



This is a shortened version of final report comprising of assessments of institutional setup, procurement and financing systems, and logistics system for a study entitled National Import Dry Bulk Cargo Procurement and Logistics Institutional Set up.

National Import Dry Bulk Cargo Procurement and Logistics Institutional Set up Study:

Revised Final report

Shortened version

By AAU consulting team

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Acronyms

FGD	Focus Group Discussion
AfDB	African Development Bank
AISE	Agricultural Input Supply Enterprise
APL	American President Lines Ltd
B/L	Bill of Lading
BoA	Bureaus of Agriculture
BPL	Below Poverty Line
C&F/ CFR	Cost and Freight
CAD	Cash Against Documents
CBE	Commercial Bank of Ethiopia
CCTV	Stands for Closed-Circuit Television
CMA/CGM	Compagnie Maritime d'Affrètement/Compagnie Générale Maritime
COMESA	Common Market for Eastern and Southern Africa
COVID-19	Corona Virus
CPFR	Collaborative Planning, Forecasting and Replenishment
CPT	Carriage Paid To
CRS	Catholic Relief Services
CRWC	Central Rail side Warehouse Company Limited
CSA	Central Statistical Agency
CUs	Cooperative Unions
CWC	Central Warehousing Corporation
DA	Development Agents
DAT	Delivery at Terminal
DBC	Dry Bulk Cargo
DC	Distribution Center
DCP	Decentralized Procurement Scheme
DCT	Doraleh Container Terminal
DHL	Dalsey, Hillblom and Lynn
DID	Dubai International Djibouti
DMP	Doraleh Multipurpose <i>Port</i>
DOD	Department of Defense
EABC	Ethiopian Agricultural Business Corporation
EAC	East African Community
ECX	Ethiopia Commodity Exchange
EDR	Ethiopia- Djibouti Railway
EMA	Ethiopian Maritime Authority
EPSA	Ethiopia Pharmaceuticals Supply Agency
EPSE	Ethiopian Petroleum Supply Enterprise
ERC	Ethiopian Railway Corporation
ERCA	Ethiopian Revenue and Customs Authority
ESC	Ethiopian Sugar Corporation
ESLSE	Ethiopian Shipping and Logistics Service Enterprise
ETBC	Ethiopian Trading Business Corporation
ETLP	Ethiopia Trade Logistics Project
FA	Framework Agreement
FAO	Food and Agriculture Organization
FCI	Food Corporation of India
FDI	Foreign Direct Investment
FICC	Fertilizer Industry Coordination Committee

FILO	Free In/Liner Out
FIO	Free In/Out
FLT	Full Liner Terms
FOB	Free on Board
FRP	Fair and Remunerative Price
FXD	Foreign Exchange Directive
FY	Fiscal Year
GASC	General Authority for Supply Commodities
GCSS	General Company for Silos and Storage
GDP	Gross Domestic Production
GoE	Government of Ethiopia
GPS	Geographical Positioning system
GTP	Growth and Transformation plans
GVM	Gross Vehicle Mass
HDTL	Horizon Djibouti Terminals Limited
HVOC	Hindustan Vegetable Oils Corporation Limited
ICT	Information and Communication Technology
IDA	International Development Association
IFDC	International Fertilizer Development Center
IMF	International Monetary Fund's
Incoterm	international commercial term
IRI	International Roughness Index
IS	Import Substitution
ISSA	International Social Security Association
ISSSTE	State's Employees' Social Security and Social Services Institute
KII	Key Informant Interview
L/C	Letter of Credit
LAPSSET project	Lamu Port-South Sudan-Ethiopia Transport project
LGP	Liquefied Petroleum Gas
LIFO	Liner In/Free Out
LPI	Logistic Performance Index
LTA	long-term agreements
MDM	Midday Meal Scheme
MMT	Million Metric Tones
MMTC	Minerals and Metals Trading Corporation
MoA	Ministry of Agriculture
MoSIT	Ministry of Supply and Internal Trade of Egypt
MoT	Ministry of Trade
MoTL	FDRE Ministry of Transport and Logistics
MSP	Minimum Support Price
MTI	Ministry of Trade and Industry
MTPL	MMTC Transnational Pte.
MTS	Maritime & Transit Services
NBE	National Bank of Ethiopia
NDRMC	National Disaster and Risk Management Commission
NFSA	National Food Security Act
NLS	National Logistics Strategy
NWR	Negotiable Warehouse Receipt
OECD	Organization for Economic Co-operation and Development
PCs	Primary Cooperatives
PDS	Public Distribution System
PESTEL Analysis	Political Economic Social Technological Environmental Legal Analysis

PIL	Pacific International Lines
PPDS	Public Procurement and Property Disposal Service
PPP	Public Private Partnership
RMG	Rail Mounted Gantry
RPDS	Revamped Public Distribution System
SADC	Southern African Development Community
SADC	Southern African Development Community
SCG	Supply chain Governance
SCM	Supply Chain Management
SCZ	Suez Canal Zone
SDTV	Société Djiboutienne Terminal Vracier
SGTD	Société de Gestion du Terminal à conteneurs de Doraleh
SME	Small and Medium Enterprise
SNNP	Sothorn Nations Nationalities and People
STC	State Trading Corporation
SWCs	State Warehousing Corporations
TEU	Twenty Equipment Unit
TOR	Term of Reference
TT	Telex Transfer
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNoPS	United Nations Office for Project Services
WB	World Bank
WDRA	Warehousing Development and Regulatory Authority
WFP	World Food Program
WIS	Warehouse Information Systems
WR	warehouse receipt
WRS	Ware House Receipt System

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EXECUTIVE SUMMARY

Overview

The challenges facing the national dry bulk import cargo procurement and financing practice necessitated this study. Especially, major dry bulk procurement items such as sugar, wheat, fertilizer, and coal are planned and procured separately resulting in frequent rush procurement, overlapping activities, lengthy process, and inefficient practices throughout the value chain. As the Ethiopian government spends about 65% of its budget on procurement and procures 80% of dry bulk cargo imports accounting for 28% of country imports, efforts to tackle key challenges of dry bulk importation are believed to be transcendent. In view of this, this study intends to offer insights and solution options on institutional, procurement, financing, and logistics remedies for four DBC commodities: wheat, fertilizer, steam coal, and sugar.

Study objectives

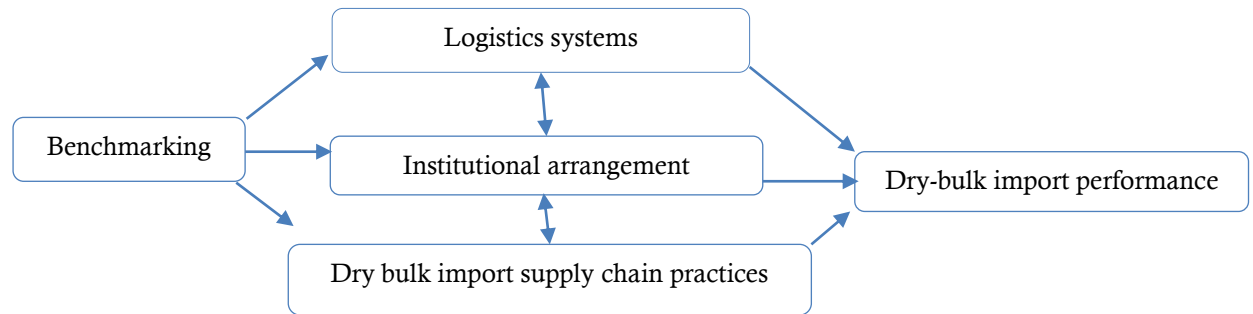
The general objective of this study is to critically examine the structural and working systems of the different government bulk cargo importers and come up with an efficient, coordinated, and reliable end-to-end-management structure and refined systems that ensures efficient planning, procurement, transit/transport, and delivery of dry bulk cargo. The study has the following specific objectives:

- To conduct diagnostic analysis on dry bulk: procurement, financing system, shipping, port operation, inland transport, and distribution for wheat, fertilizer, coal, and sugar.
- Propose the roadmap that should be pursued to create synergy in the planning, procurement, logistics and delivery systems of dry bulk imports among different government bulk cargo importers.
- To advise appropriate procurement modalities and import financing systems for dry bulk cargo import particularly for wheat and fertilizer.
- To devise the appropriate modalities for shipping and port operation, inland transport, storage facilities and distribution system.
- To recommend a solution on how to synchronize the procurement plan of the four commodities by different enterprises and their mode of delivery and time.

Conceptual framework of the study

The study considers different assessment frameworks such as supply chain characteristics, supply chain analysis, Collaborative Planning, Forecasting and Replenishment (CPFR), logistics system assessment, supply chain governance & institutional arrangement paradigms and dry-bulk cargo procurement process. This study zooms in on determining the best institutional arrangement, logistics management practices, and import supply chain management practices based on benchmarking

assessment to gain insight on how performance of dry-bulk cargo importation is impacted. The study thus follows the given conceptual framework:



Methodology

This study employed a mixed-research approach focused on national DBC institutional setup. The research project employed both qualitative and quantitative research approaches as well as primary and secondary data sources. Sampling was made to involve 90 survey participants, 42 KII's, and 8 FGD groups for 2 hours on average based on the principles set by (Yin, 2003). A stratified random sampling technique was used to select survey participants from stakeholders of DBC importation for questionnaire administration

Conclusion and recommendations

This study investigated the national import dry bulk cargo procurement and logistics institutional setup and system through primary and secondary data sources and triangulation by involving diverse stakeholders and experts through KII, FGDs, and survey. Given the significance share of national resource and challenges DBC procurement poses, the lack of centralized coordination, unifying facility networks, data capturing and analysis, and integrated technology among others stand as paradoxical. This study thus investigated the broad national DBC import system of Ethiopia and identified key bottlenecks in three key study areas: institutional setup, procurement and financing, and logistics.

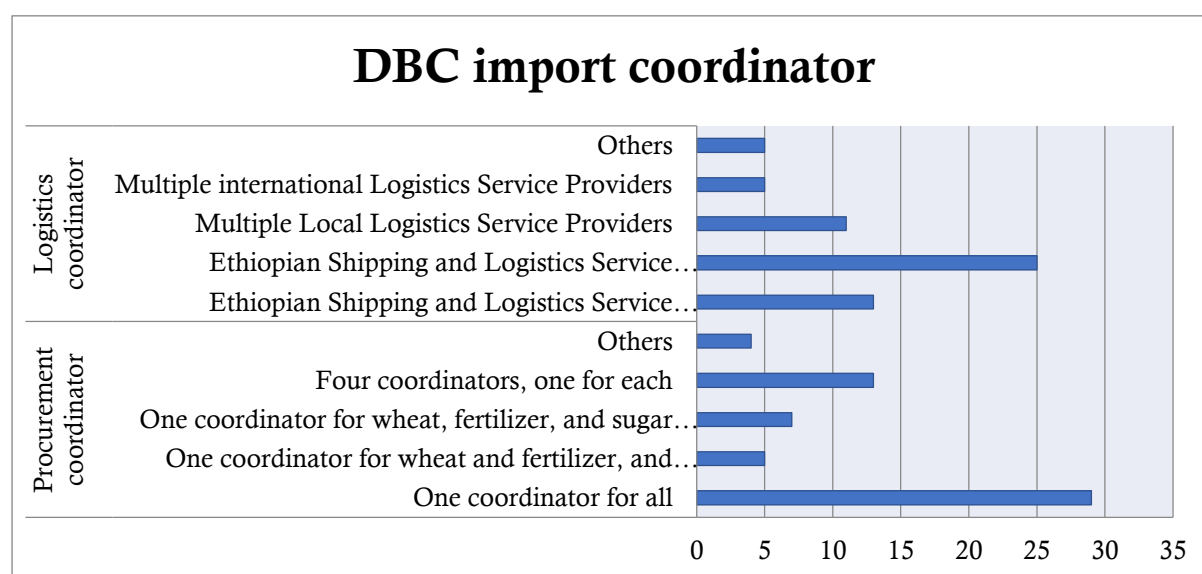
The first pressing issue in DBC import practice is institutional arrangement and legal framework. In Ethiopia, dry bulk imports are undertaken by various procurement organs and the logistics is coordinated by steering committee chaired previously by Ministry of Transport and Logistics and currently by NLC. The current system is basically decentralized procurement system for DBC commodities that cover about 28% of import and demand enormous foreign currency. In supply chain stages of planning, sourcing, make/operate, and deliver coordination from early stage is vital. However, in the DBC importation system planners are fragmented involving various regulatory authorities and stakeholders such as MoA, MoTRI, MoTL, MoM, MoF. Similarly procurement is also decentralized in which each procuring organ structurally makes isolated procurement decision. Thus, the desired strong coordination at the desired early stages of planning and procurement are missing. It follows that coordination is postponed to deliver

(logistics) stage, creating coordination an uphill task. EMA is positioned at such later stage and coordinate logistics operations through vessel scheduling and priority setting. As coordination is done by a committee, there is limited accountability and enforcement power over planning, procurement, and logistics of dry bulk import. Planning & implementation delay, delay over currency permit especially for unplanned purchase decisions, overlap of purchase schedules, overlapping demand for use of foreign currency, vessels, shipping and logistics service, trucks, and storage facilities. As a result, the country is suffering from demurrage cost of about 7.5 million USD yearly for DBC only, loss of shipments, and delay in distribution of key commodities such as fertilizer and wheat, militating food security risk due to reduced productivity and food shortage. Besides, there is no overarching regulatory framework that helps to govern entire DBC importation and distribution operations. Some of DBC's organizations do not have explicitly stated mandate for DBC procurement; some of them have role duplications; others have performance problems; still others with procurement mandate are hampered by rigid procurement rules not suitable to international practices. In view of this, the current DBC procurement organs operate with several limitations in DBC procurement and distribution as described hereunder:

- EABC (mandated only for fertilizer, traditional organizational setup, and extensive specialization on fertilizer with limited warehouse)
- ETBC (Traditional organization setup, limited experience in DBC importation with fitting mandate and warehouse and distribution capacity)
- ESC (Traditional organization setup, no clear mandate on DBC procurement but mandated for distribution, limited warehouse capacity)
- EPSE (No explicit mandate for coal, experience only on coal with relatively effective specialization, DBC importation creates additional burden)
- PPDS (strong mandate, but rigid legal framework, limited past experience and performance in specific DBC procurement, no distribution and warehouse experience, traditional organization setup)
- NDRMC (No mandate for procurement of DBC but for distribution, strong warehouse and distribution, good organizational setup)
- EMA (experience in DBC coordination via steering committee, no mandate for procurement but for logistics regulation, no enforcement power over procuring organs, good organizational setup)
- ESLSE (extensive experience in shipping and logistics, no mandate for procurement and distribution of DBC, no warehouse for DBC)

Benchmarking assessment was made to carefully selected countries and domestic organizations. The result shows that both Egypt and India apply strong centralized procurement and distribution institutional arrangement with clear overarching legal and policy frameworks. They both have national strategic commodities or essential goods and long standing national food security programs for which national focal procurement organization is established. In Egyptian case, GASC is a central organ procuring DBC especially wheat for decades making Egypt the largest global importer of wheat.

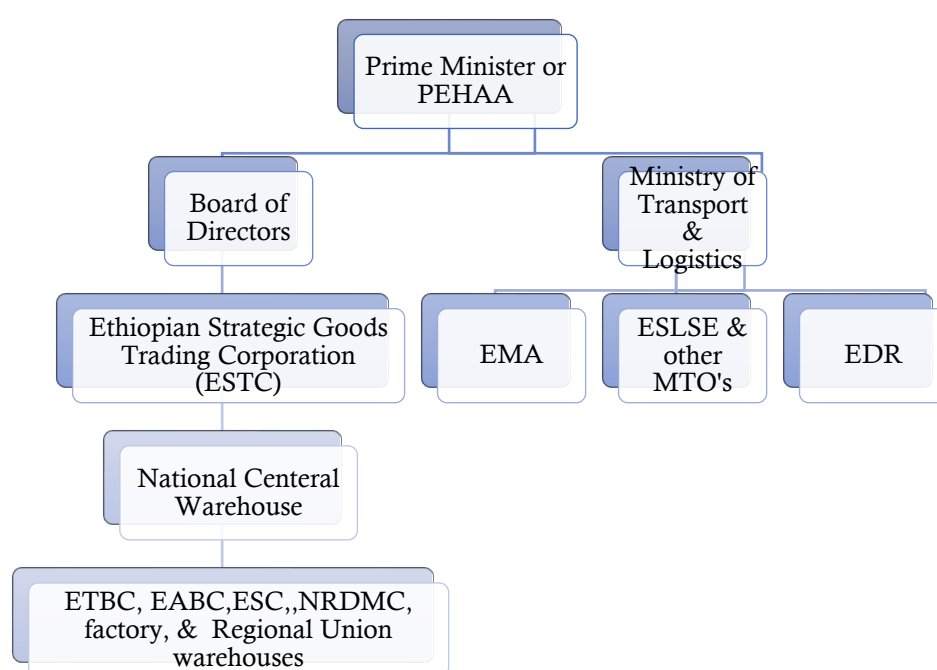
Similarly India has two central organizations involved in DBC procurement and distribution. Unique to India is the central warehousing system guided a separate act, regulatory body, and clear hierarchical structure throughout the country. Both countries have strong and complex warehouse development involving grain silos and warehouse information system. From domestic example, EPSA is known for modern warehouse operation system with clear structure, digital capability, and real time tracking system. The benchmarks offer key lesson to a rather haphazard DBC procurement and distribution system of Ethiopia: the need for national focal coordinating organization for DBC procurement and distribution, for central warehouse system, and for centralized logistics coordination. In view of this, alternative institutional arrangements were analyzed to coordinate the procurement and distribution with EMA as steering committee given the existing decentralized procurement, with EMA as a standing office given the existing decentralize procurement, with one of the better positioned existing procuring entity, i.e ETBC. None of these proposals were found to be feasible in solving the recurring DBC import bottlenecks. Survey participants supported central coordination of DBC procurement as indicated the following figure.



Thus, establishment of a single new focal organization is considered the most appropriate to transform the DBC importation practice and bring the intended result. This option offers the opportunity to establish central warehousing system and modern digital procurement and distribution organization. As a result, the following structural arrangement options are proposed:

1. The first proposal relates to centralization into a new single focal organization called ESTC (Ethiopian Strategic Commodities Trading Corporation (ESTC). ESTC is proposed to centrally procure DBC, establish central warehouse and silo system nationally follow up distribution of DBC to central warehouses, and flexibility set the national strategic commodities. As DBC shipments cover 28% of

countries import, the country cannot afford offering it a lose focus. Such centralization is expected to offer scale advantage, learning curve effect, and information access on international market trends at every stages of the supply chain from procurement, to shipment, silo storage. ESTC is expected to be structured either under the Prime Minister for maximum enforcement or PEHAA for practicability with possibility of future structuring under EIH to transition itself into self-sustaining export income generator. ESTC's finance sources could be government budget, revolving fund, service charge, loan, grant, citizens' donations, and aid by tying it to food security policy. The second proposal is to centralize under the current ETBC that has the mandate, flexibility to operate as enterprise and use its own procurement manual, and has the largest capacity of storage facilities. This proposal is suggested for ease of implementation although the traditional form of organization is expected to limit transformation effort. The following figure shows the first proposal.



2. Policy intervention needs to start from overarching legal frameworks for DBC procurement and distribution reflecting governing government programs on food security, agricultural productivity, and industrial development following the practices of Egypt and India.

The second key issue of national import DBC supply chain is management of the supply chain especially the procurement and financing system. The study found out that DBC procurement system is characterized by traditional manual system, weak forecasting practice, overlapping procurement and logistics executions, limited practices towards achieving consolidation, bulk purchase, and economies of scale. Besides, strategic sourcing is barely practiced with framework agreement, e-procurement, and global

market assessment are almost missing. Use of incoterm is another challenge with FOB being government preferred incoterm and C&F being a choice of some procuring organs. Finance is found to be the main bottleneck with shortages of foreign currency and local budget hampering importation progress and accumulated farmer's credits risking regional and Federal governments. In view of the procurement and distribution practices of wheat, fertilizer, sugar, and coal often face enormous challenges leading to fire fighting and emergency operations year after year. Despite government's plan to import substitute DBC commodities, forecasts up to 2030 and evidences on the ground signify that import substitution for wheat, fertilizer, sugar, and coal could hardly be realized in the foreseeable future even if sugar and wheat import projections show a declining trend. In general, the current practice results in delay of essential commodities affecting national productivity and food security purchase at highest price seasons, and purchases beyond the actual needs. Thus, the following key interventions need to be taken to refurbish the current procurement and financing system:

- There needs to be a digital system of forecasting to determine the right volume and timing of purchase based on consideration of crop season, global market price, and local demand. As per the current assessment, the procurement of the four DBCs needs to be distributed across three quarters, Quarter II, III, and IV avoiding quarter I for either inflated price season or mismatching usage period. Accordingly, fertilizer needs to be procured end of quarter IV, wheat in quarter III, sugar in Quarter II. Coal can be procured in quarter II and III.
- In order to ensure end to end supply chain, multi modal system in the dry bulk procurement needs to be promoted.
- Strategic sourcing practices such as e-procurement and framework procurement are not optional in international procurement. Besides, flexible, simple, and fast method of procurement needs to be in place with simple bid document, short validity period, and reasonable bid security. Empanelment or preferred procurement method needs to be in place to ensure sustainable supply source. To practice dry bulk procurement through a deeper international monitoring and knowledge of global suppliers to leverage on procurement from direct producers
- Procurement needs to be guided by national policy framework and flexible procurement manual. There needs to be adequate autonomy for and accountability to the procuring organ to smoothly and flexibly function in international market.
- The use of FoB as per the existing directive needs to be promoted as it is found to have multifaceted advantage for importing countries. However, this needs to be coupled with strong and functional waiver system and logistics price monitoring and transparency requirement to fetch the theoretical benefits of FoB for the procuring organs. In circumstances when FoB is proved to be less favorable for cost, operational hassle, or related challenges, the waiver system needs to be effective enough to allow for C&F or CPT as the case maybe.

- To resolve the incessant financing problem, revolving fund needs to be established for the focal procuring organization to ensure seamless DBC procurement and distribution. Through pooling system, in which DBC are procured by a single organ, the requirement for revolving fund would be significantly reduced as it allows for common use of currency through sequential procurement of DBCs. Through pooling, sequential procurement, and efficient reimbursement system, nearly 300 million USD is required currently. The payment collection system needs to be digitalized at grass root level, and institutionalized to create accountability and reduce the political and financial risks borne by Federal and Regional governments. The focal organization can serve as a central organ to execute the credit collection system. Besides, the implementation of the newly launched warehouse receipt system needs to be expedited to solve financing problems of farmers as it allows farmers to access credit and effect payment to the value of deposited grain.

The third key bottleneck of import DBC supply chain is logistics system. As a landlocked country highly exposed to a single sea port country, Ethiopia is not in the ideal position when it freight logistics. This is evident from the fact that Ethiopia the World biggest landlocked country by population and that it experiences among the lowest ranked in LPI. This is attributed to inadequate road and railway infrastructure and connectivity, limited truck and wagon capability, limited competency in logistics sector, and low digital penetration in logistics sector, among others. Considering DBC, Ethiopia has national central warehouse system; it has no DBC cargo vessel; it faces inadequate utilization of rail transport in DBC. As a result, DBC freight logistics is characterized by painstakingly high inland transport cost, long transport time, and high demurrage cost. Data reveals that the country achieves only 42% of daily discharge plan translated in to 74 out of the required 175 daily truck usage. As a result, the country pays on average 7.56 million USD in demurrage costs every year for wheat and fertilizer, experiencing delays by 504 days. On Logistics Service Providers, it is characterized by limited competition; lack end to end services, limited facilities such as warehouses, and limited PPP arrangement. ESLSE happens to stand out through extensive experience but needs constructive monitoring to trickle down its scale and bargaining advantage to procuring organs. Given such facts, the study reveals that the DBC procurement and distribution lacks logistics mindset. To curb these challenges, the following key remedies need to be taken.

- The DBC import logistics needs to be devised for seamless supply chain through end-to-end logistics service provision. To this end, the DBC logistics needs to have a single coordinator to streamline logistics activities, achieve scale economies, and improve bargaining power at international shipping sector. In this case, ESLSE is well positioned to take a leading role. As per the study, ESLSE needs to take a leading role in DBC logistics condition that it can jointly work with PPP partners, its pricing competitiveness and transparency can be subject to monitoring, and functional waiver practice can be put in place based on the FOB

directive. Ultimately, rationale over ESLSE's service in DBC needs to be established based primarily on economic imperatives of efficiency to stakeholders, secondly on strengthening national carrier.

- As the current DBC supply and logistic chains are not well supported by ICT, digital integration needs to be made through proper timely investment.
- National Competency development to the logistics sector should be done through well-functioning center of excellence comprising of key stakeholders from industry and academic institutions.
- As a land locked country, Ethiopia has to figure out the most feasible port against physical, political, economic, technical, commercial, diplomatic, etc. criteria's. Apparently, Djibouti port is the most feasible port even with the present setbacks. Though there are set backs which need diplomatic and commercial solutions. The Berbera port is also another alternative feasible port to explore although bilateral agreement is a challenge at the moment. The Sudan port is potentially feasible port to North- West part of the country although technical, operational and political issues are upheld. Lamu Port can be considered as potential port for the southern part of the country. The Assab and Massawa ports are potential future options for North East part of the countries but require further diplomatic, technical and commercial assessments. The former however is not accessible on the sea side at the moment.
- Ethiopia needs to devise well thought and cut-throat port strategy that goes beyond physical ownership but practical ownership through broader alternatives, bargaining tactics, diverse ownership participation modalities, strong shipping and vessel presence, among others. Ethiopia needs to devise effective sea port strategy considering the relative port feasibility. Although the study finding reveals Djibouti port is overall the most feasible, there needs to be constant search for alternatives to uplift Ethiopian bargaining power. Apart from direct negotiation and bilateral agreements, Ethiopia can use indirect influencing mechanisms such as alternative ownership or port use modalities and control of the extreme ends of supply chain. In this sense, ESLSE's ownership of more vessels, global presence, and participation in value added port services such as bagging are options to consider. On the other hand, Ethiopia's participation in creating broader hinterland to sea port countries through regional road, railway, and warehouse network, will make Ethiopia a hub and attractive transit option for sea port countries. In connection to this, Ethiopia needs to plan to connect to landlocked countries further deeper than South Sudan to serve as a logistics hub and warehouse center in the long run.
- Road and railway infrastructure and maintenance projects have to be commissioned for swift completion with utmost priority to main trade corridors of the country. Road and railway infrastructure should not be done in isolation with the notion of maintaining system balance through proportionate parallel developments such as warehouses, value adding port service activities such as stevedoring and bagging.

- There needs to be a shift from truck dominated DBC transport to railway dominated DBC transport system. Based on the findings, a mix of truck and wagons dedicated to DBC is recommended to be made available at 66.67% capacity utilization and 50-50 split: 970 trucks and 222 wagons now, 1255 trucks and 287 wagons in 2025, and 1429 trucks and 327 wagons in 2030.
- The railway system is hampered by long overdue construction works, power reliability and quality problems, security problems, commercial and marketing bottlenecks, working capital shortage, unscheduled DBC importation, lack of coordination and integration within stakeholders, infrastructural and operational pitfalls. Measures should be taken to alleviate such problems in a way that railway can transform DBC import performance. This requires policy direction, strategy, and commitment by the Government.
- Serious improvements on road and rail facilities, warehouses, storage practices and operational capabilities, connectivity of rail way systems to meaningful nodes such as silos and warehouses are needed. Even small integrated improvements in such areas are believed to have large dividend and lasting transformation to the DBC import sector.
- Building flexible capacity of national central warehouse would do wonders in import and export performances. Along this line central warehouses that will be linked to regional and district warehouses should be developed through DBC procurement and distribution coordinator. This arrangement will help in expediting and streamlining the newly launched national warehouse receipt system. As a the start, low capacity warehouse with a weekly clearance system can be established for later upgrade to a higher capacity with a 15 days or 30 days clearance period. Accordingly, based on the study findings, at least the central warehouse capacity of 57,595 tones currently, 74,484 tons in 2025, and 83,928 in 2030 needs to be achieved through a one-week clearance system. Such capacity of central warehouses needs to be developed in four locations: Endode, Adama, Dire Dawa, and Kombolcha.
- In the long run, Ethiopia needs to adopt DBC low price season purchase along with complex storage system comprising of grain silos to ensure national food security and serve as a warehouse service hub for deeper hinterland countries such as Sudan, Chad, Central Africa Republic, and Republic of the Congo.
- Ethiopia experience very high import and export imbalance as high as 17 to 1 ratio. On top of that, it experiences mismatches of top export and top import seasons. Although remittance's contribution is undeniably important, the import and export mismatch in both value and seasons present foreign currency strain upon need. This also presents inland transport capacity wastage of trucks and wagons and subsequently high transport cost. Therefore, the following actions need to be made to minimize the foreign currency challenges:

- To promote tightly scheduled sequential imports for big imports such as DBC procurement. A central procuring organ is helpful to ensure well dispersed and coordinated importation of DBC.
- To promote export diversity especially in oil and pulses to boost export performance and foreign currency availability is high import seasons.
- To match imports to high export seasons to allow for efficient use of inland transport capacity such as trucks and wagons.
- To promote a centralized inland transport coordination to allow for utilization of the same truck capacity for imports and exports of coinciding schedules. As it stands, ESLSE is well positioned to coordinate such effort.

PART ONE: INTRODUCTION

1.1. Overview

Following its split-up of the communication sector through proclamation number 691/2010, the then FDRE Ministry of Transport currently renamed as FDRE Ministry of Transport and Logistics (MoTL) was established to coordinate different institutions among which includes the Ethiopian Maritime Authority (EMA).

EMA takes a leading role in modernizing the logistics system of the country. It has been taking part in improving trade logistics of the country with key projects, change initiatives, and institutional arrangement. Among the notable contributions of EMA include Ethiopia Trade Logistics Project and formation National Logistics Council and strategy. Moreover, EMA's initiative to coordinate dry bulk cargo importation through a steering committee is critical first step in the right direction. However, further structuring of the dry bulk cargo (DBC) importation is required in order to forge leadership to the logistics sector in particular through institutional arrangement, designing internationally accepted bulk procurement and financing method and logistics services. As the Ethiopian government spends about 65% of its budgets on procurement, and procures 80% of dry bulk cargo imports accounting for 28% of country imports, efforts to tackle key challenges of DBC importation are believed to be pivotal in improving DBC as well as country's import performance in terms of cost, time, and supply availability. In view of this, the National Logistics Strategy (NLS) identified as the primary intervention area the restructuring of dry bulk cargo importation and ways of streamlining its planning, logistics, and distribution for efficient practice. This study is therefore part and parcel of the implementation of NLS and Logistics sector policy of the country. Given that the DBC procurement commodities such as sugar, wheat, fertilizer, and coal are planned and procured separately resulting in frequent rush purchase and execution, overlapping activities, lengthy procurement process, and inefficient procurement and distribution practices, this study is key in providing insight into appropriate modalities of institutional arrangement, procurement and financing system, and logistics service.

The general objective of this study is to critically examine the structural and working systems of the different government bulk cargo importers and come up with efficient, coordinated, and reliable end-to-end-management arrangement and refined systems that ensures efficient planning, procurement, transit/transport and delivery of dry bulk cargo.

The study has the following specific objectives:

- To conduct diagnostic analysis on dry bulk: procurement, financing system, shipping, port operation, inland transport, and distribution for wheat, fertilizer, coal, and sugar.
- Propose the roadmap that should be pursued to create synergy in the planning, procurement, logistics and delivery systems of dry bulk imports among different government bulk cargo importers.

- To advise appropriate procurement modalities and import financing systems for dry bulk cargo import particularly for wheat and fertilizer.
- To devise the appropriate modalities for shipping and port operation, inland transport, storage facilities and distribution system.
- To recommend a solution on how to synchronize the procurement plan of the four commodities by different enterprises and their mode of delivery and time.

1.2. Conceptual framework of the study

The study considers different assessment frameworks such as supply chain characteristics assessment frameworks, supply chain analysis frameworks, Collaborative Planning, Forecasting and Replenishment (CPFR), logistics system assessment frameworks, supply chain governance & institutional arrangement paradigms and dry-bulk cargo procurement process. This study zooms in on determining the best institutional arrangement, logistics management practices, and import supply chain management practices through benchmarking assessment to improve the performance of dry-bulk cargo importation. The following conceptual framework is considered for this study:

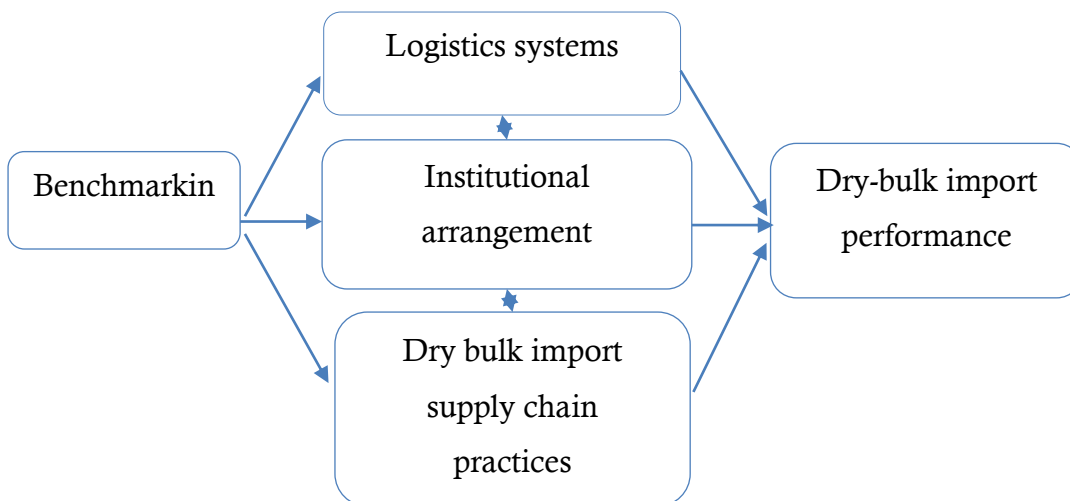


Figure 1. 1: Conceptual framework

1.3. Methodology

This study employed a mixed-research approach focused on national import DBC institutional setup. The research project employs both qualitative and quantitative research approaches as well as primary and secondary data sources. Published and unpublished literature, internet sources, institutional manuals on strategies, trade logistics, transportation, and dry bulk cargo importation, and key legal documents such as proclamation, policies, regulations, and directives made up the secondary data. Primary data source included cross-sectional data obtained from regulatory bodies, top management, directors, team leaders, and employees of the main stakeholders of DBC importers pertinent to wheat, steam coal, fertilizer, and sugar. Interview included Key

Informants (KII) from Federal regulatory bodies, DBC procuring organizations, development partners, transport and chamber associations, cargo owners, freight forwarders, drivers, banks, regional agricultural and finance bureaus, farmers associations, custom offices, and users of DBC among others. Focus group discussions (FGD) involved immediate participants in DBC planning, procurement, and logistics.

Sampling was made to involve 90 survey participants, 42 KIIs, and 8 FGD groups for 2 hours on average based on the principles set by Yin (2003). Stratified random sampling technique was used to select survey participants from stakeholders of DBC importation. The following approach was used to determine the sample proportion:

$$n = \frac{z^2 pq}{e^2} = [1.70^2 * 1.70 (0.5 * 0.5) / 0.09^2] = 90.$$

The research used both descriptive and inferential statistical analysis using Statistical Package for Social Science (SPSS). Descriptive analysis presented data using percentage, frequency table, items analysis and mean. Qualitative analysis employed techniques such as narrative, content, and framework analysis. Finally, Analysis includes forecasting and benchmarking assessment.

PART TWO: INSTITUTIONAL ARRANGEMENT

2.1. Diagnosis report

This section diagnoses the dry bulk cargo importation of Ethiopia associated with Sugar, wheat, fertilizer, and steam coal with the aim to show the overall picture of the practice as it is. PESTEL analysis is the framework used to display macro environmental variables as a basis for making diagnosis assessment of focal organizations and their functions.

- **Political:** Ethiopia has seen major political change in the last three years that shaped the future vision of the country and the manner through which government operates. The formation of the newly elected government also presents uncertainty on the future political landscape of the country especially with respect to the constitution, the government structure, composition of parliament, and formation of ministerial organizations, ownership structure of some public organizations, etc. Such changes would present opportunity to better harmonize the dry bulk importation practice. The development of National Logistics Strategy and the formation of National Logistics Council and Logistics Transformation Office have a very important stride to bring proper change and decision on Dry Bulk Cargo logistics transformation.
- **Economic:** The future is expected to see increased urbanization, with investments in industrial parks, dry ports, and recreational parks to name few. Such trend calls the country for sophistication and modernization. Such changes would present access and alternatives in terms of transport lines, road, warehouse and port facilities, and vehicles for a well-organized dry bulk cargo shipment practice. The recent global political and economic situation such as war between Russia and Ukraine brought about significant strain in the DBC importation with a further soaring of fuel, wheat, and fertilizer price adding to the already upward price trend. Supply disruption especially for wheat is a present risk as Ukraine and Russia are providing nearly 30% of the global wheat supply.
- **Social:** The growth of population of Ethiopia is expected to be 150 million in 2030. The population is rising with average growth rate of 2.6%. This will have its own implications on the economy of the nation and volume of public spending. Following this, the level of domestic as well foreign procurement transactions would likely be very high along with demand for basic consumption items such as wheat and sugar. As such trend would demand more resource, activity, and money, the need for a well-organized and better planned dry bulk importation system is apparent.
- **Technological:** At present, the level of growth of digitization in Ethiopia appears to lag behind the rest of the world as well as African countries. Ethiopia is one of the few African countries with a public monopoly on information technology. The national importation practice has long been characterized by lack of advanced

technologies and advanced IT systems, leading to poor information exchange, delay, and added costs. But, low utilization of technologies will not continue. Cognizant to this, one of the actions that the government is willing to take is privatizing some share of Ethio Telecom, which may allow the services to be improved.. The implementation of an adequate system of information technology will greatly contribute to integrate different actors in freight logistics. The level of interface among buying organizations, transport operators, warehouses, ports, custom offices, etc would depend on IT and telecom infrastructure.

- **Environment:** Ethiopia has been pledging to ensure sustainable economic growth and signed many agreements in relation to building green economy. The rate of urbanization and industrialization is too quick to plan for environmental sustainability. Pressure for environmental protection is intensifying with major global actors such as China and USA are coming to table to respond to the increasing pressure. Ethiopia cannot be isolated from such global trend.
- **Legal:** During recent times, the Ethiopian government has made amendments to proclamations and regulations such as tax, trade law, transport, etc. A key public procurement Proclamation No. 649 is expected to be revised. The National Logistics Strategy is now being implemented following the formation of the National Logistic Council. In addition, a 10 year strategic plan for the transport sector is devised. The introduction of FOB as a preferred importation is also a recent trend shaping national importation practices. Such trends imply that the national logistic structure is under formation, presenting opportunity for organization of the dry bulk importation system afresh among others.

The following table summarizes the PESTEL analysis.

Table 2. 1: Summary of PESTEL analysis

PESTEL category	Issues that could affect dry bulk cargo importation	
	Opportunities	Threats
Political	• New government structure & reforms • Move towards regional integration • Government priority for logistics sector • Improved logistics governance	• Regional & internal instability
Economic	• The plan towards import substitution for wheat & coal. • Increased industrialization & commercialization. • Alternative ports & dvts. • Improving transport & logistics infrastructure	• Slowing economic growth • increasing trend of importation • Inflation • Shortage of foreign currency
Social	• Improved national effort to develop human resources	• Population growth • Urbanization

		• Internal conflict, migration, & draught • COVID-19 epidemic
Technological	• Improved IT infrastructure • Telecom improvement • Improved logistics & transport technologies	
Environmental	• The plan to building green economy	• Climate change • Transport sector pollution
Legal	• Potential revision of proclamations • Formation of Logistics council • Issuance of National Logistics Strategy, FOB directive	• Lack of overarching legal frameworks

National dry bulk cargo importation system strength and weakness

This section focuses on key strength and weaknesses of the current dry bulk cargo importation of sugar, fertilizer, steam coal, and wheat with respect to institutional arrangement, procurement process, financing options, and logistics systems arrangement. The following table summarizes key strengths and weaknesses of national dry bulk cargo importation.

Table 2. 2: Summary of internal assessment

Area	Strength	Weakness
Overall practice	• Separate and more specific legal framework and practices	• High cost, high wastage, and long lead time performance challenges
Institutional arrangement	• Specialization of practice • Decentralization of activities	• Fragment process • Weak coordination among actors • Lack of harmonized system • Multifaceted bottlenecks in the process • Assignment of DBC Procurement with no clear mandate
Procurement and financing	• Distribution of activities	• Long process • Lack of timely consolidation of plans • delay Finance release • Shortage of hard currency • Lack of integrated system • High cost of procurement • Poor planning of DBC

		importation
Logistics systems and Port facilities	• Availability of main dry port at centroid location • Connectivity through rail way to main port • Exploration of emerging alternative sea ports	• Multi-faceted bottlenecks related to railway, road, & warehouse infrastructure • Lack of holistic planning, assessment, and intervention • Poor coordination, demand and supply matching, • Poor logistics configuration • Monopolistic structure along corridors • Poor port productivity • Lack of discharging warehouses, • Long documentation process, • Lack of incentive for logistics investment such as warehouses, loading/unloading equipment and truck and railway • Outdated trucks

Based on assessment of opportunities, threats, strength, and weaknesses of DBC importation practice, interventions in four areas-Legal, institutional, operational, and infrastructural- is considered vital as depicted in at the center of the following figure.

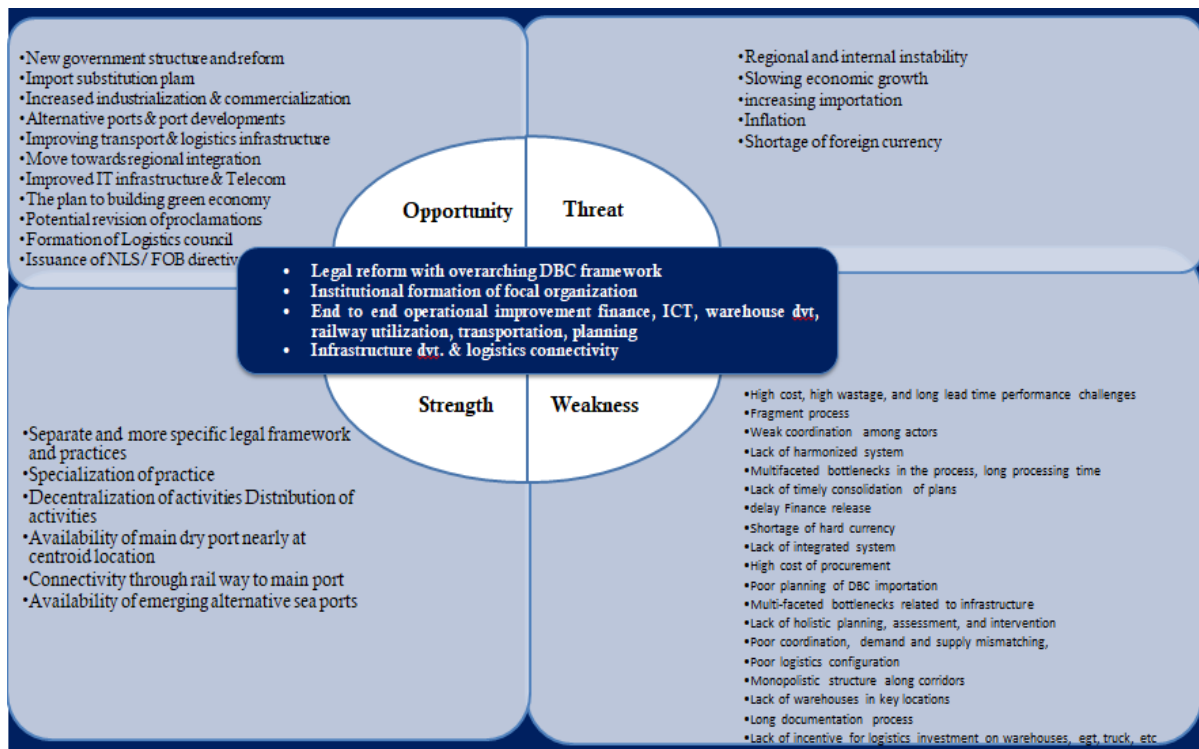


Figure 2. 1: DBC intervention requirement based on diagnosis

2.2. Review of regulatory framework

The following section briefly discusses the regulatory mandates of actors in dry bulk import cargo along with other regulatory frameworks.

