply the population of the region.
- Addis Ababa: The capital city is the only city with a population surpassing one million individuals, with around 5 million inhabitants. Addis Ababa serves as the central hub for the nation's road network,

encompassing significant arterial roads and expressway, as well as for the EDR line. Due to these factors, the city stands as an ideal strategic position for establishing a multimodal logistics park, be it within the city itself or in the surrounding metropolitan area.

- Hawassa: The A7 trunk road passing through Modjo establishes a connection between the city and the capital. Furthermore, two projects are currently being under construction involving the city: an expansion of the EDR line is connecting Hawassa with Addis Ababa; and the development of a new dry port planned to hold 1,000 TEU at a time. These developments are expected to increase the interest for the construction of the plant as different synergies can be created between the different projects.

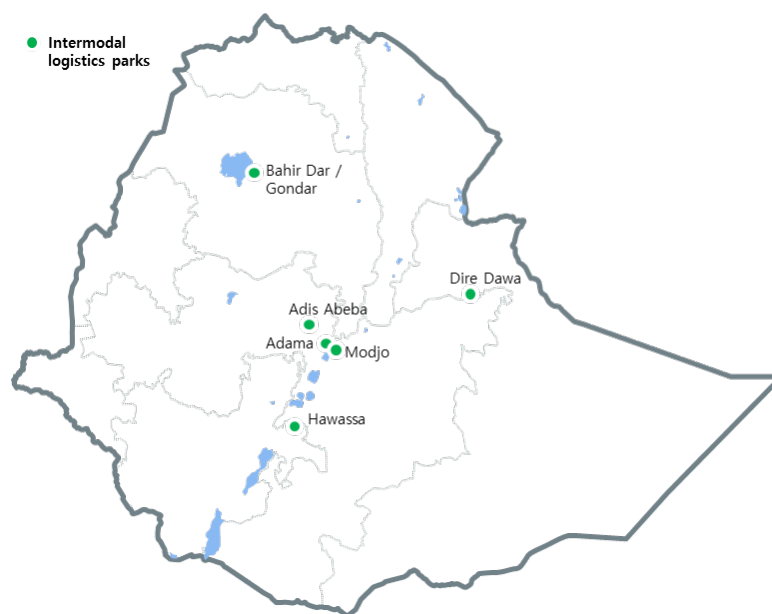


Figure 8: Ethiopian proposed locations for intermodal logistics parks

Typically, the construction of a logistics park ranges from 50 to 100 USD/sqm without built warehouses and the potential sizes could range from 25 to 50 Ha. The price for built warehouses in Africa ranges from 500 to 750 USD/sqm.

4.4.3 Logistics centre operation

Due to the novelty of the infrastructure, there is not any previous acknowledgement of the management of this type of asset. However, due to the country's history with similar asset, it is assumable that management would have been fully handled by a public entity. Yet, this asset could be managed either by a public entity, by an external private party, or by a partnership created between both the public and private companies.

Management method	Advantages	Disadvantages
Public management	1. Government control ensures that warehouses and depot dry ports serve national interests and strategic goals. 2. Public ownership can prioritize equitable access to container depot services across the country, promoting regional development. 3. Government investment can support the development of necessary infrastructure, such as road and rail connectivity. 4. Public ownership allows the government to regulate and set standards for operations, ensuring adherence to safety, security protocols and management of empty containers. 5. Revenues generated from public ownership can be reinvested in improving infrastructure and expanding services for the benefit of the public.	1. Bureaucratic processes and slower decision-making may hinder operational efficiency. 2. Limited competition and lack of market forces may lead to inefficiencies and higher costs. 3. Political interference and nepotism can potentially undermine fair practices and competitiveness. 4. High pressure on government for investment and resource allocation that may result from budget constraints or competing priorities. 5. Lack of expertise and innovation compared to private sector counterparts may hinder technological advancements and service quality.
Private management	1. Private ownership fosters competition, efficiency, and innovation in warehouse depot operations. 2. Market-driven decision-making allows for swift responses to customer needs and changing market dynamics. 3. Private sector investment can bring in capital and expertise to develop world-class infrastructure and services and reduce government burden. 4. Profit-driven mindset can lead to cost-effective operations and service optimization. 5. High-quality services and customer satisfaction can be	1. Private ownership may prioritize profit over public interests, potentially leading to higher costs and limited accessibility. 2. Lack of uniformity and standards across privately-owned container depots may pose challenges for coordination and regulation. 3. Inadequate competition or monopolistic practices can negatively impact pricing and service quality. 4. Social or regional equity considerations may be overlooked in pursuit of profit. 5. Lack of government oversight may raise concerns related to safety, security, and adherence to regulations.

prioritized to maintain a competitive edge.

Public – Private management

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| <ol style="list-style-type: none">1. Combines public and private sector strengths, leveraging expertise, resources, and investment.2. Improved efficiency through private sector involvement while ensuring public oversight and accountability.3. Shared risks and rewards between the public and private entities involved.4. Potential for innovative financing models, attracting private investment while reducing the burden on public funds.5. Balance between public interest considerations, market competition, and profitability. | <ol style="list-style-type: none">1. Complex contractual agreements and negotiations may cause delays or disputes.2. Balancing public and private sector priorities can be challenging and lead to conflicts of interest.3. Unequal distribution of risks and benefits, favoring the more influential or financially strong party.4. Potential for increased costs due to profit requirements of private partners.5. Dependency on the efficiency and transparency of government oversight in ensuring fair practices and public welfare. |
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