2.2.1. Regulatory mandates of focal organizations

i. Ethiopian Agricultural Business Corporation/EABC/

EABC is established with the aim to procure and distribute agricultural inputs, and to undertake market price stabilization activities. It is a focal organization to procure fertilizer. The fertilizer procurement starts from planning. The planning system involves the Ministry of Agriculture, which conducts regional fertilizer need assessment and consolidates the annual fertilizer demand. The need assessment on paper following a grass root method in which farmers share quantity of need to local representatives, who in turn shares to Kebele for successive aggregation at Woreda, Zonal, and regional level by respective agricultural bureaus. Then, the Ministry of Agriculture consolidates the demand from each region and passes onto the EABC for procurement. EABC is mandated only for fertilizer, traditional organizational setup, and extensive specialization on fertilizer with limited warehouse.

ii. Ethiopian Trading Business Corporation (ETBC)

The Ethiopian Trading Businesses Corporation (ETBC) is established mainly with the aim of purchasing selected agricultural and industrial products and basic commodities from local and foreign markets to stabilize the domestic market. ETBC started procuring wheat this year taking over from PPDS. ETBC has the most overlapping mandates with other DBC procuring organizations such as PPDS (agricultural crops and others), ESC (industrial products), EPSE (industrial products), and EABC (agricultural products). ETBC is a merger of four traditional independent organizations relying on traditional and manual systems; it appears to lack the level of unique culture and sophistication needed from an organization that is required to solve a core national challenge in strategic commodity procurement and distribution. ETBC has limited experience in DBC importation with fitting mandates and warehouse and distribution capacity.

iii. Ethiopian Sugar Corporation (ESC)

ESC imports sugar to consumers and industrial users. The Ministry of Trade and Regional Integration notifies the ESC its plans for the importation sugar in the country. The plan is primarily quota based set for each industrial establishment and user. ESC then completes the bidding process from bid floating to contract award. ESC manages the contracts. The ESC mandate doesn't explicitly mention importation of sugar. ESC's current mandate and experience is too specific to expand ESC's in all strategic DBC procurement. Furthermore, the traditional institutional set up and lack of clarity on DBC import mandate happen to be prohibitive in such regard.

iv. Ethiopian Petroleum Supply Enterprise (EPSE)

EPSE is importing coal for industrial customers such as cement factories. EPSE does not have explicitly stated mandate to import coal for industrial customers although it is practically engaged in such to solve the existing energy problems of industries especially cement factories.

v. Public Procurement and Property Disposal Service/PPDS now renamed as Public Procurement Service/PPS

PPDS, now PPS, was established to enable the timely supply of goods and services, which are commonly used by public bodies as well as goods and services which have national strategic significance. PPDS is not engaged in distribution or warehousing activities. PPDS has the mandate to involve in international procurement of wide range of goods and services basically for Federal public organs. The PPDS has the authority to import goods that have national strategic significance. However, the types of strategic goods that PPDS imports are not clearly specified in the regulation. PPDS was involved in the importation of wheat from overseas markets. Currently, PPDS is not importing wheat due to various challenges it has faced in managing the wheat importation process.

vi. National Disaster Risk Management Commission

Ethiopia remains a net importer of wheat, satisfying around 25 percent of the local demand with wheat imports. Ethiopia's grain imports are dominated by wheat. Wheat imports, except wheat donated for food and development aid has been made through PPPDS for NDRMC in the past. When PPDS faces procurement challenges, NDRMC gets wheat imports through other procuring organs such as ETBC and UNOPS. The mandate given to NDRMC is silent on procurement of strategic commodities in general but it is clear on distribution.

vii. Ethiopian Maritime Authority (EMA)

EMA coordinates DBC imports with a mandate to ensure fast and economical sea freight. The unprecedented DBC import logistics' challenges made EMA play a coordinating role for DBC procurement organizations through steering committee comprising of regulatory organs, procuring organizations, and LSP. EMA intends to ensure early procurement plan consolidation for further logistics coordination but lacks enforcement authority over procuring organs. As a result, the persistent DBC importation challenges such as delay, demurrage cost, and firefighting activities could not be amicably solved with this arrangement, resulting in regulatory bodies such as MoTL and MOA to get involved in operational matters.

viii. Ethiopian Shipping and Logistics Service Enterprise/ESLSE

The ESLSE is mandated to provide efficient maritime and transit transport services to customers. ESLSE played a primary role in provision of DBC logistics service as the country's DBC import increases from 2,059,555 tons in 2013 to 3,724,584 tons in 2021. ESLSE has extensive experience working with international shippers and sea ports through charter out. In this sense, ESLSE is well positioned to build its capacity and

bargaining power in international shipping sector and better serve the national interest on DBC procurement.

2.2.2. Related Regulatory frameworks

i. Public Procurement Frameworks

The Federal public procurement is governed by Proclamation No. 649/2009 that is outmoded, rigid, and focused on federal public bodies. Dry bulk procuring organs, however, are importing using their own procurement policy derived from such proclamation. Thus, DBC procurement is not guided by procurement policy catered to the international market requiring flexibility, simplicity, advancement, and digitization.

ii. Franco valuta

Franco-Valuta could be taken as one source to import goods on which foreign exchange is not payable following the strict payment procedures implemented by banks and regulated by the National Bank of Ethiopia (NBE). Such measures provide short-term respite for the government by easing the pressure on some strategic commodities.

iii. National Bank Foreign Currency Permit

NBE has Transparency in Foreign Currency Allocation and Foreign Exchange Management directives to ensure that foreign exchange is allocated in a transparent and sound manner. Foreign currency priority is not applied for import of DBC commodities such as coal, fertilizer, wheat, and sugar. The foreign currency allocation is automatic and not as per currency allocation directive. NBE claims to go extra miles in availing from reserve based on the DBC procurement organs plan although procuring bodies complain of lack of availability at time of need at CBE.

iv. FOB Regulation

The FOB Directive is issued by the Ministry of Transport and Logistics to enforce the use of FOB incoterm during importing cargos from abroad. The directive is issued to decide import shipments and importers that must and must not be obliged to import on FOB term and centrally manage and monitor the waiver system, the service level and service fee of carriers licensed to transport shipments obliged to be imported on FOB term. However, EMA needs to ensure transparency between logistics service providers and dry bulk importing organizations so that they will develop confidence to use FOB Incoterm.

2.3. Planning and Coordination Practice

There is a strong need to plan and coordinate the activities of actors of dry bulk import commodities. A review of documents shows that there are several instances of efforts to

coordinate the import activities in the dry bulk cargo. For example, in 2016, EMA proposed a monthly meeting schedule for importers of bulk products, humanitarian and agricultural products, coal, fertilizer, sugar, and steel. EMA also stressed the importance of planning and scenario-planning for bulk cargo that has been imported via different trade corridors. Each dry bulk import cargo has its supply chain and wide range of actors and stakeholders. EMA is a focal organization that is trying to coordinate actors in the dry bulk import cargo. The practice of planning and coordination encompasses need assessment and consolidation practices, budget approval, foreign currency supply, procurement, and logistics services. The study found out that there was no effective and efficient planning and coordination practice among importers of dry bulk cargos that makes firefighting operation a normalcy. Generally, regulatory organs are often involved in operation activities, planners and executioners are not well organized, coordination is pushed to later logistics stage, and diverse actors are not synchronized to ensure smooth supply chain flow at:

- Need assessment and plan consolidation
- Budget allocation, release, and foreign currency supply
- DBC procurement
- DBC logistics

ETBC, EABC, NDRMC, PPDS, ESC, and EPSE are DBC procurement organizations. At the back of each purchase organizations, there are several regulatory and end user entities. Fertilizer purchase is linked to EABC as procurer, MoA as regulatory body and plan consolidators, regional actors as beneficiaries and facilitators. Wheat is mainly linked to ETBC, NDRMC, and PPDS as procurers, MoTRI as regulatory and plan coordinator, and various industries and consumers as users. Sugar is tied to ESC as procurer, MoTRI as plan consolidator, and various industries and consumers as users. Coal is tied to EPSE as procurer and plan consolidator, MoM as regulator, and cement and industrial factories as users and procurers in rare cases.

This is further reflected by the current disorganized structure of DBC procurement and participant's reflections on the need to centralize as well the level of c as indicated in the following figures.

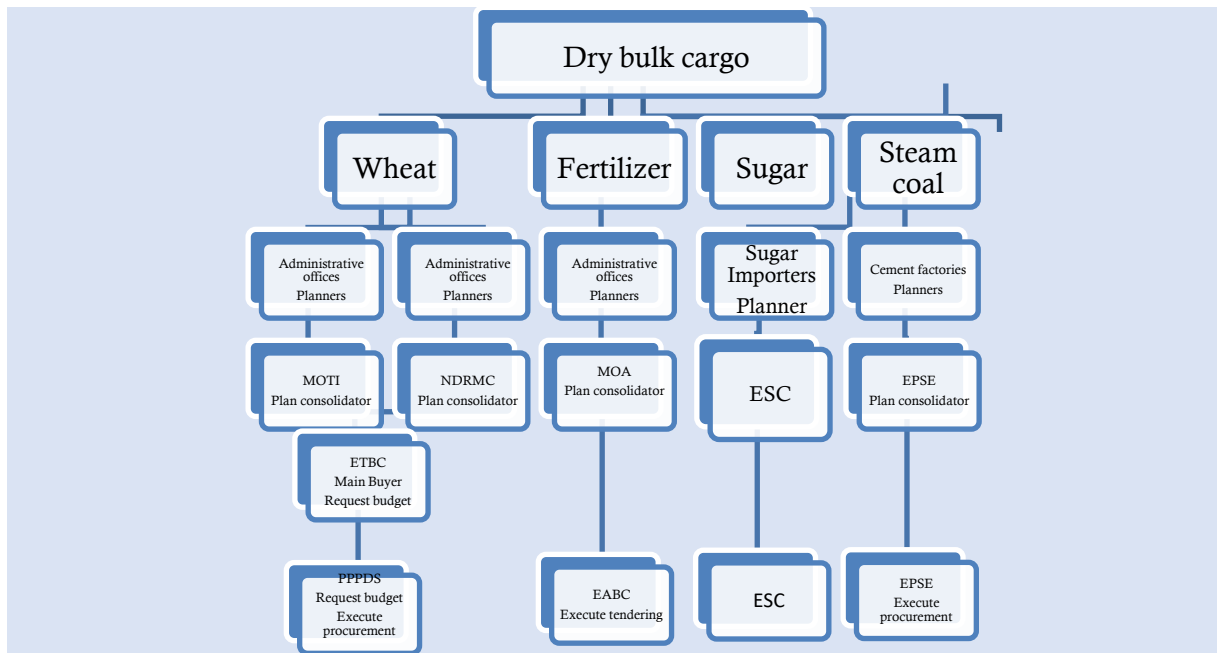


Figure 2. 2: Structure of dry-bulk cargo import in Ethiopia; Source: AAU consulting team (adapted from TOR of National Logistics Council 2020)

Survey data provided assessment of coordination among procuring organizations as indicated in the figure given below.

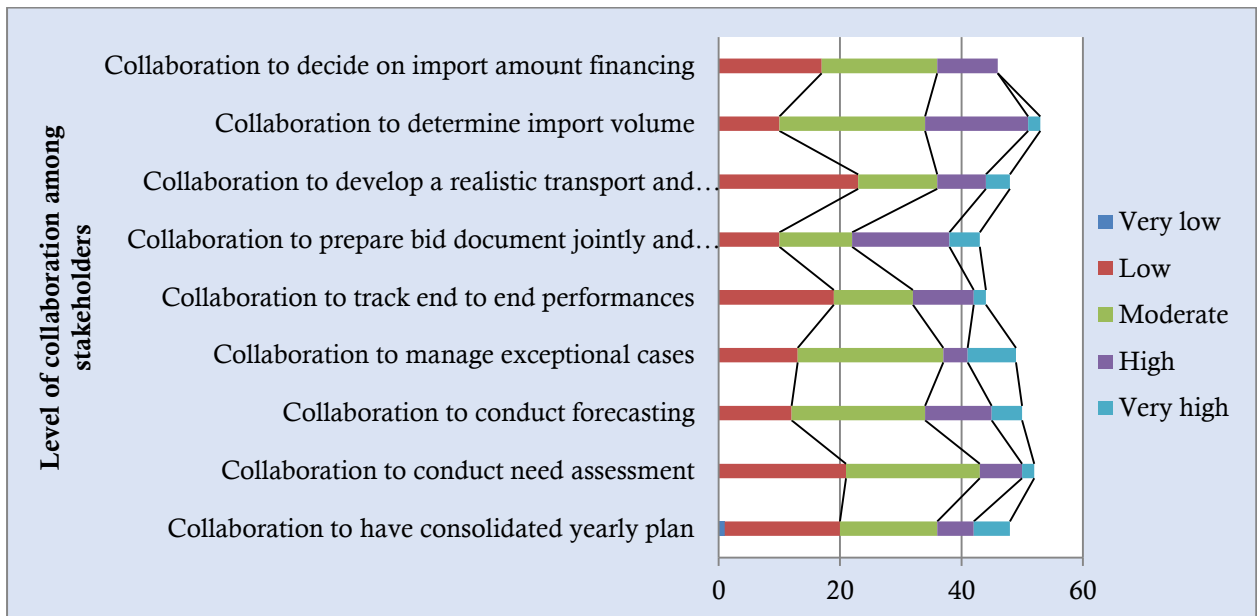


Figure 2. 3: Level of dry bulk procurement coordination and planning

As per the study participants, as can be seen above, there collaboration among stakeholders in determining import volume, preparing bid document jointly and standardize purchases, and conduct forecasting can be generally considered moderate,

implying some degree of coordination on routine matters. Collaboration is relatively better only in exceptional cases, suggesting reactive tendency. It is low in creating end to end supply chain, showing gaps in strategic collaboration. However, it was found out that there was limited collaboration in developing a realistic transport and distribution plan.

Considering the above limitations, participants indicated the pros and cons establishing a central coordinating organ as indicated in the following figure.

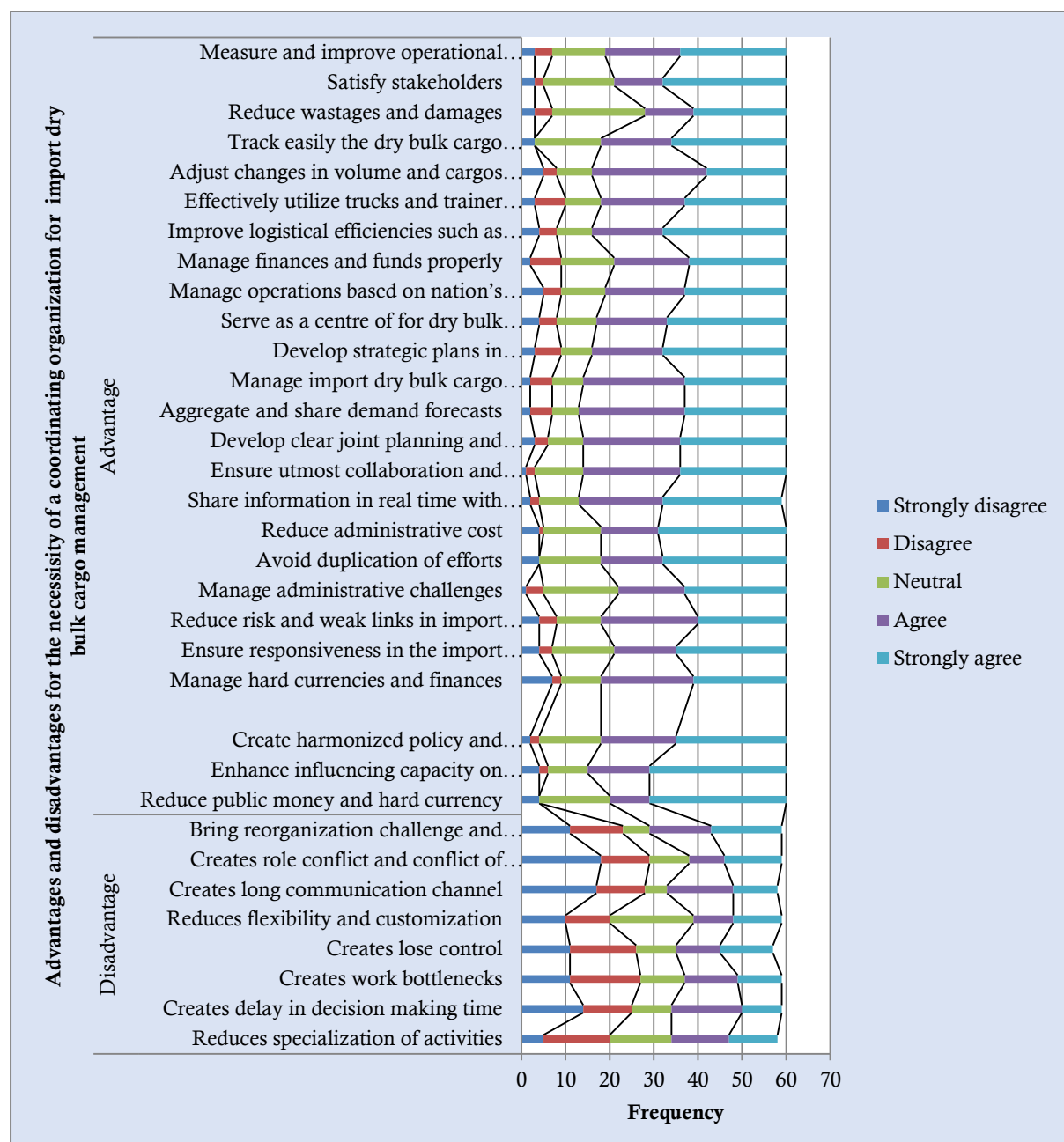


Figure 2. 4: Advantages and disadvantages for the necessity of a coordinating organization for import dry bulk cargo management, AAU team

According to the above figure, respondents agreed that most of the benefits considered (e.g. enhance influencing capacity on stakeholders, save public money and hard currency, reduce administrative cost, and avoid duplication of efforts) are real advantages of having a coordinating organization in importing dry bulk cargo. However, the respondents reported that a single coordinating organization will have disadvantages related to presenting reorganization challenge, bringing resistance to change, reducing specialization, and limiting flexibility and customization. As per the perception of the stakeholders, the need for having a coordinating organization is overwhelming.

Study participants dominantly supported the one single coordination organ for procurement and one end to end coordinator of logistics service provision with PPP arrangement as indicated in the following figure.

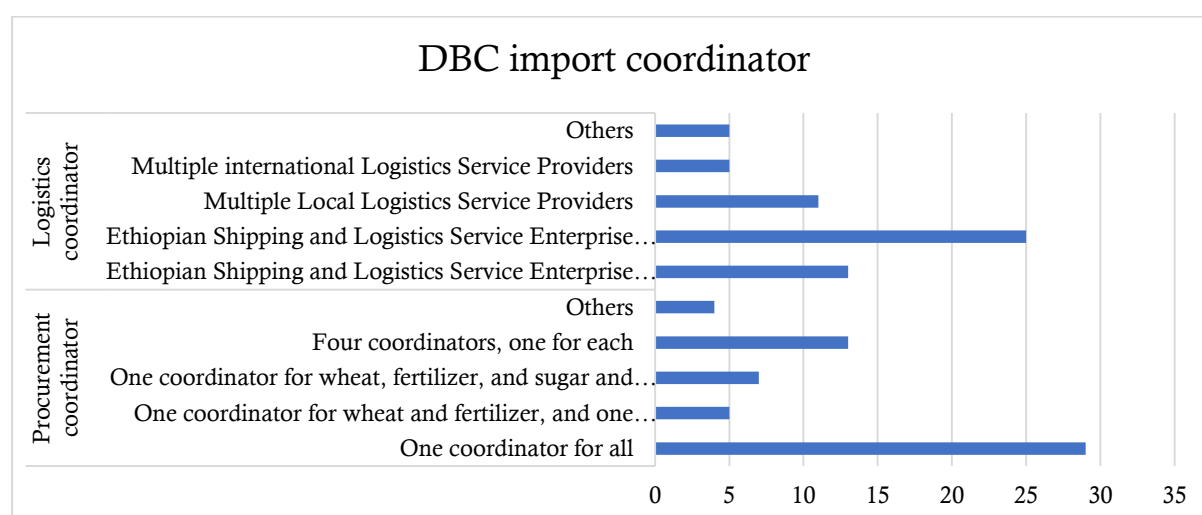


Figure 2. 5: Suggested DBC coordinator

2.4. Institutional Arrangement of Focal Procuring and Logistics Organization in Dry Bulk Cargo Import

The composition of the major actors in the import of bulk dry cargo in Ethiopia can be categorized into regulatory bodies, importers, the public procurement service, port authorities, land transport companies, customs clearance agents, shipping companies, and inland depots organizations. As implied in the preceding section on the regulatory framework, the national DBC import sector is overburdened by regulatory complexities. There are many authorities, for example, in the purchase and importation of grain, such as NBE, MOF, MOA, MOTRI, ETBC, etc. The maze of relationships among regulatory

entities and other actors in the DBC import supply chain creates duplication of efforts, cumbersome documentation, long delays, and role ambiguity. The study participants evaluated the performance of DBC importing organizations. They rated ESLSE as a multimodal operator the highest and PPDS the lowest. Of the procuring organs, EPSE is ranked higher. Functionally, procuring organizations were assessed poorly followed by warehouse service providers and key regulatory body. Overall LSP's are given a higher rating, implying that the significance role of ESLSE in DBC importation. The result is shown in the table below:

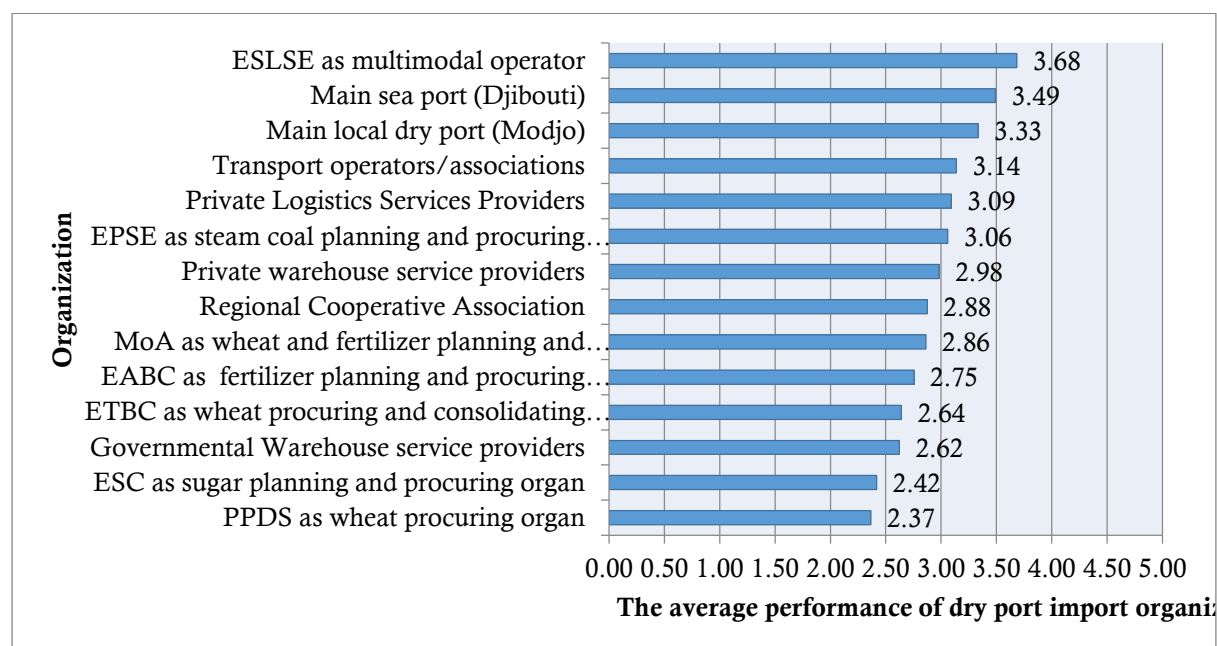


Figure 2. 6: Evaluation of the performance of dry bulk import organizations

2.4.1. Bottlenecks of existing institutional arrangement

The Government of Ethiopia has made several efforts to improve the performance of the import of bulk dry cargo. A huge investment has been made to improve logistics services. However, there are still several bottlenecks besetting the bulk dry cargo procurement as well as the transportation system. These are:

- **Bottlenecks related to DBC importing institutional arrangement:** Plans and decisions are made by different government organs while coordination of importation is made by a steering committee chaired by EMA. This institutional arrangement suffers from fragmentation with no unifying direction over planning, foreign currency utilization, and logistics facility development among others. This is the bedrock of other problems in DBC importation.
- **Bottlenecks Related to Logistics Service Providers:** The logistics service for dry bulk import cargo has been managed by the ESLSE. Importing organizations do not operate with Third-Party logistics service providers other than ESLSE. And the

logistics service arrangement is not fully integrated and falls short of ensuring seamless end-to-end operations.

- **Lack of Proper Planning and Coordination :** Although dry bulk importing organization submit their plan which comprises the type, amount, and time of purchase to the Ethiopian Maritime Authority at the beginning of each fiscal year, their plan didn't consider complete packages such as shipping queues, warehouse and truck availability, and time elapses for document preparation and to get finance.
- **Lack of Infrastructure for Dry Bulk Import:** The existing procuring organizations are not jointly planning to utilize limited logistics infrastructure and transportation to import bulk cargo seamlessly.
- **Foreign Currency Issues:** Due to the country's foreign exchange deficit, foreign currency is managed through strict planning and predetermined priority. Although DBC procurement organizations are given access to a foreign currency based on their annual plan and are not lined up on the priority list, there is a significant delay in the release of foreign currency.
- **Inability of ships to reach the port as per schedule due to poor procurement process:** Delay in the procurement process creates the problem of untimely and unplanned delivery of cargos at the port of shipment. In general, several cargo ships of dry bulk import cargo arrive at the port of shipment at the same time. In addition, some dry bulk imports for instance wheat, and fertilizers arrive in Djibouti at the same time causing wheat distribution to be put on hold for fertilizer. Such instances expose the country to huge demurrage costs as well as spoilage of DBC commodities.
- **Documentation Delay:** Arranging port clearance documents before boarding a ship is very vital to allow procuring institutions to offload shipments on time. Otherwise, ships will wait for an extended period of time in anchorage.
- **Port congestion due to poor planning and port capacity shortage:** There is a shortage of berths at the port of Djibouti and this creates a burden to unload cargos from the ship on time. Overcrowding of ships at the port of Djibouti due to lack of proper planning and coordination and lack of adequate trucks is considered as a bottleneck in the dry bulk import cargo supply chain.
- **Challenges related to unloading and bagging:** Stevedoring service provider company machines are too old to provide unloading and bagging services on time as the machines are frequently damaging.
- **Shortage of trucks for inland transportation:** Inability to utilize limited truck capacity properly is a major factor in the fluctuations of transportation costs and it is difficult to deliver goods on time. The number and size of trucks and the country's import and export volume are not proportional and the fleet management system is not supported by information technology.
- **Road condition between Djibouti and Galafi:** The road between Djibouti and Galafi is severely damaged and transporters associations are complaining about the road condition. As a result, the number of trucks involved in the operations reduces

due to accidents, and truck owners are greatly exposed to repair and maintenance costs.

- **Lack of Storage and Challenges coming from loading/unloading workers:** There is a shortage of warehouse capacity required to accommodate the volume of shipments that DBC has. There is no national warehouse system in which warehouse spots are determined strategically at appropriate places. In most local areas, locally organized workers often disrupt unloading activity by quoting exorbitant prices while local authorities are reported to take over warehouse facilities for other use.
- **Infrastructure problem at the final destinations:** The conditions of roads usual at last mile delivery are generally poor and unthinkable to access during the rainy season. This is sensitive especially for fertilizer. This challenge creates manifold problems such as significant delay in delivery, vehicle breakage, limiting vehicle capacity, and lengthy truck turnaround time.
- **Payment delays in DBC supply chain:** DBC procurement involved diverse actors who expect on-time payment settlement after services. The budgetary organizations and regional governments who expect repayment for purchases made face delays in reimbursement, especially for fertilizer. Farmer's credit repayment delay or default is another challenge coming due to the loss system. Transporters are also facing payment delays following service. Furthermore, study participants outlined the following issues as bottlenecks in dry bulk importation:
 - Transport corridor condition and network problem
 - Warehouse capacity problem
 - Coordination problem among stakeholders
 - Finance shortage and access problems
 - Procurement system problems
 - Scheduling and communication problem
 - Sea port alternative problems
 - Logistics infrastructure problems
 - Lack of central information on national capacities on vehicles, warehouses, etc.
 - ICT system problems
 - Warehouse and DC location problems
 - Shortage of inland transporters (truck & Rail)
 - Poor procurement and logistics planning
 - Contract administration problem

2.5. Benchmark assessment on institutional arrangement and legal framework

2.5.1. Benchmark assessment

Based on a carefully crafted benchmarking assessment guide, the following countries and organizations are considered for benchmarking over the institutional arrangement for dry bulk importation of key products such as wheat, sugar, fertilizer, and steam coal. Country-wise Egypt, India, Nigeria, Tanzania, India, and Kazakhstan were reviewed

based on a predetermined benchmarking guide and Egypt and India were selected based on higher overall results on multiple criteria; Organization wise, EPSA was selected for the ample lessons it offers in the area of central procurement and warehousing system.

2.5.1.1. Country benchmarks

This section presents county benchmarks for the organization of DBC procurement and logistics of dry bulk importations with a focus on the institutional arrangement, regulatory relations, ownership structure, mandate, organizational structure, procurement products, the scope of services, and key lessons, among others. Given this, Egypt, and India are thoroughly analyzed as cases for drawing down lessons to Ethiopia.

Country Benchmark: Egypt

Food security is a pressing issue in Egypt. With over a quarter of the Egyptian population living under the poverty line, assuring the food security of all citizens is a key challenge for the government. In the context of such a socioeconomic reality, the Egyptian Government is pressured to maintain food security risk mitigation measures while the public feels entitlement to major subsidy programs such as the long-standing bread program. A key component of government policy in this regard is the provision of low-priced bread to the population. This is achieved through a number of government subsidies at the various stages of the value chain: from subsidized fertilizers to subsidies of the price of the final product, *baladi* bread.

Dry bulk import Procurement institutional arrangement of Egypt

The procurement of dry bulk is made by the Egyptian government with tight control of the procurement, storage, and distribution of selected strategic goods, namely: wheat, sugar, tea, and edible oil. Such strategic purchases are managed by General Authority for Supply Commodities (GASC) organized under the then Ministry of Supply and Internal Trade of Egypt (MoSIT), now named the Ministry of Trade and Industry (MTI). GASC has been established by the republican decree No 1189/1968 as a financially and administratively independent organ in procuring the essential commodities that has been expanded to 50 in the 1970s, dwindling in the 1980s and 90s with the increasing participation of private sectors on fundamental goods to end up in just four commodities today. The four commodities, i.e wheat, sugar, oil, and tea, are procured by GASC, making the latter the largest global procurer of wheat.

Apart from procurement, Egypt adopts a centralized warehousing and distribution system. According to decisions No 364 and 626/1984, GASC has entrusted the General Company for Silos and Warehousing to perform all the tasks relating to customs clearance, unloading, and loading to silos within the state.

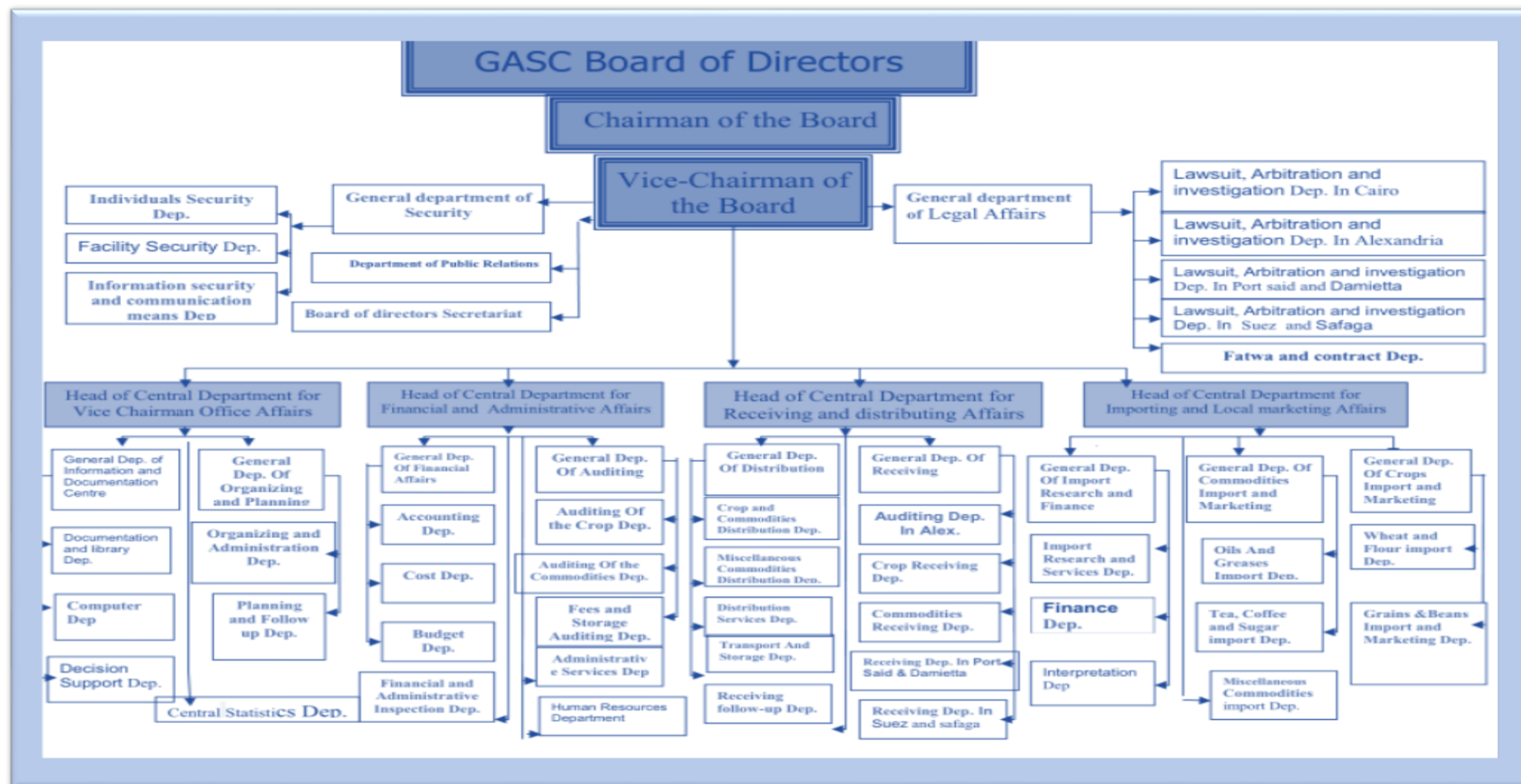


Figure 2. 7: Structure of GASC; Source: GASC

Dry bulk distribution system of Egypt

In addition to centralized procurement of strategic commodities, Egypt adopts a centralized distribution and warehousing system. The Egyptian government operates all large-scale inland storage. Storage comes in two forms: traditional flat storage or Silos. The majority of government storage consists of a system of traditional flat storage called *Shona*. The state started to build developed wheat storage silos with the world's most advanced technology on the level of wheat storage and management. The National Project of Silos comes within the framework of the State's plans to secure the needed stock of strategic foods by building nearly 50 silos with a storage capacity reaching nearly 1.5 million tons distributed over 17 governorates.

EGYPT Synopsis

1. **Regulatory authority:** Ministry of Trade and Industry (MTI)
2. **Availability of central focal organization:** Available ; the General Authority for Supply Commodities (GASC)
3. **Ownership structure of focal organization:** Government owned public enterprise
4. **Structure of focal organization for strategic commodity:** Chaired by Board, planning, procurement, Logistics, Contract administration
5. **Focal organization functions:** local procurement, import procurement, storage, distribution
6. **Current strategic commodities and historical dynamism:** wheat (most strategic import), sugar, tea, edible oil; dynamic
7. **Subsidiary of focal organization:** Egyptian Holding Company for Silos and Storage (GCSS)
8. **Procurement system:** (IT/bidding/framework/dominate Egypt's wheat imports via a tender system
9. **Sourcing countries for main strategic commodity:**
French milling wheat, Bulgaria milling wheat, Australian standard white wheat, Polish wheat, German milling wheat, and/ or UK milling wheat (UKP or UKS variety) and/or Romanian milling wheat and/or Russian milling wheat and/or Ukrainian milling wheat and/or Serbian milling wheat and/or Hungarian milling wheat and/or Paraguayan milling wheat
10. **Main incoterm:** a “free on board” (FOB) price and a separate freight offer, both denoted in USD per ton
11. **Main sources of foreign currency:**
Egypt's main sources of foreign currency are: exports, remittances (including loans and grants), tourism, FDI and Suez Canal fees
12. **Foreign currency availability:** Foreign exchange regulations fall under Law No 88/2003. According to this law, individuals and businesses can hold foreign currency in

Egypt and can have local bank accounts denominated in foreign currency. Individuals can buy foreign currency and transfer it abroad.

13. **Access to finance and credit to farmers:** Egypt has established the Egyptian Credit Bank Pursuant to Decree Law No. 50 of 1930 with a capital of one million pounds and the Royal Decree of the Egyptian Agricultural Credit Bank in 1931 during the global economic crisis to provide loans to Egyptian farmers to protect them from foreign real state and money lender.
14. **Warehouse/storage system:** central storage control, flat stores, sea port silos, regional silos
15. **Logistics networks:** own and operates sea ports managed by localized port authorities, seaports within 3kms radius of city centres, silos at sea ports, silos and Shona stores throughout the country, road and rail networks in the country, and global trade connection via silk roads.

Key lessons from Egyptian dry bulk importation system

- The Egyptian government adopts centralized procurement of strategic dry bulk imports especially wheat.
- The Egyptian government operates all large-scale inland storage that comes in two forms: Traditional flat stores called *Shona* and silos.
- GASC is the main procurement and distributor of four strategic commodities wheat, edible oil, tea, and sugar, and has decades of experience. It is the largest buyer of wheat in the world.
- Egypt's state buyer has central information and fairly accurate data on the demand-supply gap and the reserve level, and the needed amount of import. Such knowledge helps to make accurate strategic decisions over time to stabilize or reduce imports overtime.

Country Benchmark: India

India is a country having an estimated 1.4 billion population, which is nearly 17.7 % of the world population, a population facing significant economic disparity. India is considered among the economies with high prospect of growth and expansion as it is the world's second largest producer of rice, wheat, sugarcane, groundnut, vegetables, fruits and cotton. This being the case, as per the FAO estimates, India faces nearly 40% food losses overall and 10-15% losses to focal organization, Food Corporation of India. Apart from food loss, Food security is thus a pressing issue. As a result, India enacted National Food Security Act in 2015 laying funding and assistance to state government for supply of food grains.

The Indian government has established essential commodities through the Act since 1963. Currently, food grains mainly wheat and rice, sugar, edible oil, and fertilizer are tied to government support and intervention programs as essential commodities. Two public enterprises and four warehousing corporations are involved in the procurement and distribution of these products.

Coordination of Procurement and Distribution of essential commodities

Essential commodities such as food grains, sugar, and edible oil are procured and distributed mainly by two focal organizations: Food Corporation of India (FCI) and Minerals and Metals Trading Corporation (MMTC).

a. Food Corporation of India (FCI)

The Food Corporation of India procures rice and wheat from farmers through many routes like paddy purchase centers/mill levy/custom milling and stores them in depots. FCI maintains many types of depots like food storage depots and buffer storage complexes and private equity godowns and also implemented the latest storage methods of silo storage facilities.

b. Minerals and Metals Trading Corporation (MMTC)

MMTC is a major global player in the minerals trade and is the single largest exporter of minerals from India. With its comprehensive infrastructural expertise to handle minerals, the company provides full logistic support from procurement, and quality control to guaranteed timely deliveries of minerals from different ports, through a wide network of regional and port offices in India, as well as an international subsidiary. MMTC is amongst the leading Indian exporters and importers of agro products.

Warehouse and Distribution system of India

Warehouse developments and practices are guided by a regulatory authority, Warehousing Development and Regulatory Authority (WDRA), structured under Ministry of Consumer Affairs, Food & Public Distribution System. Apart from regulatory organ, India controls warehouse operations through well organized and integrated warehousing corporations: namely: Central warehousing corporation (CWC), State Warehousing Corporations (SWCs), FCI, Central Railside Warehouse Company Limited (CRWC), and Hindustan Vegetable Oils Corporation Limited (HVOC).

INDIA Synopsis

- 1. Regulatory authority:** Ministry of Consumer Affairs, Food & Distribution System, Warehouse Development Regulatory Authority (WDRA)
- 2. Availability of central focal organization:** Available ; Food Corporation of India (FCI) for grain, Mineral and Metal Trading Corporation (MMTC) for dry bulk, Central Warehousing Corporation (CWC)for warehouse

3. **Ownership structure of focal organization:** Government owned public enterprise
4. **Structure of focal organization for strategic commodity:** Chaired by Board, planning, procurement, Logistics, Contract administration
5. **Focal organization functions:** local procurement, import procurement, storage, distribution
6. **Current strategic commodities and historical dynamism:** rice, wheat (most strategic import), sugar, edible oil, kerosene; dynamic
7. **Subsidiary of focal organization:** State Warehousing Corporations, Central Rail side Warehousing Corporation
8. **Procurement system:** (IT/bidding/empanelment/dominate India's wheat imports via a tender system
9. **Sourcing countries for main strategic commodity:** Local and international depending on the commodity type
10. **Main incoterm:** diverse CIF, C&F, "free on board" (FOB)
11. **Main sources of foreign currency:** India's main sources of foreign currency are: FDI, loans, export activities, remittances (including loans and grants).
12. **Foreign currency availability:** Foreign exchange reserve is considered formidable at half a trillion USD. India swells its reserve mainly through capital account surplus instead of current account with a swelling FDI but 35% of reserve is from external borrowing.
13. **Access to finance and credit to farmers:** India provides subsidies through TPDS to farmers and the poor. It provides food borrowing programs, and advance storage incentive through advance payment at later scale.
14. **Warehouse/storage system:** central storage control, traditional and modern storage options.
15. **Logistics networks:** own and operates sea ports managed by localized port authorities, diverse and integrated storage operators.

Key lessons from India

- India adopts decentralized public procurement system but provides a single mandatory e-procurement platform for all government institutions.
- India established proper legal framework, acts or regulations to guide establishment of institutions in dry bulk importation
- Legal framework, government policy, and institutional arrangements are well linked to ensure implementation and sustainability of government programs such as PDS.
- India builds on old dry bulk procurement and distribution related enactments and institutional arrangements in advancing its practices
- Warehouse system is guided by national warehouse act, separate regulatory authority, centrally controlled and integrated warehouse corporations.
- Indian government adopts a clear and integrated national warehousing structural arrangement

- FCI is the main grain procurement and distribution organ tied to India's flagship Public Distribution System that distributes to states from its central depots.
- CWC is a focal warehouse operator owning shares of states and other warehouses, helping to harmonize and integrate warehouse operations throughout India
- India adopts systematic central control of dry bulk procurement through central government two focal corporations while flexibility allowing for decentralized dry bulk procurement state organs.
- MMTC is a flagship Indian procurement and distribution public enterprise in dry bulk import and export of selected items from various sectors involving food, sugar, coal, fertilizer, among others.

Organizational Benchmark: EPSA

EPSA stands as a full-fledged and central organization that ensures a sustainable supply of quality-assured pharmaceuticals to health facilities at an affordable price through pooled procurement, a central warehouse management system, robust inventory management, and distribution, efficient financial management, and an integrated management information system. EPSA is using a health commodity management information system to improve health care commodity management, data visibility, and overall performance. This system helps to get real-time data.

2.5.2. Benchmark lessons

The table below summarized the benchmark lessons taken from benchmarking countries and organizations.

Table 2. 3: Benchmark summary

Benchmark Issue	Egypt	India	EPSA	CRS	Kazakhstan	Ethiopia	Best lessons for Ethiopia
Regulation	Food Security Policy	Food Policy Security			Landlocked oriented logistics strategy	No overarching regulation, National Logistics strategy	India and Egypt for procurement, Kazakhstan for logistics
Availability of strategic commodity	Yes	Yes	N/A	N/A		No	India and Egypt
Availability of focal organization	Yes	Yes	Yes for health care	Yes	N/A	No	India and Egypt
Procurement organization/s	GASC	MMTC, FCI	EPSA	With UNOPS		ETBC, EABC, ESC, NDRMC, PPDS, ESPE	India, Egypt, EPSA, CRS
Procurement system	Centralized, IT based, Framework	Centralized, IT based, Empanelment	Centralized	Centralized, Global IT network	N/A	Decentralized, rigid, complex, bureaucratic, manual based	India, Egypt, EPSA, CRS

Use of incoterms	FoB dominated/separate freight price	FoB,CIF,C&F	FoB	CPT	N/A	Restricted to FoB	Egypt, EPSA
Warehouse organization	Focal organization for silos and warehouse	Warehouse act, Warehouse authority, central warehouse corporation,					Egypt for centralized warehouse, India for warehouse regulation
Warehouse operation	Centrally controlled seaport silos, regional silos & warehouses	Highly organized, hierarchical from central to state & rail side warehouses	Hierarchical with central, regional, & district warehouses	N/A	N/A		Egypt for silos; India and EPSA for warehouse
Logistics system	Well structured	N/A	N/A	N/A	Hub & spoke, outward looking & integrated	Inward looking and fragmented	Kazakhstan, Egypt
Integrated Logistics	Highly integrated among port, transport & warehouse	Highly integrated among port, transport & warehouse	Vertically integrated and self-managed procurement, warehouse, & distribution	N/B	Highly integrated among dry ports, transport capacity & lines	Not integrated	Kazakhstan & EPSA

Based on this, the dry bulk procurement and distribution system of Ethiopia requires integrated institutional arrangement for procurement, logistics, and warehousing. Central coordination allows for integrated facility development and integrated digital system that would help create a smooth functioning supply chain.

2.6. Proposed solution for institutional arrangement

Based on diagnosis assessment, bottleneck assessment, and benchmarking assessment, the following institutional arrangement options are explored and proposed. Accordingly, the following alternative arrangements for dry bulk import cargo are investigated with their pros and cons.

2.6.1. Alternatives For Institutional Arrangement

Alternative 1: Coordination through STEERING COMMITTEE under EMA: This alternative reflects the existing practice whereby procurement and later distribution are decentralized while coordination is made for import logistics. This arrangement postpones coordination at later stage of supply chain at Deliver leaving the previous stages of planning, sourcing, contract administration decentralized. This alternative has the following characteristics:

Characteristics of alternative 1:

- *Existing institutional arrangement*
- *Coordination of dry bulk import logistics through a steering committee at EMA*
- *Decentralized procurement by various procurement organs*
- *Decentralized transport and distribution by procurement organs*

Pros:

- **Sectorial specialization of procurement organs:** When importing institutions face a variety of costs in procuring and distributing dry bulk import cargo, they can benefit from specialized operations by focusing on a single dry bulk cargo. The benefits of specialization include greater opportunities to ensure efficiency and control of the actors in their circle.
- **Experience:** These dry bulk importing institutions have been importing dry bulk cargo for a long time and have the experience and understanding of dry bulk cargo import bottlenecks.
- Provides autonomy to procurement organs
- Division of work among procurement organs

Cons:

- **Lack of Clear Mandate:** some existing dry bulk cargo procuring organizations do not have clear mandate in engaging in DBC procurement. Those who have mandate face legal framework incompatibility or capacity limitation. EPSE, ESC, and NDRMC have no clear mandate for DBC procurement while ETBC and PPDS have a seemingly overlapping mandates.
- **Loose of Coordination:** The bulk of DBC import system problems such as high demurrage costs, long lead time, high turnaround time, and inefficiency in utilizing logistical facilities and infrastructure, and frequent firefighting activities are attributed to lack of effective coordination arising from this existing alternative.
- **Traditional system:** The dry bulk importing organizations are using manual process to handle dry bulk importation operations for the most part. This process is not only time consuming but also misses out the opportunity to aggregate quality data for better national decision. Effective DBC requires digital applications, which are missed in this alternative, in planning, logistics, and warehousing to create seamless and efficient supply chain.
- **Inability to instill systemic change:** The organization's setup is not conducive to ensure significant improvement and change in the entire system as each existing organization has unique and mostly traditional identities. As a result, forward progress could be stifled with the existing system.
- **Lack of Qualified Staff:** Dry bulk import requires a high level of professional and technical proficiency to manage procurement, logistics, transportation, and distribution

operations seamlessly. In this regard, the existing procuring focal organizations are facing challenges.

- **Lack of integrated ICT:** Information technology can enable interactions among different organizations along the dry bulk import supply chain. However, there is no system that facilitates data sharing and exchange of information to enable organizations to manage the importation.
- Overall, there are a number of other key disadvantages of the existing system. These are:
 - Limited enforcement capacity of steering committee
 - Limited accountability and enforcement system
 - Committee assumes additional responsibility to main activity and has no formal accountability
 - High cost of logistics and distribution
 - Frequent emergency procurement and delay
 - Loss of scale economy
 - Limited bargaining power of procurement organs due to fragmentation
 - Ineffective link to national procurement strategy and Macro decisions
 - Inefficient utilization domestic organizations in shipping, transport, and warehouse operations
 - Lack of adequate knowledge in import and international trade
 - Lack of holistic link between procurement, warehouse, distribution, and payment system

Alternative 2: Coordination through Standing Coordination Office under EMA

Ethiopian Maritime Authority has the mandate to direct and coordinate efforts of the respective government bodies to minimize the transit time of import and export goods. Each procurement entity has its own planning and decision-making process and is not fully accountable to the EMA; this does not allow it to manage its coordination role effectively. The problem lies with the entire process of importing dry bulk cargo. EMA has been closely coordinating dry bulk cargo importers so far. However, EMA has no standing office and thus resorts to coordination through committee. This alternative is to upgrade the steering committee to standing office under EMA as indicated below:

Characteristics of alternative 2:

- *Strengthening existing institutional arrangement*
- *Coordination of dry bulk import through a standing office at EMA*
- *Decentralized procurement by various procurement organs*
- *Decentralized transport and distribution by procurement organs*

Pros:

- Experience in import logistic coordination: EMA has been coordinating the dry bulk importing organization for an extended period of time. Therefore, the plan and

coordination office will help guide the sea port and inland transport operations of the importing organization.

- Provides autonomy to procurement organs
- Division of work among procurement organs
- Sectorial specialization of procurement organs
- Assigns dedicated staff and establish formal responsibility
- Helps to guide DBC import through formal procedures

Cons:

- Lack of mandate: the planning and coordination office lacks the mandate to involve in procurement and distribution of DBC. Nor does EMA have experience of such. Therefore, this alternative is not legally and operationally sound.
- Lack of strategic outlook: the planning and coordination office may lack the focus needed to manage dry bulk imports at national level as it is not a full-fledged autonomy.
- Lack of employee motivation: the planning and coordination office may be busy and overloaded. Due to a lack of commitment from procuring organizations, the office may be demotivated.
- Loose coordination of dry bulk import and distribution: Considering the DBC challenges, a single office could be too small to handle the national coordination and enforcement of DBC import and ensure accountability across the chain.
- Limited facility: the necessary warehouse and distribution facilities and operational capacity needed for a seamless supply chain is lacking with office level coordination.
- In general, this alternative comes with the following key disadvantages:
 - High cost of logistics and distribution
 - Frequent emergency procurement and delay
 - Loss of scale economy
 - Limited bargaining power of procurement organs
 - Ineffective link to national procurement strategy and Macro decisions
 - Inefficient utilization domestic organizations in shipping, transport, and warehouse operations
 - Lack of specialization in import and international trade procurement and distribution by the office
 - EMA's and MoTL sector is not linked to procurement function.

Alternative 3: Coordinating Dry Bulk Import through Single Existing Procurement and Distribution Organization as Separate Business Unit at Deputy CEO Level

Currently several procuring organs are involved in the procurement DBC in Ethiopia, namely: ESC, ETBC, EABC, NDRMC, EPSE, and PPDS. This decentralized procurement makes coordination an uphill task leading to often overlap in schedules as well

executions. As DBC share the same national logistics capacity for sea port to inland transport and warehouses in some cases, the consequences of lack of coordination and overlap happened to be horrendous. This alternative is based on the notion of bringing the coordination work to early stage, sourcing, of the supply chain and has the following characteristics:

Characteristics of alternative 3:

- *Strengthening existing institutional arrangement*
- *Coordination of dry bulk import through one of the existing procuring organization*
- *Centralization of procurement to one existing organ*
- *Centralization of transport up to main warehouse of a procuring organ*

Pros:

- **Experience curve effect in problem solving:** existing procuring organizations have experience in importing dry bulk cargo that they are aware of the bottlenecks and operational intricacies. Thus, they could bring quick fix to operational and routine problems.
- **Resource Utilization:** Some of the existing dry bulks procuring organizations have offices, warehouses, and trucks for managing purchase, warehousing, and distribution operations of dry bulk.
- **Avoid Duplication of Efforts:** Procurement and distribution of DBC through a single existing procuring organ is useful to avoid duplication of efforts along with administrative and coordination hassle.
- In general, single existing procuring organ will bring the following key advantages:
 - Economy of scale advantage over bulk procurement, use of sea and land transport, and use of warehouses
 - Provides autonomy to the assigned focal procurement organ
 - Division of focus for procurement organs as central procurer and distributors
 - Assigns dedicated staff and establish formal responsibility
 - Helps in better management of existing warehouses

Cons:

- **Limitation of Mandate:** Existing DBC procurement organs either lack mandate in procurement or retain mandate to only a single DBC commodity. Those with better mandate either follows legal framework incompatible to flexibility required in international DBC procurement or have commercial goal incompatible to that pursued in DBC procurement. This complexity creates anomaly for promoting existing DBC procurement organization as coordinator.
- **Traditional system:** The existing dry bulk importing organizations are following traditional practice such as time-taking manual processing and traditional organizational culture that makes it hard to bring about significant and sustainable improvement in DBC cargo importation system.

- **Conflict of interest:** Each dry bulk importing organization has a different mandate and objectives that the coordinator may provide priority to its own main area of business at the expense of coordination all DBC shipments at national level. This creates not only conflict of interest among procuring organs but also the desired holistic approach in DBC importation.
- In general the following are the key demerits this alternative:
 - The coordinating organ needs to upgrade internal facility and capability to suit for procurement and distribution of other BDC commodities.
 - The coordinator as directorate could be overstretched with a wider scope of work that may result in bottleneck
 - Lack of experience on other DBC commodity may lead further inefficiency.

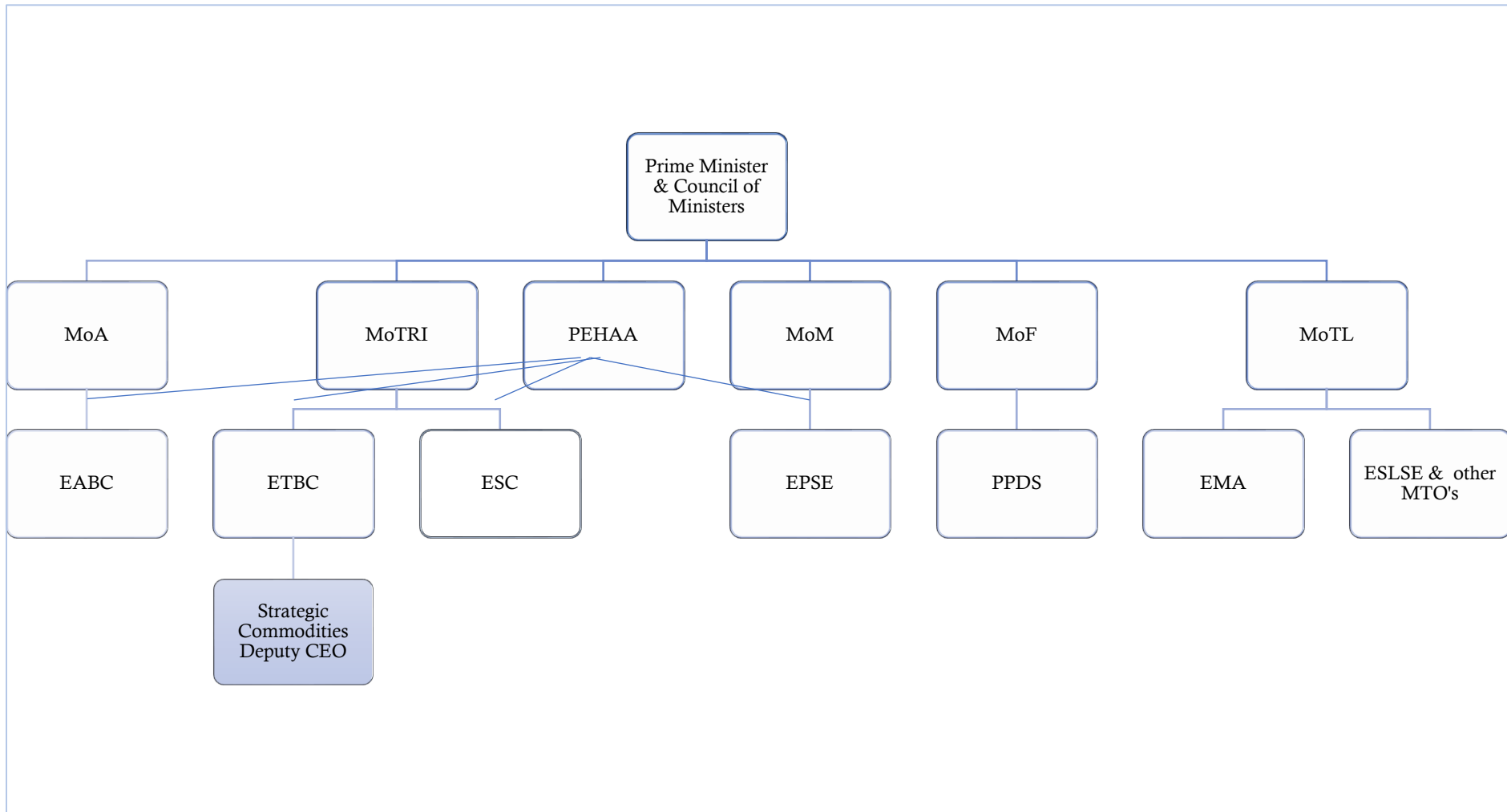


Figure 2. 8: Separate Business Unit structure under existing procuring organ

Alternative 4: Coordinating Dry Bulk Import through a New Single Coordinating Procurement and Distribution Organization

It is noted that the existing dry bulk import organizations have wide range of responsibilities other than importing DBC commodities. Besides, there is mandate, legal framework, operational performance related challenges facing each DBC procurement organ. Besides, they are operating through traditional system devoid of latest digital capability and inadequate high caliber procurement and distribution professionals. Besides, the existing system lacks strategic national warehouse infrastructure and modern warehouse management system even if the some of the procurement organs have warehouse facilities. In this context, the existing DBC importation practice is marred by incessant crises in all stages of supply chain from planning, sourcing, and distribution that firefighting becomes the norm rather than exception. Thus, the system needs significant transformation that can only be done through a single national focal organization that serves as a bridge between regulators/planners and Logistics Service Providers through procurement and central warehousing services. This alternative has the following characteristics:

Characteristics of alternative 4:

- *New single procurement and distribution organization*
- *Organization having national central warehouse facilities*
- *Procurement on behalf of existing procurement organizations till central warehouse*
- *Organization equipped with modern digital and professional capability*

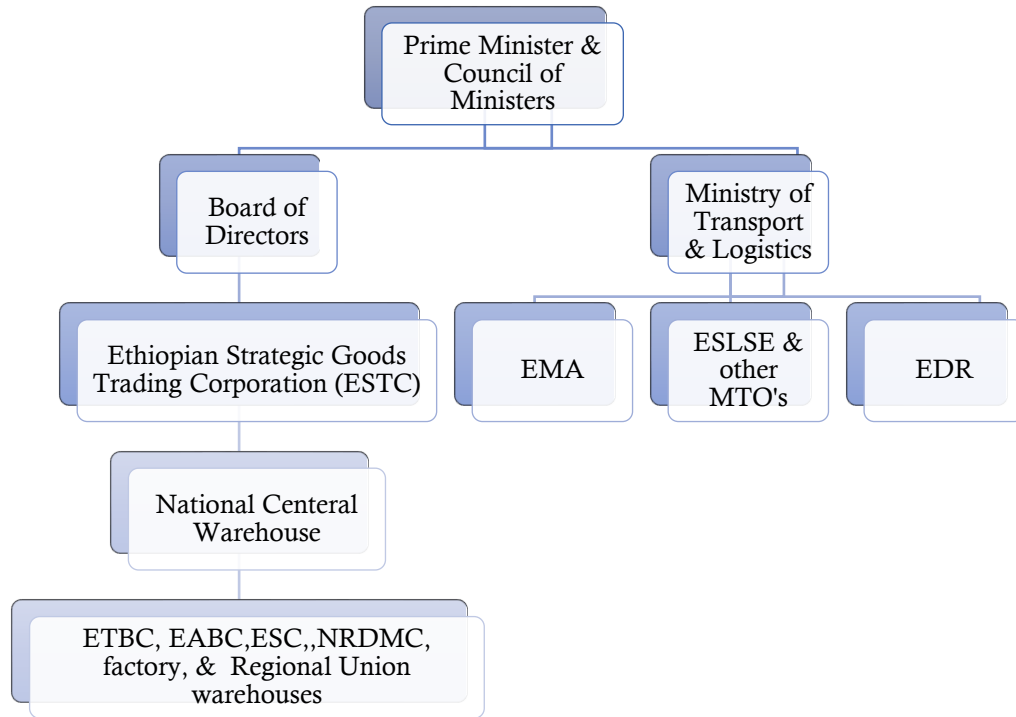


Figure 2. 9: Single organization structure

Pros:

- **Facilitate utmost integration of supply chain:** This form of arrangement offers maximum integration at national level by introducing coordination at later stages of planning through a new digital system as well legal framework compatible to DBC importation.
- **Promotes effective execution:** By establishing a focal organization the integration and enforcement task falls under a single body. This provides sufficient autonomy and accountability to enforce compliance. Besides, the focal organization will help in streamlining plans, schedules, procurement, financing, logistics, and warehousing across all DBC commodities and stakeholders. As result, this arrangement will help in ensuring smooth DBC procurement practice and seamless supply chain.
- **Handle emergency cases timely:** As a standing organization, the focal organization is always present to monitor and timely tackle emergency cases and problems.
- **Standardize procedures and systems:** The new organization enables to install smooth operating system with in itself and among other key stakeholders down the line to local warehouses through integrated warehouse system and to final users through digital forecasting and payment system.
- **Economic of Scale:** This institutional arrangement allows for centralized procurement characterized by large-scale purchase. This results in economies of scale

advantage in procurement, sea transport and vessel chartering, inland transport, and warehousing. In this sense, there will be substantial cost and time saving.

- **Ensure maximum visibility and information aggregation:** with proper synchronized warehouse system shipments can be easily tracked, national stock level can be accurately determined, proper database on warehouse and truck capacities can be maintained, and real time national data can be provided to government decision makers.
- **Flexible and overarching legal framework:** The new institution shall be governed by fresh legal framework that allows for flexibility matching the dynamism of international DBC commodities market. This focal organization can serve as implementer of overarching government development policy especially on food security and price stability.
- In general, this alternative offers the following core advantages:
 - Allows for effective coordination of dry bulk import procurement and logistics
 - Allows for seamless supply chain
 - Assigns accountability to dry bulk logistics
 - Provides scale economies in procurement and logistics
 - Improve bargaining power of the procuring organ on procurement, securing finance and foreign currency
 - Allows for resource sharing such as foreign currency through sequential use of limited currency
 - Allows for coordinated national strategy and MACRO decisions
 - Allows for modern organizational setup, culture, and working model
 - Allows for setup of national warehouse and distribution system
 - Allows for flexible determination of strategic commodities
 - Serves as information pool

Cons:

- Establishment cost: there is a cost to establishing an independent organization that manages an end-to-end operation smoothly.
- Work overload: due to high work volume employees may be overloaded and this results in delaying operations.
- Limited autonomy to existing procurement organs over procurement function
- Time and resource needed to establish new organization
- Possibility of resistance to change and implementation period disruption

2.6.2. Proposed solution for institutional arrangement

First proposal

Alternative 4: Coordinating dry bulk import through a new single coordinating procurement and distribution organization

- *New single procurement and distribution organization*
- *Organization having national central warehouse facilities*
- *Procurement on behalf of existing procurement organizations till central warehouse*
- *Organization equipped with modern digital and professional capability*
- *Accountable to either Prime Minister Office or Ethiopian Public Enterprises Holding & Administration Agency (PEHAA)*

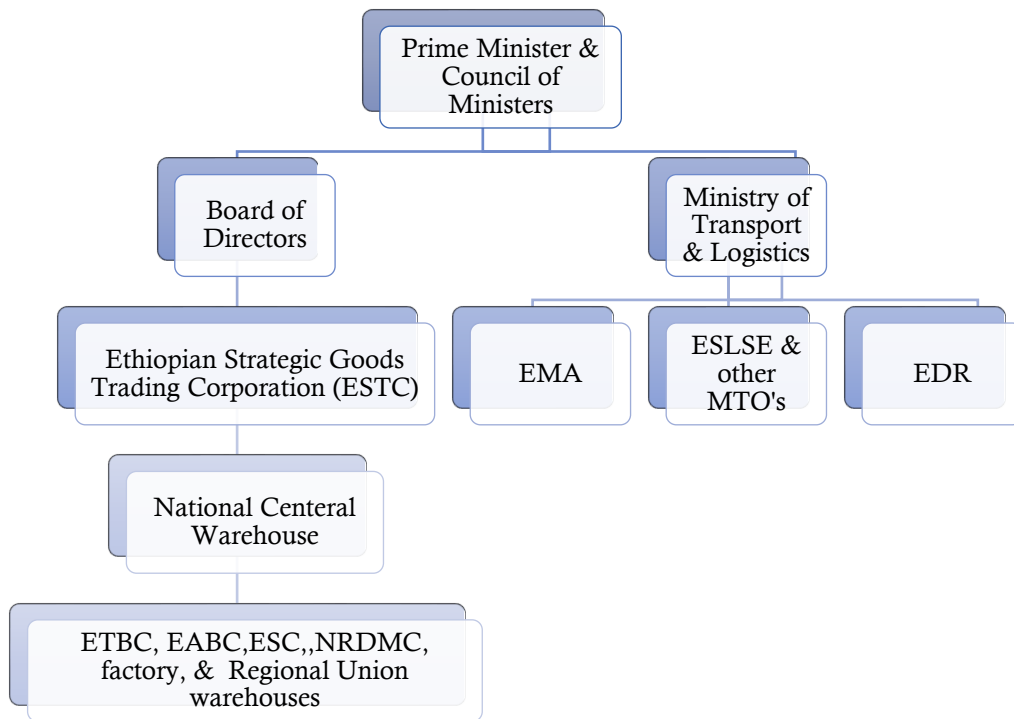


Figure 2. 10 (a): New single organization structure under the Office of the Prime Minister

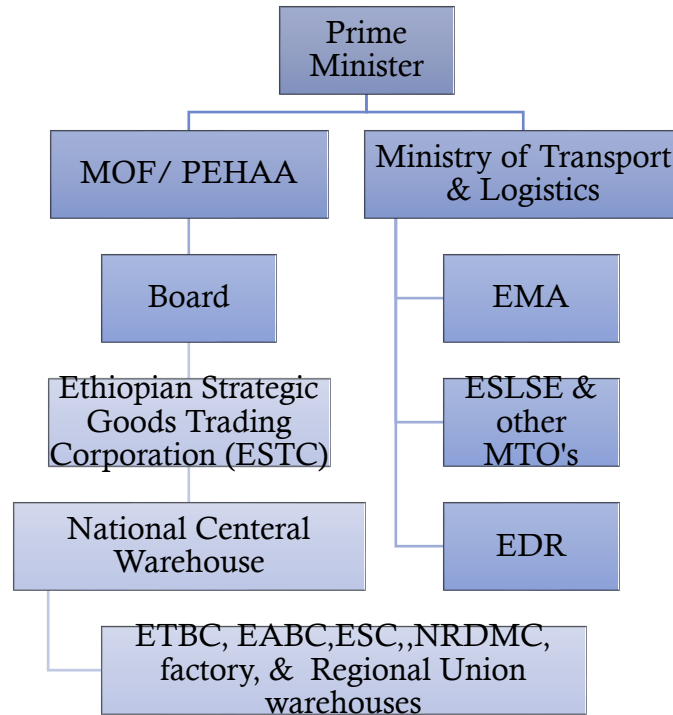


Figure 2. 11(b): New single organization structure under PEHAA

Second proposal

Alternative 3: Coordinating dry bulk import through SINGLE EXISTING PROCUREMENT AND DISTRIBUTION organization

- *Strengthening existing institutional arrangement*
- *Coordination of dry bulk import through one of the existing procuring organization*
- *Centralization of procurement to one existing organ*
- *Centralization of transport up to main warehouse of a procuring organ*

Strengthening ETBC is considered the most preferred for the second proposal for the following reasons:

- It has extensive trading experience and has warehouse facilities across the country
- Its mandate allows it to engage in dry bulk procurement
- As public enterprise, it could apply flexible procurement methods that allows for efficient and effective procurement, attract international suppliers, and avoid cancellation of bids
- As its establishment was linked to government policies associated with price control and food security, it will allow better implementation of government policies

Points of concern over ETBC

- Limited import experience on dry bulk procurement
- Traditional organizational setup and system may limit progress
- May lose sight of strategic focus to selected dry bulk imports due to wide scale of trading activities

The rest organizations are least preferred for dry bulk import procurement for the following reasons:

- PPDS: It is guided by stringent public procurement proclamation, has no distribution facilities, has work burden associated with framework purchase and property disposal, past experience shows repeated bid cancellation and lengthy procurement
- ESC: Its mandate is limited to just a single product, Its main warehouses are tied to only sugar factories, and there is lack of experience on purchase of other dry bulk items
- EABC: It is mandated only to agricultural inputs
- NDRM: Its mandate is specific to food assistance

2.6.3. Proposed structure of recommended options:

First option: The new Ethiopian Strategic Commodities Trading Corporation (ESTC)

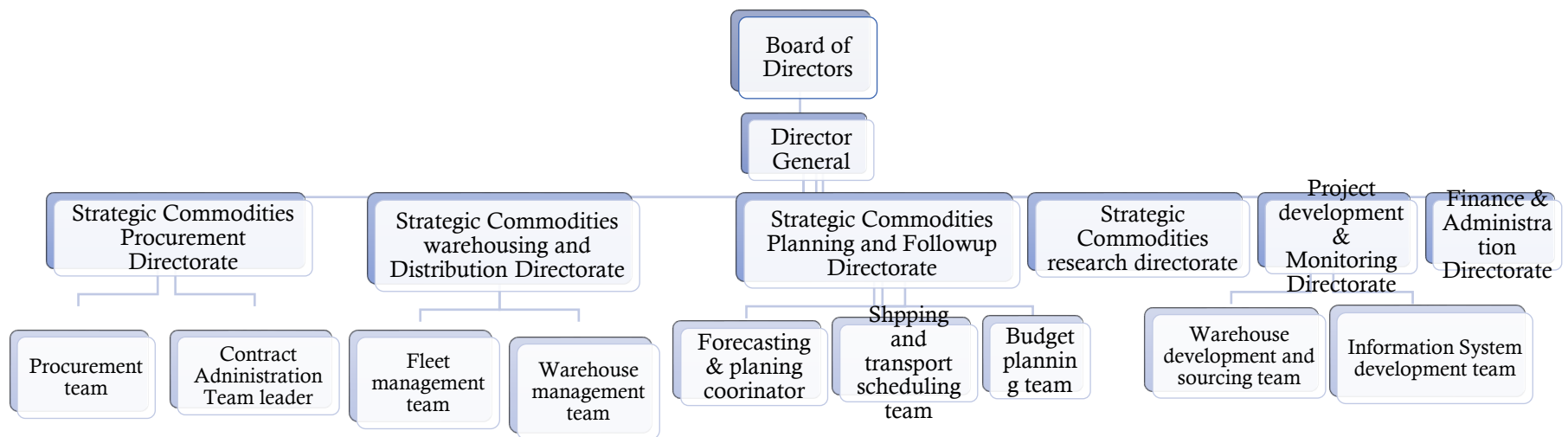


Figure 2. 12(a): Proposed internal structure of proposed organization

Proposed institutional mandates for the new single coordinator (ESTC)

- The proposed institution is expected to coordinate both procurement and central warehouses
- Be equipped with high calibre professionals with international exposure
- Is expected to serve as government policy implementation wing and input provider for MACRO committee
- Operates with highly integrated digital environment and work to harmonize the DBC import system
- Flexibly determine strategic goods and operate as import-export trading corporation
- Serve as a model to other procurement organs
- Governed by board represented from diverse stakeholders as well as the existing DBC procuring organs: NBE, ECC, MOF, MOTRI, MOTL, EMA, MOA, ESTC, ETBC, EABC, ESC, and NDRMC.
- The various stakeholders shall have the following working relationship with ESTC that serve as national procurement plan aggregator, procurer, and central warehouse administer:
 - Regulatory organs such as MoA and MoTRI as plan aggregators, NDRMC and steam coal customers as import need input providers,
 - focal corporations as distributors from central warehouse, steam coal customers as collectors from central warehouse, and
 - Logistics service providers as end to end transport service providers.
 - ESTC shall finance its operation through government budget, service charges for procurement and warehouse service, loans, grants associated with food security policy, revolving hard currency fund, advance payment from beneficiaries, donations from diverse stakeholders, and exportation.
 - Focal corporations and LSP shall be part of an integrated digital system through which they are alarmed during planning, procurement, and logistics for timely input provision, respective budget allocation, and central warehouse clearance.

Second option: structure under ETBC as separate business unit led by Deputy CEO

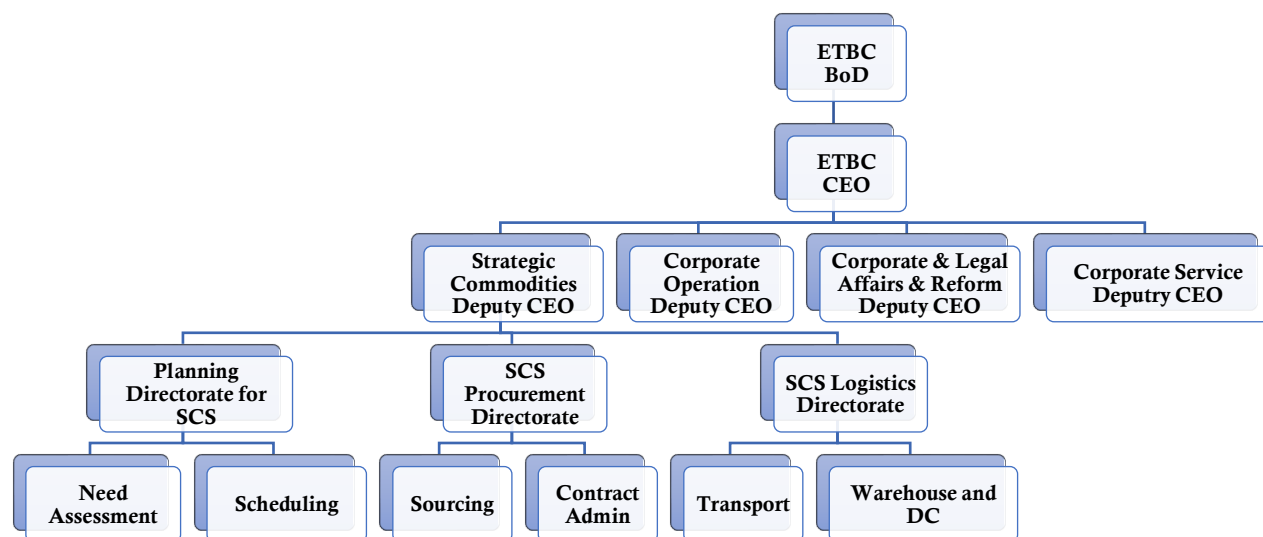


Figure 2. 13(b): Proposed internal structure of proposed organization

PART THREE: PROCUREMENT AND FINANCING PRACTICE IN DRY BULK CARGO IMPORTATION IN ETHIOPIA

3.1. Outlook of dry bulk Procurement of fertilizer, wheat, sugar and steam coal in Ethiopia

In today's globalized environment, there is no self-sufficient country. The changing nature of the business, technological, economic, political, legal, and social environment made countries depend on each other more than before. Following the economic growth of the country over the last couple of years, the nation's foreign trade and dry bulk cargo imports have shown remarkable growth from time to time. On the other hand, the economic growth was not accompanied by improvement in the logistics service specifically in terms of employing advanced technologies and related infrastructure development to support the economy and ensure smooth importation of DBC.

3.2. Demand and Supply Pattern of dry-bulk cargo importation and forecasts for Ethiopia

3.2.1. Demand and supply patterns of dry-bulk cargo importation

Demand determination in DBC is key. The procurement and import process should begin with import planning if resources are to be used efficiently and effectively. Import planning begins with the assessment of import demand. It is a bottom-up approach. For wheat flour mills, factories, consumer associations, and aid recipients, demand is forecasted and aggregated independently by different organs such as ETBC, NDRMC, Development partners, MoTI. For Sugar, the sugar demand quota for consumer associations, industrial users, and small businesses are set by MoTI for aggregation by ESC. For coal, cement factories and industrial customers submit their plan to EPSE for aggregation. For fertilizer, it starts at local kebele level. Extension workers referred as Development Agents (DA) collect farmers' requirements, which are then gradually aggregated at woreda, zone and region levels by the respective primary cooperatives, cooperative unions, Bureaus of Agriculture (BoA). The final aggregation at national level is carried out by the Ministry of Agriculture (MoA) for procurement by EABC. Overall, except for coal demand assessment, the rest DBC are characterized by inaccurate data collection at sources as well as aggregation levels and follows highly traditional manual system.

Once the import requirement is estimated, respective procuring organs get involved for each DBC with bid preparation, floating, contract award, contract administration, L/C processing with Commercial Bank of Ethiopia (CBE), sea shipment, and inland transport. DBC demand is met through domestic production and importation as the case may be. Local coal and fertilizer production is at infancy level. However, wheat and sugar demand are substantially met through local production.

For wheat, Ethiopia is the third largest producer in Africa standing at 5.18 million Metric tons in 2021 (USDA, 2021). Following the global trend, the demand for wheat has increased sharply due to human population pressure, urbanization and lifestyle changes (Minot et al. 2015). The total per capita consumption of wheat in the Least Developed Countries (LDC) is projected to increase by 0.37 kg/person/year between 2014 and 2024 (OECD/FAO, 2015). About 28.9kg/person/year and 46.7kg/person/year wheat is expected to be consumed by 2024 in LDCs and Africa, respectively. Following this pattern, Ethiopia has been the net importer of wheat of covering about 1.1 million Metric tons or 25% of local demand in 2021 (USDA, 2021).

With regard to sugar, the current sugar supply is between 650 thousand to 700 thousand tons of sugar per annum. Of these 325 thousand to 400 thousand tons of sugar is produced in the country. To fill in this gap, about 200 thousand to 300 thousand tons of sugar is imported annually by the government spending high amount of foreign currency. Though only 7 kilo grams are being supplied, the current sugar consumption per individual in Ethiopia is more than 10 kilo grams a year. The interview data reveals the country is importing between 200,000 and 500,000 tons of sugar per year. In fourth quarter of 2021, for instance, the corporation has bought 200,000 tons from which 100,000 tons have already been delivered at the time of the interview. The following table and figures show import patterns for dry bulk commodities as obtained from EMA.

Table 3. 1: Import volume patterns for selected dry bulk commodities

Year	Wheat	Fertilizer	Coal	Sugar	Total
13/2012	1,114,094.31	470,260	247,451	227,750	2,059,555.31
14/2013	1,319,984.89	769,343	910,000.00	236,835.00	3,236,162.89

15/2014	1,910,324	964,856	500,000	280,400	3,655,580.00
16/2015	1,910,464	834,525.40	500,000	300,000	3,544,989.40
17/2016	2,611,305	844,534	717,133.69	197,946.48	4,370,919.17
18/2017	1,120,285	917,721	974,542	163,194	3,175,742.00
19/2018	890,968	1,274,195	745,014	350,824.25	3,261,001.25
20/2019	1,630,478	1,458,561	651,734	251,273	3,992,046.00
21/2020	1,157,674	1,637,271.00	729,639	200,000	3,724,584.00

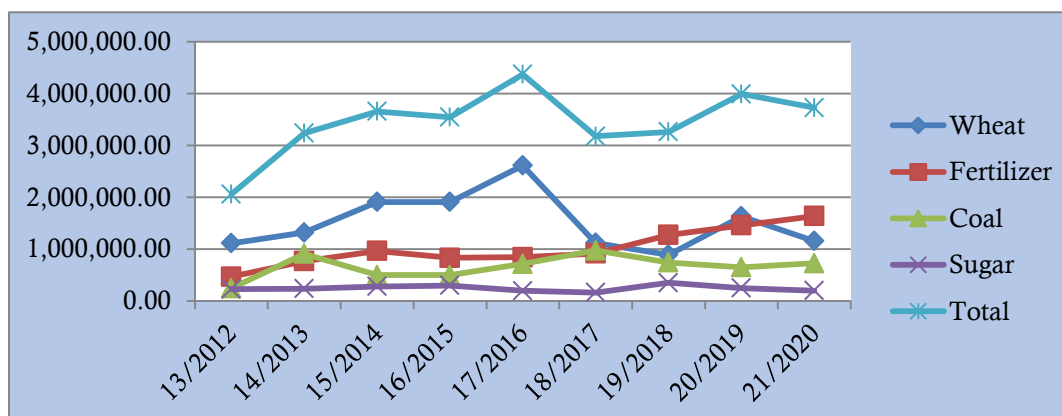


Figure 3. 1: Import of total DBC in tone, Source: Adopted by AAU Consulting team

3.2.2. Import demand Forecast for dry bulk cargo commodities of Ethiopia

Based on the assessment of past data and patterns, import forecasts for wheat, coal, and sugar were made using the Compound Annual Growth Rate (CAGR) method and trend projection up to the year 2030. Each DBC data pattern was analyzed in producing prediction equation that has the highest prediction power. To this end, the consulting team used trend projection method to predict DBC volume importation until 2030. The trend forecast is indicated in the following figure.

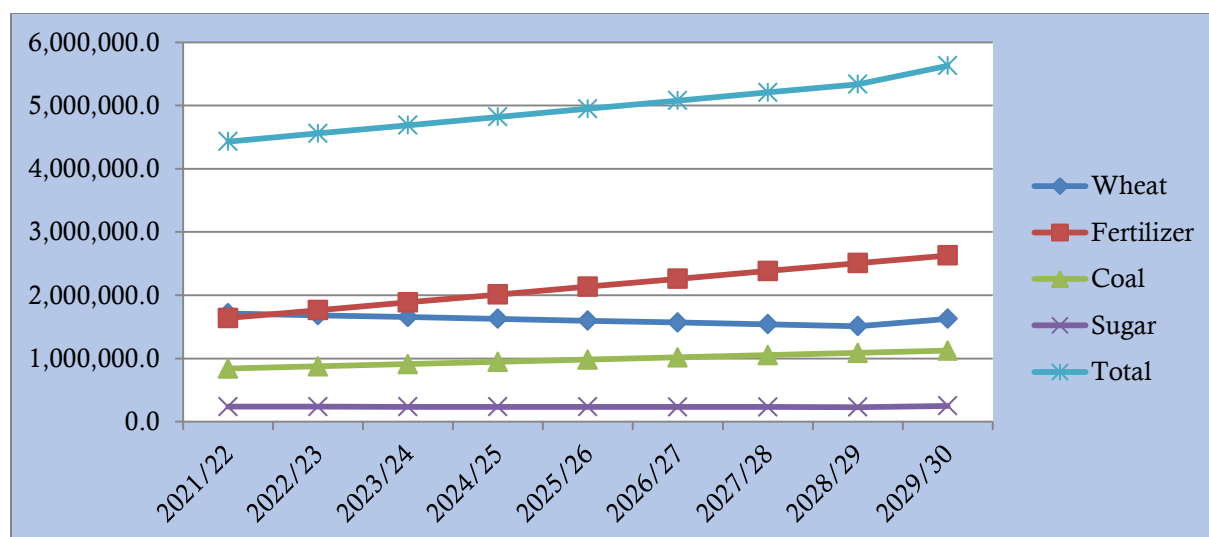


Figure 3. 2: Forecast trend of DBC in tone, Source: Adopted by AAU Consulting team

Based on the above forecast, fertilizer and coal shows increasing trend with the former being sharper while wheat and sugar are marginally decreasing. Accordingly, the changes from actual data of 2021 to 2025 and to 2030 reflect increases with an increasing rate for fertilizer and coal and with a decreasing rate for wheat and sugar. Overall, DBC cargo import volume is predicted to increase by 29.4% by 2025 and 47.32% by 2030 from 2021 actual as detailed in the following table.

Table 3. 2: Forecasted percentage changes on DBC from 2020/21 actual.

Year	Wheat	Fertilizer	Coal	Sugar	Total
2020/21 Actual	1,157,674	1,637,271.00	729,639	200,000	3,724,584
2024/25	1,626,666	2,010,712	946,419	235,812	4,819,609
2029/30	1,483,076	2,630,512	1,122,964	250,662	5,487,214
% change at 2025	40.51%	22.81%	29.71%	17.91%	29.40%
% change at 2030	28.11%	60.66%	53.91%	25.33%	47.32%

While the import forecast shows positive results until 2030, there is a plan to replace the importation of DBC commodities, especially wheat and coal. Concerning the planning and forecasting practices, the study participants confirmed that there were limitations in forecasting dry bulk cargoes purchases, poor communication between planners and dry

bulk procurement decision-makers, the dry bulk procurement planning process was not efficient and timely, and ineffective coordination in planning, implementation problem due to lack of involvement of key stakeholder in dry bulk importation, and operation among procurement organs, logistics service providers, warehouse service providers, and transporters. The respondents agreed about the need for one strong procurement institution for efficient dry bulk import planning and procurement.

3.3. Dry bulk Cargo Procurement and Import process

The dry bulk procurement and importation process for coal, sugar, wheat, and fertilizer comprises of need assessment, budget approval, local and foreign currency release, procurement, vessel scheduling, sea transport, port operation, customs clearance, and inland transportation. DBC import volume identification, plan consolidation, local budget, and foreign currency approval are time taking, limiting optimal utilization of trade logistics capacities to cause lengthy lead times and significant and demurrage costs.

3.4. Assessment of the current dry bulk Importation system of Ethiopia

3.4.1. Coordination of strategic commodity procurement

In Ethiopia, strategic goods are hardly identified. KII from various stakeholders indicated that the existing focal procuring organizations are not synchronized to operate in a coordinated manner. KII indicated that DBC procurement is failing due to:

- Lack of flexible and bold decision making required in strategic commodity procurement
- Lack of coordinated planning at national level
- Treatment of dry bulk procurement as simple purchase that can be done with short notice
- Lack of accountability for bid cancellation compared to bid endorsement
- Frequent bid cancellations to be on the safe side in case of complaints or gaps
- Price offer differences between supplier and ESLSE cause bid cancellations
- Limited expertise of management in complex procurement
- Long validity period of public procurement extending to 30 days is not reflective of price volatility of dry bulk items in international market
- High bid bond requirement of 10% discourages international suppliers from participation for large value procurements

As a remedy to the mentioned challenges, KII from various stakeholders recommended the following:

- To establish dynamic strategic commodities list at national level

- To establish a single procuring and distributing organization of strategic commodities equipped with high caliber professionals, digital system, and warehousing capacity
- To allow for procurement procedure that is customized enough to suit international requirement
- To capacitate the respective procurement organ with procurement professionals, expertise in international procurement, and logisticians
- To appoint competent leadership that can make sound, timely, and bold decisions due to expertise in the area

3.4.2. Use of Incoterms

Ethiopia has recently adopted FOB directive that had been operational for years through administrative decision. Study participants reflect their opinion over the applicable incoterm in various ways. Bidders may not reflect subsequent shipping costs that may vary in their FOB price quotation. KII pointed out that that ESLSE's shipping costs tend to be higher than the international price for the following reasons:

- ESLSE has to charter in vessels
- Chartering agreement price is neither transparent nor well regulated
- ESLSE has no competitor or has "monopoly power"

FOB helps to allow participation of local carrier and overall brings a number of advantages and disadvantages:

FOB Advantages

- Helps to capacitate local carrier
- Helps to save and retain foreign currency in the country
- Helps to properly apply multimodal operation including inland transport
- Helps to capacitate local expertise in end to end logistics services
- Helps to ensure reduction on logistics cost and time due to scale advantage and synchronized operations
- Allows inspection at port of shipment and potentially avoid added costs and time associated with defective quality shipments

FOB Disadvantages

- Logistics hassle to the buyer
- Higher shipping charges if buyer has limited bargaining power and scale
- Longer delivery time in the absence of experienced multimodal operator

KII from ESLSE indicated that procuring organizations normally prefer C&F to avoid logistics hassle and in return bear higher logistics costs that suppliers charge for the added

services and risk. Literature and practice support the notion that C&F tends to increase logistics costs but reduce logistics hassle and time to the buyer. In general, C&F tends to provide the following advantages and disadvantages to the importer:

C&F Advantages:

- Avoids logistics hassle to the buyer
- Helps to allow fast delivery

C&F Disadvantages:

- High cost of logistics due to added activities, risks, and hidden costs
- Poor quality related added costs and time due to lagged inspection at the port of destination

In general, the following table summarizes the preference on incoterms by informants of dry bulk procuring organs, ESLSE and benchmarked organizations, and **theoretical merits of each**.

Table 3. 3: The Use of and preference to INCOTERMS

	Product	C&F	CIF	FoB	DAT	KII Main reason
EABC	Fertilizer			√		Timely delivery
ETBC	Wheat	√				Cost as it offers at fixed price
ESC	Sugar	√				Cost as it offers at fixed price
PPDS	Wheat	√				Effective procurement as per the law
NDRM	Wheat	√			√	Timely delivery
EPSE	Coal	√				Logistics hassle
ESLSE	All			√		Logistics efficiency via multimodal
CRS	Wheat Sugar		√		√	Allowing carriers preferred by US
Egypt GASC		√	√	√		Flexible to case wise advantage
India's MMTC		√	√	√		Flexible to case wise advantage
Theoretical Advantage		Fast No logistics hassle	Fast No logistics hassle	Low logistics cost	Fast No logistics hassle	
Theoretical disadvantage		High cost	High cost	High Logistics hassle	High logistics cost	

Source: AAU consulting Team

Apart from assessments on incoterms through interviews and document review, study participants reflected their view on benefits of incoterm through survey as indicated in the following figure.

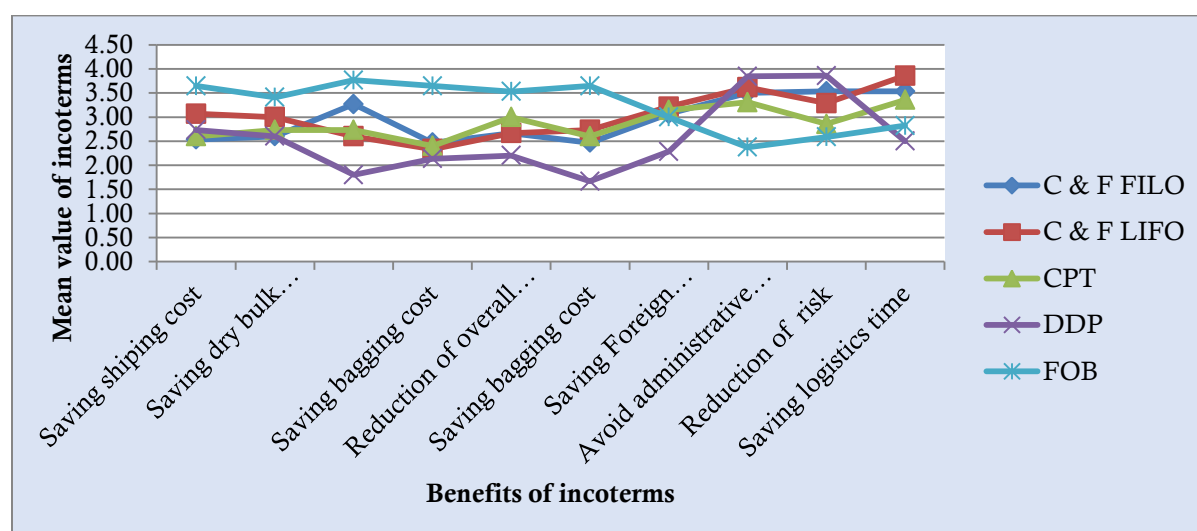


Figure 3. 3: Benefits of incoterms; source: AAU consulting team

In general, the results from figure show that FOB is preferred incoterm as its benefit is relatively higher for improved saving shipping cost, saving dry bulk cargo transport costs, saving stevedoring service cost, saving bagging cost, reduction of overall import cost, and saving foreign currency while C&F LIFO found to be the preferred incoterm as it helps avoid administrative hassle linked to transport, reduce risk, and save logistics time. Most of these findings coincide with theoretical advantages and disadvantages. Although C&F helps to save logistics time for importers with access to sea ports, its merit for landlocked countries should be investigated as the inland transport hassle is cumbersome. As the above figure indicates FOB dominates the most advantages followed by C&F LIFO.

Concluding remark on the use of INCOTERMS

KIIs recommended the following on incoterms and on use of local shipping company:

- To encourage the use of FOB with certain degree of flexibility to use other methods on grounds of cost, time, and availability of local Logistics Service Provider
- To encourage price quotation with both FOB and C&F in bidding
- To encourage using a multimodal operator with local expertise to allow for end-to-end services and reduce the logistics hassle that procuring organization may experience

- To enforce pricing competitiveness and transparency in shipping and transportation services
- In using FOB, involvement of experienced end to end logistics service provider will help reduce shipping costs due to higher bargaining power and large scale operation.
- Provision of shipping services need to also include national strategic objectives of enhancing the capacity of national logistics carrier
- In using FoB, involvement of a single logistics service provider without alternatives, competition, transparent pricing, or regulation is likely to result in higher shipping charges against procuring organizations, further driving the cost of essential commodities.

Despite a wide range of reflections over INCOTERMS, per the body of knowledge, the following can be concluded:

- The use of FoB is generally advantageous for importing body if used properly
- The opportunity to involve local logistics service provider can be considered an added advantage
- Minimal competition among local shipping and logistics service provider is alarming and necessitating abatement
- ESLSE needs to work towards suppressing its shipping cost structure to make FOB the most viable option for the wider stakeholders in dry bulk importation. Offering support to ESLSE towards building capacity and wide scale operation are notable remedies.

3.4.3. Main bottlenecks of the existing dry bulk procurement

Survey participants assessed the performance of dry bulk import supply chain activities as indicated in the following table.

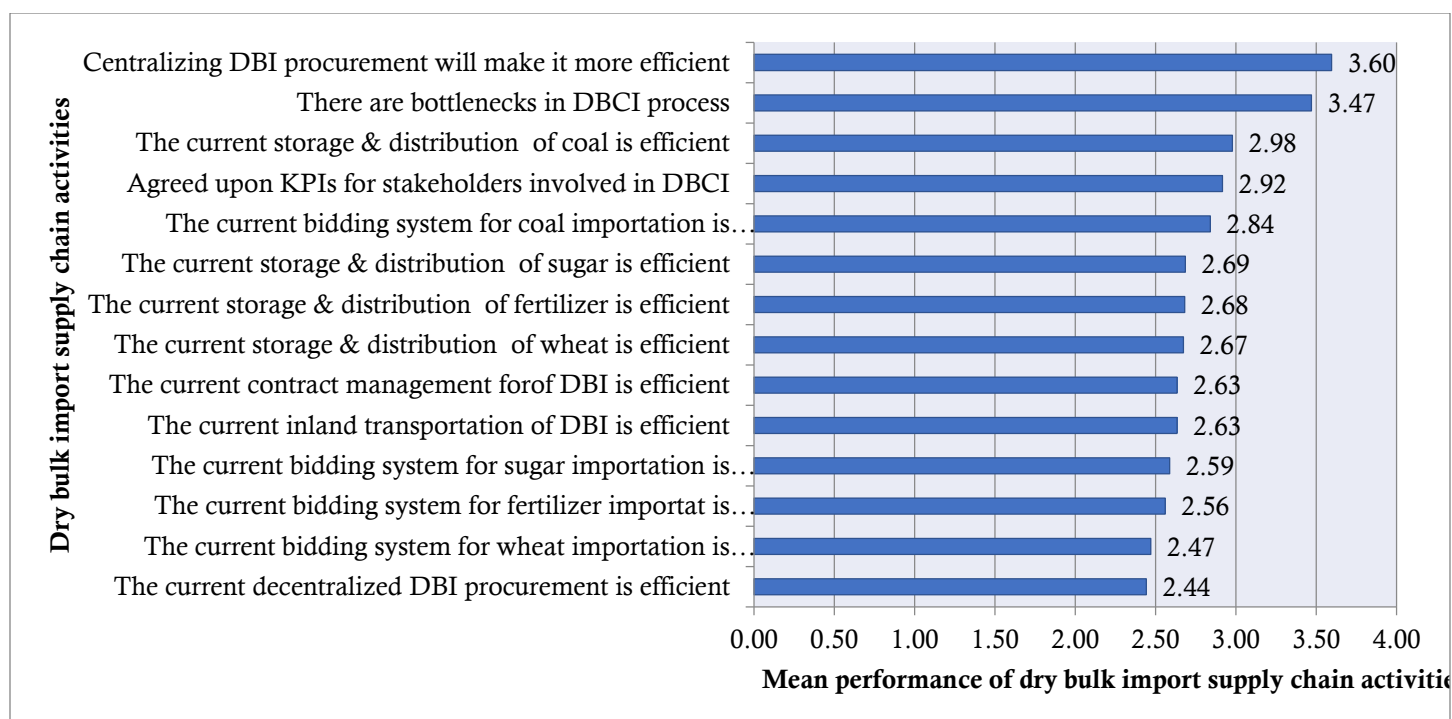


Figure 3. 4: Performance of dry bulk import supply chain activities; Source: AAU consulting team

Respondents agree that there are bottlenecks in the DBC importation system. Procurement system, storage, and transport systems are considered high inefficiency areas in that order. However, coal bidding system fares better than that for other commodities. In agreement with Alfarra (2009), respondents consider centralizing DBC importation instrumental to achieve efficiency.

Further KII from various stakeholders outlined different bottlenecks in the existing dry bulk procurement. These are:

- Making international procurement without observing the national law
- Ethiopia as a nation follows a trade term that would favour least price over quality
- Attracting quality assessor professionals at Djibouti port is found to be a challenge for ECAE
- Shortage of foreign currency
- Delay in payment issuance as it is handled by the NBE
- Poor procurement practices that hardly allows for cost minimization
- lack of digitalization for demand planning and data collection

3.5. Supply Chain Mapping and digital interventions

3.5.1. Supply Chain Mapping

Dry bulk procurement involves diverse actors that can be classified under five supply chain activities: procurement planning, sourcing, contract administration, logistics and distribution, and payment collection. Planning stage involves final users at grass root level such as farmers at kebele level, industrial establishments such as cement factories as well as administrative offices and respective authorities, sourcing involves main procuring entities, Logistics involves EMA, ESLSE, transporters, and warehouse operators; payment involves final users. The following figure shows the overall picture of the as-is supply chain map.

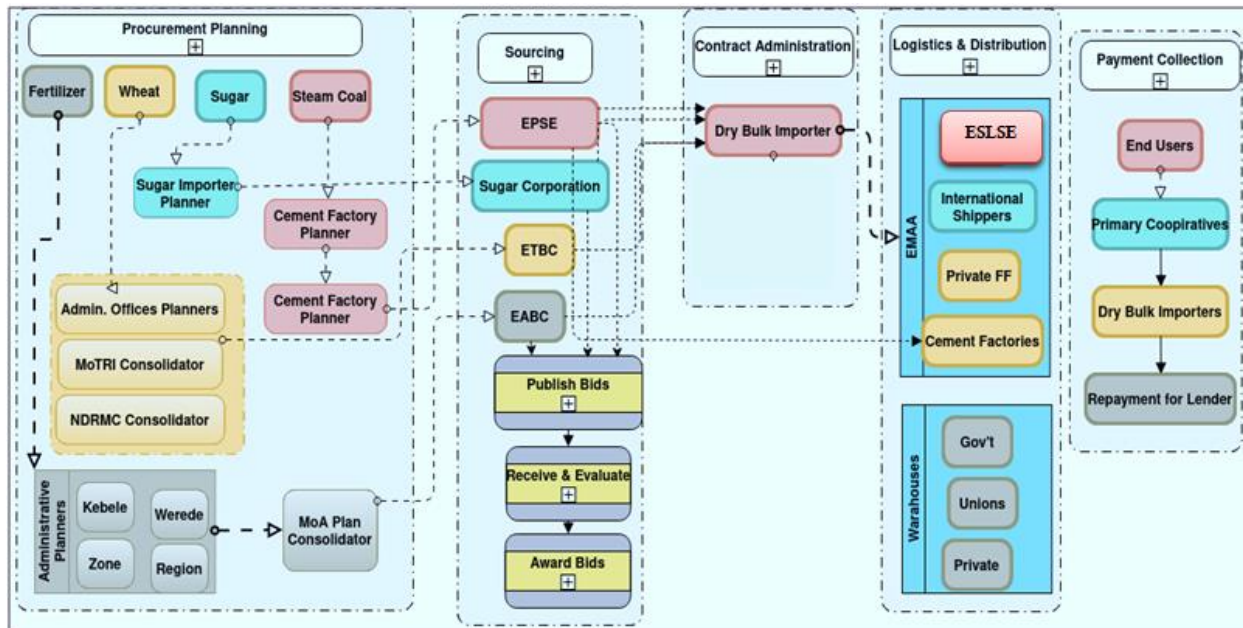


Figure 3.5: AS-IS supply chain map of DBC procurement of Ethiopia, Source: AAU consulting team

As can be seen from the figure above, there are different plan aggregators and sourcing organizations interact with limited logistics and distribution system, pushing the coordination work to the later stage. In this system the coordination task is pushed to EMA creating all forms of bottlenecks identified in this study in other sections. The further the coordination task is pushed towards the planning stage, the better overall system integration. To that end, the following supply chain map is proposed:

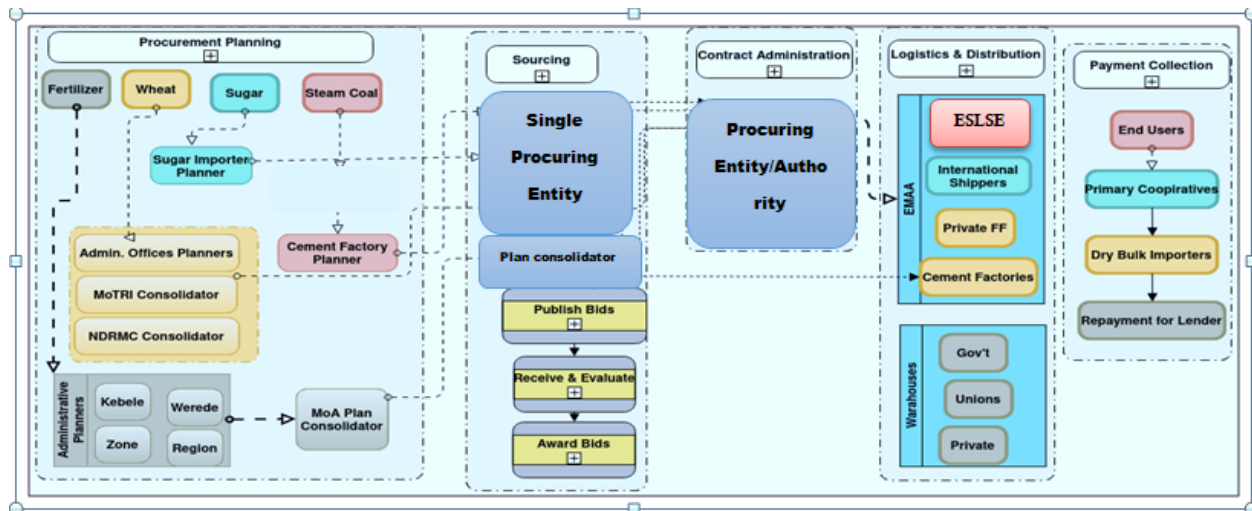


Figure 3.6: To-be supply chain map of DBC procurement of Ethiopia, Source: AAU Consulting team

As indicated in the above figure, coordination task is concentrated at sourcing stage allowing for smooth operation for later stages as indicated in the findings of this study. In the proposed supply chain relationships, the procuring entity is well positioned to link up the entire supply chain through digital intervention. In favorable instances, the sourcing institution can favorably reintegrate contract administration with sourcing function.

3.5.2. Digital Interventions for DBC supply chain

The above supply chain maps presented structural solutions to supply chain problems. However, the intricacy of supply chain calls for several solutions and interventions. One of the most common solutions to supply chain problems is digital intervention. Digital intervention ensues from existing problems and actual or proposed supply chain structure. In view, of these alternative digital interventions are proposed for both the existing supply chain structure and the proposed structure. The following IT Intervention needs and digital architecture solutions are proposed for the AS-IS and the TO-BE supply chain.

IT Intervention Needs of DBC importation system

In today's international trade facilitation, ICT has become the main enabling factor rather than a mere technical support for the entire supply chain operation performance. The Ethiopia DBC importation system requires the following IT interventions:

1. **Cargo Tracking System:** This system allows to submit/collect bills of loading from stakeholders and to manage each consignment.
2. **Warehouses Management System:** This allows dry bulk importers and the stakeholders to locate, plan, share, and trace each warehouses available within territory of Ethiopia.

3. **E-Procurement Management System:** The proposed e-Procurement Management System needs to at least encompass modules involved in software such as a service (SaaS) model, and to create access to dry bulk importers and stakeholders hierarchically.

Digital Intervention Solution 1: for As-Is Decentralized Dry Bulk Importation Institutional Arrangement

Given the current decentralized dry cargo import practice, the digital platform needs to be in place for all procuring organs. As a result, it will duplicate infrastructure and facility costs and operational activities. For this structure, end-to-end system for business process from planning to distribution is recommended as portrayed in the following Figure. The schema portrays the business layer planning, procurement, contract administration, logistics and distribution, transportation planning and tracking, consolidation of information exchange, resource sharing and real-time information flow. In view of this, the recommended application level systems consist of e-procurement system, cargo tracking system and warehouse management systems.

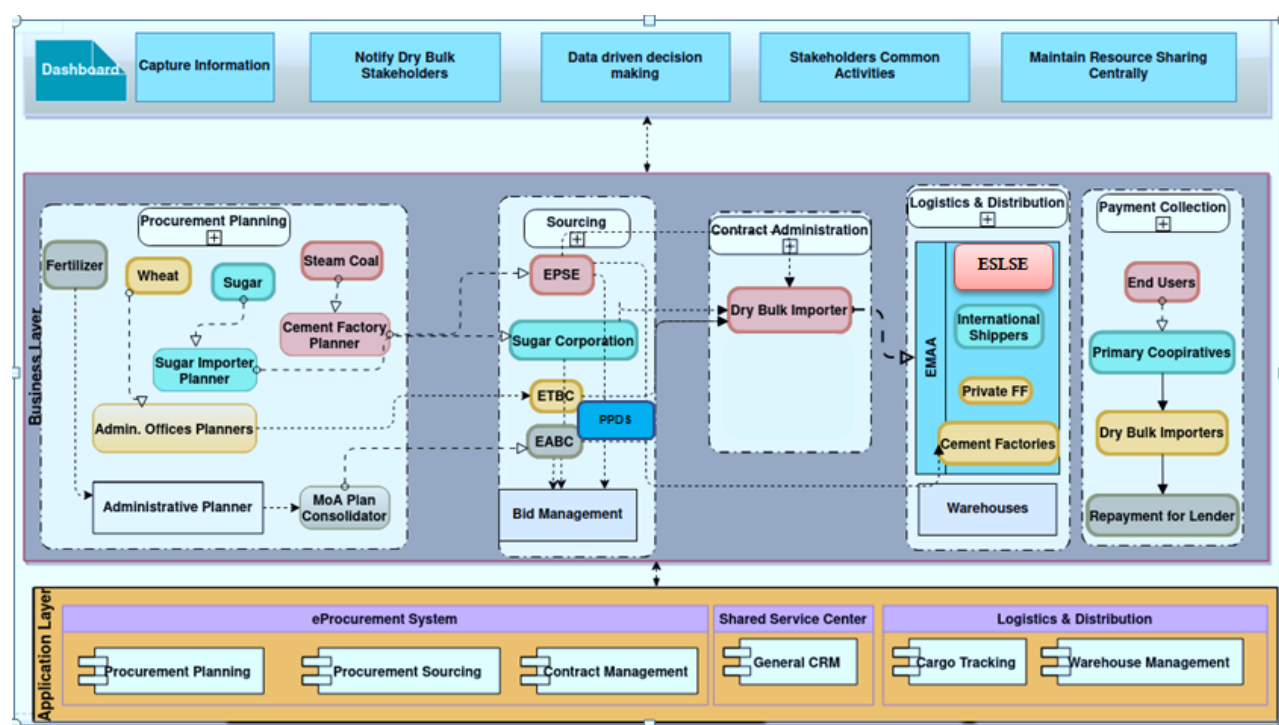


Figure3.7: Digital Intervention for dry bulk importation stakeholders (As-Is): current; Source: AAU Consulting team

Digital Intervention Solution 2: For To-Be centralized DBC importation via a single focal Institution

To create a single strong institution coordinating the procurement centrally, the following digital intervention is recommended as portrayed by the business layer and application layer of the following diagram. The recommended application level systems are e-procurement system, cargo tracking system and warehouse management systems that are accessible for the stakeholders based on their role and privilege.

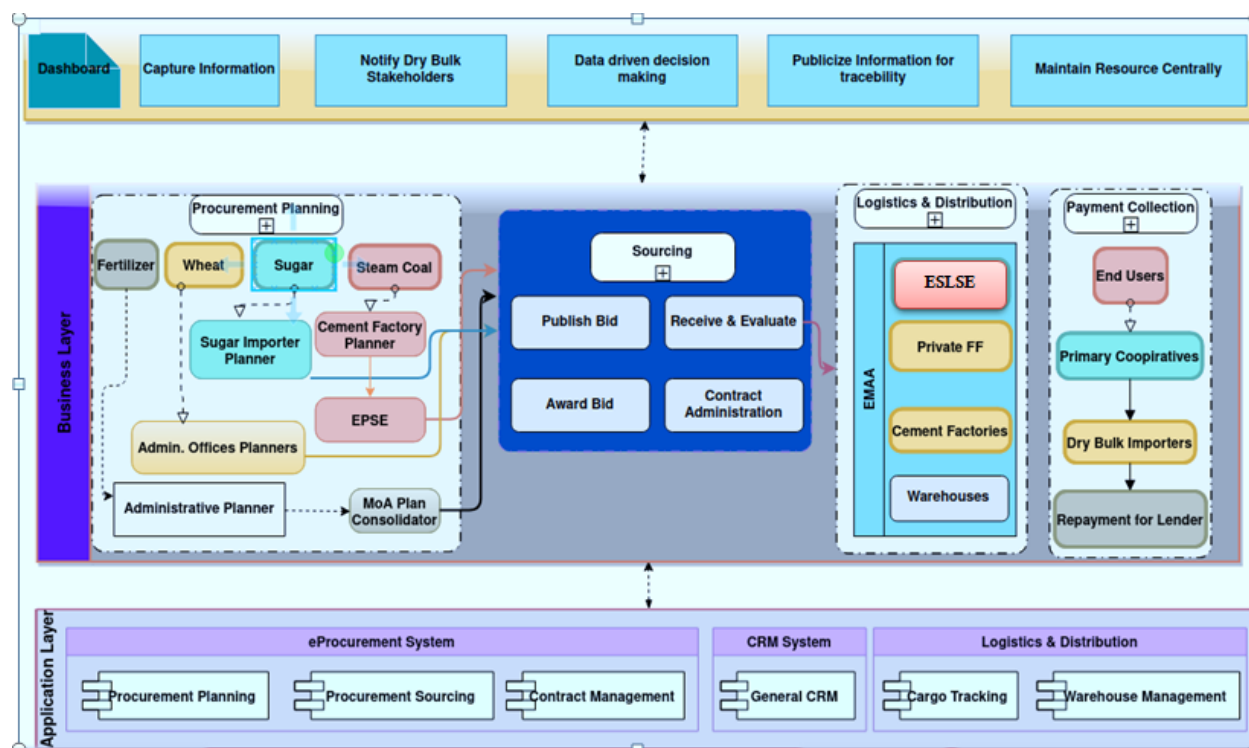


Figure 3.8: Digital Intervention for Single Institution of dry bulk importation; Source: AAU Consulting team

Implementation guide for Digital solution for DBC importation

The following actions are required for successful implementation of IT solution for DBC importation system:

- Development ICT Data Centers by using the existing IT Infrastructure
- Stakeholders Mobilization
- Project Task force and Committee formation
- Business Process Analysis (BPA) and Re-engineering:
- Implementation Budget and Time frame
- Testing and Quality Assurance
- Phased operation of the proposed systems

3.6. Strategic Sourcing Practices and Prospects

Countries that cannot produce certain products on their own or the amount they produce cannot cover the demand in the country are required to engage in international procurement. Ethiopia needs to conduct analysis and develop a global sourcing strategy for DBC. The strategy needs to address key issues such as identifying key global suppliers, matching national requirements, analysing suppliers' financial positions, gathering data, examining market trends, ensuring detailed specifications exist for each cargo type, establishing transportation requirements and identify areas of risk and uncertainty.

3.6.1. Sourcing practices

Strategic sourcing strategy adopted need to identify low-cost country. Countries have been able to realize significant savings, reportedly up to 40 %. Typically, these countries are in emerging regions where there may be some offsetting risk as supply chains are developed. Countries currently classified as low-cost producers include Brazil, Bulgaria, China, India, Philippines, Romania, Thailand, Ukraine, and Vietnam. For dry bulk imports major global players affect the world reserve stock and hence global price. India, Thailand, and Brazil come as major global sources of sugar while Russia, Ukraine, Argentina, Canada, and USA are leading global sources of wheat. Besides, Russia, China, Canada, and Morocco are world leading fertilizer exporters while Indonesia, Australia, Russia, and South Africa are amongst the leading coal exporters. Sourcing strategy requires close monitoring of the trends in such countries before devising sourcing location and time. Of all, crop calendar is the most pressing because it affects domestic supply availability especially for wheat, availability of storage capacity due to domestic harvest season, and commodity consumption period especially for fertilizer. The following figures and alternative tables indicate the international price trends and proposed sourcing time.

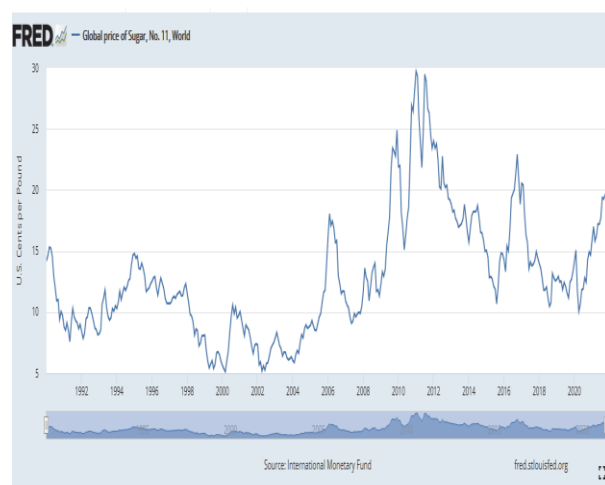


Figure 3. 9: Price trend of Wheat

Wheat		
Year	Low months	High price months
2020	Jul	Dec
2019	Sept	Jan
2018	Jan	Sep
2017	Oct	July
2016	Oct	Janu
2015	Nov	Janu
Overall	Sept to Nov	Dec to Jan
	Quarter III	Quarter I
Strategy	Buy in QIII	Don't buy in Q I & IV

Table 3. 4: Proposed sourcing time for wheat

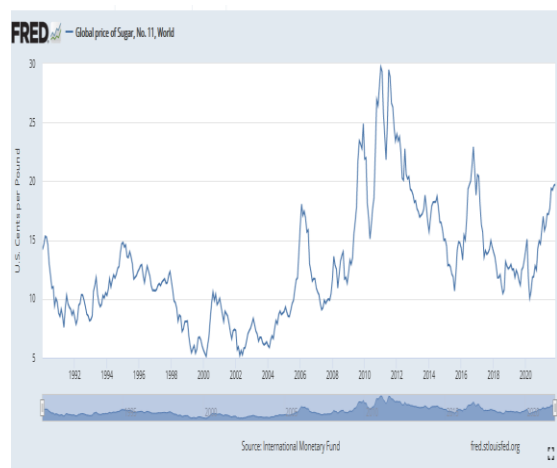


Figure 3. 10: Price trend of sugar

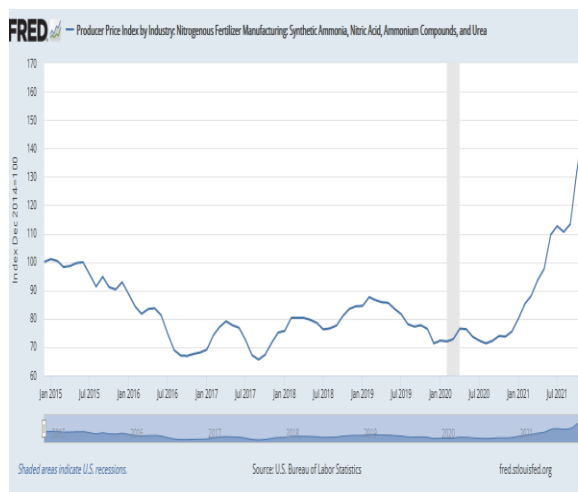


Figure 3. 11: Price trend of fertilizer

Sugar

	Low price months	High price months
2020	April	Feb
2019	September	Feb
2018	August	Jan
2017	June	Feb
2016	Feb	Oct
2015	August	Jan
Overall	April to August	Jan to Feb
	Quarter II	Quarter I
Strategy	Buy in QII	Do not buy in QI

Table 3. 5: Proposed sourcing time for sugar

Fertilizer

	Low price months	High price months
2020	Aug	April
2019	Dec	February
2018	Jan	Dec
2017	Sept	April
2016	Oct	Jan
2015	Nov	June
Overall	Oct to December	Jan to June
	Quarter IV	Quarter I & II
Strategy	Buy in QIV (late)	Do not buy in QI & II

Table 3.6: Proposed sourcing time for fertilizer

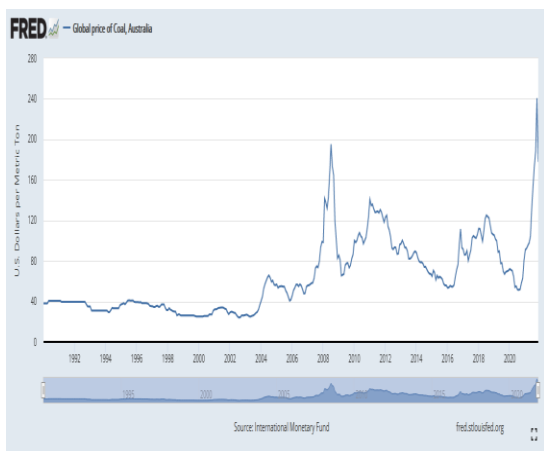


Figure 3. 12: Price trend of coal

Coal		
	Low price months	High price months
2020	Sep	Dec
2019	Sept	Jan
2018	April	July
2017	May	Dec
2016	Jan	Nov
2015	Dec	Feb
Overall	April to Sept	Nov to Feb
	QII & III	Q I & IV
Strategy	Buy in QII & III	Do not buy in QI & IV

Table 3. 7: Proposed sourcing time for coal

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wheat - Major Season (Long Rains)												
Sowing												
Fertilizer Application												
Harvest												
Barley, Teff, Wheat, Millet, Oats, Sorghum, Maize - Minor Season (Short Rains)												
Sowing												
Fertilizer Application												
Harvest												

Figure 3. 13: Ethiopian crop calendar

Based on the above crop calendar, Ethiopia has two fertilizers application seasons and harvest seasons, main season and minor season. In view of fertilizer distribution needs to be majorly finalized just before application period and wheat imports need to come either before in before or at the start of harvest season or well after the harvest season for reasons of abundant availability and occupied storage and truck capacity. Based on the international price trend and domestic crop calendar, the following sourcing timing is recommended.

Table 3. 8: Proposed sourcing timing for dry bulk cargo imports

Basis	Price-wise		Crop calendar-wise		Overall	
Season (Jan-Dec)	Best Buying season	Worst buying season	Best Buying season	Worst buying season	Best Buying season	Worst buying season
QI		Coal, fertilizer, sugar, wheat	Fertilizer (early)	Fertilizer (late)		Fertilizer (late)
QII	Sugar & Coal	Fertilizer	Wheat (Late), Fertilizer (late)		Sugar & coal	

QIII	Wheat & Coal		Wheat (early)	Fertilizer (late), Wheat (late)	Wheat & coal	
QIV	Fertilizer (late)	Wheat & Coal	Fertilizer (late)	Wheat (early)	Fertilizer (late)	Wheat (early)

3.6.2. Framework agreements (FAs)

Framework agreements are arrangements between one or more buyers and one or more suppliers that provide the terms governing contracts to be established for a certain period of time, in particular with regard to price and, where necessary, the quantity envisaged. The main rationale for using FAs is to achieve cost savings in procurement by generating economies of scale, as well as in the process of procuring by reducing the administrative burden of issuing multiple tenders. FAs are the main tool used by central purchasing bodies, and these bodies generally achieve the most savings by using FAs. The main advantages of FAs lie in increased administrative efficiency, namely, allowing flexibility in procurement but reducing time and administrative costs of running the procedure. Once an FA has been awarded, there are no requirements to run other full procedures or to advertise contracts, thus decreasing the length and costs of procurement procedures. In Ethiopian dry bulk procurement, FA is not a common place. However, Framework agreement needs to be in place in dry bulk procurement for its benefits. Generally, framework agreement helps to reduce unnecessary administrative tasks through call-off as indicated in the following figure.

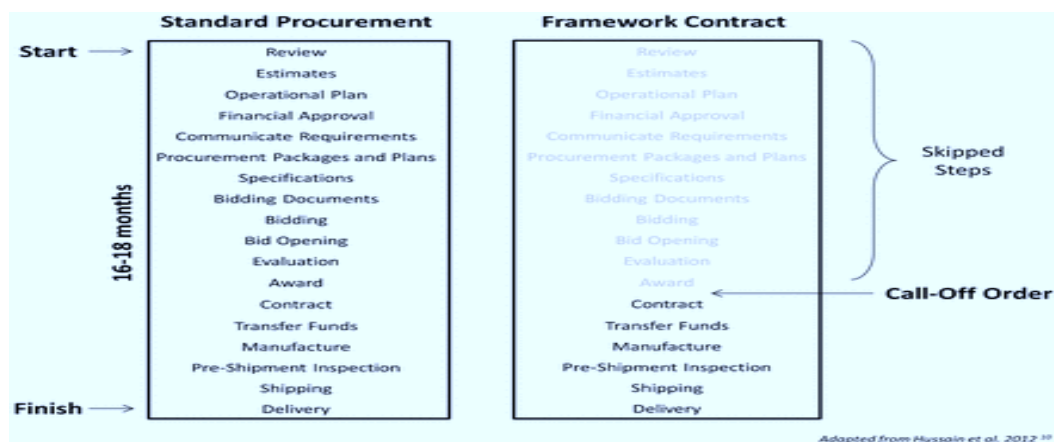


Figure 3.14: Benefits of FA; Source: Arney & et.al (2014)

3.6.3. Sourcing from producers versus traders

DBC procurement can be sourced directly from producer or traders depending on the nature of the market and commodity. For wheat and coal international traders are the linchpin of the market. However, fertilizer and sugar can be sourced from producer and traders.

Normally, traders are involved in a bid system while producers are attracted through direct procurement or long-term agreement with big buyers and large volume of purchase. Here are the pros and cons of buying from producers versus traders.

i. The pros and cons of buying directly from producers

One of the main advantages of buying directly from a producer is that DBC importers can gain access to more affordable prices and ensure the continuity of supply of DBC. The pros and cons of buying from a producer are explained below:

Pros:

- Transparency: Buying directly from the producers adds transparency. Procurers have an opportunity to visit the plant/farm for themselves, and this builds trust, which in turn builds loyalty. It enables procurers to share information with producers and to establish long lasting commercial deal.
- Seasonal Production Advantage. DBC importers can learn about production time and hunt seasonal price and quantity advantages.
- No Middleman: this gives an opportunity to reap the full profits for producers and producer can reduce the price to the procuring corporation
- Long contract: a longer framework allows procurers to sign a framework contract to eliminate unnecessary repetitive administrative cost and time following each procurement initiation
- Gives an opportunity to sustain the flow of DBC

Cons:

- Location: where the producer is located in far areas, this may increase the cost of transportation and the total procurement cost of DBC and the producer may not be interested to sell relatively small volume of cargo to each importer
- Regulations: producers may be restricted to deal with single procurer unlike traders
- Expertise: producers may not have the expertise and willingness to engage in international trading matters and challenges

ii. The pros and cons of buying directly from Traders

There are some pros and cons that procurers can experience by procuring from trading companies.

Pros:

- Relationships with producer: Trading companies are uniquely positioned to develop longstanding relationships with the producers they purchase from. Trading companies routinely place enormous orders with their producers, with the promise of more business to come. This is almost always more than a single DBC importer can offer to a factory. As a result, producers may not be interested to have a commercial deal with single DBC importer.
- Experience: Trading companies offer an all-inclusive approach to procurer. They will not only be able to get DBC importers the commodities type need, but will also be able to easily handle the logistics matters better than producers.
- Flexibility: When negotiating with a producer, you may find that using the term “negotiation” to describe the discussion may not be wholly accurate. Issues like per-unit pricing, minimum purchase quantities, and payment terms can sometimes seem like they are set in stone. Flexibility on these points is another huge selling point usually left for trading companies. Again, due to their relationships with the factories and their streamlined operations, trading companies can often work with importers to reach a favorable buying agreement.

Cons:

- Overprice: In return for taking on trade-related risks and burdens, traders will expect higher margin of profit. No more traders means no more margin to place
- Storage problem: A potential downside of buying from trader is storage space to put the bulk purchases and may not avail the commodities timely

As a concluding remark, to fetch the cost and sustainable supply advantage, DBC needs to purchase directly from the producer where the market permits. However, success in this regard rests on having big central procurement organ and large volume of consolidated purchase order.

3.6.4. Warehouse Receipt System

Warehouse system in Ethiopia is not centralized or harmonized at national level. As a result, farmers are not getting the most out of it. Farmers can benefit from Ware House Receipt System (WRS). Under a WRS, a warehouse receipt (WR) is issued to a named depositor (who may be a farmer, farmer group, processor or trader) as evidence that he or she has deposited a specified commodity, of stated quantity and quality, at a specified location. A warehouse receipt system (WRS) enables farmers to deposit storable goods (usually grains or coffee) in exchange for a warehouse receipt (WR). A WR is a document issued by warehouse operators as evidence that specified commodities of stated quantity and quality have been deposited at a particular location. The holder of the receipt may pledge it

to a lender (with the stored commodity being the collateral for a loan) or transfer it to a buyer (by way of a sale). Usually, prices slump right after harvesting time. By deciding to sell the goods at a later time, when prices have picked up, the depositor can avoid price risk. The warehouse operator or collateral manager, who has custody of the stocks, guarantees delivery against the receipt, and should be able to make good any value lost through theft, fire or other catastrophes.

3.6.5. Import Substitution strategy: challenges and prospect for dry bulk commodities

Ethiopia imports huge amounts of goods every year. For example, in the third quarter of 2020, the value of imports of Ethiopia was USD3573.8 million, whereas the value of exports was just USD 883.1 million. This resulted in USD -2,690.8 million. This is a huge burden to the economy. It depletes the scarce foreign currency reserve of the country. One of the remedial measures to ease the problem is argued to be the implementation of import substitution (IS) strategy.

Import substitution potential for Wheat

In Ethiopia, past development plans usually raised the need for import substitution. For this purpose, efforts were made to attract foreign direct investment (FDI) by providing various incentives including tax-holiday, exemption from import taxes, etc. Ethiopia has a big potential for import substitution of some of its imports. The GOE has allocated about 6 million USD for the establishment of agricultural machinery rental to improve agricultural production. wheat import can be replaced by domestic cultivation with time. However, the gap between domestic demand for and production of wheat has been big due to population growth and inability of small holder producers to produce sufficient wheat to feed the growing population. That means the country must import wheat to fill the gap. The following table shows the imbalance between domestic production and consumption of wheat.

Table 3. 9: Wheat production and Consumption (1000 MT) in Ethiopia

Year	Production	Consumption	Shortage
2017/18	4200	5,950	1750
2018/19	4700	6,557	1857
2019/20	4925	6,566	1641
2020/21	5100	6,650	1550

Source: USDA/United States Department of Agriculture, March 2021

Although there is a continuous effort to increase domestic production, the full replacement of import with domestic production will require some time and still there is a need for a planned import of wheat for some time. International projections set Ethiopia as wheat importer by 2030 as indicated in the following table.

Table 3.10: Wheat projections: Production and trade; Source: FAO (2021)

	PRODUCTION (kt)		Growth (%) ¹		IMPORTS (kt)		Growth (%) ¹		EXPORTS (kt)		Growth (%) ¹	
	Average 2018-20est	2030	2011-20	2021-30	Average 2018-20est	2030	2011-20	2021-30	Average 2018-20est	2030	2011-20	2021-30
AFRICA	27 141	30 445	0.42	0.79	49 182	63 617	2.22	2.26	1 578	1 274	1.83	-1.39
Egypt	8 783	10 470	-0.10	1.84	12 967	15 523	3.36	1.23	598	523	34.12	-1.20
Ethiopia	5 068	5 654	5.80	1.01	1 350	2 578	5.66	6.91	0	0	..	..
Nigeria	65	71	-7.50	1.02	4 733	6 060	1.89	2.20	600	475	3.73	-2.15
South Africa	1 850	1 511	-0.60	-3.36	1 610	2 507	0.06	5.10	89	65	-15.49	6.10
ASIA	336 190	372 583	1.11	0.92	90 177	112 456	3.92	1.42	15 409	18 223	-2.73	1.62

The GoE repeatedly announce the move to significantly boost wheat production through irrigation and large-scale agriculture to avoid importing wheat in the future. However, a number of factors suggest importation to continue against plan:

- There are only few investors applying for loan for wheat production especially in Afar and the grant approval is yet underway, suggesting low participation according to KII from DBE,
- Demand for wheat may vary depending on disaster risk and in the absence of strong national reserve system; shortage may force importation any time,
- Some milling factories require a special type and quality of wheat that domestic production cannot meet, and
- Experiences of countries such as Egypt signals that import substitution for wheat takes long time for developing countries with large population.

Import substitution potential for fertilizer and coal

Regarding fertilizer, the use of fertilizer has increased from about 0.4kg per hectare in 1969 to 36.2Kgs per hectare in 2018 as per the World Bank data. There are about 12 companies that supply fertilizer in the country most of which are domestic firms. Import of Fertilizer is made by Ethiopian Agricultural Business Corporation on the basis of estimates of the needed amount by DAs, woreda level, then zone level, regional level and federal level assessment. The process is lengthy taking up to 3 months to aggregate the estimates. As an alternative, forming a regional and national forecast team along with participants from DAs will aid in resolving the time and accuracy problems. In any case, a crop-based need estimate by the farmers might give somewhat more accurate estimates. As to the prospect for import substitution, there is a potential. For example, the Yayu manufacturing project is a multi-complex of industries that will have two Urea and one DAP fertilizer manufacturing plants, a coal mining plant and a chemical manufacturing plant that will manufacture

chemical inputs for the fertilizer factories. The coal mine has the potential to produce 300,000tns of Urea, 250,000tns of DAP fertilizer, 20,000tns of ethanol and 90MW of electric power annually. But this has not yet materialized. Still the country imports fertilizers and this might continue for years to come.

Coal can also be produced in Ethiopia and the 200 million dollars expenditure on coal import annually can be saved. A total of about 653,000,000-1,000,000,000 tons of oil shale reserve and a total of about 297,000,000 tons of coal reserve are registered in the country (Ahmed, 2008). Coal production was started on a small scale in Delbi Moye area in the SNNP region in 2008. The objective for coal production was to supplement import of coal by Ethiopian Petroleum Service Enterprise (EPSE). In December 2021, the Council of Ministers of FDRE reviewed and approved the mining projects of coal production prepared by the Ministry of Mines Petroleum and Natural Gas (MoMPNG). Following the Council's approval, the Ministry of Mines is expected to issue coal production license for the eight mining companies. Coal is among the major minerals found in Ethiopia in bulk especially in Oromia region. The ministry of mines of Ethiopia reports shows that there is 430 million tons of potential of coal in the country. In June 2021, Sun Mining Coal factory, which is the first coal factory in Ethiopia, laid a foundation to commence coal production at Gibe Ibare Kebele in Abeshge Woreda of Gurage Zone. The plan is to fully stop coal import of coal within one year. However, there should not be a haste to totally stop imports, until the quality of domestic production of coal reaches the required level. Quality improvement comes through time. But the prospect for import substitution of coal supply is high. Be that as it may, quality of local production is a main concern.

Import substitution potential for sugar

There have been 13 public owned sugar factories in Ethiopia. Now the Government has decided to privatize all the sugar factories. As to production of sugar, in 2017/18, it was estimated at 400,000 MT. But thereof, it started to decline substantially. On the other hand, consumption was estimated to reach 640,000MT by 2019/20. However, in 2018/19, sugar consumption was limited to 580,000 metric tons due to shortage of supply. Considering current supply is After 2017/18 with local production decreasing, it has become common to see long lines of people at community owned shops waiting for sugar. The import of sugar was estimated at 310,000 MT in 2018/19 and 400,000 MT in 2019/20. There is greater potential import substitution in sugar, but it needs aggressive effort before substantially reducing import. In general, although there is strong commitment by Ethiopian government to substitute imports of sugar, predictions contradict with domestic plans with swelling imports and shrinking exports by 2030 as indicated in the following table.

Table 3. 11: Sugar projections: Production and trade; Source: FAO (2021)

	PRODUCTION (kt)		Growth (%) ⁴		IMPORTS (kt)		Growth (%) ⁴		EXPORTS (kt)		Growth (%) ⁴	
	Average 2018-20est	2030	2011-20	2021-30	Average 2018-20est	2030	2011-20	2021-30	Average 2018-20est	2030	2011-20	2021-30
AFRICA	11 099	15 072	1.36	2.92	14 526	17 334	2.80	2.18	5 452	4 221	2.97	-0.53
Egypt	2 466	3 766	3.13	3.85	1 041	994	-4.32	-0.89	270	433	-2.54	0.90
Ethiopia	440	707	6.44	3.74	262	365	17.18	3.61	37	23	245.51	-6.49
Nigeria	20	0	4.06	..	1 630	1 750	3.33	2.17	0	0	-47.76	..
South Africa	2 202	2 905	0.52	3.23	380	64	-8.28	-5.42	1 139	1 404	9.51	5.73

Be that as it may, import substitution has not been successful in promoting countries' economies in many instances. For example, in Latin America, import substitution (IS) is under very heavy state regulation ended up in inefficiency and development crisis. Thus, the countries turned to liberalize the economy by encouraging the private sector later on. South Eastern Asian countries also moved to Export promotion leaving IS, which they adopted as a growth strategy initially. In India, a more successful IS example can be seen. IS was started in the fifties in India. By 1966, IS output was 23% of the GDP growth.

The problem is that IS under heavy government subsidies, breeds inefficiency and weak and bankrupt firms. This means that IS can be helpful if the domestic production is made to operate under market principles. The current GoE's IS plan over wheat, sugar, steam coal, and fertilizer can hardly interfere with the intention to establish a strong strategic trading corporation for the following reasons:

- Strategic commodities are normally updated periodically and changing
- Implementation of IS strategies are expected to take time based on assessment of progress on the ground
- The relevance and scope of trading corporation goes beyond the current dry bulk commodities for the following reasons:
 - Trading corporation can be engaged in export of essential commodities following India's MMTC's experience
 - Trading corporation is relevant to structure warehouse system in Ethiopia following India's and Egypt experience
 - Trading corporation can serve as information center that helps to improve the quality of policy and macro committee decisions
 - The trading corporation can serve as a model for other similar enterprises through modern organization, digital capability, professional expertise, and training as can be drawn from technology based Egyptian Silo Center.

In general, Tanzania's experience provides key lessons on import substitution. These include:

- Although commercial farms cover 90% of Tanzania's wheat production, the country's 90% of wheat demand is met through imports.
- Tanzania wheat sources are diversified covering four continents and global exporters such as Russia, Ukraine, Australia, Canada, and US.
- Although Tanzania strives to substitute wheat importation by setting a target (60% from local source against the current 10%), employing market mechanism such as premium price to farmers, the surge in demand through growing industry and urbanization makes even the slightest progress improbable.
- Wheat import substitution plan can hardly be maintained as natural causes such as losses, low rainfall, and locust invasion hamper productivity as in Tanzania's expected 22% decrease in 2021/22.
- Tanzania importation of wheat is fragmented, limiting the government's ability to implement its import substitution target of 60-40.
- Sugar import substitution is affected by inefficient local production.

3.7. Dry bulk import financing Practices and Prospects

3.7.1. Foreign currency situation of Ethiopia

Ethiopia is a country facing severe shortages of foreign currency and budget for importation of essential commodities. Foreign exchange regime is managed by NBE through currency rationing as the lone market clearing mechanism. Ethiopia's nominal exchange rate is determined by interbank foreign exchange market that allows for much more little variation than the market rate. Although, NBE supplies foreign exchange to interbank market via annual estimation of demand and supply, experts indicate that the system is supply-side determined, causing the nominal exchange rate to be unresponsive to macroeconomic fundamentals and external shocks. Experts warn that Ethiopia's managed exchange rate regimes is rather "crawl-like" and could be sustained only if adjustments are made for significant changes in the exchange rates and inflation rates of Birr. The Following figure shows the effect of managed official exchange rate on excess demand and parallel market creation.

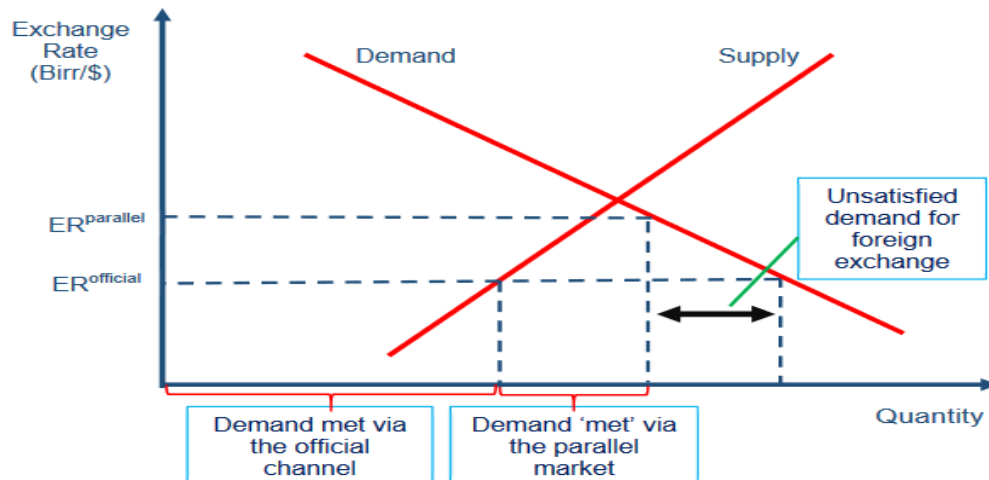


Figure 3. 15: demand and Supply of Foreign currency in rationed market; Source: (IMF, 2018).

Analysis of NBE data reveals that, Ethiopia's foreign currency shortage can be attributed to mismatch between export and import seasons. The highest export season (July) is the least importing season and the vice versa (January) as indicated in the following figures.

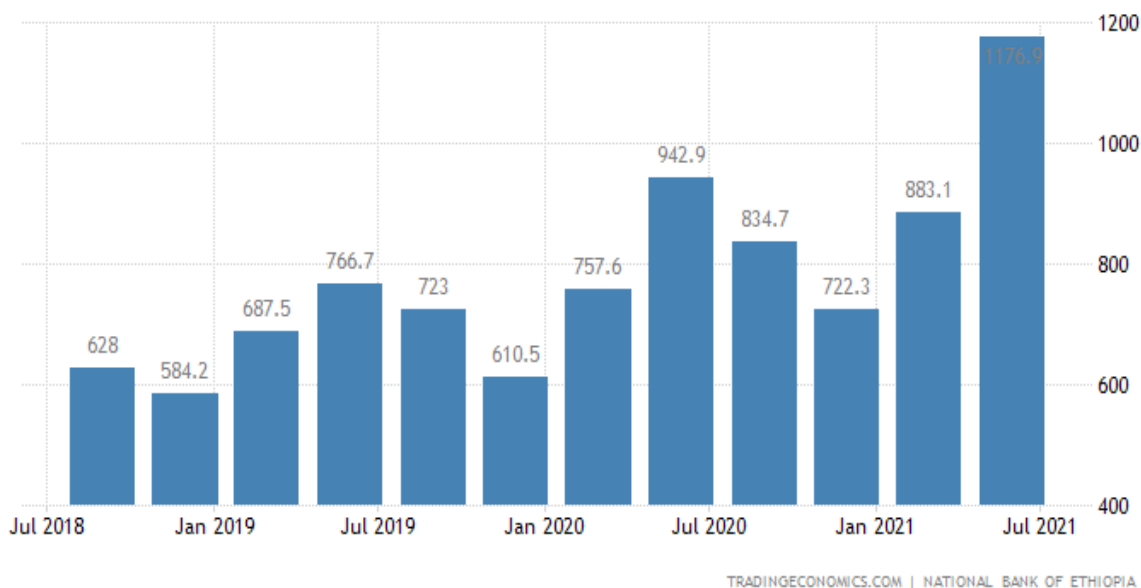


Figure 3. 16: Ethiopia Export value



Figure 3. 17: Ethiopia Import value

Apart from import, remittance is one of the main sources of foreign currency. The Population Division of the UN Department of Economic and Social Affairs estimates that there are 1.3 million Ethiopian migrants across the globe. Annually, Ethiopia receives USD 5-6 billion largely from its diaspora in the US, Europe, and the Middle East. Private individual transfers, including remittances, are the single most important category of foreign exchange for Ethiopia as in the Figure given below, covering 35% of imports. This is almost three times that of the country's goods exports.

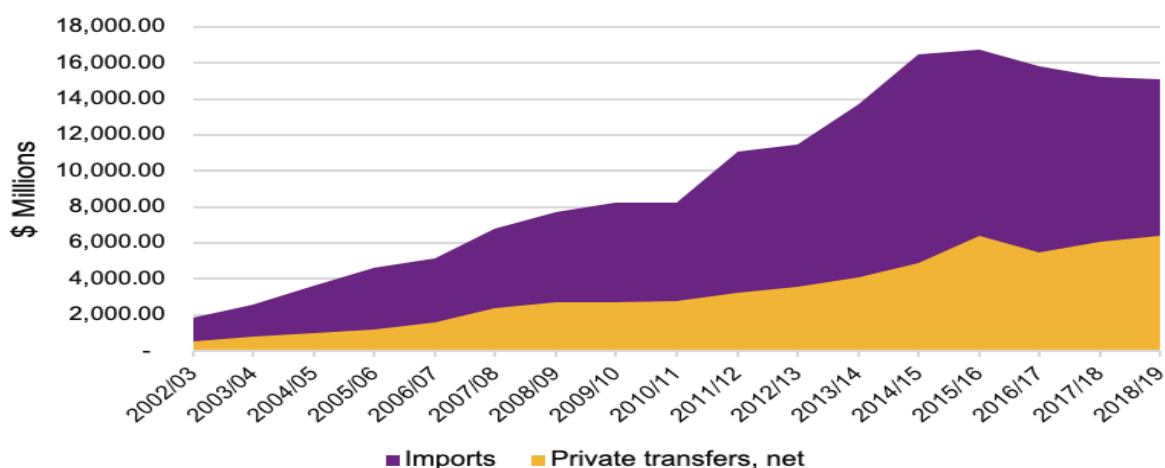


Figure 3. 18: Private individual transfers cover more than a third of imports; Source: NBE

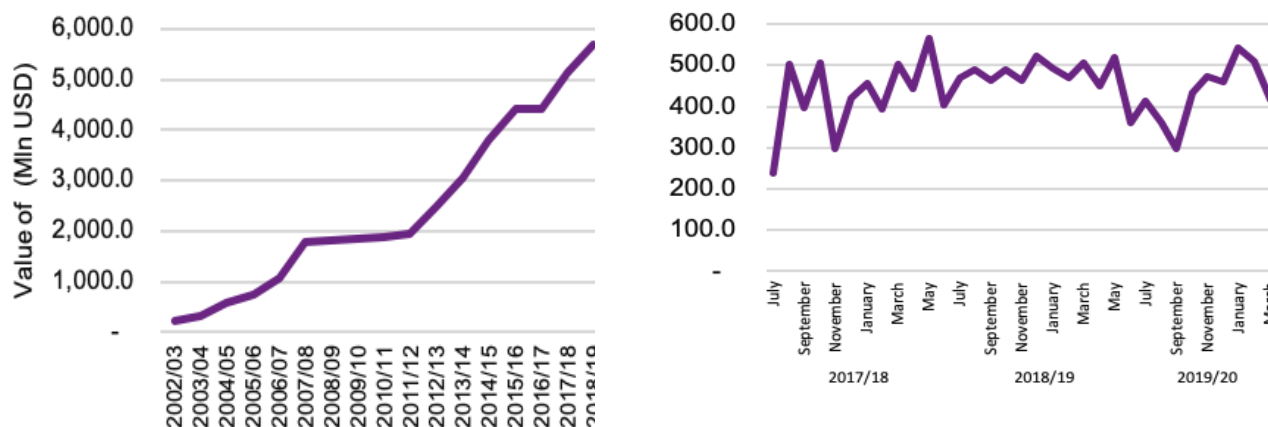


Figure 3. 19: Trends in private transfers; source: NBE

Figure 3. 20: Trends in Remittances; source: NBE

3.7.2. Foreign currency usage for dry bulk cargo imports

The last decade has shown a steady increase in the usage of foreign currency for importation of wheat, fertilizer, and sugar. By highest-to-lowest annual usage, commodities take the following ranking order: fertilizer, wheat, and sugar between 2013 and 2017; fertilizer, sugar and wheat between 2017 and 2021. Recently sugar overtakes wheat at the 2nd place. Trend wise, fertilizer use shows a U shape curve always being the highest as well as a sharp increases in the latest year while sugar's is steadily increasing. The wheat requirement is relatively unstable over the years.

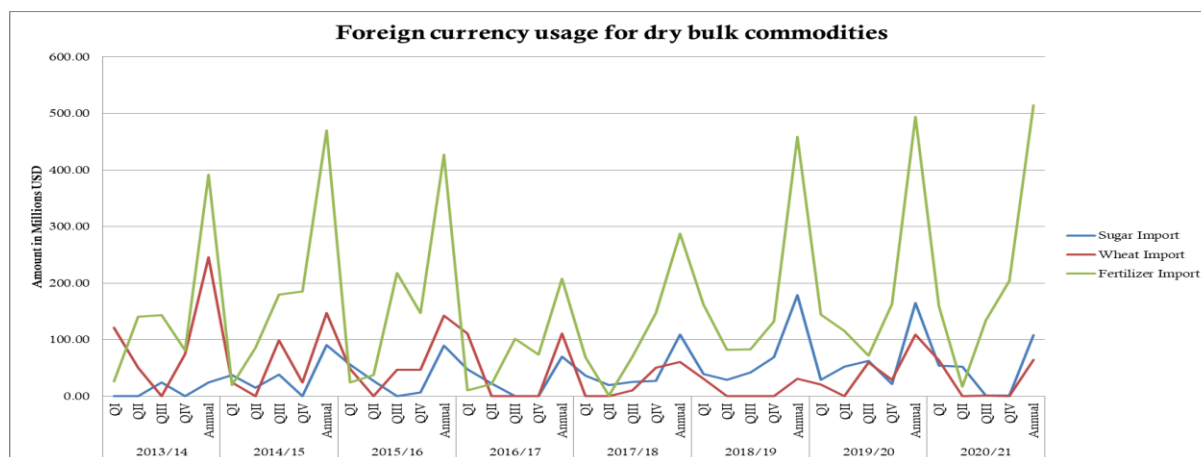


Figure 3. 21: Foreign currency usage for dry bulk commodities; Source: adopted from NBE data

During the period from 2013 to 2021, total quarterly foreign currency spending is the lowest in the 2nd quarter, the highest in 3rd quarter until 2016 and in the 1st quarter since 2018. First quarter spending exhibited the steadiest increases and now stands as the highest spending

season. Second quarter stays as the second highest spending season with relative stability in the last few years. The following figure shows the details:

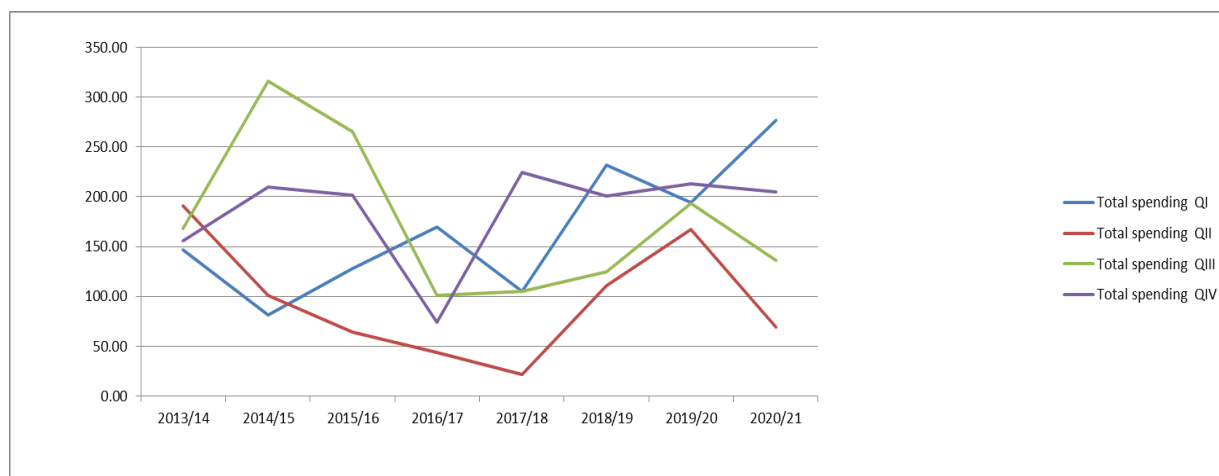


Figure 3. 22: Total Quarterly foreign currency spending. Source: AAU consulting team adopted from NBE data

As can be seen from the above figure, total quarterly spending rarely jumps 250 million USD the maximum being a little more than 300 million USD. Conversely, as indicated in the following figure, quarterly spending for each commodity barely exceeds 175 million USD, the maximum being a little more than 200 million USD. Based on past data, the following caps are rarely meet-175 million USD for fertilizer, 55 million USD for Sugar, and 80 million USD for wheat; the following are maximum caps-210 million USD for fertilizer, 70 million USD for Sugar, and 120 million USD for wheat. It can be said that quarterly spending for each commodity barely matches 200 million USD throughout the latest 32 quarters, except for two quarters as can be seen from *figure (a)* below. This finding helps to set the size of fund that can be allotted in a quarter as reserve or revolving fund. In case of decentralized procurement, as requirements add up, the size of maximum foreign currency requirement will be much higher than 200 million USD to nearly 310 million USD as can be seen from the above figure. Considering the sum of rarely meet caps, 310 million USD (175+55+80) fixed fund is required in a decentralized procurement system. Whereas, in a completely centralized procurement, synchronized and sequential procurement makes it feasible to smoothly operate with 200 million USD fixed revolving fund given that there is efficient replenishment system. In this sense, nearly a third of fixed fund requirement amounting to 110 million USD can be saved with centralized system.

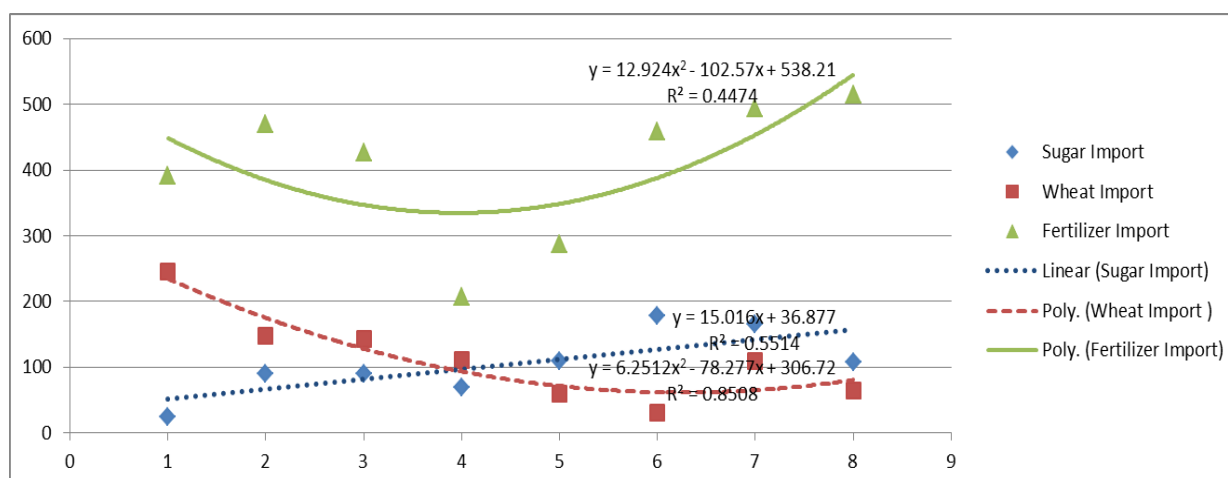


Figure 3. 23: Trend on dry bulk cargo commodities; source: AAU consulting team

Table 3. 12: Foreign currency forecast for Dry bulk cargo import (in Million USD)

Item/year	Computation	Forecast	Actual 2021	% change
Fertilizer 2023	$12.924(10 \times 10) - 102.57(10) + 538.21 =$	804.91		
Fertilizer 2025	$12.924(12 \times 12) - 102.57(12) + 538.21 =$	1168.426	514.2	227%
Wheat 2023	$6.2512(12 \times 12) - 78.277(12) + 306.72 =$	149.07		
Wheat 2025	$6.2512(12 \times 12) - 78.277(12) + 306.72 =$	782.6078	64.2	
Sugar 2023	$15.016(10) + 36.877 =$	187.037		
Sugar 2025	$15.016(12) + 36.877 =$	217.069	107.99	201%
Total 2023		1141.017		
Total 2025		2168.103	686.39	316%

In lieu of foreign currency shortage, NBE guides foreign currency allocation through directive and sectorial priority. However, KII from NBE indicated that foreign currency allocation does not affect main dry bulk procuring organizations for whom foreign currency is given based on their planned budget. NBE normally goes as far as utilizing its reserves to such purchases. However, problem occurs when L/C requests come beyond the plan, in which case a special approval requires few weeks to materialize. Thus, according to KII the main causes of delay associated with L/C permission are the following:

- Poor planning and forecasting resulting in unplanned interim period request for foreign currency
- Shortage of local budget in procuring organizations account at the time of request

Therefore, dry-bulk importing organizations need to follow strong planning system to determine nearly accurate currency demand and defined procurement timeline, and allocation of budget in such time period. NBE director also warned that the country is gradually heading to a more competitive exchange floating system that could lead to depreciation of nominal exchange rate and less predictable fluctuations. The expert predicts better foreign currency supply to the formal sector with the planned system. In such competitive system, bigger entities have leverage over small and fragmented entities due to scale economies. Survey results show a bleak picture on foreign currency availability for dry bulk cargo as indicated in the following table.

Survey results show a bleak picture on foreign currency availability for dry bulk cargo as indicated in the following table.

Table 3. 13: Financing and foreign currency

Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Financing and creative credit scheme for farmers will help improve proper utilization of fertilizer and local production of wheat	2	3.6%	1	1.8%	12	21.4%	17	30.4%	24	42.9%
There is sever financing challenge in dry bulk cargo importation	2	3.7%	2	3.7%	7	13.0%	22	40.7%	21	38.9%
The institution involved in dry bulk cargo purchase need to have its own foreign currency account	1	1.9%	6	11.3%	11	20.8%	20	37.7%	15	28.3%
Inability to get foreign currency on time is a serious problem of dry bulk importation	2	3.6%	1	1.8%	7	12.5%	19	33.9%	27	48.2%
There needs to be revolving fund for fertilizer to reduce financing problems of farmers	0	0.0%	2	3.8%	10	18.9%	12	22.6%	29	54.7%
The foreign currency access for dry bulk cargo importation requires special arrangement	0	0.0%	2	3.7%	6	11.1%	24	44.4%	22	40.7%

as shown in the above Table, respondents strongly agreed that there needs to be a revolving fund for fertilizer to reduce financing problems of farmers. They added that inability to get foreign currency on time was a serious problem of dry bulk importation.

The Ethiopian government needs to improve agricultural budget and upscale it to at least be on par with 10% of GDP minimum set by African member states via the Malabo Declaration in 2014. Especially for fertilizer, there is high stake to improve budget as such is linked to agricultural productivity and risk for hunger. Multiple evidences suggest significant yield rate gap exists between high users and low user countries thereby affecting risk for hunger as Bill gates put it:

“Two out of every five people on Earth today owe their lives to the higher crop outputs that fertilizer has made possible.” —Bill Gates

As reinforcement to Bill Gate’s idea, a recent IFDC (2021) assessment reveals that the recent surge of fertilizer price is estimated to cause a 30% (nearly 2 million MT) reduction in fertilizer usage thereby a 30 million MT less production in 2022. Giving this is a requirement of 100 million people, countries like Ethiopia need to be less compromising on fertilizer usage and take active budgetary measures to avoid being at the receiving end of projected hunger crises in the short-run.

3.7.3. Availability of sustainable financing for dry bulk procurement system

Dry bulk procurement organs commonly reflected the limitation of budget citing that they are serving a rather suppressed demand. KII from NBE attributed budgetary challenges of procuring organs to most procurement delays. The monetary flow in dry bulk procurement especially fertilizer involving credit guarantees and unmatched financial risks among the parties, proved to be less sustainable debts piling up in the chain. Besides, lack of budget by a single actor happens to delay procurement for the entire nation and in some cases transfer to next budget year. Considering such challenges, FGD and KII participants strongly recommended establishment of revolving fund for a procuring organ.

Another notable challenge associated with dry bulk procurement especially fertilizer finance is associated with challenges of reimbursement system at each stage. Farmers has to repay credit, unions/cooperatives serve as outlet to transaction with farmers, Regional government is involved in provision of guarantee to Federal government, Ministry of Agriculture regulates plan and performance, and Procurement organizations involve in procurement and distribution. The following figure shows details:

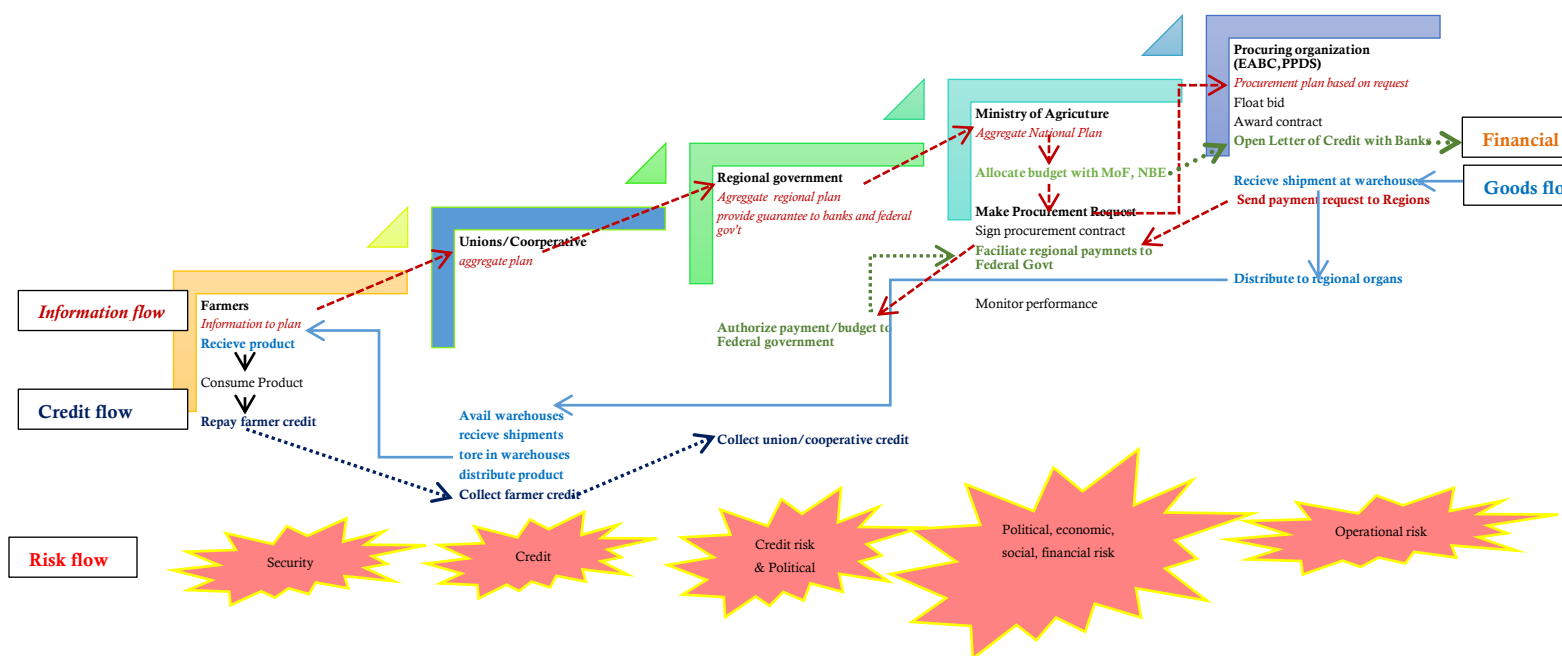


Figure 3. 24: AS-IS Supply chain flow of dry bulk imports involving fertilizer, Source: AAU consulting team

Here, the procuring organization has no financial resource to undertake timely and effective procurement, whereas regional governments guarantee is associated with plan for which financial obligation is not tied at grass root level. Thus the risk of poor planning is transferred to regional government legally through guarantee and administratively to Federal government. To resolve this case, the following remedies need to be taken:

- There needs to be well integrated planning system involving grass root level to ensure accurate planning
- There needs to be a system of accountability at grassroots level associated with plan
- There needs to be effective hierarchical guarantee system within regions backed by agreements at planning stage
- Farmers, cooperatives, and unions need to fill out pre-undertaking form linked to their respective bank account and credit account to receive guarantee at regional government level, which in turn fills out budget authorization to Ministry of Finance.
- There should be digital tracking system such as e-wallet of Kenya and agreement at planning stage
- There needs to be a focal organization facilitating central coordination and harmonization of planning, procurement, distribution, and reimbursement system

- Centralized procurement will reduce the third of the size of revolving fund requirement in decentralized system, which is nearly 110 Million USD.
- To ensure seamless procurement, the focal procuring organization needs to operate with revolving fund
- The focal organization needs to draft revolving fund guideline ensuring accountability to defaults at every stage of planning, guarantee provision, and reimbursement.
- The focal organization can play a major role in absorbing risk that Federal Government can face through a well-integrated system bridging between Federal Government bodies and regional organs. The monetary supply chain flow will look like the following:

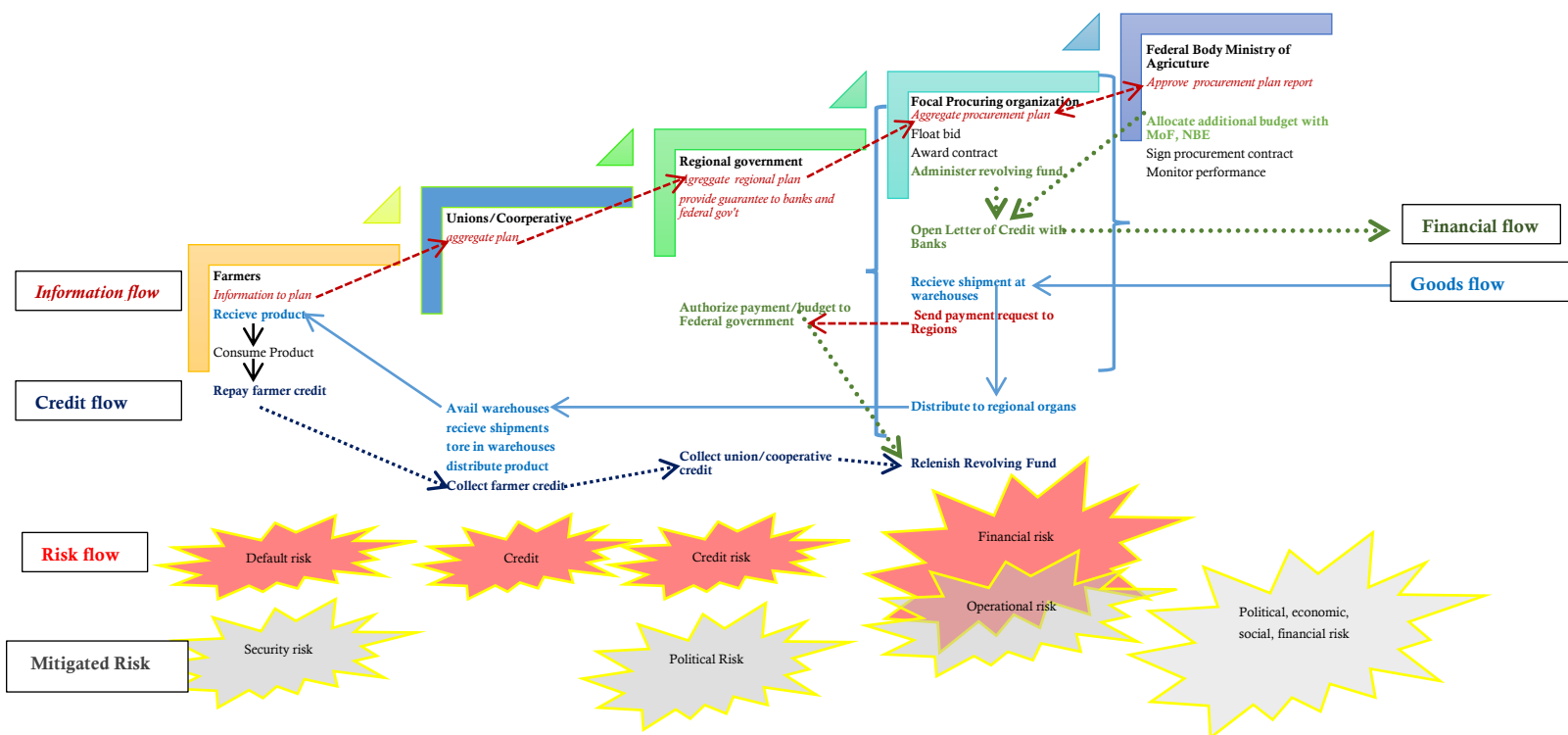


Figure 3. 25: TO-BE Supply chain flow of dry-bulk imports involving fertilizer, Source: AAU consulting team

3.8. Lessons from procurement and distribution practices

This study attempts to draw lessons from two countries that have pronounced experience in dry bulk procurement and distribution: Besides, two domestic operators are reviewed in their respective strength areas in dry bulk procurement and distribution. Thus, Egypt, India, CRS, and EPSA are reviewed.

The Egyptian Government has long subsidized baladi bread that requires 82% wheat. The bread is stable to Egyptians that wheat is both produced in and imported to Egypt. As the world's leading importer, Egypt imports over 12 million tonnes of wheat and projects to increase to 15 million tonnes by 2028. The Egyptian Government works with diverse partners to upgrade operations across its grain sector, from regular health inspections and quality controls to proper storage and transportation. It works to resolve bottlenecks throughout the entire supply chain. This allows the country to manage the large volumes of wheat imports more efficiently and cost-effectively while also safeguarding basic food security and consumer safety.

The Egyptian approach to essential commodities is holistic and involves the following:

- Central procurement system and institutional arrangement
- Central warehouse and silo development system
- Central training and development system in dry bulk distribution

On the other hand, India's practice is commendable from the perspective of warehouse systems. The central warehousing corporation coordinates the warehouse development at national level linking state warehouses and rail side warehouse operations. From Ethiopia's context, CRS comes to the fore with international experience in procurement and distribution of food aids. It utilizes global digital system that allows for procurement planning, order processing, and tracking. According to KII, the current system needs further upgrade to capture planning information from grass root level. CRS applies CPT system and mainly source from the US. It has been the preferred procurement outlet for international organizations and development agencies due to its experience. On warehouse, it designs its system based on zonal arrangement based primarily on feasibility rather than administrative maps.

On the other hand, EPSA has exemplary warehouse system. It employs integrated warehouse information system that enables controllers at the central warehouse get real time information. Inventory is counted daily and information is visible to key players. The current system requires all medicinal products to pass through the Central Warehouse. In cases where it is not feasible to ship through central warehouse, EPSA applies cross docking system. EPSA is capacitated with appropriate vehicles. EPSA's system exhibited the characteristics of smooth supply chain in which information, finance, and materials flow among entities seamlessly. The key takeaway from EPSA is:

- Centralized procurement
- Hierarchical warehouse system
- Integrated digital system
- Logistical facilities

3.9. Conclusion and Key Proposed Solutions

This study focused on procurement and finance systems of dry bulk procurement in Ethiopia. It assessed the supply chain system and bottlenecks thereof, the procurement system, strategic sourcing practices, and finance systems from document review, KII, FGD, and surveys. Based on the study findings the following conclusion can be drawn together with the follow-up proposed recommendations.

The current dry bulk importation procurement and finance system exhibited fragmentations with involvement of different plan aggregators and procuring organs. This system pushes the coordination task down to logistics coordinator, compounding mis-coordination challenges at each successive stages of the supply chain. Lack of integrated digital system happens to worsen the challenge. Strategic sourcing is little practices compared to benchmarked countries with sourcing timing failing to consider international price, framework agreement being missing, Warehouse Information System and digitization lacking. Financing and associated risk appear to be a pressing challenge that requires immediacy given the dearth of foreign currency. Revolving fund can feasibly be set through pooling of strategic goods into one establishment. The use of Incoterm was assessed thoroughly and use of FOB is justified with some degree of caution on shipping pricing practices. Data obtained from KIIs briefly indicate advantages of the presence of ESLSE in the dry bulk cargo importation include national flag carrier, experience in the shipping sector, network developed over the last years, bargaining power by consolidating imports, and so on. On the other hand, the data obtained from KIIs reveal that additional administrative costs and margin when chartering, price is not negotiable and less flexible as price is fixed once for a year though they claim this stabilizes the market, perception that it exercises monopoly power, and lack of transparency in setting prices as the disadvantages of using ESLSE in dry bulk cargo importation. On balance, the advantage of involving a single local shipping company outweighs the disadvantages in dry bulk procurement

Based on the above conclusion, the following key interventions are recommended to improve the procurement and financing system of dry bulk cargo importation:

- To promote a centralized procurement system under a single establishment to coordinate all the dry bulk procurement activities
- To establish a professionally specialized procurement organization that has the caliber to work in international environment with a relative ease, efficiency, and knowledge
- To involve existing dry bulk procurement organs and key stakeholders as boards and technical committees in the central procurement organ
- Establish strategic or essential goods at national level to ensure central control and effective delivery of national goals

- To introduce through a focal procurement organization e- procurement system and digital integration for procurement and warehouse activities of dry bulk cargoes
- To apply the FOB system along with the most efficient and workable waiver system and transparency system so that FOB leaves up to its expected cost saving for the procuring bodies. The waiver system needs to have a more flexible
- To promote multi modal system in the dry bulk procurement in order to ensure end to end supply chain
- To practice dry bulk procurement through a deeper international monitoring and knowledge of global suppliers to leverage on procurement from direct producers
- To promote Framework Agreement system with suppliers with proven record through qualification or empanelment system as practiced in India.
- To continually leverage on scale economies at every stage of dry bulk importation to add value for respective domestic players across the board
- To resolve the fertilizer financing problem through revolving fund, planning and tracing technology and formation of business modus operand'e in credit and repayment system. Institutionalizing the credit and repayment system through local organization and governing law would help mitigate political and financial risks facing the government.
- To modernize planning and forecasting system through digital application, global orientation, and grass root level involvement.
- To establish guiding procurement and distribution policy manual that is flexible enough to effectively address international DBC realities such as short bid validity period, realistic bid requirements, and preferred incoterm in bid announcement and contract.

PART FOUR: TRANSPORT AND LOGISTICS SYSTEM

This part presents overall outlook of transport and logistics systems, level of infrastructure and capacity of road transport, railway transport, warehouse, and logistics service provision, and conclusion and recommendation.

4.1. Outlook of transport and logistics systems in Ethiopia

Logistics and transport system dictate countries competitiveness in import and export activities. Ethiopia, being the largest land locked country in the World by population size, faces incessant logistics challenges especially in dry bulk cargo importation. As a long-term strategic solution, the country is working towards improving the road system, railway system, and logistics services. In this regard, therefore, the remainder of this section focuses on national outlook of road, rail, and logistics services.

4.1.1. Outlook of road transport system in Ethiopia

Road transport plays a vital role in the economic, political, and social developments of one's country. When the road accessibility is to acceptable standards, it enables to connect easily producers and consumers in the shortest distance and time. This also enables to deliver to the country import and export goods in competitive means to end-users. With these understandings, the Government of Ethiopia had devised five road development plans since 1990 E.C prior to the ten years' transport sector master plan (2013- 2022 E.C).

Table 4. 1: The national road performance and plan (Ministry of Transport, June 2020)

Indicator	World average	African Average	Middle Income Average	Sub Saharan Countries	Ethiopian Performance	Ethiopian 2022 E.C plan
Road density in 1,000 square meter	394	204	335	140	125.3	200.4
Road density in 1,000 persons	6.7	-	7.0	3.3	1.31	1.63
Asphalt Road share (%)	60	25	57	25	13.4	18.9
Share of roads in good condition (%)	-	75	82	70	73	80

As it is shown in the above table, the road density and quality of Ethiopia are relatively low compared to the world and sub-Saharan countries' average, which signaling a red flag on

transportation of DBC's across the country. The road condition to the Ethiopian side via Aysha/Deweile is generally regarded as good. However, the 120 km gravel road within the Djibouti border is damaged and becomes the cause of accident and truck damage. Often, the problem of truck damaged compounds as it often creates blockage of the narrow lane, causing bottlenecks and aggravating the accident in the corridor. Therefore, the Ethiopian government has to make it top of the agenda to find diplomatic, technical, and organizational solutions to resolve the issue.

4.1.2. Outlook of railway transport system in Ethiopia

Railway transport is a guided transport system that can also provide bulk transportation capacity in safest, reliable, cheap price and environmentally friendly service. Ethiopia had a century-long experience in the railway transport service. Due to lack of adequate maintenance and upgrade works in the legacy Ethiopia – Djibouti Railway, the safety and capacity level of the line were reduced. In the first and second Growth and Transportation plans of the country, plan was devised to build 4,744 km long new railway network that comprises of 8 routes. The following table and figure show the plan.

Table 4. 2: Planned national railway network links

Route Name	Estimated Length(km)
Addis Ababa-Modjo-Awash-Dire Dawa-Dewanle	656
Modjo-Shashemene-Arbaminch-Konso-Moyale Including Shashemene-Hawasa and Konso-Weyto	905
Addis Ababa-Ijaji-Jimma-Guraferda-Dima including Jimma-Bedele (direct to Boma with further extension to south Sudan)	740
Ijaji-Nekemet-Assosa-Kumruk	460
Awash-Kombolcha-Mekele-Shire	757
Fenoteslam-Bahirdar-Wereta-Weldia-Semera-Elidar	734
Wereta-Azezo-metema	244
Adama-indeto-Gasera	248
Total	4744

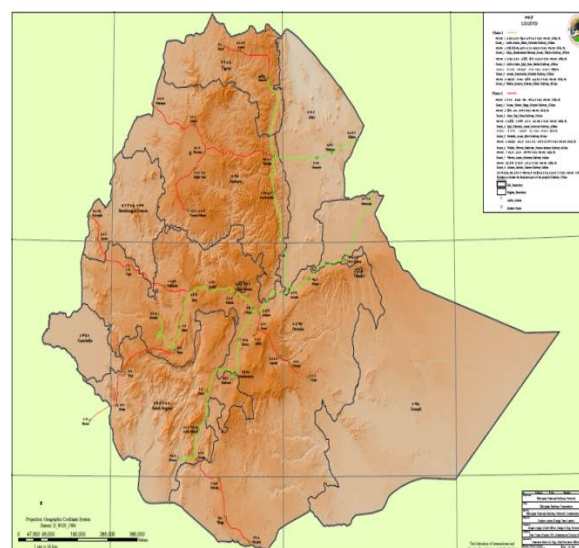


Figure 4. 1: Planed National Railway Network of Ethiopia

4.1.3. Outlook of Logistic Services in Ethiopia

The World Bank Logistic Performance Index report helps to undertake measures required to improve once country logistic performance. According to this report, the Ethiopian logistic

performance figures show that the country logistic system performance is amongst the poorest performing countries in the world as shown in table below (The World Bank, 2018).

Table 4. 3: The Ethiopian Logistic Performance Index (LPI) 2007-2018

Year	LPI Rank	LPI Score	Custo ms	Infrastr ucture	International Shipment	Logistic Competence	Tracking and tracing	Timeliness
2007	104	2.33	2.14	1.88	2.43	2.0	1.83	3.67
2010	121	2.43	2.17	2.45	2.54	2.32	2.44	2.65
2012	141	2.24	2.03	2.22	2.35	2.16	2.10	2.54
2014	104	2.59	2.42	2.17	2.50	2.62	2.67	3.17
2016	126	2.38	2.60	2.12	2.56	2.37	2.18	2.37
2018	Ethiopia is not included in the 160 countries LPI rank list							

Source: The World Bank

Inland transport is dominated by national players taking 95% of the overall share. There were 105 cross-border freight transporters and 59 special freight transporters companies. 155(55%) of them were associations while 129(45%) were private or share companies. According to the baseline data of the ten years' transport sector master plan, 12,766 cross-border trucks were on duty by 2020 (Ministry of Transport, June 2020).

Central warehouses are not nationally built and existing dry bulks do not offer DBC warehouse services. Existing locations of warehouses are not in proximity to the sea ports. As a result, the dwell time of vessels and turnaround time of trucks/wagons are long, leaving little room to saving the high demurrage cost.

Given the above road condition, lack of seaport to railway connection, lack of central warehouses and long truck travel, there is long vessel dwell time and ultimately high demurrage cost for DBC procurement. Based on five years data (2012 to 2016) from EMA and STDV Djibouti (2016) on wheat and fertilizer import, the country achieves only 42% of daily discharge plan through daily average use of 74 out of the required 175 trucks. On average, 504 days of discharge delays, 7.56 million USD demurrage costs, and 24.28% increasing trend are experienced yearly, with maximum of 11.4 million USD and minimum of 5.2 million USD, from wheat and fertilizer as indicated in the following table. The trend shows that demurrage increase by 14.46% on average

Table 4. 4: Average daily discharge performance and yearly demurrage cost

Item	Daily discharge in MT	Daily 40 ton truck requirement	Yearly average delays in days	Yearly demurrage cost @ \$ 15,000
Plan	7,000	175		
Actual average	2,972	74	504	7,560,000.00
Achievement %	42%	42 %		
Minimum				5,206,543.00
Maximum				11,407,335.00
Yearly average growth trend				24.28 %

Source: Adapted from STDV Djibouti (2016)

The KII from logistics companies summed the procurement of DBC in a single phrase: “*the DBC procurement lacks logistic mindset*”. The freight forwarders' situation, the shipping enterprise plan, the transporting company's availability, other conflicting import schedules, etc. are hardly considered when the procurement process is initiated and concluded. This is particularly less surprising given that there are diverse procurement organizations. Survey results also show major gaps in the logistics operation and facilities as indicated in the following table:

Table 4. 5: Logistics operation performance

Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	n	%	n	%	n	%	n	%	n	%
There is seamless logistics operation among DBC actors	21	37.5%	15	26.8%	11	19.6%	7	12.5%	2	3.6%
There is shortage of trucks/wagons	4	6.9%	5	8.6%	11	19.0%	19	32.8%	19	32.8%
There is often shortage warehouses and distribution centers	2	3.6%	8	14.3%	16	28.6%	20	35.7%	10	17.9%
Truck, wagon, warehouse, vessel capacity shortage comes due to lack of synchronized planning and scheduling in dry bulk importation	0	0.0%	3	5.3%	15	26.3%	21	36.8%	18	31.6%
The locations of distribution centers and warehouses are conducive	5	8.8%	23	40.4%	23	40.4%	5	8.8%	1	1.8%
Transportation and shortage capacity requirements determined centrally at national level	2	3.6%	10	18.2%	23	41.8%	14	25.5%	6	10.9%
There is properly prepared schedule for vessel arrivals at sea ports	9	15.5%	16	27.6%	18	31.0%	10	17.2%	5	8.6%

Truck deployment and fleet management are done with advance planning and scheduling	12	21.1%	16	28.1%	16	28.1%	7	12.3%	6	10.5%
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Source: AAU consulting team

The study participants were asked to evaluate issues linked to logistics operations in Ethiopia. As per the responses, there is inadequate logistics integration among planners, procurement organs, logistics service providers, warehouse service providers, and transporters, shortage of warehouses and distribution centers, and shortage of trucks/wagons in the dry bulk importation.

4.2. Road Infrastructure and Truck Capacity In Ethiopia

Nearly all Governmental DBC are imported through Djibouti Port, other ports Berbera and Sudan ports barely used. The DCB is being imported via two main road routes through Mile or Aysha. DBC destined to Amhara, Tigray, and Afar regions use Djibouti- Milie-Semera/Chifra-Mekelle/Weldiya- Dessie/Gashena- Mekane Selam/Debretabour- Debre Markos/Bahirdar/Gondar pathway. However, when there is inconvenience in the route, DBC is carried via the second alternative route (via Aysha). The second route covers Djibouti- Dewele- Aysha- Diredawa- Mojo- Addis Ababa/ Awasa- Jimma/Nekemet/Arbaminch/Bahirdar/Dessie, etc. The Addis Ababa- Djibouti corridor is the busiest road way in the country. Poor road condition translated into high transport cost and congestion.

Table 4. 6: Varied fare for DBC applied due to road condition

No.	Destination place from the Djibouti port	Distance (km) from the Djibouti port	Fare (birr) per Quintal
1	Addis Ababa	925	265
2	Shashemene	1030	296
3	Gondar	997	420
4	Bahir Dar	936	340

The DBC procurers such as EABC, ETBC, ESC, EPSE are not harmonized and coordinated. They attributed deviation from schedule to a delay in L/C issuance. Ultimately, lack of scheduled and coordination characterizes the DBC import systems; this has a bearing on performance of the Shipping Enterprise and transporters as well as overall trade logistics performance. Thus, the Government needs to establish enforcement apparatus to let DBC parties work under a stricter schedule. Over lapping schedules needs to be minimized by assigning empowered coordinating body, introducing integrated system, and creating accountability. DBC import operation needs to shift from crises mode to

normalcy. Apart from scheduling, capacity of transporters is key to DBC importation. DBC importation is road dominated, covering 92.8% of DBC while rail covers the balance.

There is concern about the national fleet truck size. As shown in the above table, the national track fleet size is around 5654 trucks which has a capacity of more than 38 MT based on WFP's declared source. However, the study team learned that the fleet size reached to 7,451 as there are unaccounted cross boarder operators in WFP list from primary sources at WFP (WFP Logistic Cluster).

The Government DBC owners alarmed that those transporters do participate in almost all of government bids without having adequate capacity to transport the quoted DBCs. On the other hand, the transporters assert that there is a conflict of interest within the Governmental DBC importing organizations. The transport providers may be able to handle the transport demand of those companies at a time; however, the shipping company does not allow them to transport the second priority goods on top of its failure to meet the initial pledge schedule.

In addition to this, as tender normally floats way ahead of the required transport time, transport bid price often does not reflect the price at the time of transport. For example, the transporters who submitted a bid to give service in September 2021 with the then market price of 260 birr/ quintal are awarded in December 2021 when the actual time market price is 320 birr/ quintals. Such situations are reported to be causes of frustrations on the side of transporters and reasons for dissociation from their associations. Transporters expressed preference to bids that are closer to service time, at least ahead of a month. Even in some exceptional cases due to security reasons the transporters may be forced to travel in diverging routes in addition to the agreed distance which is not reflected in the signed contract. Transport companies commented on the service quality of the new Djibouti port. The new port has the following challenges: lack of silos, limited facilities such as canteen especially for drivers, entrance restriction to assistant drivers, limited responsiveness of port officers when problems emerge, corruption practices around the port and loading services. KII from transporters working with ESLSE suggested ESLSE to come stronger in defending freight transporters.

The freight transporters indicated security problems in the wake of war and conflicts in various areas of the country especially around main trade corridors as well as some local areas where informal local groups charge exorbitant amount for passage and unloading. Conflicts such as in the North, around Gedamawitu and Indfo, Metekel, Welega as well as local areas known for informal charges require special administrative attention for smooth DBC operation.

As solution, the transporter companies advised the following to improve the overall performances in DBC's logistic and supply chains.

- To coordinate the logistic through a single shipping enterprise that can offer end-to-end logistics service and extensive experience in the national DBC cargo environment.
- Due to miscommunication with end-users, there are demurrage cost overruns. The farmers and trade unions aggregate more demand need than their warehouses can accommodate, resulting in a forced practice of using trucks as warehouses until delivery to final users. This happens due to lack of awareness on the implications on demurrage and the time value of money. Although farmers and unions sign service level agreement bilaterally with Agricultural offices, it is not legally binding. There are cases where a truck was used for 11 days as warehouse. This needs to be improved by introducing tri-lateral agreements that have legal consequences.
- The long documentation process in custom and port can be significantly reduced if user-friendly ICT system is used to integrate actors and give real-time information and service for those who are in need.
- A coordinated and integrated schedule needs to be agreed upon through promotion of joint decision making by stakeholders in DBC logistics.
- Accountability needs to be established in enforcing scheduled services that benefits everyone be it procurer, operator, or end-user.
- Some warehouses need improvement in overall building quality, adding laborers, increasing working hours, increasing the number of gates, etc.
- If the warehouses can be built at the outskirts of Addis Ababa, towards Endode to avoid traffic congestion
- The road quality needs to be improved not only in the main Addis Ababa – Djibouti road but also the branch roads quality is very essential.
- Vehicle capacity needs to be determined based on import volume projection. The vehicle capacity requirement for DBC based on import volume projection, central warehouse system, and the following key assumptions are indicated in the following table. As per the result, the country needs 1,940 number of trucks currently, 2,510 in 2025, and 2,858 in 2030 dedicated to DBC working at 66.67% actual capacity and given that all DBCs are transported through truck.

Table 4. 7: Projected truck capacity requirement for 100% DBC importation

capacity requirement for DBC importation

	Wheat	Fertilizer	Coal	Sugar	Total tones	Maximum truck load in ton	Total number of trips	Trip/car/month	months/year	Average no. of trucks
2020/21	1,157,674	1,637,271	729,639	200,000	3,724,584	40	93,115	4	12	1,940
2024/25	1,626,666	2,010,712	946,419	235,812	4,819,609	40	120,490	4	12	2,510
2029/30	1,483,076	2,630,512	1,122,964	250,662	5,487,214	40	137,180	4	12	2,858

Key Assumptions

- Transport capacity requirement is based on average usage throughout the year
- Inland transport is from sea port to central warehouse at Adama 780km
- Days of transport/trip 2days
- Days for loading/unloading 1 day
- A total truck occupancy/trip 5 days
- Monthly trip/truck 4
- Days/round trip 5
- Days/month 20
- Days/year 240
- Days for maintenance, rest, system bottleneck, & other 1/3
- Demurrage Free time 21 days
- Annual carrying capacity/ton 2400
- Annual travel km/truck 74, 976
- Capacity utilization 2/3 (66.67%)

4.3. Railway infrastructure and wagon capacity in Ethiopia

The Ethiopia- Djibouti Railway (EDR) Standard Gauge railway has 220 Box Wagons, 130 Gondola Wagons, and 40 Hopper Wagons in total 390 wagons as shown below in the Table. Due to technical, operational, and commercial reasons the wagons are not adequately utilized for DBC transport. The table given below shows existing wagon capacity after incomplete data on average miles, turnaround time, and additional wagon requirement is excluded.

Table 4. 8: The DBC Wagons in EDR

Wagon type/Qty	Capacity in Quintal	No. of wagons	Average year made	Overall wagon condition (New/Good/Old/non- working)	tracking system
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Box Wagon	700	220	2015 /Estimate/	Good	OCC
Gondola Wagon /both covered and uncovered	700	130	2015 /Estimate/	Good	OCC
Hopper Wagon /both covered and uncovered/	700	40	2015 /Estimate/	Good	OCC

The amount of DBC transported by EDR is increasing significantly every year since it has been started in 2018. The volume of DBC transported by rail is presented in the table below in terms of the type of cargo and its respective cargo volume in each year.

Table 4. 9: DBC transported by EDR 2018- 2021

Transported Cargo Volume (000, tons)						
Year	Fertilizer	Wheat	Steel	Edible Oil	Malt	Total
2018	28.48	35.74	11.67	0	0	75.89
2019	82.8	28.49	1.45	0	0	112.74
2020	75.11	98.42	25.9	0	0	199.43
2021	246.64	23.31	10.28	22.25	10.36	312.84

EDR has pre-arrival service warehouses which help to store a small number of early arrival cargos before loading and loaded cargos which are not picked up promptly within three days from the Wagons. EDR has warehouses in Indode, Modjo, Adama, and Dire Dawa with a storage capacity of 400000 quintals.

The survey result on the railway infrastructure capacity and condition is indicated in the following pictures:

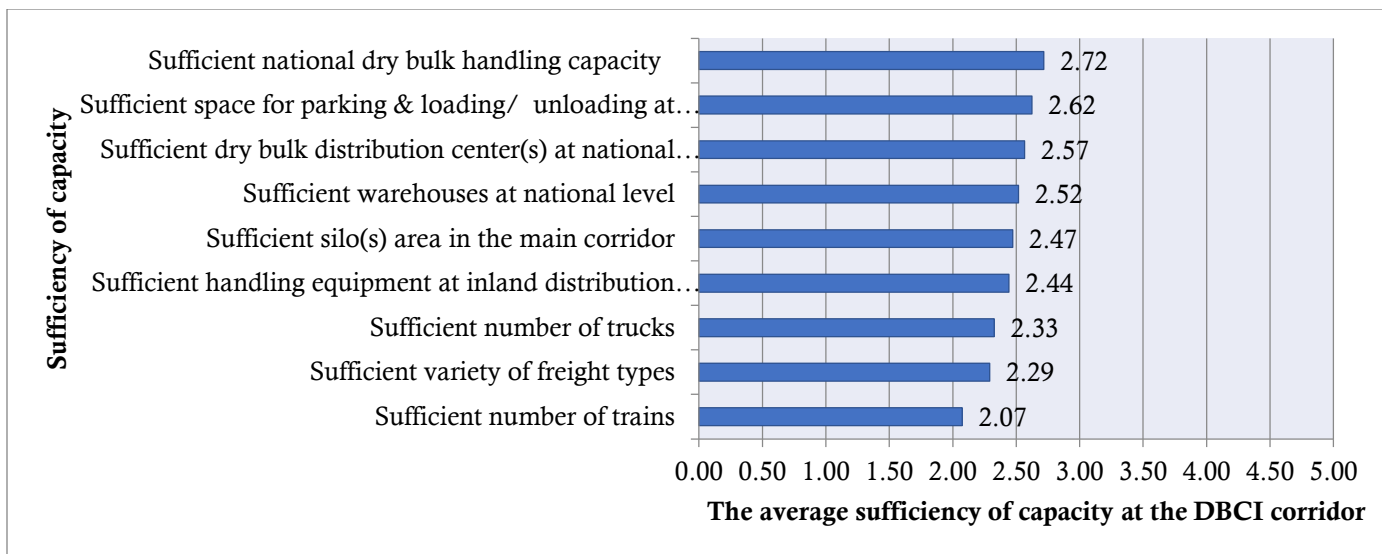


Figure 4. 2: Sufficiency of capacity at the main dry bulk cargo importation corridor, AAU

Respondents strongly believe that there is insufficient capacity of train, freight varieties, trucks, warehouses, silos, distribution centers, DBC handling capacity along the main trade corridor as shown in the figure above.

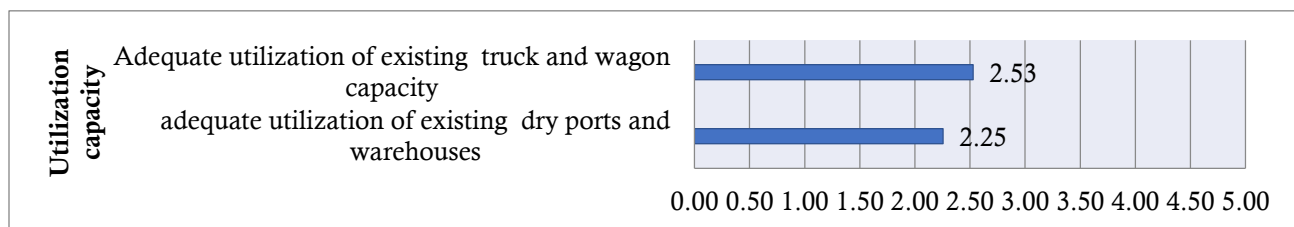


Figure 4. 3: Utilization capacity at the main dry bulk cargo importation corridor, AAU

Respondents highly disagree on the notion that there is high utilization of truck and wagon capacity as well as dry ports and warehouses. From the documents review, interview and observations the following problems have been identified in association with DBC transportation in railway:

- Outstanding issues during the EPC Turkey construction project
- Power reliability and quality problem.
- Security problem
- Commercial problem
- Shortage of working capital
- Lack of integration in logistic sector
- The loading and unloading capabilities

- The documentation system

Table 4. 10: Projected wagon capacity requirement to 100% DBC shipment from 2021 to 2030

Year	Wheat	Fertilizer	Coal	Sugar	Total tones	Average wagon load in tone	Total number of trip/wagon/year	Trip/wagon/month	months/year	Average no. of wagon capacity
21/2020	1,157,674	1,637,271	729,639	200,000	3,724,584	70	53,208	10	12	443
2024/25	1626666	2010712	946419	235812	4819609	70	68,852	10	12	574
2029/30	1,483,076	2630512	1122964	250662	5487214	70	78,389	10	12	653

Key Assumptions

- Transport capacity requirement is based on average usage throughout the year
- Rail transport is from sea port to central warehouse at railway end 759 km
- Days of transport/round trip 1days
- Days for loading/unloading 1 day
- Days for setup maintenance 1day
- A total wagon occupancy/full trip 3 days
- Monthly round trips/wagon 10
- Days/round trip 1
- Days/month 10
- Days/year 120
- km/round trip 1518
- km/year 182160
- Days for maintenance, rest, system bottlenecks & other 1/3
- Capacity utilization 2/3 (66.67%)

This being the case, however, there needs to be a plan towards mixed use of truck and wagon capacity as this allows for sound capacity utilization of all resources (vehicle, wagon, road, railway line) and for efficient and fast transportation via bulk shipment and reduction of road corridor congestion. In this way, turnaround time can be reduced. In light of this, the following mix of truck and wagon capacity availability dedicated to DBC is recommended at 66.67% capacity utilization and 50-50 split: 970 trucks and 222 wagons now, 1255 trucks and 287 wagons for 2025, and 1429 trucks and 327 wagons in 2030,

respectively. Projected mixed truck and wagon capacity requirement to 50-50% DBC shipment from 2021 to 2030 is portrayed in the table below:

Table 4. 11: Projected mixed truck and wagon capacity requirement to 50-50% DBC shipment from 2021 to 2030

Capacity mix options	Single use capacity		Mixed use capacity	
Year	Average no. of trucks	Average no. of wagon capacity	50% Truck use capacity	50% wagon use capacity
2020/21	1940	443	970	222
2024/25	2510	574	1255	287
2029/30	2858	653	1429	327

4.4. Warehouse infrastructure and capacity in Ethiopia

Warehouse system is controlled by decentralized system, creating difficulty of accounting the warehouses especially the private ones. Considering the advanced system account each single items passing through warehouse system, lack of knowledge of the where about of warehouses is striking. The warehouse condition of the country has been studied in this project based on data from different organizations, which includes ETBC, EABC, NDRM, Sugar Corporation, EPSA and ECX. EPSA and ECX have been added to be taken as a benchmark for warehouse information management systems. Different attributes of the warehouses such as capacity, warehouse condition, and accessibility to road, loading/unloading facilities, temperature control system and CCTV camera have been used to characterize the warehouses.

Table 4. 12: Warehouse information from NDRM

Warehouse Name	Regional location	Capacity (quintal)	Number of warehouses
Diredawa	Dire Dawa	250,000	3
Adama	Oromia	1,000,000	20
Kombolcha	Amhara	800,000	15
Woreta	Amhara	400,000	11
Shashemene	Oromia	350,000	5
Wolaita	SNNPRS	400,000	11
Shinile	Somali	400,000	7
Mekele	Tigray	400,000	9
Total Capacity		4,000,000	

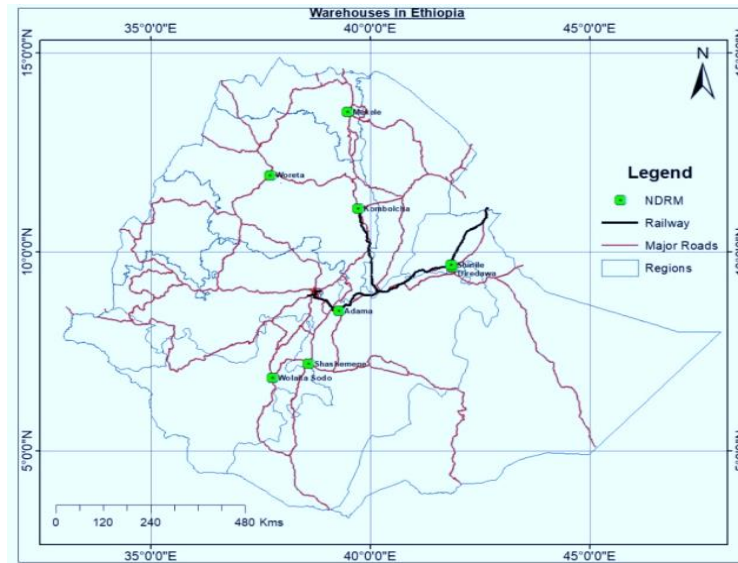


Figure 4. 4: Geographic Distribution of warehouses from NDRM, AAU

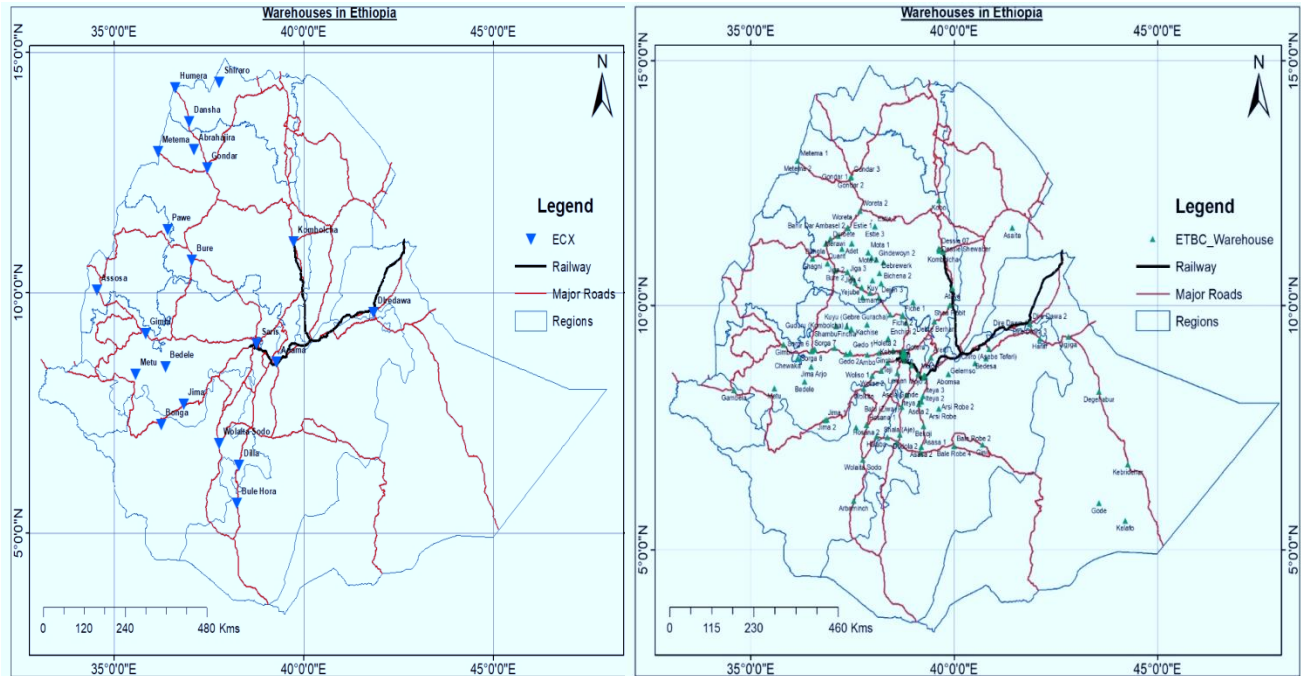
Table 4. 13: Warehouse information from EABC

Warehouse Name	Regional Location	Capacity (quintal)
Adama WH 5	Oromia	10000
Adama WH 6	Oromia	8000
Adama WH 13	Oromia	9000
Adama WH 14	Oromia	8000
Adama WH 17	Oromia	30000
Adama WH 23	Oromia	20000
Kality WH	Addis Ababa	120000
Yerer Kessem 1	Addis Ababa	70000
Yerer Kessem 2	Addis Ababa	50000
Yerer Kessem 3	Addis Ababa	50000
Shashemene	Oromia	10000
Kombolcha	Amhara	85000
Dessie	Amhara	4000
Mojo	Oromia	120000
Assela	Oromia	50000
Nekemte	Oromia	80000
Bahir Dar	Amhara	75000
Finote Selam	Amhara	6000
Bure	Amhara	6000
Total Capacity		811,000

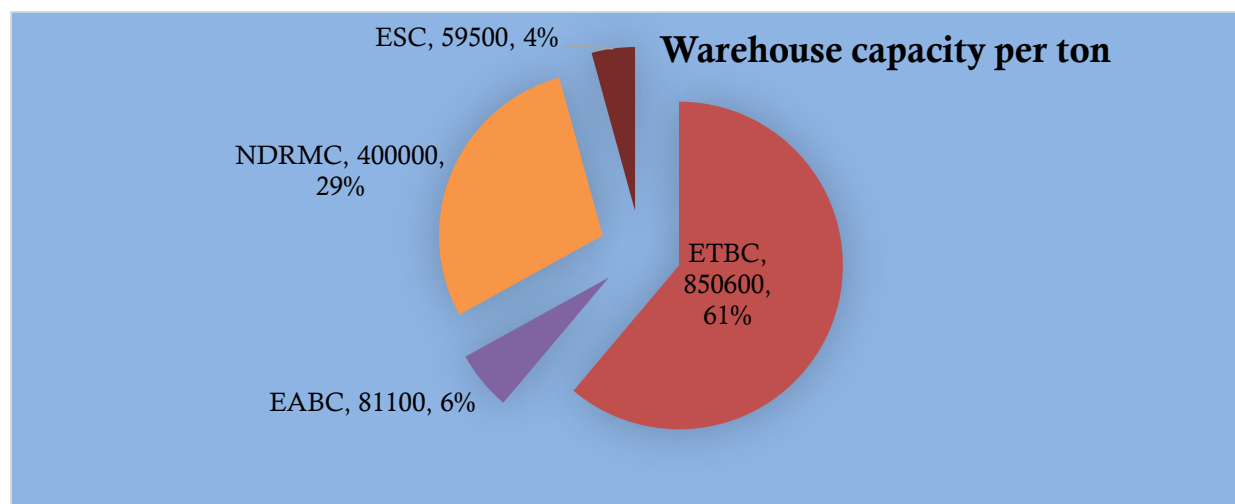
Table 4. 14: Warehouse information from Sugar Corporation

Warehouse Name	Regional Location	Capacity (quintal)	Function	Floor Condition	L/U facilities	Accessibility	T ^o control	CCTV
EIISA	Addis Ababa	60000	Dry Bulk	Good	No	Good	No	No
Ersha Sebel	Addis Ababa	80000	Dry Bulk	Good	No	Good	No	No
Fincha AA	Addis Ababa	60000	Dry Bulk	Good	No	Good	No	No
Kessem Sugar Factory	Kessem Factory	50000	Dry Bulk	Good	No	Good	No	No
Metehara Sugar Factory	Metehara Factory	80000	Dry Bulk	Good	No	Good	No	No
Wonji Dodota	Wonji Factory	120000	Dry Bulk	Good	No	Good	No	No
Wonji Gefersa	Wonji Factory	25000	Dry Bulk	Good	Yes	Poor	No	No
Wonji Shoa 1	Wonji Factory	60000	Dry Bulk	Good	Yes	Good	No	No
Wonji Shoa 2	Wonji Factory	60000	Dry Bulk	Good	Yes	Good	No	No
Total Capacity		595,000						

Figure 4. 5: Geographic Distribution of warehouses from EPSA, AAU Figure 4. 6: Geographic Distribution of warehouses from ETBC, AAU



Overall main DBC procurement organs have a total warehouse capacity of 1,391,200 tons, ETBC taking the largest share. The following figure shows the total capacity and share of warehouse capacity among the four DBC procuring organs.



Share of warehouse capacity by major DBC procuring organs, source: AAU

The distribution of ETBC warehouses shows that the organization has the largest warehouse numbers. However, most of the warehouse are not evenly distributed and are concentrated mainly around the central parts of the country. On the other hand, warehouses from NDRM are small in number but each warehouse center has large capacity and more than one warehouse within it. Key informant interview from NDRM indicated that the distribution of warehouse is demand driven and zonal allocation which allows efficient distribution. The warehouses are found mainly along major cities and as a result are accessible to major road networks of the country. Similarly, ESC also has small number of warehouses that are concentrated mainly in the central parts of Ethiopia. The warehouses are specifically found at Addis Ababa and sugar factories of Wonji Shoa, Kesseme and Metehara. The warehouses are accessible to both the major road network and the Ethio-Djibouti railway line. The EABC's warehouses are usually located in the central and north western parts of the country, including the cities of Bahir Dar and Nekemte. The geographic distribution of warehouses is presented in the figure below.

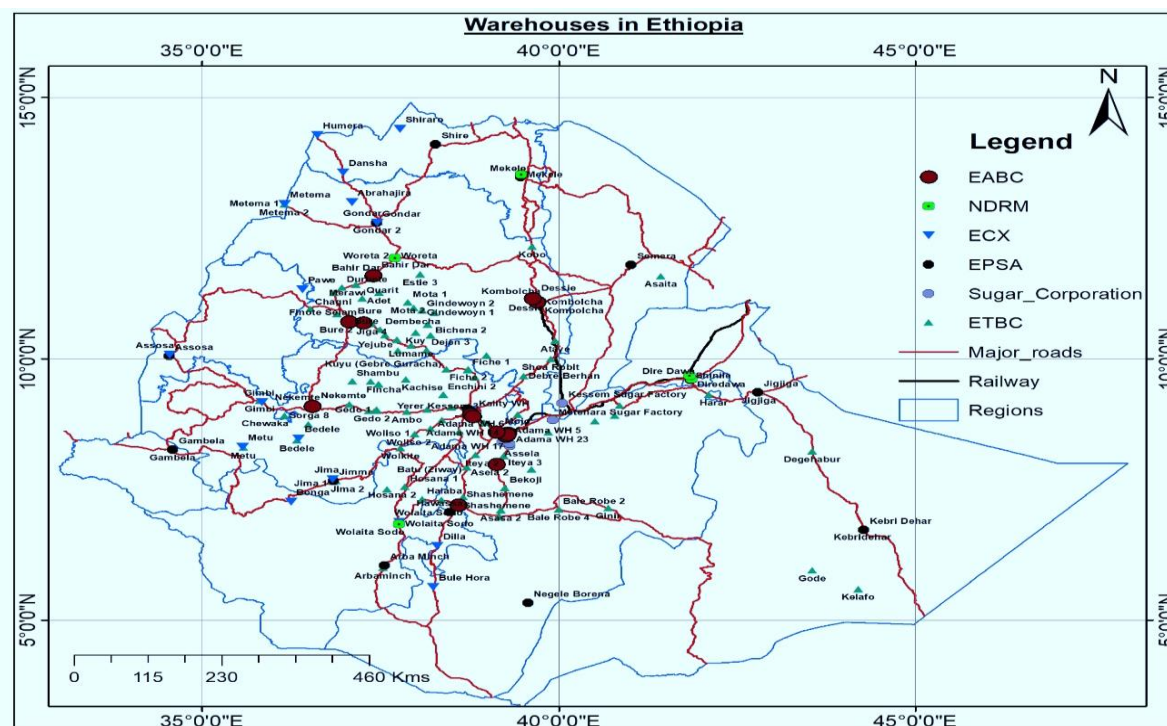


Figure 4. 7: Geographic Distribution of warehouses in Ethiopia (main public warehouses), AAU

As depicted in the picture below, respondents believe that construction of new distribution center or dry port will help reduce truck turnaround time and vessel dwell time. The existing distribution and dry bulk locations are not helpful in reducing turnaround and dwell time. Besides, the existing transport operating capacity is not much helpful to reduce turnaround and dwell time. On the flip side, locating new distribution centers and upgrading truck and wagon capacity are considered the solutions to long dwell time and turn-around time.

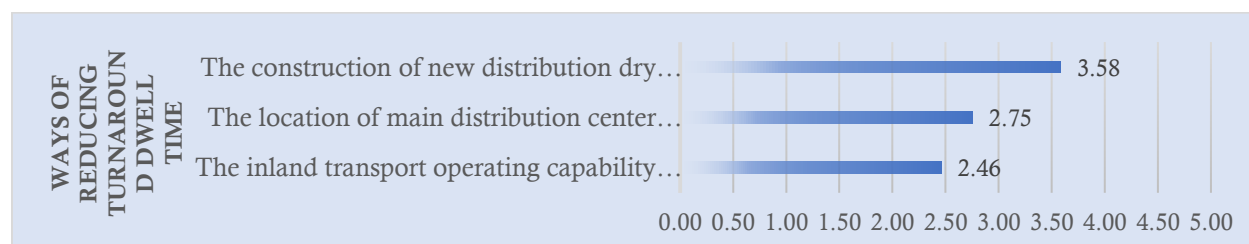


Figure 4. 8: Ways of reducing turnaround dwell time at the main dry bulk cargo importation corridor

The following figure presents respondent's view on the locations of distribution centers.

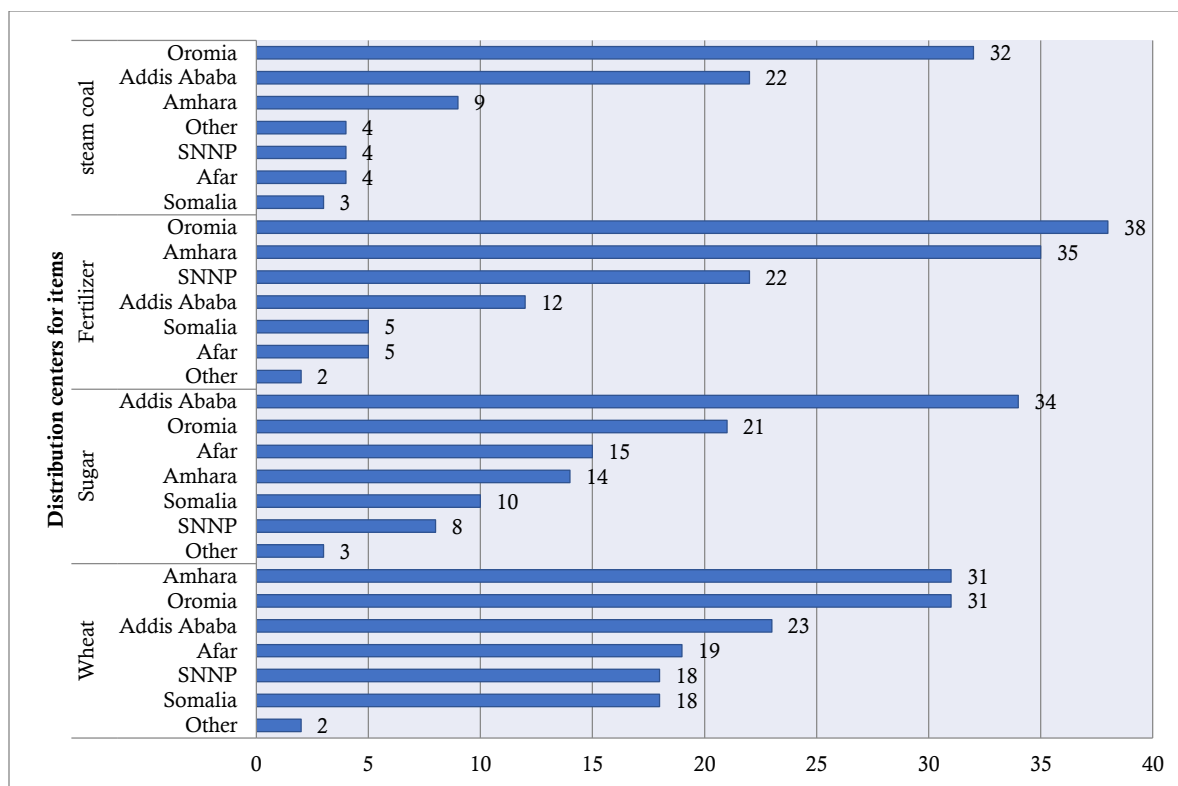


Figure 4. 9: Proposed locations of main distribution centers for optimal distribution of items

As indicated in the above figure, respondents rated where main distribution centers need to be located for the DBC commodities. Majority of them proposed Oromia followed by Addis Ababa for steam coal, Oromia followed by Amhara for fertilizer, and Addis Ababa for sugar, and Oromia and Amhara for wheat. From the responses it can be said that majority preferred the central part of the country for main Distribution centers. From transport and logistics point of views, the silo/warehouse can be built in Ethiopian Borders, for example, Galafi, Metema, Moyale, Zalenbesa and Bure to reduce port demurrage cost. This may need to triangulate with the vessels truck fleet capacity to clear out the 5,000 ton loaded ship with the port infrastructural and operational capabilities and willingness within the demurrage-free three days. If it is so, the bagging process and the cross countries truck destination points will be those warehouses/ dry ports.

The railway warehouses have limited capacity and building higher capacity warehouses on the available free lands at freight stations is keen. The DBC destination points, unions and corporate companies, warehouses have quality and quantitative problems. Ensuring all needed warehouses to the required quality and quantity at every destination point of the DBC is essential to improve the national DBC transportation efficiency.

Conclusion

Generally, based on the results of this study it can be concluded that it is a better solution if central warehouses are built at different locations to decrease the dwell time and turnaround time for transport facilities. The criteria for selecting central warehouse locations include:

- Distribution of other existing warehouses,
- Main transport corridor of the country related to sea port,
- Railway network and nodes
- Regional distribution

As a result, it would be useful if multi-purpose warehouses are established at the following appropriate locations.

1. Dire Dawa

Practical feasible location because:

- Main transport corridor of the country,
- Reduce dwell time and turnaround time
- Can serve as distribution station for eastern Ethiopia
- Connected to the railway network of the country.

2. Kombolcha

Practical feasible location because:

- Main transport corridor of the country,
- Reduce dwell time and turnaround time
- Can serve as distribution station for northern and north western Ethiopia.
- Connected to the railway network of the country.

3. Adama

Practical feasible location because:

- Reduce dwell time and turnaround time for shipment of goods further to western and southern part of the country
- Can serve as main distribution center to the entire part of the country, especially the central part.
- Connected to the road corridor and railway network of the country.

4. Endode (Addis Abeba-Gelan)

Practical feasible location because:

- Main transport corridor of the country,
- Located at the center and the capital city of the country,
- Located at the end node of the railway line
- It is optimal location to establish warehouses of multi-purpose, dangerous goods and grain silos.

Recommendations on warehouse development

- There should be a central administering organ of warehouses at a national level

- There is a need for central warehouses at main corridors to reduce dwell time, turnaround time, and serve as main distribution centers for each region
- There is a need to allow for standardized distribution system and network with logistic service provider and national warehouse operator.
- There is a need to integrate regional and district warehouses with the national central warehouses with Warehouse Information system (WIS) and standardized warehouse facilities and systems
- Warehouse system need to have defined structure: Central warehouse, Regional warehouse (Distribution Centers), District warehouses
- Ethiopia need to develop central warehouses, silos, DCs to ease out the rather chaotic DBC importation practice
- PPP should be promoted in warehouse development and private warehouses need to be factored in the national plan
- The central warehouse capacity based on the DBC import projection and the following assumption is indicated in the following table in two alternatives: central warehouse for all DBC, and central warehouse capacity for DBC commodities excluding coal. Also, alternative is offered with one week and two weeks maximum clearance period. Accordingly, excluding coal, there is a need for DBC commodities central warehouse at a one week clearance period with the capacity of 57,595 tons now, 74,484 tons in 2025, and 83,928 tons in 2030; for a two weeks clearance period, the need is 115,190 currently, 148,969 in 2025, and 167,856 in 2030. As shown in the following figure, central warehouse requirement growth is steeper at the long clearance period than the most efficient short clearance period, week. In this least likely case of one clearance period, the central warehouse capacity of 57,595 tones currently, 74,484 tons in 2025, and 83,928 in 2030 needs to at least be achieved.

Table 4. 15: Projected central warehouse capacity requirement at weekly & bi-weekly clearance period

Year	Wheat	Fertilizer	Coal	Sugar	Total tones	No. of half months/year Warehouse capacity with 15 days clearance	No. of weeks/year warehouse capacity at weekly clearance		
Central warehouse capacity for all DBC									
2020/21	1,157,674	1,637,271	729,639	200,000	3,724,584	26	143,253	52	71,627
2024/25	1,626,666	2,010,712	946,419	235,812	4,819,609	26	185,370	52	92,685
2029/30	1,483,076	2630512	1122964	250662	5487214	26	211,047	52	105,523

Central warehouse capacity without coal											
Year	Wheat	Fertilizer	coal	Sugar	Total tones	No. of half months/year	Warehouse capacity with 15 days clearance	No. of weeks/year	warehouse capacity at weekly clearance	No. of months/year	warehouse capacity at monthly clearance
2020/21	1,157,674	1,637,271	0	200,000	2,994,945	26	115,190	52	57,595	12	249579
2024/25	1,626,666	2,010,712	0	235,812	3,873,190	26	148,969	52	74,484	12	322766
2029/30	1,483,076	2,630,512	0	250,662	4,364,250	26	167,856	52	83,928	12	363688

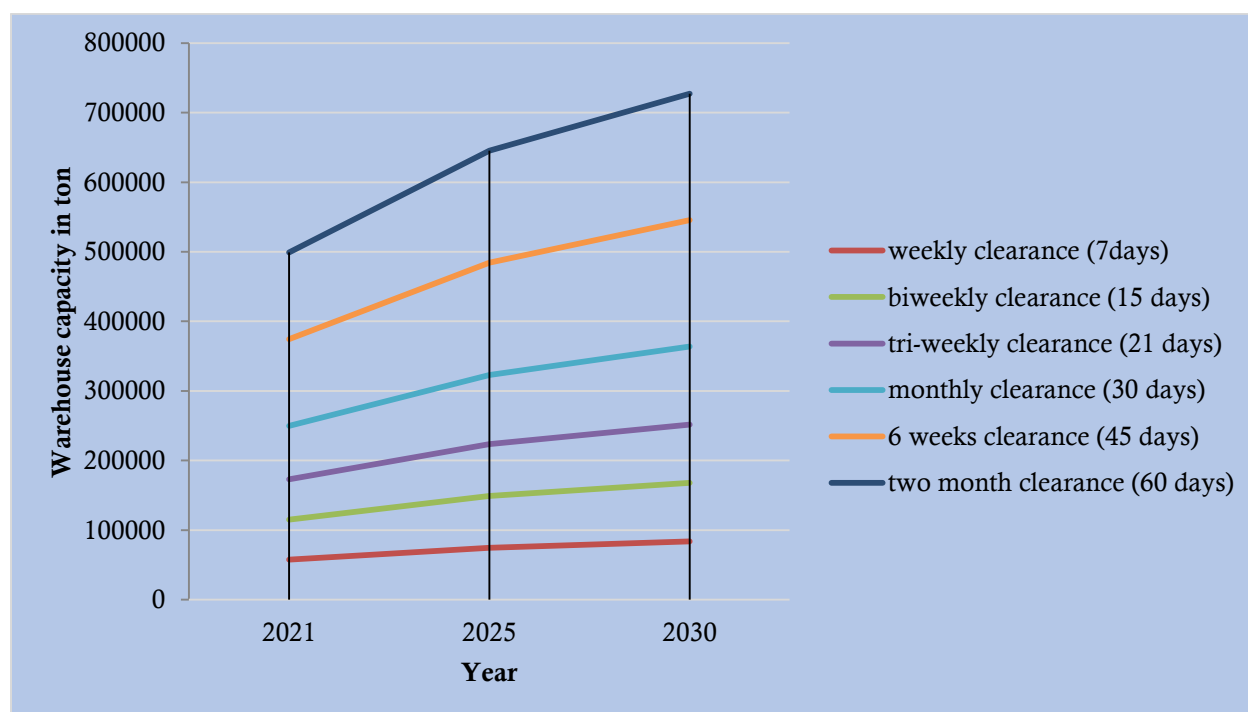


Figure 4. 10: DBC Central warehouse capacity development ladder at various clearance periods

4.5. Access to seaports

Ethiopia has experience in using three ports for import and export services. The Djibouti port shares 98.8%, Sudan 0.3%, and 1.1% Berbera by 2012 E.C. Based on these figures and, as per the interview conducted, so far, though different ports surround Ethiopia, due to numerous reasons the most accessible and utilized port is the Djibouti port. There are other potential ports other than Djibouti, such as the Mombasa and Lamu in Kenya, Sudan Port in Sudan, Berbera in Somali land, and Assab in Eritrea. However, from the interview, there are contradicting opinions. Some respondents said as long as Ethiopia is dependent on other

ports it would imperative to consider and assess all the potential ports and consider them as alternatives other than Djibouti. The other respondents have totally rejected the potential use of other ports other than Djibouti in many aspects such as the long-term national agreement we have, existing road infrastructure, the flexibility and vessel capacity of the ports, and sovereignty issues. However, there are still some issues that need to be addressed in terms of working hours, incompatible of public holy days and weekends, and the working culture of the people in Djibouti.

Factual data about each alternative sea ports is presented in the table below.

Table 4. 16: Summary of information on alternative ports

Parameters	Port name						
Item	Port Sudan	Massawa	Assab	De Djibouti (DMP)	Berbera	Lamu	Mombasa
Port Distance to the boarder (km)	933 (Metema)	247	75 (Bure)	191 (Galafi)	250 km Wajale	935/1295 Moyale	1032/1210 Moyale
Port Distance to Addis Ababa (km)	1,767	1321 (Zalanbesa)	883	920	937	1,701	1,986
Port conventional berth (Quantity)	16	Data not found	Data not found	06	06	The port was inaugurated on 21 May, 2021 and the remaining works and its practical capacity requires further investigation	11
Silo Storage capacity (MT)	536,000	Data not found	Data not found	130,000 (nil practically)	Nil		245,000
Silo berth (quantity)	N/A	Data not found	Data not found		N/A		02
Bagging machine	Yes	Data not found	Data not found		Out sourced		Yes
Dry bulk capacity (MT/ year)	4,000,000	Data not found	Data not found	8.2 million	521,300	further investigation	1,854,000
Rail link	Yes, Narrow gauge	Data not found	Data not found	1-1.15 km away	N/A		Yes
Country	Sudan	Data not found	Data not found	Djibouti	Somalia land	Kenya	Kenya

As a land-linked country, with no access to the sea, the potential of all the surrounding ports must be assessed and utilized accordingly. Some of the respondents have stated the belief that a closer assessment on each port will reveal that there all surrounding ports can be feasible for Ethiopia. Therefore, the surrounding ports must be assessed based on the cost, locational, and even political advantages. As long as Ethiopia has cargo, sea ports can be welcoming for their own sake. Stating the historical background of Djibouti, Ethiopia

operated in Djibouti and rejuvenated the latter's port to the extent that the ports become the busiest hub for many corridors because we have cargo.

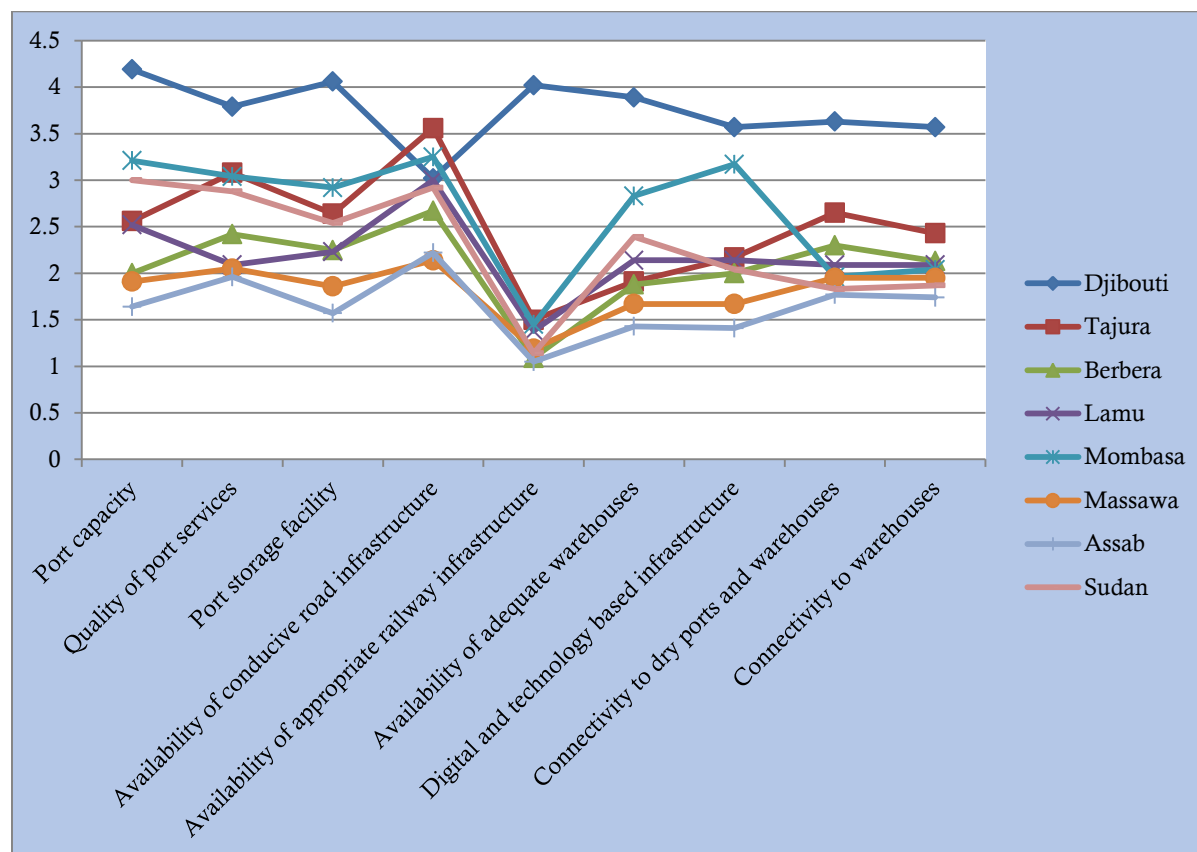


Figure 4. 11: Availability of logistics infrastructure in the trade corridors

As can be seen from the above graph Djibouti corridor is above the rest followed by Tajura on port capacity, service, storage, availability of road and rail system, warehouses and connectivity, among others. Djibouti fares lower than Tajura on road conditions. Mombasa port rated for port capacity, ICT, port warehouses. Assab was rated the lowest on most accounts, a finding consistent with expert warning that Assab port is not accessible at the sea side and not comparable to other port on this account. This implies that Djibouti and Tajura are the most favorably capacitated corridors for DBC imports to Ethiopia.

Feasibility of sea ports was assessed based on survey through various criteria as indicated in the following table.

Table 4. 17: The feasibility of trade corridors for dry bulk importation to Ethiopia

Feasibility criteria	Trade corridor							
	Djibouti	Tajura	Berbera	Lamu	Mombasa	Massawa	Assab	Sudan
Proximity/Distance to Destination	4.02	3.80	3.64	2.54	2.32	2.67	3.97	2.68
Low cost of inland transport	3.91	3.71	3.13	2.09	2.21	2.77	3.50	2.39
Short transport time	3.88	4.00	3.38	2.40	2.19	2.80	3.78	2.15
Low cost of port service	3.05	2.68	3.21	2.81	2.68	3.22	3.63	3.05
High transport convenience	4.10	4.12	3.35	2.64	2.58	2.59	3.08	2.83
High level of port capacity	4.37	3.21	3.24	3.43	3.78	2.29	2.17	3.32
Possibility for regionally integrated freight & customs system	4.05	3.73	3.60	3.29	3.77	3.57	3.70	3.59
Low level of import risk	3.98	3.84	3.09	3.36	3.58	3.00	3.14	2.95
High level of berth at sea port	4.31	2.77	2.59	2.95	3.65	2.00	2.25	3.71
Low restrictions on size and weight on the road transport	3.45	3.48	3.45	3.00	2.87	3.16	2.80	3.21
Low port congestion	3.05	3.53	3.27	3.47	2.45	4.21	4.15	3.70
Sum of Mean	42.17	38.87	35.95	31.98	32.08	32.28	36.17	33.58
Ranking	1 st	2 nd	4 th	8 th	7 th	6 th	3 rd	5 th

As indicated in the above table, Djibouti is the most preferred for proximity, low inland cost, low port cost, transport convenience, port capacity, regional integration, low risk, and high berth while Tajura is the second across most of the factors and first for short transport time and road convenience. Massawa and Assab are highest rated for low congestion, the later rated better overall. Assab is rated better than Berbera overall although it is rated low for berth.

4.6. Transport and Logistics service providers

The ship transport services have a wider scope than DBC transport. It demands to have the knowledge of various international business rules and shipment knowledge. In this regard, ESLSE has been serving the country for a long time now and has accumulated rich experience in bridging this gap. In connection to this, the presence of a logistic service provider like ESLSE for a nation like has at least three key advantages. The first benefit relates to being a center for proliferation of experienced full-fledged professionals in the international shipping and sea transport industry as per global logistics practices and standards. The second is that ESLSE's learning curve effect advantage in transportation of

cargos and containers to the country will bring a ripple effect to procuring organs if managed properly. The third advantage relates to the ability to gear ESLSE services to solve top national interests and challenges such as selected services via local currency, service based on national priority, and government acquisition of strategic assets and port services.

Having such a company is also an advantage for the country to operate in the international business arenas and have global presence. With regard to the logistic service, ESLSE is well positioned. ESLSE has ample international experiences and a long list of customers in the shipment industry. Due to this reason, ESLSE would be a better option to secure bargaining advantage in handling shipments (ship transport) than other decentralized outlets. As per most of the study participants, while the performance of ESLSE was not much questioned, they complain that service charge is high and uncontrolled.

Along this line, FGD and KIIs participants point to monopolistic tendency in the logistics industry. The DBC procuring organs, except for the Ministry of Agriculture, express complaints on unfair shipment price. As per their evaluation, prices are at times quoted at higher than international price, in some cases, twice that of the international price. The major complaints of Dry Bulk Cargo procuring organs and stakeholders point to high transportation cost, extremely higher service charge than the international prevailing market price including those of insurance and bank charges, lack of room for negotiation with ESLS on price or price adjustment even during transportation phase, and lack of transparency on chartering price. DBC procurement organs warn that such costs trickle down to the public or farmers, resulting in a broader implication on the livelihood of the society and the agricultural productivity of the country.

Most of the study participants attributed such problem to lack of control over price and competitive environment and recommended to have a regulatory body that can monitor the service price against international price.

For companies whose selling price is fixed by the government, however, either creating challenges in recovering their cost or forced to trickle down to the end consumers. To address such concerns, there needs to be open forums and policy interventions that are useful to ensure transparency and protection to procuring organs, if any. This study however has not found conclusive evidence on this. ESLSE on the other hand reasons that it receives order through board approval and procuring organs come with C&F price they obtain through competition to engage ESLSE.

The private transporters companies on the other hand reflected ESLSE is now monopolizing the transport and logistics industry. Private transporters complain about bid cancellations after they won. The railway operators have complained about significant

DBC's allocation despite offering cheap fare and better capacity. Generally, the transporter companies agree the practice of ESLSE lacks some degree of transparency and call for independent body fare regulation to defend the interest of the freight operators.

On the other hand, the National Logistic Council can address the policy and operational problems within Logistic Service Providers. The private logistic providers' involvement in the National Logistic Council and other policy and regulatory bodies has to be enhanced to improve their capacity and growth in line with the national economic growth and policy directions. The plan of having five more multi-modal operators can be backed with the establishment of some local logistic companies in the form of PPP, Consortium companies, Joint Venture companies, etc. which can help to liberalize the transport and logistics industries.

Uni-modal transport arrangement for importing cargo for landlocked or land-linked countries like Ethiopia is not practical. While inter-modal and multi-modal are workable solutions depending on terms and conditions of the transport service contract/ bill of loading it has been used.

In inter-modal transport arrangements, more than one transport mode operator is involved to deliver the freight and a separate contract/ bill of loading has to be signed for every leg of the freight movement. A single contract/ bill of loading will be signed and a multi-modal operator owes all the responsibilities of delivering the freight though more than one mode of transport could be used for different legs of the freight movement.

The comparative advantage of multi-modal transport system:

- Increased shipment tracking efficiency as it able to monitor with one transport carrier from door-to-door;
- Access to remote parts of the world with responsibility and liability of the movement with one transport carrier;
- Efficiency in the delivery time; and
- Minimization of logistics coordination expenses of a shipper

The comparative advantage of inter-modal

- Shippers can choose carriers to take advantage of lower rates for each transport leg;
- Shippers gain flexibility and specialized handling of loading and unloading goods at different ports;
- There is increased security of the products being transported; and
- Shippers have more access to equipment and can better control the capacity and selection of transit schedules.

Both inter-modal and multi-modal transportation have the advantage of combining the most efficient transport modes which optimizes lead times, reduces inventory costs and keeps the level of freight costs under control.

ESLSE is the only marine-based multimodal operator company in Ethiopia. Some Joint Venture logistic companies are also operational in the country: Bollare, Merask, GMG, DHL with partnership Ethiopian Airlines, etc. on land and air transportation systems. The Government has a plan to introduce five more multi-modal companies in the coming years. This will be important to liberalize the logistic and the transport industry but the local transporter companies and ESLSE have to be well prepared prior to this action. Otherwise, they will be kicked out from the market due to huge differences in capital and experience on logistic service.

4.7. Market structure and stevedoring at port of Djibouti

The stevedore or handling operator is legally bound to the Port Authority by a public equipment concession, an authorization of private-owned equipment with public service obligation, or an equipment lease agreement if the equipment used belongs to the port. Prior to setting-up stevedoring business, the operator must apply for a stevedoring license issued by the Ministry of Equipment and Transport on approval by the sea transport auxiliaries licensing commission. As the Ethiopian private companies except SDTV have limited access for stevedoring business in Djibouti port and the ESLSE, the maritime operator in the considered DBC's is criticized by the freight forwarder and transporter companies that it is not in the position to defend their interest. According to participants, there are inconveniences they are experiencing in finding Get Pass, freight handling line, refreshment services, inappropriate responses and services by the port personnel, etc. The government of Ethiopia should foster the bilateral relationship in diplomatic works as well as engage the ESLSE in a better position and finding alternative institutional arrangements to increase the stevedoring efficiency of the country.

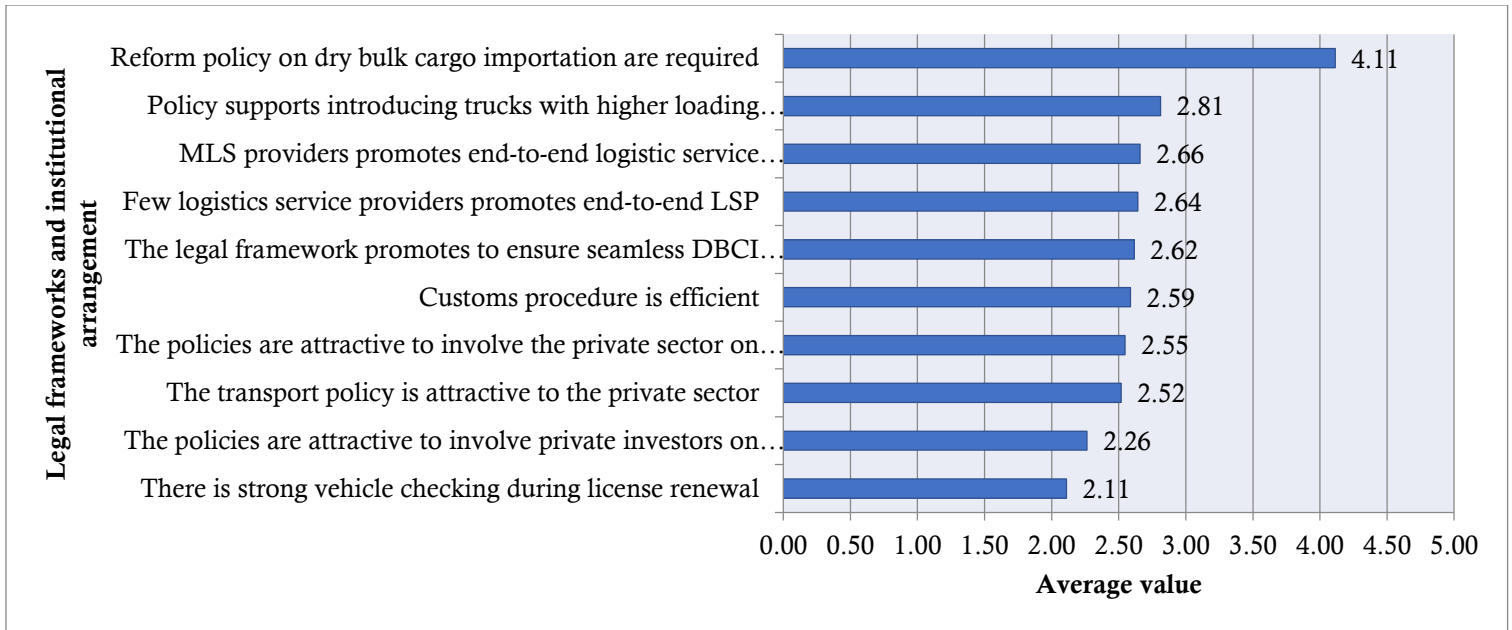


Figure 4. 12: Legal frameworks and institutional arrangement to enhance logistics and transportation services

Based on the findings in the above Figure, DBC importation processes requires a policy reform, the existing policy is considered not instrumental to effective DBC import. Nor does it provide adequate room to attract and involve the private sector. Policy reform and legal interventions are required across all spectrums of logistics as indicate in the above figure.

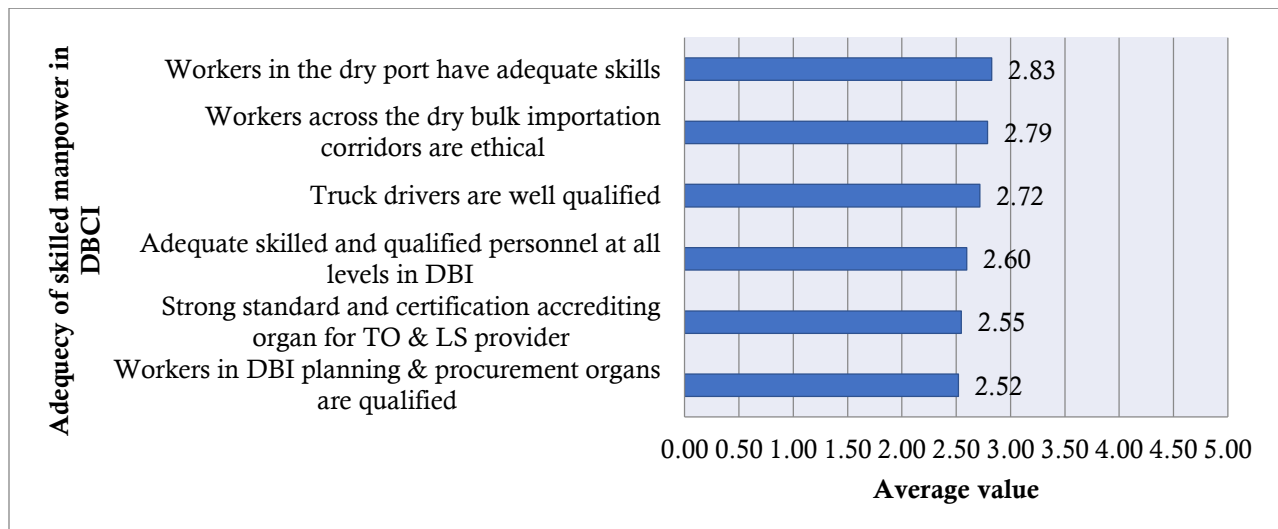


Figure 4. 13: Adequacy of skilled manpower in dry bulk cargo importation

As indicated in the above Figure, respondents believe that workers at the procuring organs are far less qualified; truck drivers are less qualified and have ethical limitation. Respondents implies that there is neither adequate qualified personnel nor strong certificate accreditation organ. From the result, it can be said that the human resource capacity is by far below the expectations of respondents.

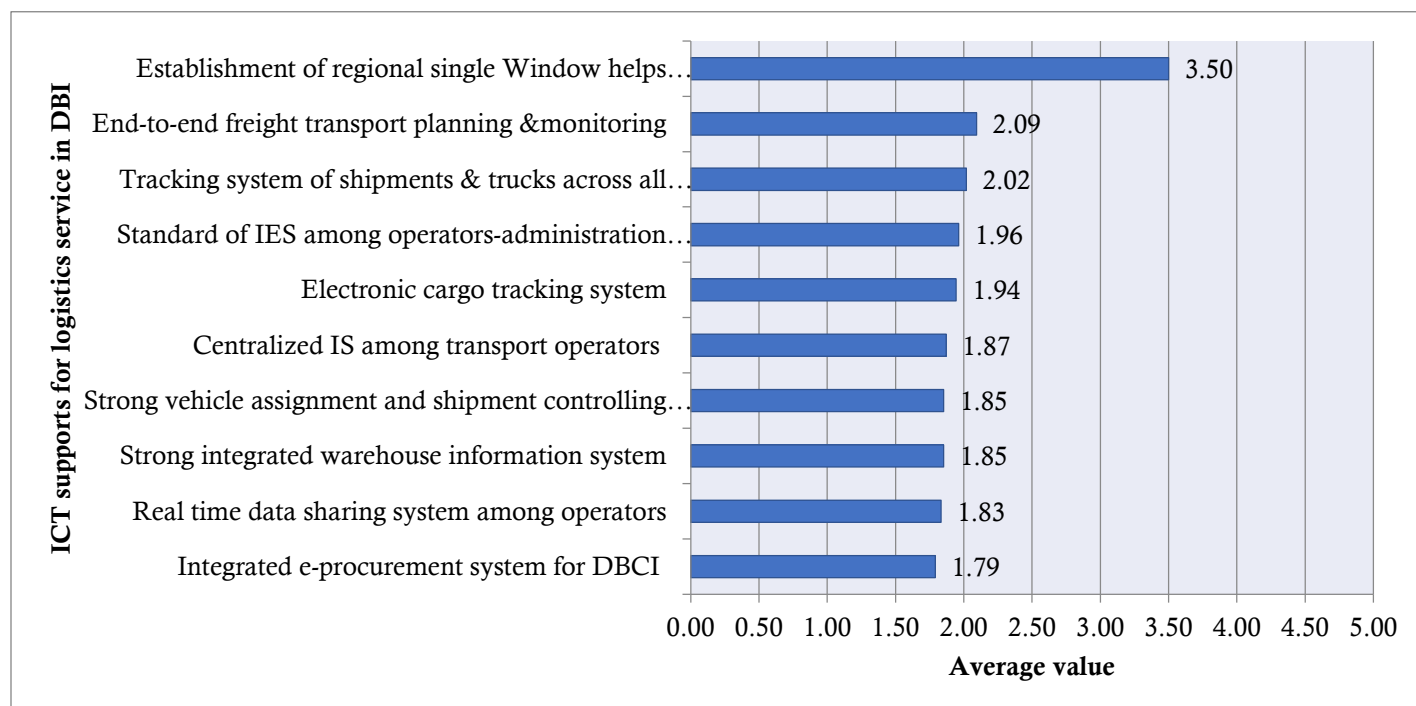


Figure 4. 14: ICT supports for logistics services in dry bulk import

As indicated in the above Figure ICT infrastructure in DBC procurement, tracking, transportation, warehouse, end to end freight transport planning are all labeled very low, e-procurement getting the least. This implies that the use of ICT infrastructure is very low across the entire DBC supply chain. Establishment of ICT based single window service will enhance the DBC import process.

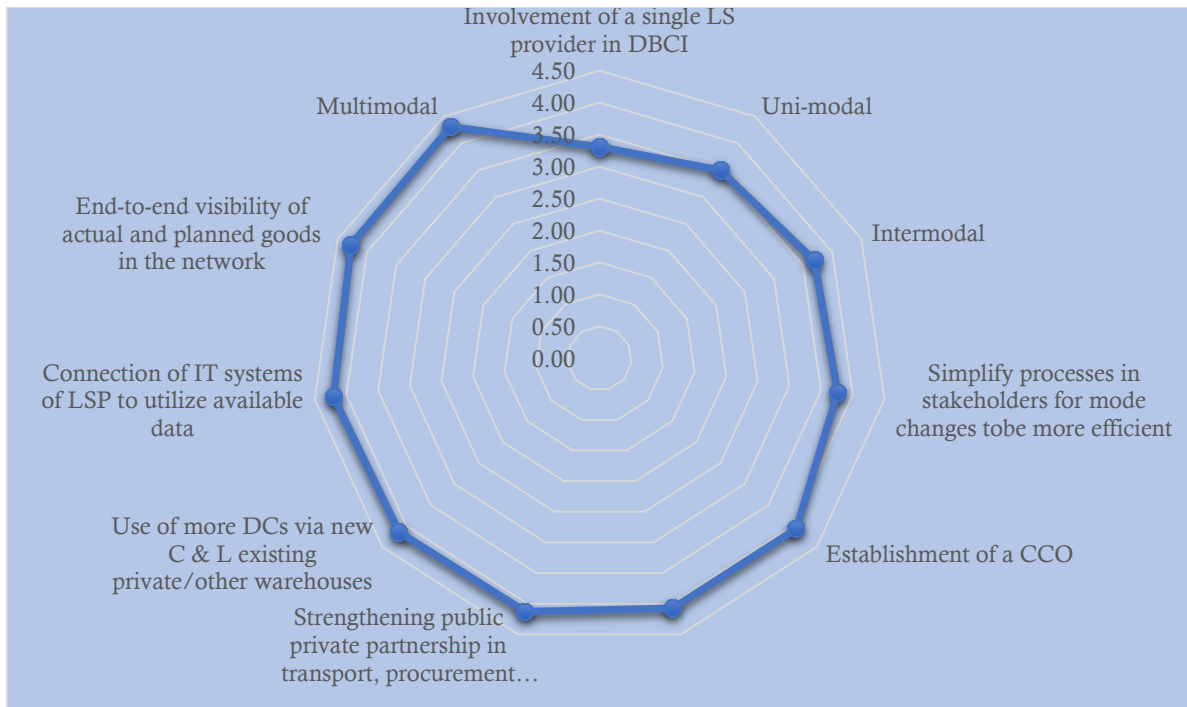


Figure 4. 15: Relevance measures that ensure smooth operation on dry bulk cargo

As indicated in the above chart, respondents believe that the following propositions will help in creating smooth operation of dry bulk cargo importation:

- Promotion of multimodal system
- End to end visibility across DBC supply chain
- ICT infrastructure
- Use of more distribution centres at new corridors and key logistics networks
- Promotion of public private partnership

4.8. Logistics lessons from benchmarking country

4.8.1. lessons from benchmarking country: Kazakhstan

Kazakhstan is the world's 2nd populous landlocked country next to Ethiopia. Kazakhstan enjoyed massive improvement in LPI after adopting the National Programme for Infrastructure Development for 2015-2019 that aims to forge a single economic market through regional integration via infrastructure using hub and spoke principle. The strategy "Kazakhstan 2050" set developing industrial transport and logistics facilities outside Kazakhstan as prime objective especially through joint ventures with neighboring countries China and Russia. Kazakhstan's success in LPI improvement since 2007 is

attributed to measurement system of logistics performance by a transport union called "Kazlogistics", completion of major infrastructure projects, customs improvement, reduced documentation and border crossing hurdles. Kazakhstan made LPI improvement from 133 in 2007 to 77 in 2016 and to 71 in 2018. As the following figure depicts Kazakhstan achieved road connectivity to neighboring countries that became part of its success. It now aims to achieve 40 LPI ranking through custom simplification, extended regional railway, simplification of export and import transport requirements, and attraction of foreign forwarders.



Source: <https://img.tourister.ru/files/4/5/2/6/2/5/7/original.jpg>.

Figure 4. 16: International trade corridors of Kazakhstan

Kazakhstan's experience shows that landlocked countries such as Ethiopia can have impressive improvement in LPI via regular measurement of logistics performance, simplified customs and transport system, hub and spoke based logistics, and completion of regional infrastructure.

4.8.2. Lessons from benchmarking country: Egypt

Egypt is a sea port country whose demurrage cost structure and the port access and administration issues are managed within Egypt jurisdiction (Arab Republic of Egypt Maritime Transport Sector, 2022). Egypt has extensive logistics experience in importation of strategic commodities. It has well-structured truck operators, well-organized logistics holding companies, and regional-hub focused logistics investment.

Regarding truck operators, Egypt organized its truck operator companies in to two as shown in the figure below (Japan International Cooperation Agency, 2008).

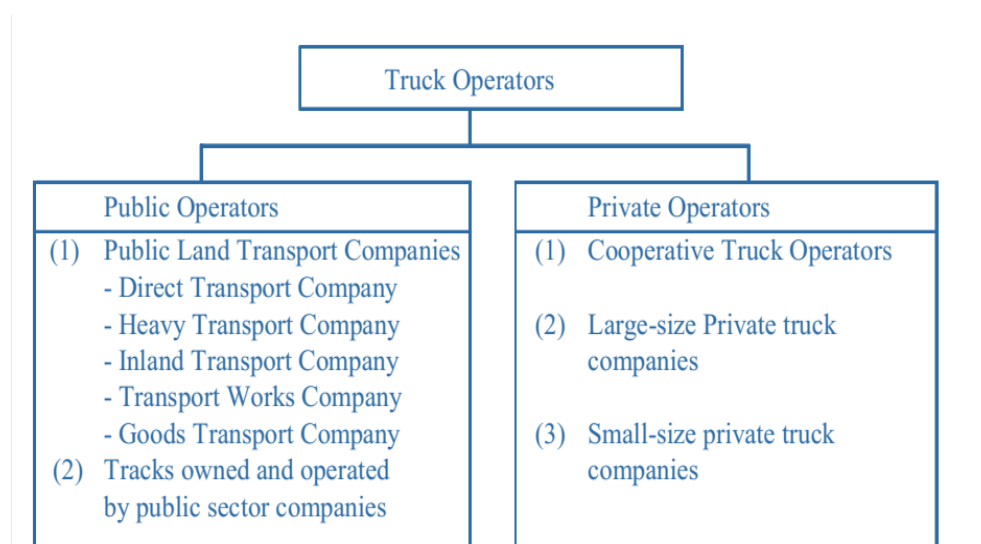


Figure 4.17: Egyptian truck operators' organization

Pertinent to logistics holding companies, Egypt has 17 independent public status companies with budgetary and managerial autonomy structured under the Ministry of Investment. The holding company for Maritime alone has 18 companies clustered in to five: container handlers, shipping agencies, ship builders, supplemental workers, and land transporter. Under the holding, there are four shipping agencies, two supplemental work such as loading/unloading companies, and full-fledged transport company involved in heavy, goods, direct, and inland transport, including transport works. The details are presented in the following figure.

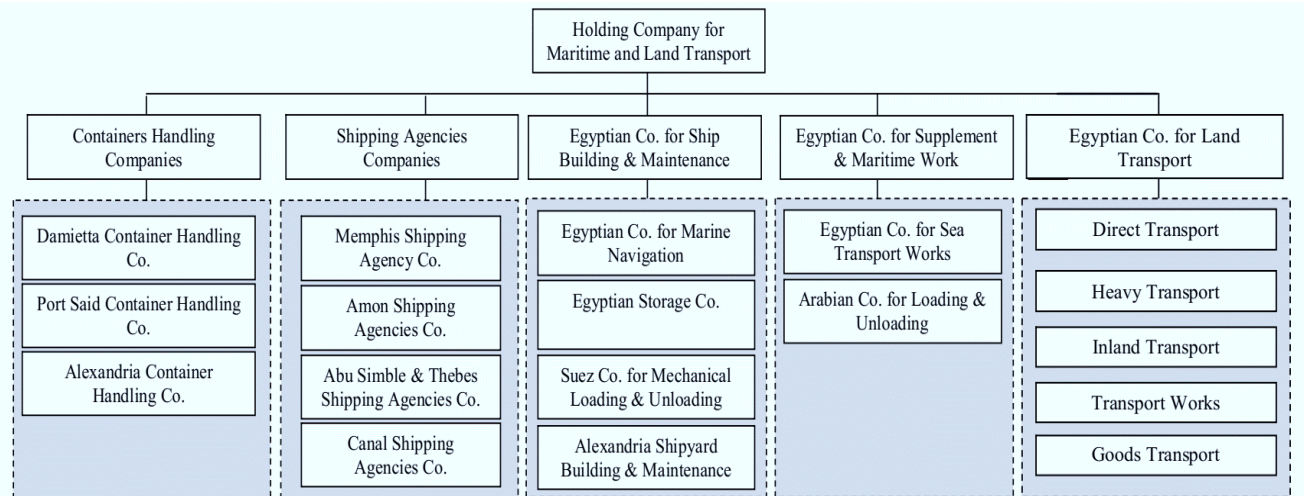


Figure 4. 18: Organization Chart of the Holding Company for Maritime and Land Transport

Regarding logistics investment, Egypt invests in establishing logistics hub in Suez Canal Zone (SCZ) with the aim of turning the region into a single integrated logistics system at 100 sq. k.m and of fetching a third of its economy from the logistics region in 10 years' time. Included in such plan is a 65 million tons capacity of multimodal facility for import, export, manufacturing, and storage of agricultural products including wheat, corn, oils, soybeans, and sugar. In addition, Egypt has been receiving international support in its efforts to become a “logistics hub for food products”. It obtained UAE support for 25 wheat silos, it strives to learn from Chinese expertise, it attracted global agricultural product processors and traders such as LummoX of Italy, which intends to use Egypt as a hub for the distribution of wheat to African markets, and France-based Louis Dreyfus Commodities to invest in wheat silos for Damietta Logistics Centre, a center involved in food commodities and grain trade.

.Such investments, both on soft and hard components of the logistic, have uplifted Egypt's Logistic Performance Global rank from 97 by 2007 to 67 by 2018 out of 160 world countries (The World Bank, 2018).

Table 4. 18: The Egypt Logistic Performance Index (LPI) by The World Bank 2007 - 2018

Year	LPI Rank	LPI Score	Cust oms	Infrastru cture	International Shipment	Logistic Competence	Tracking & tracing	Timel iness
2007	97	2.37	2.08	2.00	2.33	2.38	2.62	2.85
2010	92	2.61	2.11	2.22	2.56	2.87	2.56	3.31
2012	57	2.98	2.60	3.07	3.00	2.95	2.86	3.39
2014	62	2.97	2.85	2.86	2.87	2.99	3.23	2.99
2016	49	3.18	2.75	3.07	3.27	3.20	3.15	3.63
2018	67	2.82	2.60	2.82	2.79	2.82	2.72	3.19

Arab Academy for Science, Technology and Maritime Transport offered series of improvement recommendations about the multi modal transport in Egypt. Egypt has to:

- Set law to regulate the relationship between shipper and client,
- Provide ports with new technologies,
- Expand land areas to accommodate new activities related to storage, compiling and others,
- Create the legislative environment for the application of the system,
- Establish modern dry ports to be linked with a road and railways network specially equipped for containers' transport,
- Develop the railways between main ports,
- Establish a modern shipping company specialized not only in maritime transport but also in services related to multimodal transport,
- Complete the bridges and roads development projects and railways links to Eastern and Western Arab countries, and
- Establish an Arab Classification Society for trucks for regional harmony.

In view of this, Egypt provides lessons to Ethiopia on proper organization of truck operators, formation of specialized logistics and transport companies, and regional hub focused logistics investment. Although such logistics practices saw Egypt made massive improvement in LPI since 2007, Egypt is alarmed to complete its logistics projects to fully benefit from regional hub formation.

4.8.3. benchmarking on Axle load limits

In Ethiopia, currently, there are 12,766 cross border vehicles of which 2,871 are of 20 – 29.9MT capacity, 710 are of 30 – 34.9 MT capacity, 1,734 are of 35 – 37.9MT capacity and 7,451 are of 38 MT and above capacity. The current axle limits truck weight to 58 tons, higher than the Egypt; however lower than maximum permissible axle load of develop country that can be extend up to 64 to 74 tons. Increase the number and quality of trucks used at the cross border. The Ethiopian permissible axle load limits are in a good position when it is compared with most African countries as shown in the following table. However, the tandem and tridem axle load limits have some deviation from tripartite –COMESA, EAC, and SADC - standardized vehicle and axle/axle unit load limit agreements. The tripartite agreement stipulates 18 tones and 8 tones while the Ethiopia axle load limit is 17 tones and 10 tones for tandem and tridem axles. This will be an obstacle for the country to be part of the interoperable road network of the content in the future aspired plan. On the other hand, comparison of the Ethiopian permissible axle load limits with developed country's axle load limits suggests working towards increasing the axle load limits is keen in the journey of transforming this country into a developed countries category.

Table 4. 19: Permissible axle weight limits in different Regional Engineering Centers and counties

Regional Engineering Center/ Country	Axle load limits (tons)				
	Steering axle (2 tyres)	Single axle Non-steering (2 tyres)	Tandem axle unit (8 tyres)	Tandem axle unit (12 tyres)	Vehicle combination
COMESA	8	10	16	24	53
SADC	8	10	18	24	56
ECOWAS	8	12	21	25	51
CEMAC	8	13	21	27	50
Kenya	8	8	16	24	48
Uganda	8	8	16	24	56
Tanzania	8	8	18	24	56
Burundi	NS	NS	16	24	53
Rwanda	NS	NS	16	24	53
Lesotho	7.7	8	18	24	56
Malawi	8	8	18	24	56
Swaziland	7.7	8	18	24	56
Zambia	8	8	18	24	56
Ethiopia	8	10	17	24	58

4.9. Conclusion and recommendations on DBC logistics

The DBC procurement, logistics, and other end-to-end activities are being conducted in chaos. The stakeholders and the actors in DBC logistic and supply chains are operating in a fragmented way although EMA is trying its level best to coordinate it in some way. However, the magnitude of the problem appears to be beyond the capacity of EMA or any single institution. Thus, it requires holistic solutions.

- The procurement has to be scheduled and integrated among respective stakeholders. Institutional arrangement needs to show delicate balance between public and private involvement although the system appears to have a need for strong central organ.
- The road transportation system faces poor road quality, low road density, security problems, bad driver behaviors, extended documentation process, custom screening queues, miscommunication with DBC owners, lack of market-driven transport service, shortage of truck fleet size, warehouses capacity limitations, problems in ports service quality, etc. These are practical challenges that need strategic interventions in order to make the transport and logistics systems efficient and effective for the DBC import system.
- Moreover, the railway system is also hampered by long overdue construction works, power reliability and quality problems, security problems, commercial and marketing bottlenecks, working capital shortage, unscheduled DBC importation, lack of coordination and integration within stakeholders, infrastructural and operational pitfalls due to small number of pairs of trains are operating. Therefore, measures should be taken to alleviate such problems such as improving the daily availability of train capacity in a way that railway can transform DBC import performance. This requires policy direction, strategy, and commitment by the Government.
- In order to enhance the railway system to integrate and support the DBC transport, serious improvements on the following facilities along the rail system should be developed. These are the dry ports and their facilities, warehouses, operational capabilities, and connectivity of the rail way systems to meaningful nodes such as silos and warehouses should be enhanced. Improvements in such areas are believed to have large dividend and lasting transformation to the DBC import sector.
- As a land locked country, Ethiopia has to figure out the most feasible port against physical, political, economic, technical, commercial, diplomatic, etc. criteria's. Though, there are various impediments which require diplomatic and commercial interventions, apparently, Djibouti port is the most feasible port at present scenarios. The Berbera port is also another alternative feasible port to explore although bilateral

agreement is a challenge at the moment. The Sudan port is potentially feasible port to North- West part of the country however; technical, operational and political issues are upheld. Lamu Port can be considered as potential port for the southern part of the country. The Assab and Massawa ports are option for North East part of the countries with a through due considerations on the diplomatic, technical and commercial subjects.

- Ethiopia needs to devise well thought and cut-throat port strategy that goes beyond physical ownership but practical ownership through broader alternatives, bargaining tactics, diverse ownership participation modalities, strong shipping and vessel presence, among others.
- As the current DBC supply and logistic chains are not well supported by ICT, the development and implementation of the digital integration needs to be ensured through proper and timely investment. As compared to the international standard and the current digital technology, the logistics and transportation system in Ethiopian is impaired by the absence of connectivity and digitalization. This requires having reliable and complete data in all areas of the logistics supply chain. The limited rail and road infrastructure hindered the logistics services. The connectivity using either rail or road infrastructure among corridors and ports are so minimal and below the standard as compared to the international logistics. Moreover, the number of logistics service providers are low uncoordinated, and below the standards. Furthermore, there is no also legal foundation for horizontal coordination and effective integration among logistics institutions. Road security in all corner of the port is still an issue for Ethiopia that inflicts conflict in the regions due to various political or community issues. All these require an immediate action by all the stakeholders at large by the Ethiopian government to intervene in the development of digitalization, building and expanding the road and rail infrastructures, establish a reliable security of trucks and drivers along the rail road lines.
- ESLSE needs to play a key part in DBC logistics with proper support from the government to improve its capacity and international standing. However, there needs to be parallel regulation to avoid monopolistic tendency and higher service charge. ESLSE's involvement in DBC has multiple merits over its demerits. However, domestically ESLSE need to operate through PPP and subcontracting to promote local transport sector. ESLSE needs to explore possible and feasible mechanisms to own dry bulk cargoes in collaboration with the upcoming multi-modal operators.
- ESLSE as a main multimodal operator has the following pros and cons:
- **Pros:** Scale advantage, plan synchronization advantage, foreign currency access advantage, and reduction of transport and logistics hassle, upgrading national shipping capacity, enhance competitiveness of transport operators through

centralized bidding, synchronized transport operations, and improved bargaining power in international sector.

- **Cons:** Too much power to ESLSE may result in unrealistic shipping charges and monopolistic tendencies. However, even if new operators will involve in the multimodal operations, still having ESLSE as the prime multimodal operator is generally advantageous to the country. However, it needs reasonable regulation to ensure transparency on shipping price and inland transport fares mentioned above. In the presence of evidence on unrealistic pricing, waiver system needs to be in place to allow for C&F and other methods.
- Warehouse development needs to be given national priority and need to follow a structured centralized approach to ensure overall efficiency at the broader national level. There needs to be focal organization, guiding rule, national structure and warehouse system that is backed by technology. Central warehouses, silos and distribution centers need to be developed considered reduction of turnaround time, extending value adding activities such as bagging, utilization of railway line. To this end the Strategic goods trading corporation should be the focal organization to develop and manage central warehousing and silos at national level. The central Warehouses are proposed to be located around Dire Dawa, Kombolcha, Adama, Indode and at the proper train terminals ends.
- The dry bulk cargo logistics system requires significant policy interventions, Digital revolution, and intensive capacity and skill development scheme. Policy interventions need to involve building sea port strategy, improving maximum load through improved road and bridge infrastructure standards, PPP involvement modality in DBC. Digital application in tracking, warehouse information system, and road traffic congestion needs to be employed. The respective transport operators, drivers, and controllers needs to be capacitated to utilize such technologies.
- Policy intervention needs to start from overarching legal frameworks for DBC procurement and distribution reflecting governing government programs on food security, agricultural productivity, and industrial development following the practices of Egypt and India.
- Building flexible capacity of national central warehouse would do wonders in import and export performances. Accordingly, excluding coal, DBC commodities central warehouse needs to be developed at least at the most efficient one-week clearance period to the capacity of 57,595 tons currently, 74,484 tons in 2025, and 83,928 tons in 2030.
- Intensive work needs to be done to scale up vehicle and wagon capacities of the nation. Based on the findings, a mix of truck and wagon capacity availability dedicated to DBC is recommended at 66.67% capacity utilization and 50-50 split:

970 trucks and 222 wagons now, 1255 trucks and 287 wagons in 2025, and 1429 trucks and 327 wagons in 2030, respectively.

PART FIVE: CONCLUSIONS, RECOMMENDATIONS, INTERVENTION GUIDE

5.1. Conclusion and recommendations

This study investigated the national import dry bulk cargo procurement and logistics institutional setup and system through primary and secondary data sources and triangulation by involving diverse stakeholders and experts through KII, FGDs, and survey. Given the significance share of national resource and challenges DBC procurement poses, the lack of centralized coordination, unifying facility networks, data capturing and analysis, and integrated technology among others stand as paradoxical. This study thus investigated the broad national DBC import system of Ethiopia and identified key bottlenecks in three key study areas: institutional setup, procurement and financing, and logistics.

The first pressing issue in DBC import practice is institutional arrangement and legal framework. In Ethiopia, dry bulk imports are undertaken by various procurement organs and the logistics is coordinated by steering committee chaired previously by Ministry of Transport and Logistics and currently by NLC. The current system is basically decentralized procurement system for DBC commodities that cover about 28% of import and demand enormous foreign currency. In supply chain stages of planning, sourcing, make/operate, and deliver coordination from early stage is vital. However, in the DBC importation system planners are fragmented involving various regulatory authorities and stakeholders such as MoA, MoTRI, MoTL, MoM, MoF. Similarly procurement is also decentralized in which each procuring organ structurally makes isolated procurement decision. Thus, the desired strong coordination at the desired early stages of planning and procurement are missing. It follows that coordination is postponed to deliver (logistics) stage, creating coordination an uphill task. EMA is positioned at such later stage and coordinate logistics operations through vessel scheduling and priority setting. As coordination is done by a committee, there is limited accountability and enforcement power over planning, procurement, and logistics of dry bulk import. Planning & implementation delay, delay over currency permit especially for unplanned purchase decisions, overlap of purchase schedules, overlapping demand for use of foreign currency, vessels, shipping and logistics service, trucks, and storage facilities. As a result, the country is suffering from demurrage cost of about 7.5 million USD yearly for DBC only, loss of shipments, and delay in distribution of key commodities such as fertilizer and wheat, militating food security risk due to reduced productivity and food shortage. Besides, there is no overarching regulatory framework that helps to govern entire DBC importation and distribution operations. Some of DBC's organizations do not have explicitly stated mandate for DBC procurement; some of them have role duplications; others have performance problems; still others with procurement mandate are hampered by rigid procurement rules not suitable to international practices. In

view of this, the current DBC procurement organs operate with several limitations in DBC procurement and distribution as described hereunder:

- EABC (mandated only for fertilizer, traditional organizational setup, and extensive specialization on fertilizer with limited warehouse)
- ETBC (Traditional organization setup, limited experience in DBC importation with fitting mandate and warehouse and distribution capacity)
- ESC (Traditional organization setup, no clear mandate on DBC procurement but mandated for distribution, limited warehouse capacity)
- EPSE (No explicit mandate for coal, experience only on coal with relatively effective specialization, DBC importation creates additional burden)
- PPDS (strong mandate, but rigid legal framework, limited past experience and performance in specific DBC procurement, no distribution and warehouse experience, traditional organization setup)
- NDRMC (No mandate for procurement of DBC but for distribution, strong warehouse and distribution, good organizational setup)
- EMA (experience in DBC coordination via steering committee, no mandate for procurement but for logistics regulation, no enforcement power over procuring organs, good organizational setup)
- ESLSE (extensive experience in shipping and logistics, no mandate for procurement and distribution of DBC, no warehouse for DBC)

Benchmarking assessment was made to carefully selected countries and domestic organizations. The result shows that both Egypt and India apply strong centralized procurement and distribution institutional arrangement with clear overarching legal and policy frameworks. They both have national strategic commodities or essential goods and long standing national food security programs for which national focal procurement organization is established. In Egyptian case, GASC is a central organ procuring DBC especially wheat for decades making Egypt the largest global importer of wheat. Similarly India has two central organizations involved in DBC procurement and distribution. Unique to India is the central warehousing system guided a separate act, regulatory body, and clear hierarchical structure throughout the country. Both countries have strong and complex warehouse development involving grain silos and warehouse information system. From domestic example, EPSA is known for modern warehouse operation system with clear structure, digital capability, and real time tracking system. The benchmarks offer key lesson to a rather haphazard DBC procurement and distribution system of Ethiopia: the need for national focal coordinating organization for DBC procurement and distribution, for central warehouse system, and for centralized logistics coordination. In view of this, alternative institutional arrangements were analyzed to coordinate the procurement and distribution

with EMA as steering committee given the existing decentralized procurement, with EMA as a standing office given the existing decentralize procurement, with one of the better positioned existing procuring entity, i.e ETBC. None of these proposals were found to be feasible in solving the recurring DBC import bottlenecks.

Thus, establishment of a single new focal organization is considered the most appropriate to transform the DBC importation practice and bring the intended result. This option offers the opportunity to establish central warehousing system and modern digital procurement and distribution organization. As a result, the following structural arrangement options are proposed:

1. The first proposal relates to centralization into a new single focal organization called ESTC (Ethiopian Strategic Commodities Trading Corporation (ESTC)). ESTC is proposed to centrally procure DBC, establish central warehouse and silo system nationally follow up distribution of DBC to central warehouses, and flexibility set the national strategic commodities. As DBC shipments cover 28% of countries import, the country cannot afford offering it a lose focus. Such centralization is expected to offer scale advantage, learning curve effect, and information access on international market trends at every stages of the supply chain from procurement, to shipment, silo storage. ESTC is expected to operate as follows:
 - ESTC is expected to serve as a highly professional international procurement and distribution organ capacitated with high calibre professionals in international economic analysis, procurement, distribution, warehouse, and Information technology. It is expected to effectively establish end to end DBC supply chain system across the country and create interface with global suppliers.
 - ESTC is expected to be structured either under the Prime Minister for maximum enforcement or PEHAA for practicability with possibility of future structuring under EIH to transition itself into self-sustaining export income generator. For better enforcement capability, the first recommendation is to make ESTC directly accountable to the PM office.
 - ESTC's finance sources could be government budget, revolving fund, service charge, loan, grant, citizens' donations, and aid by tying it to food security policy.
 - Existing focal organizations and regional actors are recommended to handle the distribution with the already established arrangement and facilities while ESTC focuses on procurement, central warehouse management, establishment of integrated warehouse and distribution system, and end-to-end performance monitoring.

- Potential transport operators and loading and unloading service providers need to be registered by respective regional offices and ESTC. ESTC needs to put in place a system of tracking and performance monitoring of key players in the chain.
- Focal distributors and regional distributors shall be subject to performance measurement and contract based financial penalty of non-tolerable performance failure.

The second proposal is to centralize under the current ETBC that has the mandate, flexibility to operate as enterprise and use its own procurement manual, and has the largest capacity of storage facilities. This proposal is suggested for ease of implementation although the traditional form of organization is expected to limit transformation effort.

2. Policy intervention needs to start from overarching legal frameworks for DBC procurement and distribution reflecting governing government programs on food security, agricultural productivity, and industrial development following the practices of Egypt and India.

The second key issue of national import DBC supply chain is management of the supply chain especially the procurement and financing system. The study found out that DBC procurement system is characterized by traditional manual system, weak forecasting practice, overlapping procurement and logistics executions, limited practices towards achieving consolidation, bulk purchase, and economies of scale. Besides, strategic sourcing is barely practiced with framework agreement, e-procurement, and global market assessment are almost missing. Use of incoterm is another challenge with FOB being government preferred incoterm and C&F being a choice of some procuring organs. Finance is found to be the main bottleneck with shortages of foreign currency and local budget hampering importation progress and accumulated farmer's credits risking regional and Federal governments. In view of the procurement and distribution practices of wheat, fertilizer, sugar, and coal often face enormous challenges leading to fire fighting and emergency operations year after year. Despite government's plan to import substitute DBC commodities, forecasts up to 2030 and evidences on the ground signify that import substitution for wheat, fertilizer, sugar, and coal could hardly be realized in the foreseeable future even if sugar and wheat import projections show a declining trend. In general, the current practice results in delay of essential commodities affecting national productivity and food security purchase at highest price seasons, and purchases beyond the actual needs. Thus, the following key interventions need to be taken to refurbish the current procurement and financing system:

- There needs to be a digital system of forecasting to determine the right volume and timing of purchase based on consideration of crop season, global market price, and local demand. As per the current assessment, the procurement of the four DBCs needs to be distributed across three quarters, Quarter II, III, and IV avoiding quarter I for either inflated price season or mismatching usage period. Accordingly, fertilizer needs to be procured end of quarter IV, wheat in quarter III, sugar in Quarter II. Coal can be procured in quarter II and III.
- In order to ensure end to end supply chain, multi modal system in the dry bulk procurement needs to be promoted.
- Strategic sourcing practices such as e-procurement and framework procurement are not optional in international procurement. Besides, flexible, simple, and fast method of procurement needs to be in place with simple bid document, short validity period, and reasonable bid security. Empanelment or preferred procurement method needs to be in place to ensure sustainable supply source. To practice dry bulk procurement through a deeper international monitoring and knowledge of global suppliers to leverage on procurement from direct producers.
- To avoid abuse by experienced international suppliers, procurement system and legal framework need to be flexible enough. In line with this, Framework Agreement needs to be bundled with Long term agreement (LTA) that incorporated varied modalities such as multiple supplier agreement and bid at call-off.
- Procurement needs to be guided by national policy framework and flexible procurement manual. There needs to be adequate autonomy for and accountability to the procuring organ to smoothly and flexibly function in international market.
- The use of FoB as per the existing directive needs to be promoted as it is found to have multifaceted advantage for importing countries. However, this needs to be coupled with strong and functional waiver system and logistics price monitoring and transparency requirement to fetch the theoretical benefits of FoB for the procuring organs. In circumstances when FoB is proved to be less favorable for cost, operational hassle, or related challenges, the waiver system needs to be effective enough to allow for C&F or CPT as the case maybe.
- To resolve the incessant financing problem, revolving fund needs to be established for the focal procuring organization to ensure seamless DBC procurement and distribution. Through pooling system, in which DBC are procured by a single organ, the requirement for revolving fund would be significantly be reduced as it allows for common use of currency through sequential procurement of DBCs. Through pooling, sequential procurement, and efficient reimbursement system, nearly 300 million USD is required currently. The payment collection system needs to be

digitalized at grass root level, and institutionalized to create accountability and reduce the political and financial risks borne by Federal and Regional governments. The focal organization can serve as a central organ to execute the credit collection system. Besides, the implementation of the newly launched warehouse receipt system needs to be expedited to solve financing problems of farmers as it allows farmers to access credit and effect payment to the value of deposited grain.

The third key bottleneck of import DBC supply chain is logistics system. As a landlocked country highly exposed to a single sea port country, Ethiopia is not in the ideal position when it freight logistics. This is evident from the fact that Ethiopia the World biggest landlocked country by population and that it experiences among the lowest ranked in LPI. This is attributed to inadequate road and railway infrastructure and connectivity, limited truck and wagon capability, limited competency in logistics sector, and low digital penetration in logistics sector, among others. Considering DBC, Ethiopia has national central warehouse system; it has no DBC cargo vessel; it faces inadequate utilization of rail transport in DBC. As a result, DBC freight logistics is characterized by painstakingly high inland transport cost, long transport time, and high demurrage cost. Data reveals that the country achieves only 42% of daily discharge plan translated in to 74 out of the required 175 daily truck usage. As a result, the country pays on average 7.56 million USD in demurrage costs every year for wheat and fertilizer, experiencing delays by 504 days. On Logistics Service Providers, it is characterized by limited competition; lack end to end services, limited facilities such as warehouses, and limited PPP arrangement. ESLSE happens to a stand out through extensive experience but needs constructive monitoring to trickle down its scale and bargaining advantage to procuring organs. Given such facts, the study reveals that the DBC procurement and distribution lacks logistics mindset. To curb these challenges, the following key remedies need to be taken.

- The DBC import logistics needs to be devised for seamless supply chain through end-to-end logistics service provision. To this end, the DBC logistics needs to have a single coordinator to streamline logistics activities, achieve scale economies, and improve bargaining power at international shipping sector. In this case, ESLSE is well positioned to take a leading role. As per the study, ESLSE needs to take a leading role in DBC logistics condition that it can jointly work with PPP partners, its pricing competitiveness and transparency can be subject to monitoring, and functional waiver practice can be put in place based on the FOB directive. Ultimately, rationale over ESLSE's service in DBC needs to be established based primarily on economic imperatives of efficiency to stakeholders, secondly on strengthening national carrier.
- As the current DBC supply and logistic chains are not well supported by ICT, digital integration needs to be made through proper timely investment.

- National Competency development to the logistics sector should be done through well-functioning center of excellence comprising of key stakeholders from industry and academic institutions.
- As a land locked country, Ethiopia has to figure out the most feasible port against physical, political, economic, technical, commercial, diplomatic, etc. criteria's. Apparently, Djibouti port is the most feasible port even with the present setbacks. Though there are set backs which need diplomatic and commercial solutions. The Berbera port is also another alternative feasible port to explore although bilateral agreement is a challenge at the moment. The Sudan port is potentially feasible port to North- West part of the country although technical, operational and political issues are upheld. Lamu Port can be considered as potential port for the southern part of the country. The Assab and Massawa ports are potential future options for North East part of the countries but require further diplomatic, technical and commercial assessments. The former however is not accessible on the sea side at the moment.
- Ethiopia needs to devise well thought and cut-throat port strategy that goes beyond physical ownership but practical ownership through broader alternatives, bargaining tactics, diverse ownership participation modalities, strong shipping and vessel presence, among others. Ethiopia needs to devise effective sea port strategy considering the relative port feasibility. Although the study finding reveals Djibouti port is overall the most feasible, there needs to be constant search for alternatives to uplift Ethiopian bargaining power. Apart from direct negotiation and bilateral agreements, Ethiopia can use indirect influencing mechanisms such as alternative ownership or port use modalities and control of the extreme ends of supply chain. In this sense, ESLSE's ownership of more vessels, global presence, and participation in value added port services such as bagging are options to consider. ESLSE needs to continuously explore the feasibility of acquiring of DBC vessels. On the other hand, Ethiopia's participation in creating broader hinterland to sea port countries through regional road, railway, and warehouse network, will make Ethiopia a hub and attractive transit option for sea port countries. In connection to this, Ethiopia needs to plan to connect to landlocked countries further deeper than South Sudan to serve as a logistics hub and warehouse center in the long run.
- Road and railway infrastructure and maintenance projects have to be commissioned for swift completion with utmost priority to main trade corridors of the country. Road and railway infrastructure should not be done in isolation with the notion of maintaining system balance through proportionate parallel developments such as warehouses, value adding port service activities such as stevedoring and bagging.

- There needs to be a shift from truck dominated DBC transport to railway dominated DBC transport system. Based on the findings, a mix of truck and wagons dedicated to DBC is recommended to be made available at 66.67% capacity utilization and 50-50 split: 970 trucks and 222 wagons now, 1255 trucks and 287 wagons in 2025, and 1429 trucks and 327 wagons in 2030.
- The railway system is hampered by long overdue construction works, power reliability and quality problems, security problems, commercial and marketing bottlenecks, working capital shortage, unscheduled DBC importation, lack of coordination and integration within stakeholders, infrastructural and operational pitfalls. Measures should be taken to alleviate such problems in a way that railway can transform DBC import performance. This requires policy direction, strategy, and commitment by the Government.
- Serious improvements on road and rail facilities, warehouses, storage practices and operational capabilities, connectivity of rail way systems to meaningful nodes such as silos and warehouses are needed. Even small integrated improvements in such areas are believed to have large dividend and lasting transformation to the DBC import sector.
- Loading and loading service needs be institutionalized and each region and distributor needs to take accountability for timely delivery of shipments and release of trucks.
- National warehouse development needs to be done phase by phase starting from Central warehouse development. The central warehouse development needs to begin with identification and renovation of existing warehouses at the recommended locations.
- Building flexible capacity of national central warehouse would do wonders in import and export performances. Along this line central warehouses that will be linked to regional and district warehouses should be developed through DBC procurement and distribution coordinator. This arrangement will help in expediting and streamlining the newly launched national warehouse receipt system. As a the start, low capacity warehouse with a weekly clearance system can be established for later upgrade to a higher capacity with a 15 days or 30 days clearance period. Accordingly, based on the study findings, at least the central warehouse capacity of 57,595 tones currently, 74,484 tons in 2025, and 83,928 in 2030 needs to be achieved through a one-week clearance system. Such capacity of central warehouses needs to be developed in four locations: Endode, Adama, Dire Dawa, and Kombolcha.
- In the long run, Ethiopia needs to adopt DBC low price season purchase along with complex storage system comprising of grain silos to ensure national food security

and serve as a warehouse service hub for deeper hinterland countries such as Sudan, Chad, Central Africa Republic, and Republic of the Congo.

- Ethiopia experience very high import and export imbalance as high as 17 to 1 ratio. On top of that, it experiences mismatches of top export and top import seasons. Although remittance's contribution is undeniably important, the import and export mismatch in both value and seasons present foreign currency strain upon need. This also presents inland transport capacity wastage of trucks and wagons and subsequently high transport cost. Therefore, the following actions need to be made to minimize the foreign currency challenges:
 - To promote tightly scheduled sequential imports for big imports such as DBC procurement. A central procuring organ is helpful to ensure well dispersed and coordinated importation of DBC.
 - To promote export diversity especially in oil and pulses to boost export performance and foreign currency availability is high import seasons.
 - To match imports to high export seasons to allow for efficient use of inland transport capacity such as trucks and wagons.
 - To promote a centralized inland transport coordination to allow for utilization of the same truck capacity for imports and exports of coinciding schedules. As it stands, ESLSE is well positioned to coordinate such effort.

5.2. Intervention guide

Based on the study's conclusion and recommendations, the national DBC import system requires strategic transformation to trim down freight costs and time, to ensure sustainable global sourcing, and seize prospects of DBC importations.

Table 5. 1: Guiding direction for national DBC import transformation

From	To
Fragmented policy framework	Overarching policy framework
No clear commodity focus	Strategic commodity focused
Mixed regulatory and operator role	Parted regulatory and operator role
Problem-driven/reactive decision	Data-driven/proactive decision
Decentralized procurement system	Centralized procurement system
Standard procurement	Agile procurement
Manual DBC import system	Digital DBC import system
Narrow participation in DBC value chain	Extended participation in DBC vale chain
Fragmented financial system	Integrated financial system
Rigid Incoterm use	Outcome-driven incoterm use
Fragmented warehouse system	Central warehouse (silo) system
Domestic warehouse service	Regional warehouse service
Fragmented logistics system	Hub and spoke logistics system
Domestic logistics development	Regional logistics development
Road dominated freight	Railway dominated freight

Government dominated logistics operation	PPP centred logistics operation
Observant seaport strategy	Domineering seaport strategy

Based on the study, DBC importation requires 11 key interventions. The table given below presents priority weightings to 11 key interventions in lieu of resolving the current DBC importation problems. The priority-setting adopted the simplistic version of pair-wise heuristics weighting method introduced by Saaty (1980). The pair-wise comparison offers higher ranking (2), similar ranking (1), lower ranking (0) for each pair of interventions for subsequent summation, weighting and ranking. Accordingly, institutional arrangement (18%), central warehouse system (18%), financing system (15%), DBC vertical integration (12%), procurement system (9%), logistics infrastructure (9%), truck and rail capacity (9%), legal framework (4%), sea port utilization (4%), incoterm application (2%), and logistics hub (1%) are prioritized in that order as summarize in the follow up table. While each intervention is pivotal, priority weight and ranking signify the level of effort required for each intervention for better result.

Table 5. 2: Pair-wise heuristics weighting and priority matrix for national DBC importation

Interventions (11)	Introducing effective Legal and policy framework	Implementing Institutional arrangement	Implementing effective procurement system	Establishing effective financing system	Incoterm use and management	Logistics infrastructure	Creating logistics hub for deeper Africa	Logistics truck and wagon capacity	Establishing National Warehouse system	Vertical integration of BDC procurement	Enhancing optimal utilization of and access to seaports	
Introducing effective Legal and policy framework		2	2	2	0	2	0	2	2	2	2	
Implementing Institutional arrangement	0		0	0	0	0	0	0	1	0	0	
Implementing effective procurement system	0	2		2	0	1	0	1	2	1	1	
Establishing effective financing system	0	2	0		0	0	0	0	2	0	0	
Incoterm use and management	2	2	2	2		2	0	2	2	2	2	
Logistics infrastructure	0	2	1	2	0		0	1	2	2	0	
Creating logistics hub for deeper Africa	2	2	2	2	2	2		2	2	2	1	
Logistics truck and wagon capacity	0	2	1	2	0	1	0		2	2	0	
Establishing National Warehouse system	0	1	0	0	0	0	0	0		0	0	
Vertical integration of BDC procurement	0	2	1	2	0	0	0	0	2		0	
Enhancing optimal utilization of and access to seaports	0	2	1	2	0	2	1	2	2	2		Sum

Total score	4	17	8	14	2	8	1	8	17	11	4	94
Priority weight	4%	18%	9%	15%	2%	9%	1%	9%	18%	12%	4%	100%
Rank	8th	1st	5th	3rd	10th	5th	11th	5th	1st	4th	8th	//

Once 11 key intervention areas are identified, 43 milestones are set. The interventions and milestones are set for short-term, medium-term, and long-term periods. The following table summarizes the list of interventions needed as extant and prospective resolve to DBC importation problems. Three criteria are used to determine the timeline for strategic implementation. These are:

- Level of urgency classified as “Not urgent” and “Urgent” (NU,U),
- The country readiness labelled as “Not Ready” and “Ready”(NR,R), and
- Ease of implementation measured by “Not Easy” and “Easy” (NE,E).

For urgent (U) interventions given that either the country is ready for (R) or the task is easy (E), i.e (U,R) or (U,E) combinations, intervention is set for the short-term; Other urgent intervention combination, i.e. (U,NR,NE), along with Non Urgent (NU) interventions for which the country is ready for (R) and the task is easy (E), i.e (NU,R, E), are reserved for medium-term. For Non Urgent interventions for which either the country is not ready or implementation is not easy, i.e (NU, NR) and (NU, NE) combinations, long-term intervention is recommended.

While the time span for classification of short-term and long-term can vary, the two mostly used classifications are: for short-term up to one year, for medium-term between 1 year and 5 years, and for long term more than 5 years; an alternative practice categorizes short-term up to six months, medium-term up to three years, and long-term beyond 3 years. Considering the national bureaucratic hurdles a one-year span (up to 2023) for short-term is recommended. Considering the swift pace of national reforms and regional changes, 3 year’s cut-off, i.e year 2025, is recommended between medium-term and long-term. To coincide with the national 10 year prospective plan, it is recommended to delimit the long-term to 2030. Accordingly, the implementation time span and classification criteria are summarized in the following table.

Table 5. 3: Implementation time span and criteria

Planning horizon	Time span	Implementation criteria
Short-term (2022-2023)	<= 1 year	(U,R,E) (U,R,NE) (U,NR,E)

Medium-term (2023-2025)	1 -3 years	(U,NR,NE) (NU, R,E)
Long-term (2025-2030)	>=3 years	(NU, NR,E) (NU,R,NE) (NU,NR,NE)

Table 5. 4: Timeline of key intervention areas and milestones

Key Interventions (11)	Milestones (43)	Level of urgency (NU,U)/ readiness (NR,R)/ Ease(NE,E)	Timeline
1. Institutional arrangement (18%) <i>-single focal organization for DBC importation</i>	1.1. Getting approval on new institutional arrangement for DBC procurement and logistics	U,R,NE	Short-term
	1.2. Stakeholder preparations and transition	U,R,NE	Short-term
	1.3. Implementing new institutional arrangement in DBC procurement by 2024	U,NR,NE	Medium-term
	1.4. Implementing DBC logistics coordination with ESLSE & PPP	U,R,E	Short-term
	1.5. Playing significant national role by focal organization beyond operation (<i>Data centre for MACRO decisions, import substitution strategy, and regional hub development</i>)	NU,NR,NE	Long-term
2. Construction of central warehouses and silo centers	2.1. Conducting central warehouse development studies: • Feasibility assessment • Developing WIS	U,R,E	Short-term
		U,NR,NE	Medium-term
	2.2. Forging PPP in warehouse development	U,R,E	Short-term
	2.3. Identifying, renovating, and renting existing warehouse facility	U, NR, NE	Medium-term
	2.4. Constructing and launching 1 st central warehouse facility of 75,000 tons by 2025	U,NR,NE	Medium-term
	2.5. Expanding central warehousing capacity 168,000 tons by 2030	NU, NR, NE	Long-term
	2.6. Completing National Warehouse system (Integrating central, regional, and district warehouses)	NU, NR, NE	Long-term
3. Finance system	3.1. Establishing budget as budgetary organization	U,NR,NE	Medium-term
	3.2. Establishing revolving hard	U,NR,NE	Medium-term

	currency fund		
	3.3. Establishing financing means (Procurement and warehouse service charge, beneficiary advance payment, Income generating activity (IGA), loan and grant by linking to Food Security Policy, gain deposits from WRS)	<i>U,NR,NE</i>	<i>Medium-term</i>
	3.4. Applying end to end financial reimbursement digital system among grass root, focal organizations, NBE, CBE, and MoF.	<i>NU,NR,NE</i>	<i>Long-term</i>
	3.5. Engaging in export and operate as self-financing procuring organ by 2027	<i>NU, NR,NE</i>	<i>Long-term</i>
4. Vertical Integration of DBC import system (12%)	4.1. Conducting feasibility study - In country Stevedoring and bagging feasibility - demand for regional warehouse hub	<i>U,NR,E</i>	<i>Short-term</i>
		<i>NU,NR,E</i>	<i>Long-term</i>
	4.2. Forging PPP, and drafting funding proposal	<i>U, R,NE</i>	<i>Short-term</i>
	4.3. Establishing inland stevedoring and bagging facility at key rail side terminal/s	<i>U,NR, NE</i>	<i>Medium-term</i>
	4.4. Establishing regional warehouse for double landlocked neighbours	<i>NU, NR, NE</i>	<i>Long-term</i>
5. Effective procurement system (9%)	5.1. Conducting procurement study - Directive/manual development - E-procurement system development	<i>NU,NR,E</i>	<i>Medium-term</i>
		<i>NU,NR,NE</i>	<i>Long-term</i>
	5.2. Establishing and equipping offices and recruiting high calibre professionals	<i>U, NR,NE</i>	<i>Medium-term</i>
	5.3. Implementing <i>agile</i> strategic procurement system (Empanelment, FA, Right time sourcing, e-procurement, LTA)	<i>U,NR, NE</i>	<i>Medium-term</i>
6. Optimizing Logistics Truck and Wagon capacity (9%)	6.1. Fixing finance and related bottlenecks for importation of trucks	<i>U,R,NE</i>	<i>Short term</i>
	6.2. Finalizing importation of adequate no. of truck	<i>U, R,NE</i>	<i>Short term</i>
	6.3. Increasing wagon capacity to accommodate DBC	<i>U,NR, NE</i>	<i>Medium-term</i>

7. Improving logistics Infrastructure (9%)	7.1. Conducting project specific feasibility analysis	<i>NU,NR,E</i>	<i>Medium-term</i>
	- Road construction - Railway construction	<i>U,NR,NE</i>	<i>Medium-term</i>
	7.2. Maintaining major trade corridor road and railway line conditions	<i>U, NR,NE</i>	<i>Medium-term</i>
	7.3. Securing source of finance for extended freight road and railway line development	<i>U,NR, NE</i>	<i>Medium-term</i>
	7.4. Completing planned trade corridors & regional road	<i>NU, NR,NE</i>	<i>Long-term</i>
	7.5. Completing planned main trade corridor and regional railway network	<i>NU, NR,NE</i>	<i>Long-term</i>
8. Enhancing optimal utilization of and access to seaports (4%)	8.1. Setting National Seaport Strategy		
	- Conducting seaport strategy study - Obtaining seaport strategy approval	<i>NU,R,E</i>	<i>Medium-term</i>
	8.2. Effectively utilizing alternative sea port	<i>NU, NR,NE</i>	<i>Long-term</i>
	8.3. Upgrading seaport utilization power through flexible ownership arrangement, vertical integration, expansion of hinterland as hub	<i>NU,NR, NE</i>	<i>Long term</i>
9. Introducing effective legal and policy framework (4%)	9.1. Issuing DBC importation institutional establishment proclamation and revision	<i>U,NR,E</i>	<i>Medium-term</i>
	9.2. Issuing overarching National Food Security Policy	<i>NU, R,E</i>	<i>Medium-term</i>
	9.3. Establishing legal framework for farmers loan and financing through WRS	<i>U, R,NE</i>	<i>Short-term</i>
	9.4. Revising investment policy to allow private warehouse operators	<i>U,NR,NE</i>	<i>Medium-term</i>
	9.5. Reviewing axle load regulation to strike balance among logistics performance, road safety, and regional integration	<i>NU,NR, NE</i>	<i>Long-term</i>
10. Incoterm use and management (2%)	10.1. Establishing strong waiver approval team and system	<i>U,NR,NE</i>	<i>Short-term</i>
	10.2. Adapting and revising FoB directive and waiver system based on future realities	<i>NU, NR, NE</i>	<i>Long-term</i>

11. Creating logistics hub for deeper Africa (1%)	11.1. Completing regional roads west-side of the Country	<i>NU,NR,NE</i>	<i>Long-term</i>
	11.2. Completing regional railway lines	<i>NU,NR,NE</i>	<i>Long-term</i>
	11.3. Providing warehouse and logistics services to double land-locked countries	<i>NU,NR,NE</i>	<i>Long-term</i>

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Annexes:

Annex 1: Warehouse information from ETBC

<i>Warehouse Name</i>	Regional Location	Capacity (Qtal)	Material
<i>Arerti</i>	Adama	3000	Steel
<i>Adama Kiray Betoeh</i>	Adama	20000	Masonry
<i>Mojo 2</i>	Adama	25000	Masonry
<i>Adama 31 Dipo 9</i>	Adama	45000	Steel
<i>Adama Kebele 10</i>	Adama	50000	Masonry
<i>Adama Selamat 1</i>	Adama	50000	Masonry
<i>Adama Zerfu 1</i>	Adama	50000	Masonry
<i>Arsi Robe</i>	Adama	50000	Masonry
<i>Mojo 1</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 1</i>	Adama	50000	Masonry
<i>Abomsa</i>	Adama	50000	Masonry
<i>Iteya 1</i>	Adama	50000	Masonry
<i>Iteya 2</i>	Adama	50000	Masonry
<i>Iteya 3</i>	Adama	50000	Masonry
<i>Adama Zerfu 2</i>	Adama	50000	Masonry
<i>Adama Zerfu 3</i>	Adama	50000	Masonry
<i>Adama Selamat 2</i>	Adama	50000	Masonry
<i>Adama Selamat 3</i>	Adama	50000	Masonry
<i>Debre Zeyit 2</i>	Adama	50000	Masonry
<i>Debre Zeyit 3</i>	Adama	50000	Masonry
<i>Debre Zeyit 4</i>	Adama	50000	Masonry
<i>Debre Zeyit 5</i>	Adama	50000	Masonry
<i>Arsi Robe 2</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 2</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 3</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 4</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 5</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 6</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 7</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 8</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 10</i>	Adama	50000	Masonry
<i>Adama 31 Dipo 11</i>	Adama	50000	Masonry
<i>Debre Zeyit 1</i>	Adama	100000	Masonry
<i>Gotera</i>	Addis Ababa	0	Masonry

<i>Michelkots 9</i>	Addis Ababa	5000	
<i>Michelkots 7</i>	Addis Ababa	10000	Steel
<i>Michelkots 8</i>	Addis Ababa	10000	Steel
<i>Adey Abeba 3</i>	Addis Ababa	10000	Masonry
<i>Kebena</i>	Addis Ababa	25000	Steel
<i>Legehar</i>	Addis Ababa	25000	Steel
<i>Aware</i>	Addis Ababa	25000	Steel
<i>Kolfe Efoyta</i>	Addis Ababa	25000	Steel
<i>22 Mazorya</i>	Addis Ababa	25000	Steel
<i>Bisrate Gebriel</i>	Addis Ababa	25000	Steel
<i>Michelkots 4</i>	Addis Ababa	25000	Masonry
<i>Amanuel</i>	Addis Ababa	30000	Masonry
<i>Adey Abeba 2</i>	Addis Ababa	30000	Masonry
<i>Kolfe 2</i>	Addis Ababa	35000	Steel
<i>Adey Abeba 1</i>	Addis Ababa	50000	Masonry
<i>Kolfe 1</i>	Addis Ababa	50000	Masonry
<i>Michelkots 2</i>	Addis Ababa	50000	Masonry
<i>Michelkots 3</i>	Addis Ababa	50000	Masonry
<i>Michelkots 13</i>	Addis Ababa	50000	Masonry
<i>Midroc Buna Ma'ekel 3</i>	Addis Ababa	50000	Masonry
<i>Midroc Buna Ma'ekel 4</i>	Addis Ababa	50000	Masonry
<i>Midroc Buna Ma'ekel 5</i>	Addis Ababa	50000	Masonry
<i>Midroc Buna Ma'ekel 6</i>	Addis Ababa	50000	Masonry
<i>Michelkots 1</i>	Addis Ababa	100000	Masonry
<i>Michelkots 5</i>	Addis Ababa	100000	Steel
<i>Michelkots 6</i>	Addis Ababa	100000	Steel
<i>Michelkots 10</i>	Addis Ababa	100000	Masonry
<i>Michelkots 11</i>	Addis Ababa	100000	Masonry
<i>Michelkots 12</i>	Addis Ababa	100000	Masonry
<i>Midroc Buna Ma'ekel 2</i>	Addis Ababa	100000	Masonry
<i>Midroc Buna Ma'ekel 7</i>	Addis Ababa	100000	Steel
<i>Midroc Buna Ma'ekel 1</i>	Addis Ababa	150000	Masonry
<i>ET Fruit Piasa</i>	Addis Ababa	3298000	
<i>ET Fruit Kera</i>	Addis Ababa		
<i>Ale Bejimla Kality</i>	Addis Ababa		
<i>Ale Bejimla Megenagna</i>	Addis Ababa		
<i>ET Fruit Kality</i>	Addis Ababa		
<i>ET Fruit Afincho Ber</i>	Addis Ababa		
<i>Teji</i>	Addis Ababa Zuriya	3000	Steel
<i>Wolkite</i>	Addis Ababa Zuriya	3000	Steel

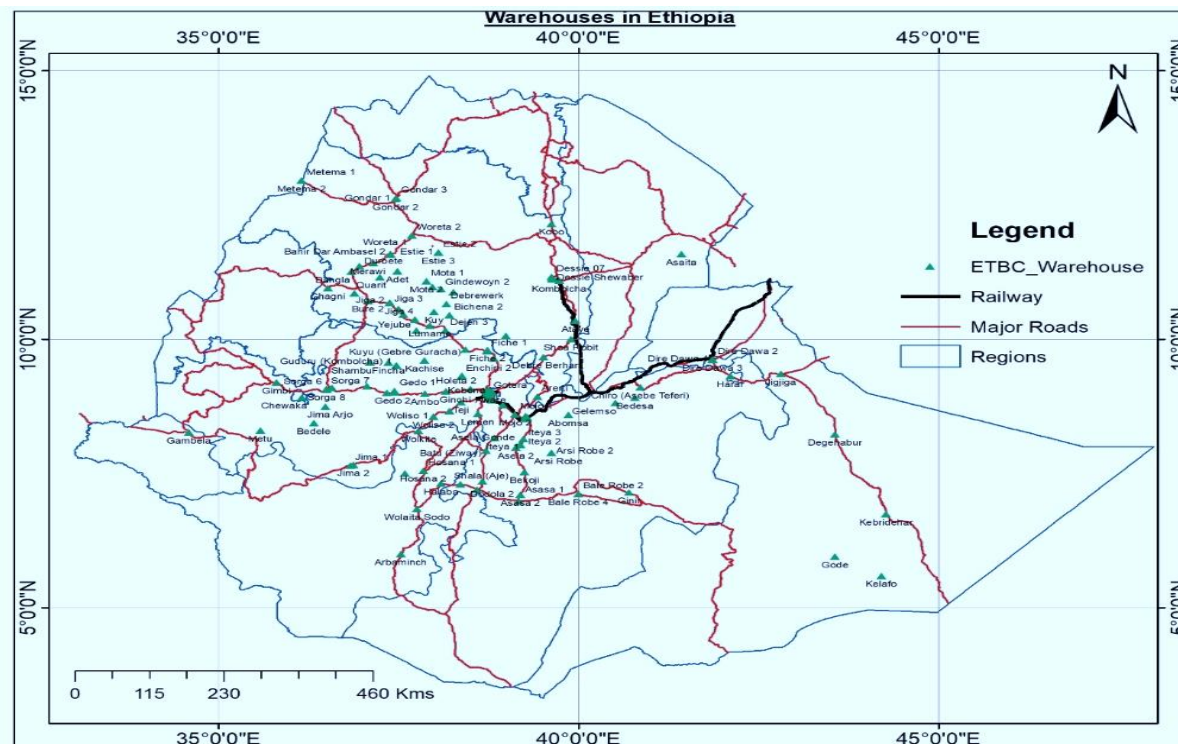
<i>Debre Libanos (Debre Tsige)</i>	Addis Ababa Zuriya	3000	Steel
<i>Fiche 1</i>	Addis Ababa Zuriya	3000	Steel
<i>Fiche 2</i>	Addis Ababa Zuriya	3000	Steel
<i>Enchini 2</i>	Addis Ababa Zuriya	3000	Steel
<i>Becho (Tulu Bolo)2</i>	Addis Ababa Zuriya	3000	Steel
<i>Holeta 2</i>	Addis Ababa Zuriya	3000	Steel
<i>Holeta 1</i>	Addis Ababa Zuriya	25000	Masonry
<i>Kachise</i>	Addis Ababa Zuriya	25000	Masonry
<i>Becho (Tulu Bolo)</i>	Addis Ababa Zuriya	25000	Masonry
<i>Kuyu (Gebre Guracha)</i>	Addis Ababa Zuriya	25000	Masonry
<i>Woliso 2</i>	Addis Ababa Zuriya	25000	Masonry
<i>Mera Bete (Alem Ketema)</i>	Addis Ababa Zuriya	25000	Masonry
<i>Woliso 1</i>	Addis Ababa Zuriya	50000	Masonry
<i>Enchini 1</i>	Addis Ababa Zuriya	50000	Masonry
<i>Ginchi</i>	Addis Ababa Zuriya	50000	Masonry
<i>Ambo</i>	Addis Ababa Zuriya	50000	Masonry
<i>Debre Berhan</i>	Addis Ababa Zuriya	50000	Masonry
<i>Lemen</i>	Addis Ababa Zuriya		
<i>Bale Robe 3</i>	Asela	20000	Steel
<i>Bale Robe 4</i>	Asela	20000	Steel
<i>Asela Gonde</i>	Asela	20000	Masonry
<i>Ginir</i>	Asela	25000	Masonry
<i>Bale Robe 1</i>	Asela	50000	Masonry
<i>Asasa 2</i>	Asela	50000	Masonry
<i>Bekoji</i>	Asela	50000	Masonry
<i>Asela 2</i>	Asela	50000	Masonry
<i>Bale Robe 2</i>	Asela	50000	Masonry
<i>Asela Gonde Lule</i>	Asela	50000	Masonry
<i>Dodola 2</i>	Asela	50000	Masonry
<i>Asela 1</i>	Asela	100000	Masonry
<i>Asasa 1</i>	Asela	100000	Masonry
<i>Dodola 1</i>	Asela	100000	Masonry
<i>Dangla</i>	Bahir Dar	5000	Steel
<i>Adet</i>	Bahir Dar	5000	Steel
<i>Estie 3</i>	Bahir Dar	5000	Steel
<i>Chagni</i>	Bahir Dar	25000	Masonry
<i>Merawi</i>	Bahir Dar	25000	Masonry
<i>Durbete</i>	Bahir Dar	25000	Masonry
<i>Gondar 3</i>	Bahir Dar	25000	Steel
<i>Estie 1</i>	Bahir Dar	25000	Masonry

<i>Bahir Dar Kebele 17 4</i>	Bahir Dar	25000	Steel
<i>Bahir Dar Kebele 17 5</i>	Bahir Dar	25000	Steel
<i>Estie 2</i>	Bahir Dar	25000	Steel
<i>Gondar 2</i>	Bahir Dar	25000	Masonry
<i>Metema 2</i>	Bahir Dar	25000	Masonry
<i>Bahir Dar Ambasel 1</i>	Bahir Dar	40000	Masonry
<i>Bahir Dar Ambasel 2</i>	Bahir Dar	40000	Masonry
<i>Bahir Dar Kebele 17 1</i>	Bahir Dar	50000	Masonry
<i>Metema 1</i>	Bahir Dar	50000	Masonry
<i>Woreta 1</i>	Bahir Dar	50000	Masonry
<i>Gondar 1</i>	Bahir Dar	50000	Masonry
<i>Bahir Dar Kebele 17 2</i>	Bahir Dar	50000	Masonry
<i>Bahir Dar Kebele 17 3</i>	Bahir Dar	50000	Masonry
<i>Woreta 2</i>	Bahir Dar		Masonry
<i>Mertolemariam</i>	Debre Markos	5000	Steel
<i>Quarit</i>	Debre Markos	5000	Steel
<i>Mota Keranio</i>	Debre Markos	5000	Steel
<i>Agew Gimja Bet</i>	Debre Markos	5000	Steel
<i>Yejube</i>	Debre Markos	5000	Steel
<i>Lumame</i>	Debre Markos	5000	Steel
<i>Debre markos 3</i>	Debre Markos	5000	Steel
<i>Jiga 4</i>	Debre Markos	5000	Steel
<i>Mota 2</i>	Debre Markos	5000	Steel
<i>Bichena 2</i>	Debre Markos	7000	Steel
<i>Gindewoyn 1</i>	Debre Markos	20000	Steel
<i>Gindewoyn 2</i>	Debre Markos	20000	Steel
<i>Amanuel (Debre Markos)</i>	Debre Markos	25000	Masonry
<i>Bichena 1</i>	Debre Markos	25000	Masonry
<i>Kuy</i>	Debre Markos	25000	Masonry
<i>Bure 2</i>	Debre Markos	25000	Masonry
<i>Dembecha</i>	Debre Markos	25000	
<i>Debre markos 1</i>	Debre Markos	50000	Masonry
<i>Jiga 1</i>	Debre Markos	50000	Masonry
<i>Bure 1</i>	Debre Markos	50000	Masonry
<i>Debrewerk</i>	Debre Markos	50000	Masonry
<i>Mota 1</i>	Debre Markos	50000	Masonry
<i>Debre markos 2</i>	Debre Markos	50000	Masonry
<i>Jiga 2</i>	Debre Markos	50000	Masonry
<i>Jiga 3</i>	Debre Markos	50000	Masonry
<i>Dejen 3</i>	Debre Markos	50000	Masonry

<i>Dejen 1</i>	Debre Markos	100000	Masonry
<i>Dejen 2</i>	Debre Markos	100000	Masonry
<i>Dessie Shewaber</i>	Dessie	15000	Masonry
<i>Dessie Maderaja 1</i>	Dessie	25000	Masonry
<i>Kombolcha</i>	Dessie	25000	Steel
<i>Asaita</i>	Dessie	25000	Masonry
<i>Dessie Maderaja 2</i>	Dessie	25000	Masonry
<i>Dessie 07</i>	Dessie	50000	Masonry
<i>Ataye</i>	Dessie	50000	Masonry
<i>Shoa Robit</i>	Dessie	50000	Masonry
<i>Kobo</i>	Dessie	50000	Masonry
<i>Kebridehar</i>	Dire Dawa	0	Masonry
<i>Dire Dawa 7</i>	Dire Dawa	20000	Masonry
<i>Harar</i>	Dire Dawa	25000	Masonry
<i>Chiro (Asebe Teferi)</i>	Dire Dawa	25000	Masonry
<i>Bedesa</i>	Dire Dawa	25000	Masonry
<i>Gelemso</i>	Dire Dawa	25000	Masonry
<i>Jigjiga</i>	Dire Dawa	25000	Masonry
<i>Degehabur</i>	Dire Dawa	25000	Masonry
<i>Gode</i>	Dire Dawa	25000	Masonry
<i>Kelafo</i>	Dire Dawa	25000	Masonry
<i>Dire Dawa 6</i>	Dire Dawa	30000	Masonry
<i>Dire Dawa 5</i>	Dire Dawa	40000	Masonry
<i>Dire Dawa 1</i>	Dire Dawa	50000	Masonry
<i>Dire Dawa 4</i>	Dire Dawa	50000	Masonry
<i>Dire Dawa 2</i>	Dire Dawa	50000	Masonry
<i>Dire Dawa 3</i>	Dire Dawa	50000	Masonry
<i>Jima 1</i>	Jima	25000	Masonry
<i>Gambela</i>	Jima	50000	Masonry
<i>Bedele</i>	Jima	50000	Masonry
<i>Metu</i>	Jima	50000	Masonry
<i>Jima 2</i>	Jima		Masonry
<i>Gedo 2</i>	Nekemte	3000	Steel
<i>Guduru (Kombolcha) 2</i>	Nekemte	3000	Steel
<i>Chewaka</i>	Nekemte	3000	Steel
<i>Brkajato 1</i>	Nekemte	10000	Steel
<i>Brkajato 2</i>	Nekemte	10000	Steel
<i>Brkajato 3</i>	Nekemte	10000	Steel
<i>Brkajato 4</i>	Nekemte	10000	Steel
<i>Gedo 1</i>	Nekemte	25000	Masonry

<i>Shambu</i>	Nekemte	25000	Masonry
<i>Guduru (Kombolcha) 1</i>	Nekemte	25000	Masonry
<i>Jima Arjo</i>	Nekemte	25000	Masonry
<i>Bako Tibe 1</i>	Nekemte	50000	Masonry
<i>Elu Gelan</i>	Nekemte	50000	Masonry
<i>Fincha</i>	Nekemte	50000	Masonry
<i>Gimbi</i>	Nekemte	50000	Masonry
<i>Sorga 1</i>	Nekemte	50000	Masonry
<i>Sorga 2</i>	Nekemte	50000	Masonry
<i>Sorga 3</i>	Nekemte	50000	Masonry
<i>Sorga 4</i>	Nekemte	50000	Masonry
<i>Sorga 5</i>	Nekemte	50000	Masonry
<i>Sorga 6</i>	Nekemte	50000	Masonry
<i>Sorga 7</i>	Nekemte	50000	Masonry
<i>Sorga 8</i>	Nekemte	50000	Masonry
<i>Bako Tibe 2</i>	Nekemte	50000	Masonry
<i>Soro Gimbichu</i>	Shashemene	5000	Steel
<i>Arbaminch</i>	Shashemene	25000	Masonry
<i>Hosana 2</i>	Shashemene	28000	Masonry
<i>Hosana 1</i>	Shashemene	50000	Masonry
<i>Wolaita Sodo</i>	Shashemene	50000	Masonry
<i>Mekidugda</i>	Shashemene	50000	Masonry
<i>Batu (Ziway)</i>	Shashemene	50000	Masonry
<i>Shala (Aje)</i>	Shashemene	50000	Masonry
<i>Halaba</i>	Shashemene	50000	Masonry
<i>Shashemene 3</i>	Shashemene	50000	Masonry
<i>Shashemene 4</i>	Shashemene	50000	Masonry
<i>Shashemene 1</i>	Shashemene	100000	Masonry
<i>Arsi Negele</i>	Shashemene	100000	Masonry
<i>Shashemene 2</i>	Shashemene	100000	Masonry
<i>Total Capacity</i>		8506000	

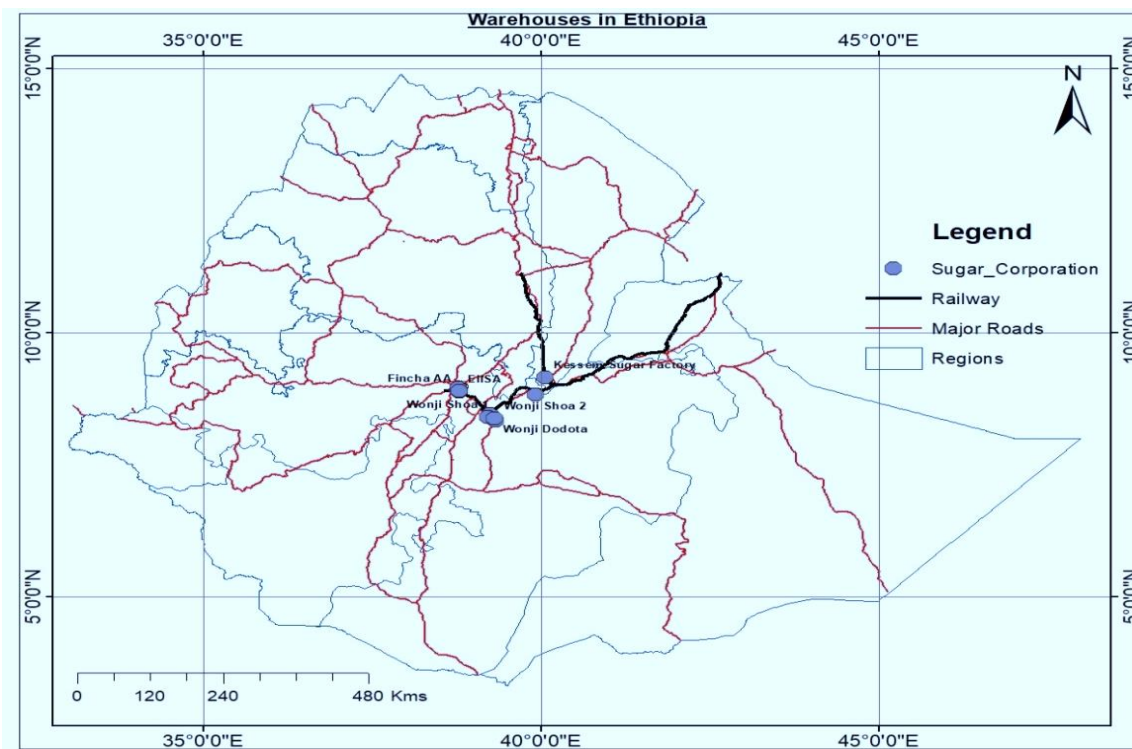
Annex 2: GPS based locational distributions of warehouses



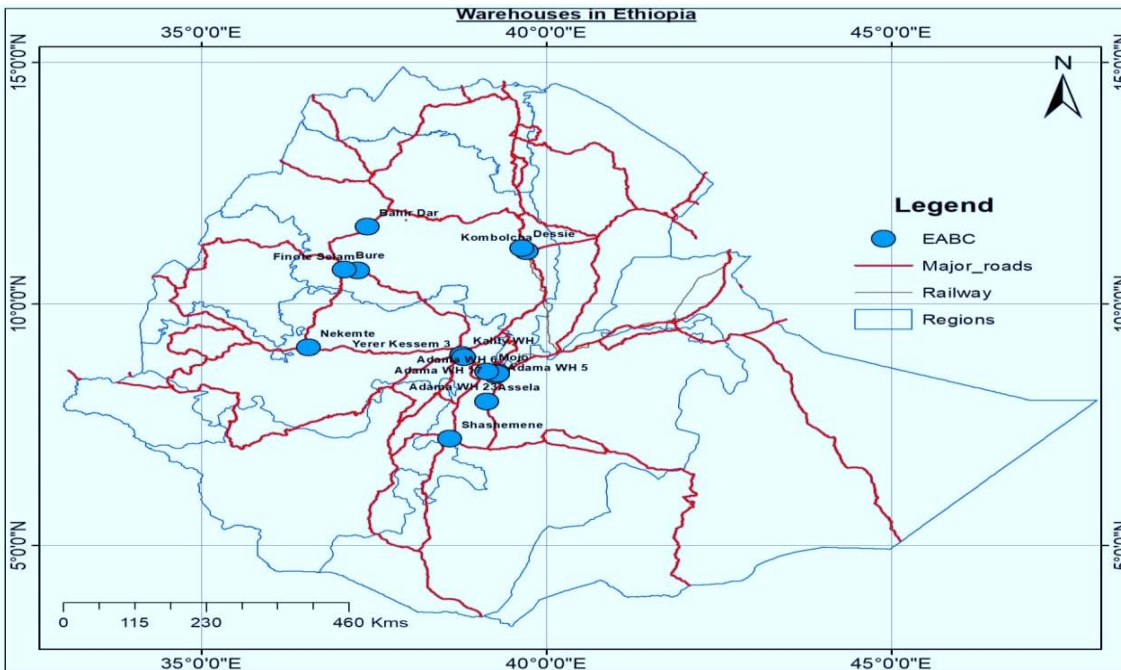
Geographic Distribution of warehouses from ETBC, Source: AAU



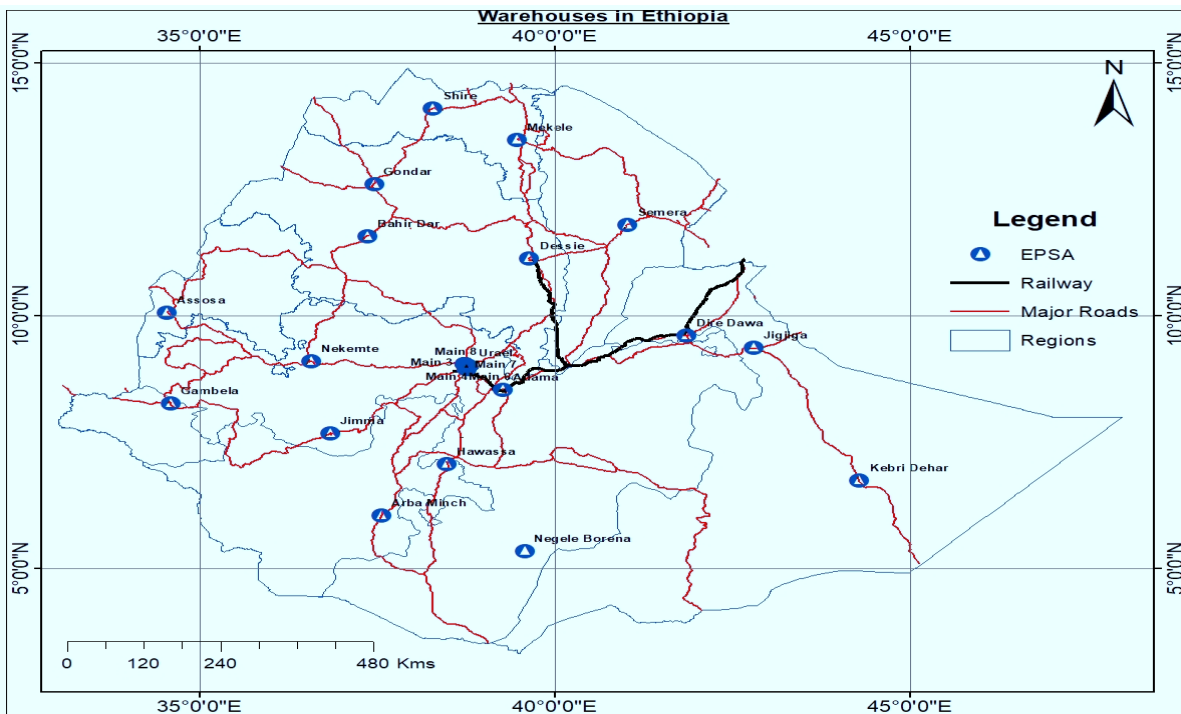
Geographic Distribution of warehouses from ECX, source: Adapted from ECX by AAU



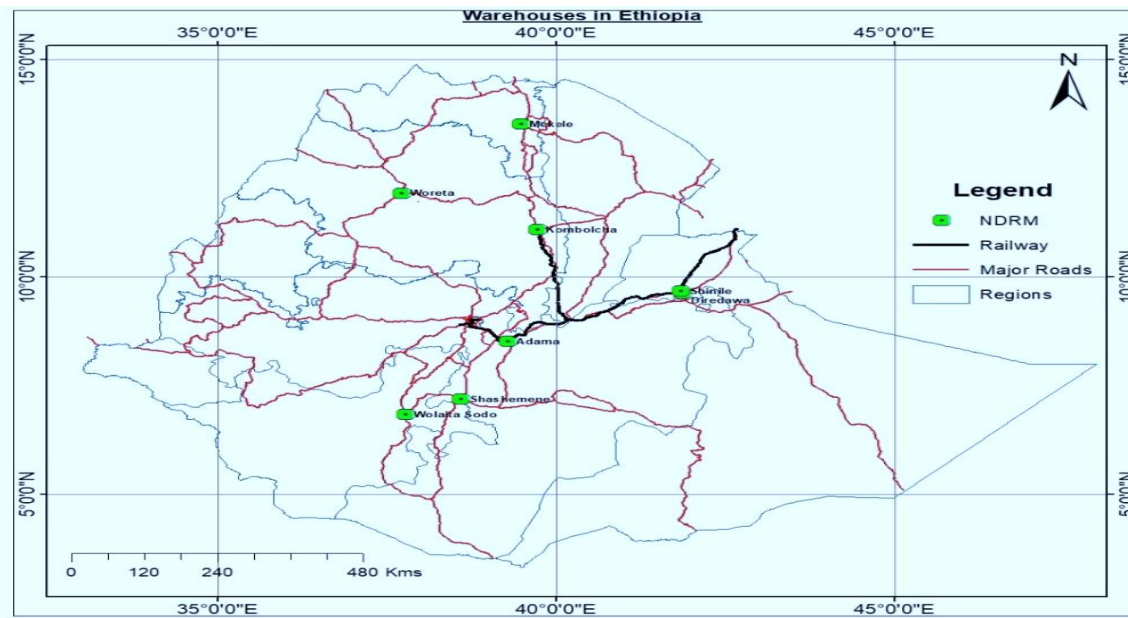
Geographic Distribution of warehouses from ESC, Source: AAU



Geographic Distribution of warehouses from EABC, source: AAU



Geographic Distribution of warehouses from EPSA, source: Adapted from ECX by AAU



Geographic Distribution of warehouses from NRDMC, source: AAU

Annex 3: Benchmarking guide

Criteria for benchmark selection	Basis for benchmark selection	Ethiopia	Kenya	Rwanda	Uganda	Egypt	Kazakhstan	India	South Africa	Tanzania	Nigeria
Availability of recent relevant data <i>Recent & best match (3), one of both (2), Moderate match (1), limited match (0)</i>	Availability		1	1	1	3	3	3	1	1	1
GDP 2020 <i>With 25% (3), within 50% (2), above 50% (1)</i>	Comparability	108	101 3	10 1	37 1	365 1	171 2	2660 1	335 1	62 2	432 1
GDP/Capita 2020 (PPP) <i>With 25% (3), within 50% (2), above 50% (1)</i>	Comparability	2423	4576 1	2214 3	2294 3	12607 1	26754 1	6503 1	13361 1	2780 3	5187 1
Population size <i>With 25% (3), within 50% (2), above 50% (1)</i>	Comparability	114.9	53.7 2	12.9 1	31.2 1	102.3 3	18.7 1	1380 1	59.3 2	59.7 1	206.1 1
Port access similarity <i>Land locked (3), double L.L (2), sea port (1)</i>	Integration potential	L/L	1	3	1	1	3	1	1	1	1
System of government <i>Semi presidential & Federal (3), one of both (2), none of both (1)</i>	Similarity		1	1	1	2	1	2	2	2	1
Exemplary practice <i>High importance (3), Moderate importance (2), Low importance (1), very low importance (0)</i>	Key lessons to learn		1	1	2	3	3	3	2	2	2
Total	Sum		10	10	10	14	14	12	10	12	8
Appropriateness for Benchmark <i>Most appropriate (MA)>13, Appropriate (A)>10, Least appropriate (LA)<=10</i>	Large sum		LA	LA	A	MA	MA	A	LA	A	LA
Decision for benchmark	Accept (A)/Not accept (NA)		NA	NA	A	A	A	A	NA	A	NA
Added reason for inclusion or exclusion	Matching, lesson, data		Limited matching lesson	Limited matching lesson	Limited matching lesson	Extensive global lesson	Special logistics lesson	Extensive lessons	Lack of fitting data	Selective lesson	Least matching peer